Literacy Studies: Perspectives from Cognitive Neurosciences, Linguistics, Psychology and Education 22

Elinor Saiegh-Haddad
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Handbook of Literacy in Diglossia and in Dialectal Contexts

Psycholinguistic, Neurolinguistic, and Educational Perspectives

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While language defines humanity, literacy defines civilization. Understandably, illiteracy or difficulties in acquiring literacy skills have become a major concern of our technological society. A conservative estimate of the prevalence of literacy problems would put the figure at more than a billion people in the world. Because of the seriousness of the problem, research in literacy acquisition and its breakdown is pursued with enormous vigor and persistence by experts from diverse backgrounds such as cognitive psychology, neuroscience, linguistics and education. This, of course, has resulted in a plethora of data, and consequently it has become difficult to integrate this abundance of information into a coherent body because of the artificial barriers that exist among different professional specialties.

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Foreword

Like the study of human behavior in general, contemporary reading science, both theory and practice, has been largely dominated by research on well-educated, monolingual English speakers learning to read their native tongue (Share, 2008) – a highly convenient but highly unrepresentative segment of the world's population (Henrich et al., 2010). Little attention, consequently, has been given to the fact that a majority of literacy learners worldwide are taught to read and write in a language or dialect that is not the same as their spoken language. Not only is this linguistic disparity or "distance" between spoken and written forms the global norm, it is probably also the most critical factor driving literacy learning, as the present volume amply demonstrates.

The dimension of linguistic distance may be regarded as a continuum of varying degrees of spoken/written divergence (Daniels & Share, 2018). At the extreme end of this continuum is the (bilingual) case of speakers of one language learning to read in a totally different language. For example, most children in sub-Saharan Africa learn to read and write in a European (colonial) language such as English, French, or Portuguese, which, at best, may be their second or third language. Slightly less extreme are diglossic situations, in which two distinct varieties of the same language exist side by side in a single (monolingual) speech community but are used for different purposes. As this volume well illustrates, a low-prestige everyday conversational dialect (or dialects) exists alongside a high prestige, typically grammatically more complex variety used in formal spoken settings and, in the case of literate communities, written settings (e.g., spoken versus literary Arabic) (Ferguson, 1959; Tsiplakou, 2020). In these cases, the spoken language is normally not written, so learning to read is tantamount to learning a rather new with significant consequences for literacy learning and assessment (Saiegh-Haddad, 2021, in this collection; Saiegh-Haddad & Armon-Lotem, 2021). Moving further along the continuum of linguistic distance is the universal phenomenon of dialectal variation, also an obstacle to literacy learning (Laing & Kamhi, 2003; Washington & Seidenberg, 2021: in this collection). Finally, situated at the point of closest proximity between spoken and written forms, but still not identical, even native speakers of the "standard" dialect used in written text will encounter new language registers when learning to

read, whether in phonology ("careful" vs. "vernacular" pronunciations, e.g., ‹exactly› /ɛgzæktliy/ vs. /ɛgzækliy/), lexicon (high-register vs. low-register forms, e.g., discontinue/stop), syntax (complex vs. simple constructions), and discourse structures (predominantly expository vs. narrative structures).

Linguistic distance, therefore, is a universal phenomenon that, in varying degrees, will challenge every reader. The evidence is overwhelming that when children learn to read written forms that diverge from their spoken vernacular, this has a profoundly detrimental impact on learning to read (August et al., 2009; Gatlin & Wanzek, 2015; Myhill, 2014; Saiegh-Haddad & Schiff, 2016).

Although numerous volumes have appeared addressing bilingualism and dialectal variation, some exploring the ramifications for literacy acquisition, most of this work has been limited to dialect variation in the North American context, such as African American or Hispanic American dialects and/or the challenges of L2 English (ELL) acquisition facing immigrants from non-English-speaking countries. The present volume provides the first wide-angled view of the global diversity in diglossic and dialectal contexts. It examines these issues in no fewer than six regions including North America, Europe, Asia, the Middle East, the Far East, and Africa, drawing on insights from linguistics, psycholinguistics, neurolinguistics, and education. Furthermore, the Handbook examines literacy development among native language speakers, immigrant populations, and heritage language speakers, addressing typically developing children as well as those with language, reading, and hearing impairments.

This volume is an essential resource for all concerned with literacy learning because every child, in varying degrees, encounters the challenges of linguistic distance.

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Introduction

It is generally assumed that learning to read involves a straightforward learning of the mappings from speech to spelling. Yet, the majority of the world's children learn to read first in a language or dialect that is not what they speak at home or in the neighborhood with their families and friends. Some of these children must learn to read first in a foreign language (e.g., Bemba speakers in Zambia learning to read in English), but many are learning to read in a dialect that shares some similarities with the formal written word but that also differs substantially from it. Positioned within an extended ecological approach to literacy development (McBride, 2016), this Handbook highlights some of the theoretical and practical issues that a mismatch between dialect and literacy requirements involves. These include a variety of linguistic aspects, but they also affect individuals demonstrably at many levels, including psycholinguistics, neurolinguistics, education, and many aspects of social interactions. A broad understanding of the interface between dialects and literacy acquisition is fundamental for all research that highlights interactions among language, literacy, and society.

How many languages are spoken in the world? How many dialects are there? While it is possible to attempt an answer to the former question, an answer to the latter is much more difficult to conceive because there are no objective boundaries delimiting the concepts of language and dialect. In other words, it is not clear when a lect/isolect (a variety) ceases to be a dialect and becomes a language; neither is it easy to specify when one dialect ends and another starts. Even though it is agreed that the distinction between dialect and language is theoretically arbitrary (Siegel, 2010), some contexts are intuitively deemed more dialectal than others. Some formal criteria proposed by linguists include social-political factors such as association with a given country ("A language is a dialect with an army and navy," Max Weinreich), as well as size, prestige, mutual intelligibility, codification, and standardization (Li Wei, 2000; Siegel, 2010). Lexical overlap is an additional criterion; according to Ethnologue (2020), there are 7117 recognized languages today (https://www.ethnologue.com/) and "lexical similarity can be used to evaluate the degree of genetic relationship between two languages. Percentages higher than 85% usually

indicate that the two languages being compared are likely to be related dialects" (https://www.ethnologue.com/about/language-info#Dialects).

Sidestepping the notoriously elusive distinction between dialect and language, an uncontested fact is that linguistic variation is a reality of the global linguistic landscape. Variation is also the hallmark of intra-personal language use (Labov, 1966, 1972; Eckert, 2000). It is estimated that "one in three of the world's population routinely uses two or more languages for work, family, life, and leisure" (Lee Wei, 2000, p. 5). If foreign languages, which are used only occasionally, are included, monolinguals become a tiny minority. Adding dialects to this tally renders monolectalism a myth. Grohmann and colleagues propose a concept of "comparative linguality" (Grohmann & Kambanaros, 2015, 2016; Grohmann et al., 2016), an approach that studies language acquisition on a gradient scale of multilingualism placing dialects on par with fully fledged languages. This approach is particularly fitting for the study of literacy acquisition in dialectal contexts because it places variations in the sociolinguistic context of language acquisition and use at the center of the study of core psycholinguistic questions about language and literacy development.

Dialectal contexts imbue the process of first language literacy acquisition with a host of sociolinguistic factors that have not been considered relevant or central for understanding variations in first language literacy acquisition. These factors include domains and contexts of language use and related affective and attitudinal factors, distribution of communicative functions, mode of acquisition, codification and standardization, linguistic distance, as well as degree and type of exposure (passive/active), age of exposure, schooling and teaching methods, transfer of skills, and others. Dialectal contexts are also rich in linguistic variation, both within and across individuals, and this variation impacts language "exposure" (Carroll, 2017), "language input environment" (De Houwer, 2017, 2018), or "language intake" (Wijnen, 2000), namely, the data that children use to extract patterns and derive hypotheses about the structure of the target language. Despite the centrality of these factors to language and reading acquisition in dialectal contexts, they have not yet attracted sufficient empirical attention.

Sociolinguistic theory distinguishes two broadly defined dialectal contexts: Diglossia and Standard-with-Dialects contexts, both different from Societal Bilingualism (Hudson, 2002). The term *diglossia* first emerged in sociolinguistic theory to describe a situation where, in a given society, there is more than one language variety in use. Charles Ferguson (1959) offered the first coherent theory of diglossia referring to Arabic as a typical example. In a diglossic context, two language varieties are used in two sets of complementary social contexts: a High (H) variety for formal contexts including reading/writing and a Low (L) variety for informal contexts such as everyday interactions in the home and the workplace. The High variety is held in high esteem; it is associated with a rich literary tradition and is the standardized form that is encoded in dictionaries and books. The Low variety is stigmatized as a literary form and is an exclusively spoken code. According to Ferguson, "in one set of situations only H is appropriate and in another only L, with

the two sets overlapping only very slightly" (p. 328). Such rigid complementarity, it is argued, should give way only to slight and insignificant overlap (Maamouri, 1998).

Several aspects of Ferguson's conceptualization of diglossia have been attacked including the dichotomous compartmentalization of H and L. Instead, the complex linguistic situation in diglossia has been described in terms of levels, or a continuum (e.g., Badawi, 1973; Basiouny, 2009). In another critique, Albirini (2016) highlights differences in diglossia in "function" rather than "context" as factors impacting language choice. He argues that despite apparent mixing in diglossia within the same context, "the two varieties are allocated to specific functions with little functional overlap" (2016, p. 20). Albirini notes that "speakers use Standard and Colloquial/Spoken Arabic to encode and index sociolinguistic functions of varying levels of importance, complexity, and seriousness. These functions are preserved within this mixture, irrespective of the context in which they occur" (2016, p. 20). In turn, it is suggested that the construct of diglossia has to be reformulated – not abandoned – based on the functional, rather than the contextual, compartmentalization of the H and the L varieties.

Apart from the controversy over contextual versus functional differentiation, Fishman (1967, 1971) argues that diglossia does not have to encompass two genealogically related varieties, a High and a Low variety, but can also refer to situations where two separate languages are used, an H language and an L language. According to this view, the most distinctive feature defining diglossia is the "compartmentalized roles," which are differentiated "in terms of when, where, and with whom they are felt to be appropriate" (1971, p. 79). This renewed configuration of diglossia encompasses many bilingual settings as well.

While Fishman's extension of the concept of diglossia has gained widespread currency, scholars warn against such a mix of terms. Hudson (2002), for instance, argues that Fishman's reformulation is problematic as the direction of language evolution in a classic diglossic context is opposite to that in the case of bilingualism. In other words, while in a diglossic context the Low variety, or at least some linguistic aspects of the Low variety, take over the outdated High variety, in a bilingual context the Low variety loses ground to the superposed High variety. By the same token, he argues that, unlike societal bilingualism or standard-with-dialects (such as Standard/Mainstream American English and African American English or Southern English dialects; Standard British English and the dialects spoken in Scotland, Wales, Ireland, and various other regions of the UK), the stratification of variation in diglossia shows sensitivity to differences in situational context (use-oriented) without much sensitivity to differences in social class (user-oriented) (Bell, 1984; Walters, 1996). In diglossia, "it is *context,* not class, or other group membership, that controls use" (Hudson, 2002, p. 6; emphasis added). In Arabic diglossia, for example, no section of the community uses Standard Arabic for ordinary conversation, and all speakers, young and old, educated and uneducated, poor and rich use the spoken variety for everyday speech. Because the settings (Ferguson, 1959) and functions (Albirini, 2016) of the two varieties are in sharp complementary distribution, at least in aspiration, the H variety does not compete with the L variety as a naturally summoned spoken variety during informal daily speech. This context

contrasts with standard-with-dialects contexts such as the African American English context in which enormous language mixing and switching are evident, reflecting the role of social identity factors such as ethnicity, SES, gender, and education (e.g., Labov, 1966; Washington & Craig, 1998).

In yet another elaboration of the concept, Snow (2013) distinguishes three categories of diglossia that are differentiated from each other by the nature of the H variety involved and the historical mechanisms which create or strengthen diglossic patterns. The first is "traditional diglossia"; it consists of diglossia in pre-modern societies where a sacred language serves as H for an entire civilization, and it is proposed that Classical Chinese, Sanskrit, Latin, and Classical Arabic be viewed as prototypes of this category. Snow (2013) argues that this category is closer to Ferguson's original description and should be viewed as the most typical manifestation of diglossia. The second category is "revived diglossia," which involves revived H varieties in which ancient languages were revived by communities in colonial contexts, as in the case of Greek and Tamil. The third is "modern diglossia" in which the H variety is a modern standard language as in German-speaking Switzerland and Hong Kong. The author argues that distinguishing these categories of diglossia sheds light on differences between different diglossic contexts in the nature and social role of the H variety, the historical and social setting, the genesis of diglossia and genetic ties between H and L, the tie of H to writing, the role of identity, the direction of change, and scale and typicality.

Despite some differences in sociolinguistic features as explicated above, both diglossia and standard-with-dialects contexts share fundamental aspects of language use, exposure, and input that might exert similar effects on literacy development. These include divided linguistic exposure, distributed linguistic and lexical knowledge, differences in age of acquisition of the two codes, mode of acquisition, and literacy support in the two varieties. For instance, divided language use implies limited exposure and input, and this has important consequences for language and literacy acquisition. Similarly, linguistic distance between the spoken and the standard written variety has implications for morpho-syntactic development, lexical representation, metalinguistic development, and reading. Finally, contextual and functional separation versus overlap can have important implications for awareness of code shifting and related aspects of literacy.

The current Handbook studies literacy acquisition at the intersection of sociolinguistics and psycholinguistics by addressing literacy acquisition in diglossia and in dialectal contexts. The Handbook emanates from an international conference organized in 2018 by Elinor Saiegh-Haddad and Lior Laks at Bar-Ilan University, Israel, under the auspices of the Israel Science Foundation (Grant number 2346/17) and the Arabic Language Academy in Israel. The conference brought together researchers from various regions across the world including Asia, Europe, the Far East, and North America to share research questions, methods, and findings on literacy development in diglossic and in dialectal contexts. The Handbook at hand features some of the talks presented at the conference in 2018 and additional chapters addressing similar questions in various other regions and languages in the world. Some of the questions that are addressed include the following: How does dialect factor into

literacy development and disorder in children? Which sociolinguistic features of dialectal contexts affect literacy acquisition? Is the role of sociolinguistic features of dialectal variation similar or different in different contexts and languages? Do different dialectal contexts differ in the settings and functions of language, and do the differences yield different literacy outcomes for children? What are the milestones of literacy development in different dialectal contexts? How should educational assessment of language and literacy address sociolinguistic features of dialectal contexts? What are the most beneficial instructional practices for children raised in dialectal contexts?

The Handbook features twenty chapters covering a variety of regions including North America, Europe, Asia, the Middle East, the Far East, and Africa. It also examines various languages including Arabic, Chinese, English, Dutch, German, Greek, Malay, Tamil, and Turkish. Furthermore, the Handbook studies the role of dialect in literacy in native language speakers, immigrant populations, and heritage language speakers. Finally, it addresses typically developing children and child populations with language, reading, and hearing impairments. The Handbook opens with some thoughts on the relations among language, dialect, and literacy by Professor Emeritus Bernard Spolsky, a pioneering researcher of literacy acquisition in spoken vernaculars (e.g., 1975). Spolsky shares major insights from many years of research, dating from the 1960s, into literacy acquisition in the vernacular in various languages including Navajo among native Indian American in the USA, Tonga in Polynesia, Guarani in Paraguay, and Māori in New Zealand. One interesting insight that emerged from this research pertains to the importance of the roles of literacy in the success of vernacular literacy programs. As such, success of literacy in a vernacular depends on whether literacy has any place in the life of speakers and whether they are ready to accept new functions to be delivered in the vernacular. Another factor is the degree of linguistic distance between the spoken and the written representation of the vernacular and the extent to which the written form of the word encodes the phonological information necessary for word identification. Spolsky illustrates this idea by referring to Navajo as an interesting case in which literacy in the vernacular probably failed because the written form of the language, which was developed by linguists, encoded disproportionate amounts of phonetic information that was unnecessary for native speakers in order to identify words in their native language.

The remaining nineteen chapters in the Handbook are organized into three sections. Part I includes seven chapters and features a discussion of some well-known dialectal contexts across the world and an outline of key language and literacy questions and findings in the respective contexts. The first chapter in this cluster (Chapter "Language and Dialect of African American Children"), by Julie Washington and Mark Seidenberg, addresses the Standard-with-Dialects context of African American (AAE) English speakers in the USA, focusing on sources of variation in literacy development in this context and on dialect density in particular. The authors note that more is known about the specific surface features of AAE in children than about how and/or when these features develop or the variables that may influence dialect use beyond the very early years of language development.

Chapter "The Sociolinguistics of Diglossia in Switzerland" by Agnieszka Stępkowska offers an overview of the sociolinguistics of the diglossic situation in German-speaking Switzerland and consequences for literacy. The Swiss-German context in the German parts of Switzerland has been referred to by Ferguson (1959) as a typical diglossia. Stępkowska explicates the sociolinguistic features of diglossia in this context, discussing the functional allocation of two language varieties within one society, the circumstances of language acquisition, and the differences between standard language usage and dialect. She notes that the functional distinction between the H and L varieties in Switzerland is less clear-cut than originally suggested by Ferguson and that Ferguson's assumption about speakers switching between dialect and standard is based on the belief that, in addition to their dialect, speakers are fluent enough in the H variety. The compartmentalization of language use and, subsequently, the lack of practice in Standard German, together with the multiplicity of spoken dialects, the availability of literary works written in Swiss German dialects, and the positive attitudes that speakers have toward Swiss German dialects as symbolizing "Swissness" all define the peculiarities of this specific context and consequences for literacy.

Chapter "Literacy Development in Cyprus: Exploring the Effects of Diglossia and Bilectalism" by Stavroula Tsiplakou, Maria Kambanaros, and Kleanthes K. Grohmann outlines the sociolinguistics of the diglossic context in Cyprus. These authors analyze the linguistic structure of Cypriot Greek vis-à-vis Standard Greek and discuss research on child language and literacy development and disorder in this context. The chapter elucidates what may be one of the idiosyncratic properties of diglossia in Cyprus, namely, that the official educational policies do not formally allow the use of the dialect in the classroom. This, it is argued, produces enhanced early exposure and use of the standard, resulting in mixed linguistic input. Notwithstanding educational policies prohibiting use of the dialect, the authors note that the dialect is present in the classroom, and they offer data revealing that teachers are aware that they code-switch. In turn, they argue for a third variety in use in the classroom besides Standard Greek and Cypriot Greek. This is Standard Cypriot Greek used mainly in teacher-student interaction. Despite the linguistic richness that this context offers, the authors state that mainstream education does not capitalize on language variation and that "Greek education in Cyprus still remains (at least ideologically) monolectal."

Chapter "Diglossia and Children's Literacy Acquisition in South Africa" by Michele Pascoe discusses diglossia and children's literacy acquisition in South Africa. The author reviews research on diglossia and its influence on South African children's literacy and language learning. The chapter reveals variability in how diglossia is conceptualized in the context of South African schools with some authors understanding diglossia with English as the H variety and other languages as L, whereas others view it as diglossia with two different language varieties contrasted. The chapter synthesizes research on the role of diglossia in language and literacy development in South Africa and contemplates the challenges that this multiply diglossic context presents for children and educators.

Chapter "Linguistic Diversity: Basic Concepts and Implications for Reading Research" by Natalia V. Rakhlin and Elena L. Grigorenko takes a global perspective and addresses linguistic diversity across the world and its implications for literacy. The authors discuss the challenges that linguistically diverse societies experience in meeting the educational needs of their people. Using global adult literacy rates, they explore the relationship between linguistic diversity and literacy by examining respective contributions of a country's Language Diversity Index and its economic wealth (GNI per Capita) to its literacy rate. The authors bring home the idea that linguistic landscapes in multilingual societies are complex and yield challenges that arise out of an intricate web of interrelations among languages, their speakers, and the institutions, cutting across economic, political, and social lines. In the face of these challenges, they stress the importance of maintaining local languages as a way of enhancing the learning of additional languages.

Chapter "Diglossia in Chinese? It's Complicated" by Leo Man-Lit Cheang and Catherine McBride compares language-and literacy-learning in Hong Kong and Beijing. Cantonese is the native spoken language for the majority of the population in Hong Kong. In Beijing, the language of oral communication is Mandarin. The grammar and syntax of written Chinese across both cities closely resemble the oral language of Mandarin. As a result, Hong Kong children struggle with a mismatch between the language of text and their spoken language, Cantonese. Contrastingly, Beijing children tend to speak in Standard Mandarin, which is almost identical to standard written Chinese. The authors use these differences in the distance between the oral and the written language, as well as empirical data from children's language and literacy performance and parent-child language interaction to ponder factors that govern literacy development in the two cities.

Chapter "A Psycholinguistic-Developmental Approach to the Study of Reading in Arabic Diglossia" by Elinor Saiegh-Haddad outlines Arabic diglossia at the intersection of sociolinguistics and psycholinguistics. The author discusses the principles of a psycholinguistic-developmental approach to the study of reading acquisition in Arabic diglossia. She explicates the basic concepts, assumptions, methods, and findings of this approach, which focuses on the role of linguistic distance between the spoken dialect and the standard written language on oral language metalinguistic processing skills and on word reading ability in childhood and adolescence. The author highlights the main theoretical insights that have been gained from this approach for the study of reading development in Arabic diglossia and various educational implications.

Part II incorporates six chapters featuring specific psycholinguistic and neurolinguistic research studies that investigate the role of dialect in language and literacy learning. Chapter "Literacy Acquisition in a German Dialect: A Behavioral and EEG Study in Swiss-German and Standard German Speaking Children" by Jessica C. Bühler and Urs Maurer reports three studies investigating the behavioral and neural mechanisms that underlie reading acquisition in children in German-speaking Switzerland. The evidence from the three studies reveals a complex picture whereby dialect has a negative impact on Grade 1 reading and spelling outcomes but a positive effect on pre-school literacy-related skills. Studying the neural reality of the

impact of lexical and phonemic distance on semantic processing, the authors reveal an intricate and complex relationship between specific aspects of dialect and their impact on language processing. In a novel methodological model, they combine behavioral and neural mismatch measures as predictors of literacy.

Chapter "About the Neural Basis of Arabic Diglossia: Behavioral and Event-Related Potential Analysis of Word Processing in Spoken and Literary Arabic" by Asaid Khateb and Raphiq Ibrahim discusses brain-based data on word processing in Spoken Arabic and Standard Arabic. The question addressed is whether Standard Arabic functions as a second language and whether diglossia represents a particular form of bilingualism. Based on a synthesis of research, the authors argues that the cognitive status of the spoken and the standard language in Arabic diglossia is not general but modality-specific. In particular, literate native speakers of Arabic, who master the use of both language varieties, function as if they had two first languages: one in the auditory modality (the spoken variety) and one in the visual written modality (the standard variety).

Chapter "A Longitudinal Comparison of Spelling and Reading Comprehension of Bidialectal and Monolingual Dutch Speaking Children in Primary School" by Leonie Cornips, Jetske Klatter-Folmer, Trudie Schils, and Romy Roumans reports a study of spelling and reading development in bidialectal Dutch speakers of the Limburgish dialects and monolingual Dutch speakers. The study compares monolingual and bidialectal children in the Netherlands on spelling and reading comprehension in Dutch at two time points during primary school (grades 2 and 6) and reveals a complex picture. One interesting finding relates to a head start for the bidialectal children in the second grade that is no longer evident in grade 6. The authors attribute the initial advantage in the bidialectal groups to the structural correspondences in the sound structure of Dutch and Limburgish and associated effects on phonological awareness, in addition to the high percentage of cognates and their corresponding effect on lexical-phonological awareness, as well as the use of phonics to teach reading.

Chapter "Between Varieties and Modalities in the Production of Narrative Texts in Arabic" by Lior Laks and Elinor Saiegh-Haddad asks whether modality (oral vs. written) and variety (spoken vs. standard) may be differentiated in the case of Arabic diglossia. Using data from the oral narratives produced by Arabic-speaking children and adults, they show that variety distinction in Arabic is functionally different from modality as reflected in the distribution of verbal patterns and in the voluntary use of syntactic case markers. This finding reveals sensitivity and accomodation of the language used by speakers to variety and modality and supports the differentiation between the two in understanding language development and use in diglossia.

Chapter "Acquiring Literacy in the Diglossic Contexts of Malay and Tamil in Singapore: Problems and Prospects in Early Childhood Classrooms" by Malikka Habib, Nur Artika Arshad, and Beth Ann O'Brien reports a study of early spelling development in the diglossic context of Malay and Tamil in Singapore. Tamil has two varieties, namely, a literary H variety used in classrooms and a colloquial L

form that is learned naturally in the home and community. Malay is also diglossic. As the traditional lingua franca of Singapore prior to its national independence in 1965, a spoken variety for Malay was established that is still in use today. However, a standard spoken form of Malay, Sebutan Baku, was introduced by the Ministry of Education in 1993 to increase proficiency in the language. This standard form of Malay is used today in formal settings such as schools, while in the private sphere Non-Standard Malay remains the norm. The authors study spelling in speakers of Tamil and Malay with a special focus on the role of diglossia and linguistic distance. This study reports counterintuitive findings and raises interesting questions. The study did not reveal a significant correlation between the extent of nonstandard speech in children and reading or spelling skills. Yet it is noteworthy that nonstandard speech occurred in only 20% and 29% in Malay and Tamil, respectively. Moreover, the teaching method used in Singapore, as the authors argue, is one that stresses standard speech in the classroom and explicitly points out the differences between the standard forms and their spoken counterparts, hence increasing children's metalinguistic awareness skills and code-switching. Relatedly, the authors describe a trend referred to as "reversing diglossia" according to which more English is spoken at home at the expense of non-standard Malay. All this demonstrates the complexity of diglossic contexts and the interactions among linguistic, sociolinguistic, and educational factors in impacting reading and language skills development in diglossic contexts.

Chapter "Reading and Writing in a Diglossic Context: A Multifaceted Perspective" by Aula Khatteb Abu-Liel, Raphiq Ibrahim, Bracha Nir, and Zohar Eviatar examines an exciting orthographic-linguistic phenomenon in Arabic that prevailed a decade or so ago and in which Arabic speakers around the world used Latin letters to write their spoken Arabic dialects. This written form was referred to as Arabizi. The study examines the writing practices, perceptions, and attitudes for Arabizi as against Standard Arabic, the default written language, as well as literacy skills and abilities in Standard Arabic and Arabizi. One interesting finding of this study relates to the positive attitudes that users had toward Arabizi that were coexistent with a sense of pride in the standard language, feelings of obligation to it, and even responsibility to preserve it. The study additionally reports on other interesting findings pertinent to reading skills in Arabizi as against vowelized and unvowelized Arabic orthography.

Part III explores language and literacy in special contexts and populations with a particular focus on assessment and instruction. This section includes six chapters. The first chapter by Abdulkafi Albirini and Elabbas Benmamoun (Chapter "Arabic Diglossia and Heritage Arabic Speakers") focuses on diglossia in the context of heritage speakers of Arabic in the USA. Interestingly, the authors argue that one important aspect of this context is the *diglossia-less* situation in which they live. They review research on the specific characteristics of this population's knowledge of the two varieties and how it contrasts with their counterparts in the Arabic-speaking world, noting features of language incompleteness, attrition, and loss of

various grammatical structures. The authors discuss the status of Standard Arabic vis-à-vis Spoken Arabic and the implications of this for language development in this special context.

Chapter "Assessment of Developmental Language Disorders in Bilinguals: Immigrant" by Chilla Solveig reports a study of assessment of developmental language disorder (DLD) among speakers of Turkish dialects in Germany. Using a sentence repetition task as a diagnostic tool for DLD, they show that linguistic differences between the Immigrant Turkish (IM) dialect and Standard Turkish result in inaccurate repetitions. Given that IM speakers lack access to a "high" L1-variety, the authors discuss the implications of these findings for the construction, the scoring, and the outcome of Turkish standardized language tests.

Chapter "Children with Hearing Impairment in a Diglossic Context – The Case of Palestinian-Arabic Speaking Children" by Rama Novogrodsky and Nardeen Maalouf-Zraik is a study of language skills development in Spoken and Standard Arabic among children with hearing impairment. It is argued that for children with hearing impairment, both Standard and Spoken Arabic are acquired rather explicitly. The study compares language skills as reflected in narrative micro and macrostructure in the two language varieties. The study reveals language deprivation in both varieties when children with impairment are compared with their hearing peers. It also shows no significant skill differences between the two varieties in the hearing-impaired children. This is an interesting finding that might be related, as the authors argue, to the written language support that the standard variety gets in language development in this population as against the spoken variety which lacks this support. The authors also argue that their findings seem to suggest that Standard Arabic skills, in this population, can facilitate the acquisition of Spoken Arabic.

Chapter "Impact of Nonmainstream Dialect Use in Language Assessment with Young African American English-Speaking Children" by Ryan Lee-James and Lakeisha Johnson discusses issues in language assessment with young speakers of African American English (AAE). The chapter addresses the theoretical and practical conundrum associated with the overlap between clinical indicators of language impairment, the language profile of children reared in poverty, and the typical linguistic profile of AAE speakers addressing two unresolved clinically motivated questions. The first pertains to the specific aspects of language that should be targeted in assessment given the overlap in expressive language profiles of disadvantage, difference, and disorder. The second relates to evidence-based recommendations for African American children and children from economically disadvantaged backgrounds.

Chapter "Assessing Diglossic Knowledge and Awareness in Language and Literacy: Pilot Results from the Syria Holistic Assessment for Learning (SHAL)" by Reem Khamis-Dakwar, Karen Froud, Carly Tubbs Dolan, and Clay Westrope is a study of reading assessment in Arabic-speaking Syrian refugees in the USA. Based on data from the Syria Holistic Assessment for Learning, the study targets the contribution of refugee children's knowledge and explicit awareness of diglossia to

their literacy and numeracy skills. The study reports promising data regarding the role of explicit awareness of diglossia in Arabic to predicting literacy outcomes in children.

Chapter "Theory-Based Approaches to Language Instruction for Primary School Poor Readers Who Speak Nonmainstream American English" by Brandy Gatlin-Nash and Nicole Patton Terry focuses on instruction and examines the contribution of different approaches to language instruction for young children who speak nonmainstream American English (NMAE). The study examines the contribution of instructional approaches that vary in explicit emphasis on spoken dialect variation: These are (1) instruction using contrastive analysis to teach children to say and write standard versus nonstandard forms (Contrastive Analysis condition) and (2) instruction using oral language instruction to improve children's morphological awareness on forms that do not contrast between the two varieties (Morphological Awareness condition). The results showed that instructional approaches that include both components produced gains in spoken NMAE use as well as improved morphological awareness. These findings highlight the role of both dialect-informed instruction and metalinguistic awareness in the spoken nonstandard variety in enhancing reading and language outcomes.

The chapters featured in this Handbook reveal that diglossia and dialectalism are fluid concepts and are complex and multifaceted. The various language varieties used in diglossia and Standard-with-Dialects contexts may be placed as points on a tridimensional continuum of linguistic structure, sociolinguistic properties, and psycholinguistic reality. Structurally, different varieties vary on a dimension of linguistic distance with the standard language (and probably structurally close idiolects) on one end of the continuum and the most distinct dialects in lexical and grammatical features on the other. In addition to linguistic distance, language varieties also vary along a multifactorial sociolinguistic dimension that includes parameters of language use, language functions, exposure, input, mode of acquisition, age of acquisition, schooling, written materials support, teaching methods, attitudes, and other sociocultural and socio-educational factors. In addition to structural and sociolinguistic dimensions, differences also exist along a psycholinguistic dimension that captures the psycholinguistic reality of dialect as it is manifest in language representation, language processing, and language acquisition. The triangulation of structural-linguistic, sociolinguistic, and psycholinguistic approaches to L1 literacy acquisition in dialectal contexts, which the current Handbook illustrates, provides a window onto this multifaceted phenomenon.

Given that the majority of the world's children learn to read in a context that includes diglossia, dialectalism, and multilingualism, much more of an understanding of the complexities of these contexts is needed. The various perspectives offered in this Handbook underscore some of the most important issues in the field of literacy in relation to diglossia and dialectalism. We hope that this Handbook contributes critically to inquiry that will benefit our children's well-being and their prospects for success. Great thanks are extended to all contributors for sharing their

research and insights. We look forward to much more excellent research on the intersection of diglossia, dialectalism, and literacy learning across diverse contexts around the world in the years to come.

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Some Thoughts on the Relation Between Language, Dialect, and Literacy

Bernard Spolsky

Literacy, like writing, is quite new: it has been around only five to six thousand years. As a result, "there is no brain area specialized for writing, but rather … writing relies on some basic abilities that existed long before writing was invented ('pre-adaptations'). Prewriting was initially a visuoconstructive and ideomotor ability, and only later did it become the language-related ability of writing" (Ardila, 2018). Nor is it certain how long the importance of the present form of literacy will last: reading written or printed text is being squeezed out by the computer's ability to communicate aurally and visually. But since its development, mastering one of the various developing systems has been a key skill for those who wish to function in the literate world.

Writing was invented more than once, but most systems are adaptations of a few early models, the Sumerian cuneiform, the Egyptian and the Cretan hieroglyphs, the Chinese logographs and the Olmec and the Maya script. The earliest alphabetic systems, Proto-Sinaitic or Canaanite emerged between 1850 BCE and 1550 BCE, and developed about 1000 BC into the Phoenician and Semitic systems from which Western alphabets evolved. Alphabetic systems spread throughout Europe and Asia, and were brought to Africa and the Pacific by missionaries and colonial governments. In Polynesia, missionaries started to teach writing about the beginning of the nineteenth century – Martin (1817) has a fascinating account of a sailor who taught Tongans about literacy. In North America, too it was taught to Native Americans by

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missionaries, though there were later indigenous systems created (often reported to be in dreams[1]) like the Cherokee syllabary invented by Sequoyah about 1815.

Of the various systems, the alphabetic scripts have an advantage in that they reflect more or less the sound system of the spoken language, but they generally leave gaps in the representation that makes them impossible to read without being taught: they require proficient speakers of a language to fill in missing details.

Teaching reading then involves showing the complex relationship between the written language and the spoken. For example, because unpointed Hebrew (the default orthography) is written except in children's books and prayerbooks without vowels, it takes time for learners to connect what they are reading with the language they speak. Modern Standard Arabic, the basis of the written variety, is sufficiently different from the spoken varieties to make learning to read extremely difficult (Saiegh-Haddad, 2003, 2017, 2018). Languages like Chinese, where there is a major gap between the Mandarin used for writing and the topolects (Mair, 1991) like Cantonese and Hokkien, and where the logograms give minimal phonetic information, require a learner to acquire each new character separately; for functional literacy, one needs to know about four thousand characters (DeFrancis, 1984). For this reason, a form of Mandarin in Latin letters called Pinyin is used for initial literacy teaching and for computer input (Spolsky, 2014). Indeed, in a recent piece on *Language Log* (March 11 2019), Victor Mair described the emerging digraphia, with Chinese who have learned alphabetization through Pinyin or English, choosing it for "phonetic annotation, ordering of lists and dictionaries, semaphore, Braille, telegraphy, road signs, brand names, international documents (e.g., passports), computer input and other types of information technology and processing, designation of items in archeological research, armament types and manufacturing designations, banking, and so on and so forth," while characters maintain their place.

Learning to read without previous knowledge of the spoken language that writing represents is difficult. One intriguing exception is the fictional Tarzan of the Apes, who, Householder (1971) noted, worked out that these "little bugs" in the book he found formed meaningful wholes. He later learned to speak. Many colonial educational systems ignore the fact that learning to read an alphabetic script depends on knowing the language it represents. They teach a standard language that children do not speak to children who speak a non-standard variety or dialect (Walter & Benson, 2012). This is not impossible, but inefficient: during the period that they were no longer spoken, Hebrew and Latin literacy depended on early and long teaching, although in the case of Hebrew, children had already learned to recite blessings in the language.

The system for writing the Navajo language reveals another interesting problem, for it chooses to mark features that turn out be unnecessary (Holm, 1972), making it harder to learn to read and very difficult to write. The first system for writing Navajo was the early twentieth century work of Franciscan missionaries, who failed to note the relevance of tone (Franciscan Fathers, 1910). Other writing systems for

[1] See Cooper (1991) for details of writing systems invented through dreams.

Navajo were developed by Protestant missionaries (Austin-Garrison et al., 1996) and by an anthropologist Gladys Reichard (1974). None of these systems were practical, omitting key features and requiring a number of special alphabetic symbols. In 1937, John Harrington, a linguist in the Bureau of American Ethnology, was assigned to develop a practical orthography; he worked with two young men, one a Navajo (Willie Morgan) and the other a graduate student (Robert Young).[2] The new system was used to teach literacy and in the Navajo newspaper published during the war (Holm, 1996); it was adopted also by the Wycliffe Bible Translators for their translation of the Bible (Wallis, 1968). In an empirical study in 1972, Holm (1972) showed that the marking of length, tone and nasalization were not needed for reading by native speakers, and made the learning of writing more difficult. However, the proposed modification was rejected by teachers and churchgoers, for whom the system was already considered "God's language." The difficulty of the Navajo writing system probably contributed to the rapid language loss that occurred in the latter part of the twentieth century (Spolsky, 2002).

But perhaps a stronger cause of the shift from Navajo to a variety of English and the earlier failure to develop the written language was that there were no social communicative tasks that written Navajo could fulfill, so that writing in English was believed to be appropriate for the tasks introduced by American conquest – newspapers, official and legal documents, communication with the Bureau of Indian Affairs, and of course schooling. (Young, 1977). Although a replication (Holm & Holm, 1990; Rosier & Holm, 1980) of the Chiapas study showed the value of teaching children to read in their own language first (Modiano, 1973), it was, I suspect, the failure of written Navajo to fulfill a needed purpose that interfered with its widespread acceptance.

To sum up the story of written Navajo, there were several factors working against it. Literacy had no place in traditional life; there were no chiefs or traditional tribal organization before both were introduced by the US government in order to give away mineral rights; there was no automatic respect for seniors or elders; and social life was restricted to occasional traditional religious events; visiting a neighbor was uncommon. The Navajo writing system developed by Anglo linguists was biased to help non-speakers by adding diacritics for length, tone and nasalization, all phonemically predictable for a native speaker. Literacy was associated with modern jobs, school, religion, towns, modern life and therefore was in English. And concern for language maintenance was low.

When this became clear (Spolsky, 1974), we thought it would be useful to look at a number of other cases of the introduction of literacy in the vernacular (Spolsky et al., 1983a, b). Among the cases we studied, Guarani in Paraguay showed a similarity to Navajo (Engelbrecht & Ortiz, 1983); a Native American language still widely spoken, especially in the countryside, but regularly mixed with Spanish in the cities, Guarani was seldom written, except in the publication of folk songs.

[2]Young and Morgan were the editors of a Navajo dictionary (Young & Morgan, 1943) which not only standardized the language but also provided strong basis for studying its structure (Holm, 1996).

Tonga (Spolsky et al., 1983a, b) provided a contrasting case, exemplifying the Polynesian rapid acceptance of literacy in the local spoken variety. Particularly relevant was the account of the time spent in preliterate Tonga at the end of the eighteenth century by a shipwrecked English sailor who demonstrated literacy to a powerful chief: the chief immediately saw how it could be used to send out messages to other villages or to carry on secret affairs with married women (Martin, 1817). When missionaries arrived a few years later, Tongan literacy was quickly adopted by chiefs and others; by the middle of the nineteenth century, books were being published in the language, and when we visited a century later, the main edition of the local weekly newspaper was in Tongan. A bilingual edition had sold well, especially in Tongan diasporas, during the major hurricane in 1981, but the editor told us that the King insisted that most news should be in the Tongan edition and that the English version be shorter. And we were told that letters were still being written by high school students to arrange weekend meetings.

A similar rapid acceptance of vernacular literacy occurred with Māori in New Zealand, so that a school textbook was published in the nineteenth century to teach English to children who could already read their own language (Colenso, 1872), and there was more published in Māori than in English by the end of the century (Spolsky, 2005). Thus, in Polynesia, the literacy introduced by missionaries was rapidly accepted and developed. In New Zealand, though, the missionary schools were closed and replaced by English-medium government Native Schools (Simon, 1998) which started a process of language shift that led to the situation that Benton & Smith (1982) found in the 1970s when there was no longer intergenerational language transmission. But, for more than a century, literacy in Māori had flourished and a movement to restore it has been successful (Spolsky, 2009).

This evidence suggests the importance of the roles for vernacular literacy. Another important factor is the relation between the spoken and written varieties. A language pattern that is detrimental to the teaching of reading is diglossia, where there is a gap between the standard written language and the spoken vernacular language or dialect. Ferguson (1959, 1991) defined diglossia as a situation where two versions of a language had distinct functions: the H (or high) variety is used in formal situations and writing, and the L (or low) variety is the spoken variety and not normally written. He identified some examples: in the German-speaking cantons of Switzerland, High German was the H variety and Swiss German the L; in Haiti, it was French and Haitian Creole; in Greece the literary variety was *katharévusa* (favored by the colonels, the military junta between 1967 and 1974) and the vernacular was *dhimotikí;* and in the Arab world, the H variety is Classical or Qur'anic Arabic and L are the various regional dialects.[3] In all of these cases, it is the written variety and not the spoken that is the basis for literacy.

The case of Arabic, with a long history of Classical Arabic literacy and the high status promoted by belief in the religious centrality of the Qur'an, produces a great

[3] Fishman (1967) extended the definition to cases where the two varieties were not related, so it included Yiddish and Hebrew in Jewish communities and Spanish and Guarani in Paraguay.

challenge for teaching literacy, for children do not know the variety in which literacy has been established, something to which Maamouri (1998) drew attention and which Saiegh-Haddad has further demonstrated (For a review , see chapter in this collection). Whereas Heath (1983) has shown that one of the most effective methods of teaching about literacy is to read to children, this was blocked for Arabic by the fact that children do not know many of the Classical Arabic words used even in books for children.

One of the complications of teaching literacy is the common gap between the standard variety of a language used in the written language and the home dialect that children grow up speaking. Perhaps the most extreme version of this is the case of Chinese, for the written version is based on Mandarin (proclaimed as Putonghua, the common variety, by the People's Republic of China) and the spoken varieties such as Cantonese, Hokkien, Hakka. These varieties are not mutually comprehensible with each other or with Mandarin; they are called *fānyán* in Chinese, commonly mistranslated as "dialect"; Mair (1991, 2013) suggests rather they should be considered topolects, for they are virtually separate languages.[4] To learn to read, then, a speaker of Cantonese must in effect learn Mandarin, but is able to do this while pronouncing the characters as though they were Cantonese. This supports the argument that all the topolects are Chinese, something that has been asserted for two millennia. Another intriguing case is Norwegian, with its many local spoken dialects. Since the late nineteenth century, there has been controversy over which writing system to use. Two were made official in 1885, one called *Bokmål*, a city variety closer to the Danish which had been the official language for many years, and the other called *Nynorsk*, built more on country dialects. School children were expected to learn both, but teachers were warned not to interfere with the local dialect (Haugen, 1966; Trudgill, 1978). Arabic, with its regional dialects and its distinction between city, country and Bedouin varieties, is still tied to a writing system developed for the Qur'an, setting a major challenge to the child learning to read.

There continues to be controversy over the influence of dialect on learning to read. Snell & Andrews (2017) report a minor effect of a regional dialect on learning to read. A Swiss study (Bühler et al., 2018) found some initial disadvantage for dialect speaking children, made up for by the development of better metalinguistic skills. A recent study of speakers of African American Vernacular English (Washington et al., 2018) showed that higher dialect density is associated with slower learning to read. Another study (Craig et al., 2009) showed that AAVE speaking children who shifted to standard American English outperformed children who did not shift. Overall, the studies show a variable but measurable influence of speaking a dialect and learning to read the standard language. The observed differences between different languages and contexts may be attributed to differences in degree of linguistic distance and to the distribution of language functions and use.

Moving beyond the influence of sociolinguistics on literacy acquisition, there is a need to explore the major effect of technological developments, and in particular

[4] There eight topolects, each with half a dozen or so dialects (Mair, 1991).

the development of smart phones and Ipads. It was for a while assumed that computers would lead to the spread of English, but now it is possible to "write" in most languages. In early stages, there was a tendency to use the Latin alphabet for most varieties, but soon the greater choice allowed one to input text in a vast range of alphabets, so that one could even handle non-standard dialects. Educators are starting to realize the importance of access to digital technologies in developing literacy; it is a rapidly developing field, and is starting to allow for easier and more flexible connections between language, dialect and literacy (Fraillon et al., 2014).

Summing up, we must accept the complexity of factors that hinder and encourage the acquisition of reading skills and literacy in the multilingual societies in which we live. It is important to realize that children's language repertoires might well be different from and not include the standard variety in which reading is normally taught. The home language and the school language may be different, and the home and the school may have different attitudes to literacy. Developing a child's literacy is not just teaching skills of recognizing letter-sound correspondence, but needs to take into account the differences in language and dialect and in attitudes to the written word. The task will be made simpler by wise exploitation of new digital technologies.

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Part I
Dialect and Literacy Interfaces: Theoretical and Empirical Insights

Language and Dialect of African American Children

Julie A. Washington and Mark S. Seidenberg

Language development is among the most widely-studied issues in the cognitive, developmental, and communicative sciences. Yet for children whose language systems differ from the established standard we know relatively little about how language variation changes beyond the elementary school years, as children enter secondary school and then adulthood. For African American children, in particular, much of our knowledge of oral language variation is focused on very young children, with a growing body of knowledge emerging about school age children, through approximately 11 years of age. Sociodemographic variables such as poverty, gender, and cultural differences have been identified as important to consider for their impact on language and academic development. However, when poverty, in particular, intersects with cultural language variation our knowledge base includes very little depth, resulting in many unanswered questions about language variation in general and about the development of general language ability in particular. African American children are disproportionately poor (Fass & Cauthen, 2008) so this is an important omission in our knowledge base. What do we know about linguistic variation and development? What do we still need to know? This chapter presents an overview of African American English (AAE) in children with these two guiding questions in mind. Although AAE is one of the most studied dialects of American English we know more about the discreet, surface features of AAE in children than we know about how and/or when these features develop or the variables that may influence dialect use beyond the very early years of language development. The absence of a data-based understanding of AAE from a longitudinal or

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lifespan perspective impacts, indeed impedes, development of valid and reliable assessments, interventions and expectations for children and youth who speak AAE.

1 What Do We Know?

1.1 Speaking a Dialect

The term "mother tongue" is most often used to refer across languages to a child's first, home language (L1) compared to the second language (L2), which the child may learn outside of the home or community in which they live. Goodman (1965), however, asserted that in the case of within language variability, the dialect that a child learns to speak at home is the child's "mother tongue" (D1) (Goodman, 1969). By implication dialects acquired outside of the home and community may be regarded as the child's second dialect (D2) (Goodman, 1969; Siegel, 2010). This is an important distinction because for many children who speak a dialect, D2 will be the mainstream variety that is first encountered outside the home upon entry into schooling, and they must acquire sufficient proficiency with D2 in order to access text and to support learning. Many children who speak a dialect have limited access to, knowledge of and, proficiency with D2 prior to entering school. Acquisition of D2 for these children can make the difference between academic, social, and employment success or failure. Indeed, the imperative for the child is to learn D2 sufficiently to manage schooling, employment and to interact verbally with strangers outside of the community (Siegel, 2010).

A child's D1 may differ from D2 among several linguistic domains (i.e., morphology, syntax, phonology, semantics, pragmatics), requiring a broad shift in language use when entering a new language context. This is the case for many African American English-speaking children for whom it has been documented that D1, African American English (AAE), presents striking differences from D2, General American English (GAE), in all five domains of language (i.e., syntax, morphology, phonology, semantics and pragmatics) (Washington & Craig, 1998; McWhorter, 1997; Szmrecsanyi & Kortmann, 2009; Antoniou et al., 2016; Stockman, 2010). These differences are particularly evident for children growing up in poverty, whose dialect use is significantly more dense than that of their middle income peers, (Washington & Craig, 1998) often complicating the development of important language-based competencies such as reading and writing which depend upon knowledge and use of the established, literate standard.

Siegel (2010) in his seminal book 'Second Dialect Acquisition' (Siegel, 2010) noted that acquisition of D2 is typically easier than learning a second language. Dialects are variants of the same language (e.g., English) and thus share more properties than two different languages (e.g., English and Spanish). Moreover despite their differences dialects, unlike languages, are thought to be "mutually intelligible." McWhorter (1997) has argued that the differences between AAE and the

established, or general, dialect are not substantial enough to present significant challenges for children or adults (McWhorter, 1997). Accordingly, no formal 'bidialectal' instruction is offered to dialect speakers in schools, but only to bilingual children transitioning from one language to another. Thus, dialect speakers are required to engage in what Siegel refers to as "naturalistic' acquisition of D2 without the benefit of formal teaching.

The validity of these assumptions is questionable. Dialects of English vary in how much they differ from the general variety and from each other (Szmrecsanyi & Kortmann, 2009). AAE speakers vary in the extent to which they use AAE features; thus the relationship between a speaker's AAE and the general dialect varies along a continuum, affecting the degree of "mutual intelligibility." Conversely, languages also vary in degree of overlap; closely-related languages such as Italian and Spanish may facilitate learning and communication in the manner usually ascribed to dialects.

Antoniou et al. (2016) referred to dialects as minimally distant and genetically related varieties of the same language. The combination of substantial overlap plus important differences between dialects creates a learning problem that differs from the bilingual case but is challenging nonetheless. The typological closeness of these varieties requires at minimum that bidialectal children learning language recognize and contrast within language variation between D1 and D2 in order to become proficient users of both varieties (Antoniou et al., 2016). This is not an easy task. Some children accomplish this acquisition with ease, while others struggle to develop proficiency with D2. Among AAE speakers, this struggle frequently characterizes acquisition of D2 for children growing up in poverty who as a result of their impoverished environments, are more socially isolated and thus have very little exposure to D2 in their day to day lives outside of schooling environments (Stockman et al., 2008).

The following sections present the current state of our knowledge of African American English, common sources of variation, its impact upon reading and writing development, language assessment and identification and diagnosis of language impairments. Finally, we will suggest future directions for the study of AAE across the lifespan, including improving our understanding of variables that influence sociolinguistic code switching, including time and amount of exposure, and cognitive variables that may be influential.

1.2 African American English

African American English (AAE) is a major dialect of American English that has been studied widely across disciplines and language domains. AAE impacts primarily the morphosyntactic (e.g., deletion of copula and auxiliary forms of 'be; 'deletion of third person singular 's'), and phonological structures (e.g., deletion of final consonant sounds; substitution of f/th in word final position) of American English; though its impact on semantics and pragmatics has also been examined (Stockman,

2010; Stockman et al., 2008; Stockman & Vaughn-Cooke, 1984, 1986). See Washington and Craig (2002), Craig and Washington (2003), and Harris and Moran (2006) for a list of major child AAE features (Craig et al., 2003; Washington & Craig, 2002; Harris & Moran, 2006).

Most research focused on the general oral language abilities of children who speak AAE has focused on children from preschool through fifth grades. Remarkably few studies have examined language use and development of children younger than four or older than 11 years of age. The paucity of studies focused on AAE-speaking children from 0 to 3 years old has been attributed to a long held belief that AAE and early developmental "errors" are indistinguishable (Stockman & Vaughn-Cooke, 1986). It has been argued that major features of AAE, especially differences in verb morphology such as deletion of regular past tense markers, characterize the normal language productions of most young children acquiring language, making it impossible to distinguish such omissions from those that characterize dialect-based omissions in AAE-speaking children developing language. There have been few systematic investigations to support this claim. Nonetheless it has significantly impacted availability of studies that focus on the impact of AAE dialect on typical oral language development of African American children younger than four. However, those studies that do exist have demonstrated that language variation is identifiable and measurable in the spontaneous language of these children as young as 3 years of age, and perhaps earlier. Importantly, development of early grammatical and lexical skills appears comparable to those of non-AAE speaking peers. As expected, early development is impacted by important demographic variables, in particular SES (Newkirk-Turner et al., 2014, 2016; Horton-Ikard & Weismer, 2005, 2007; Weismer et al., 2013).

Entry into formal schooling presents new challenges and opportunities for young children both socially and academically. Children who speak dialects are faced with the task of learning new skills and concepts in a dialect that may differ from their own in significant ways. Schooling changes dialect use and its users (Goodman, 1969). Investigations focused on African American children's language are understandably more plentiful at school age. It is at this age that most children will first leave home and enter a predominantly GAE environment where their dialects are likely to differ significantly from the variety encountered in the classroom. It is at school age that D1 encounters D2. It is also at this point that AAE-speaking children will face the reciprocal effects of their early cultural language skills on later literacy learning, and the impact of early literacy skills on language use and development. Research with school-aged AAE-speaking children has had three broad areas of focus: (1) understanding sources of variation that impact dialect use; (2) uncovering the impact of dialect variation on development of literacy skills; and, (3) distinguishing language differences from language disorders, including the impact of variation on assessment.

1.2.1 Sources of Variation

Three major sources of variation have been examined for their influence on the language skills of school aged African American children, dialect **density**, **poverty**, and **gender**. Each is discussed in the sections that follow.

Dialect Density Dialect density refers to the rate or degree of use of AAE in a child's language. Oetting and Mcdonald (2002) described three methods that have been used in the extant literature to measure dialect density. All methods involve quantifying the number of tokens or types of dialect in a language sample in relation to the number of utterances in the sample. Dialect density changes significantly with age, and exposure to GAE in the school context. Specifically, studies have found that with each year that children are enrolled in school dialect density decreases in both oral and written language when compared to the its use at the time of school entry.(Washington et al., 2018; Puranik et al., 2020; Craig et al., 2009) For example, in a large cross- sectional study Thompson et al. (2004) examined grade-related changes in the use of AAE in children from low and middle socioeconomic (SES) backgrounds enrolled in either an urban or a suburban school. Results indicated that in the early grades, preschool and kindergarten, there were no significant changes in the use of dialect across grades. In first grade however, a decrease in dialect use was evident that remained stable over time. Importantly, the results also indicated that children who did not evidence this decrease did not perform as well on measures of reading and vocabulary as those whose language changed in response to schooling, and that these children were more likely to be low income, and enrolled in urban, public schools. Similar outcomes have been reported in other investigations for reading, writing and spelling (Puranik et al., 2020; Connor & Craig, 2006; Edwards et al., 2014; Kohler et al., 2007; Terry, 2006).

It is notable that these outcomes for dialect density have been found to differ somewhat by region of the country in which data are collected. In particular, children who live in the southern region of the United States have been shown to use significantly more dialect than their peers living in the north (Washington et al., 2018; Washington & Craig, 1992). Differences in amount of dialect used have also been reported between the midwestern and northeastern regions, with midwestern AAE speakers producing significantly more dialect than their peers in the northeast (Caesar & Kerins, 2020). Of particular note, is that the stabilization of dialect in first grade reported by Thompson et al. (2004) does not appear to be true for the South which brings together two major U.S. dialects, AAE and Southern English. Washington et al. (2018) reported a nearly linear decrease in the use of AAE for their first through fifth grade AAE-speaking participants that continued across grades, slowing somewhat in fourth and fifth grade. Data for this investigation were collected in a major city in the southeastern U.S. Their participants produced higher densities of AAE overall than their midwestern or northeastern counterparts and statistically significant changes in their dialect use continued across all years of schooling, from first through fifth grades. In all grades, dialect use decreased over time in the school context.

What all of these studies agree on is that dialect density is a significant variable to include in studies of AAE speakers. Dialect was noted to significantly impact reading, writing, and spelling such that children who are the highest dialect users, also experience slower growth in literacy development (Washington et al., 2018; Puranik et al., 2020; Connor & Craig, 2006; Thomas-Tate et al., 2004). Taken together, these studies provide a consistent picture of the impact of dialect density, but a mixed picture of the ages and grades at which children demonstrate changes in their overall dialect use.

Poverty Poverty has been identified as a significant source of variation in African American children's language. African American children are disproportionately poor, (Fass & Cauthen, 2008) complicating efforts to separate language use and competence from the impact of poverty on performance. The preponderance of studies focused upon children who speak AAE emphasize the development of language in dialect-speaking children growing up in poverty; their focus is on language and academic discrepancies that can result from impoverished language and high dialect use. It is the case that African American children who speak the most dialect are also more likely to be low income, making it nearly impossible to ignore poverty sequelae and their influence on both language and literacy development of AAE speakers. Research on language and literacy development of African American children growing up in poverty report the impact of several educational, cognitive and environmental variables that negatively impact performance, leading to below average vocabulary skills, reduced language productivity, poor sentence processing skills, and below grade level performances in reading, writing and other academic skills (Snow et al., 2001; Kieffer, 2008; Duncan & Magnuson, 2005; Engle & Black, 2008; Fernald et al., 2013). These variables frequently combine in low income children to increase the risk of reading and academic failure, which appears to be compounded by high dialect density (Washington et al., 2018; Puranik et al., 2020; Craig et al., 2009).

In our own work with African American children, we have found that African American children from low SES backgrounds frequently use significantly more AAE than their middle SES peers and that this has a moderately negative relationship with reading skills and rate of reading growth (Washington et al., 2018; Craig et al., 2009; Connor & Craig, 2006; Thomas-Tate et al., 2004). Low SES African American children were also less likely to learn to use GAE easily. In all cases, as the use of AAE decreased, reading scores increased. In a diverse sample of language users, Terry et al. (2006) found that school poverty levels mattered for the relationship between dialect use and reading performance. Children's spoken dialect use and oral language skills were best predicted by whether or not they attended schools with a large number of children who were also growing up in poverty.

Overall, these studies indicate that for African American children there is an important relationship between poverty, dialect and reading. African American English is not an impoverished language system. That is, it is not a dialect that is spoken exclusively by poor children. Rather, impoverished AAE speakers are most likely to speak dialect with high densities that impact their performance on

language-dependent tasks. Among young speakers of AAE, it is poor children's language that is the greatest distance from the linguistic standard of schooling, and thus most likely to present a mismatch between what is being taught and children's oral and written language use. Brown et al. (2015) found that this mismatch likely contributes significantly to the poor reading performances of children growing up in poverty who use high amounts of AAE, making it both more difficult and more important to avoid conflating poverty and AAE.

Gender Most studies have reported that the language development of boys lags behind that of their female peers (Horton & Apel, 2014; Moyle et al., 2014; Mills et al., 2013). A much smaller number of studies report language strengths for boys compared to girls (Logan & Johnston, 2010) or no gender differences at all (Shaywitz et al., 1990). In the case of African American children, boys reportedly perform lower on reading tasks nationally than their peers of other races (i.e., Hispanic, Asian, and White), regardless of gender (Reilly et al., 2019). This includes African American girls, who reportedly read better than African American boys, especially in upper elementary school, even when boys and girls are from the same neighborhoods and schools (Washington et al., 2019). In a departure from these data, Justice et al. (2005) found a gender gap between preschool-aged girls and boys, but no racial gap between African American and White boys in most early literacy skills. In a similar vein, Washington et al. (2019) found that African American boys and girls performed similarly on a range of reading tasks in early grades, first through third grades, but that boys diverged from girls beginning in fourth grade with girls outperforming them. Importantly, Chatterji (2006) discovered that the racial gap between African American boys and other boys appears to be influenced by SES with poor performances most likely to be evident in the reading performance of low income African American boys, and not as likely in boys from middle income homes.

Taken together, these investigations suggest that African American boys may or may not perform differently from girls in the development of reading skills. When these differences are present, however, the data suggest that they persist throughout schooling, and that income status substantially influences performance (Chatterji, 2006; Matthews et al., 2010). These differences between African American boys and girls growing up in poverty are evident as early as preschool (Washington & Craig, 1998).

1.2.2 Reading and Writing

Reading research has successfully focused on identifying the main cognitive and linguistic capacities and learning mechanisms that underlie children's transition from emergent to beginning reader, and that form the foundation for skilled reading comprehension (Rayner et al., 2001). However, literacy outcomes are also greatly affected by endogenous individual differences and by differences in environments and experiences. The impact of these factors on reading in African American children has proven difficult to disentangle because they are often highly correlated

with each other and with SES in this population. Research on reading difficulties among African American children is based on current theories of reading but also addresses factors that are specifically relevant to this population: *oral language skills* and *dialect use*.

Reading failure in African American children is a longstanding concern that has received significant attention in literature focused on the achievement gap. The 25–30-point reading gap between African American and Caucasian American children as measured on the National Assessment of Education Progress (NAEP) has remained virtually unchanged for the last decade. The majority (84%) of African American fourth grade students read at or below "basic" levels in the 2017 NAEP sample, while only 16% of African American children were considered proficient or advanced readers (NCES, 2017; McFarland et al., 2017). The impact of oral language skills and dialect have proven explanatory for understanding these patterns, if not causative.

There is a large body of research demonstrating that oral language skills have a significant impact on the growth and development of reading and writing for all children, regardless of language or dialect spoken. Children who have strong early language skills (e.g., vocabulary, morphological knowledge) are often better readers and writers. Whereas children whose skills are weaker frequently lag behind (Catts, 1997; Kamhi & Catts, 2002; Hogan et al., 2011). This relationship sounds very straightforward, but among children who speak cultural dialects, the influence of their general oral language abilities intersects with their dialect to influence and complicate literacy development. This pattern appears to be magnified for children growing up in poverty (Terry et al., 2010).

Longitudinal investigations of the development of reading and writing in African American first through fifth grade children have established that dialect density significantly impacts growth and development of reading and writing skills from preschool through fifth grade (Washington et al., 2018, 2019; Puranik et al., 2020; Craig et al., 2009). High dialect users were found to have weak reading and writing skills. Whereas their peers whose density of dialect use was characterized as low to moderate evidenced better reading and writing performances. Importantly, high dialect density also slowed the growth of both reading and writing skills. However, Puranik et al. (2020) found that stronger reading skills facilitated writing skills in their first through fifth grade African American participants, even in the face of high dialect density, supporting studies which have found that reading has a reciprocal relationship with dialect, such that strong readers will be better writers and learn the language of school more easily, and dialect users who do not sufficiently acquire the language of the classroom will struggle to learn to read. Ivy and Masterson (2011) examined the use of AAE in the spoken and written language of older versus younger African American children, in third and eighth grades. Their goal was to document the developmental shift in the use of AAE cross-sectionally by examining changes in the use of AAE for these two age groups across oral and written contexts. Their results indicated that third graders showed no significant difference in the use of AAE in oral and written contexts. Eighth graders, on the other hand decreased their use of AAE in written language samples but not in spoken narratives.

Approximately 67% of their participants shifted their use of dialect with increasing grade. Their data suggested that the shift in use of dialect in writing contexts occurs sometime after third grade. Oral language data show that the greatest changes in oral dialect use occur in response to schooling from first to third grade, after which the linear decrease in dialect use slows (Washington et al., 2018, 2019; Puranik et al., 2020; Craig et al., 2009; Craig & Washington, 2002). Ivy and Masterson's data suggest that changes observed for writing may occur for AAE-speaking children only after they have made similar changes in their use of oral dialect.

These studies show that in addition to general oral language skills such as vocabulary, reading and writing, the academic difficulties of African American children are influenced also by the degree to which they use dialect. High density AAE dialect use appears to complicate reading, writing and spelling development. African American children's use of AAE features varies, as does their knowledge of D2, General American English (GAE). The concomitant differences between these home and school dialects and print appears to affect the smooth acquisition of reading skills for many children (e.g., grapheme-phoneme correspondences). Dialect variation imposes additional demands on AAE speakers, which likely contributes to the "reading achievement gap". These demands are compounded for children growing up in poverty as the complexities of navigating two language systems orally and in writing, intersects with impoverished language skills to complicate literacy and oral language development.

1.2.3 Difference vs. Disorder

The presence of dialect also complicates identification of language impairments in AAE speakers. Within the field of speech and language pathology, the impact of AAE on assessment and diagnosis of speech and language impairments has been a primary focus. These studies, focused on *difference versus disorder,* have highlighted significant overlap between the features of AAE, and the linguistic characteristics of language impairment (LI) in General American English (GAE) speakers (Seymour et al., 1998; Oetting & McDonald, 2001; Oetting et al., 2010; McGregor et al., 1997). Specifically, deletion of grammatical morphemes and copula and auxiliary forms of *be*, and subject-verb disagreement characterizes both typical AAE use and atypical GAE use characteristic of LI. In addition, phonological differences of AAE speakers may also overlap with LI.

These similarities across dialect and disorder have been examined primarily for their impact on standardized assessments, and by implication on identification and diagnosis of LI. Accordingly, the extant literature includes many studies focused upon improving diagnostic accuracy of language impairments within AAE speakers, which includes eliminating not only false positives but also avoiding false negatives. Similar to the case of literacy, the degree of dialect used impacts the performance of African American children on standardized language assessments. Children who use a lot of dialect are most likely to encounter multiple items on standardized language assessment instruments that target language features which

characterize both AAE and LI. Also similar to literacy, much of this research has focused on African American children growing up in poverty as dialect used by these children is often very dense, and thus these children are much more likely to encounter items that are "correct" in dialect but "incorrect" in GAE.

This is a longstanding issue in psychometric and clinical research. African American children growing up in poverty face "double jeopardy:" (1) poor performances driven by impoverished language, that does not rise to the level of disability; and, (2) poor performances driven by items that overlap with dialect and LI that constitute language difference rather than language disorder. In either case, inaccurate identification and misdiagnosis will be the result. For example, children growing up in poverty who have limited vocabularies, shorter utterance length and who use high levels of dialect are more likely than their middle-class peers who speak lower levels of dialect to be identified with language impairment. These problems with misdiagnosis and identification reflect the poor sensitivity and specificity of standardized language assessments when utilized with children whose language is different from that of middle class, mainstream children (Campbell et al., 1997). A response to these inaccuracies has been a longstanding push toward the use of nonstandardized measures of language analysis with children who use AAE (McGregor et al., 1997; Campbell et al., 1997; Stockman, 1996; Hendricks & Adlof, 2017; Rodekohr & Haynes, 2001). In particular, language sample analysis, tasks that involve psycholinguistic processing and dynamic assessments have been recommended to avoid the bias that results from mischaracterizing dialect forms, and presenting tasks that require significant world knowledge for accurate responding. These nonstandardized approaches have proven to be promising directions for assessment of dialect speakers (Oetting & McDonald, 2001, 2002; Oetting et al., 2010; Campbell et al., 1997; Stockman, 1996; Stockman et al., 2013). However, these methods do require a significant investment of time and clinical expertise to administer. Combining the knowledge derived from these measures with development of quick and easily administered assessment measures seems important to pursue in order to overcome the difficulties currently presented by both standardized and nonstandardized assessment of low income dialect speakers.

1.3 Summary

Language variation has a clearly established influence on the academic and linguistic performance of young AAE-speaking children. Children who use the most dialect, are most likely to struggle to learn the language of school and its application to literacy. These high dialect users are also very likely to be impoverished, compounding the complexities of assessment, teaching and language learning.

This narrative has resulted in development of a deficit perspective as it relates to dialect, literacy and language learning. Research focused on the achievement gap has made it difficult to avoid this perspective, yet it may not be the whole answer. Lee-James and Washington (2018) outlined the need for adoption of a more

strengths-based perspective for studying dialect going forward (Lee-James & Washington, 2018). Currently, we have ample research focused on the struggles of African American children, but very little that addresses not only their strengths as learners, but the potential of AAE dialect to be instrumental in supporting and improving their outcomes. This is an important consideration for the next generation of studies focused on dialect, literacy and language learning in African American children. What do we still need to know and how best do we identify and build upon the strengths of these children?

2 What Do We Still Need to Know?

Many questions about the acquisition and use of AAE are unresolved because they have not been studied in sufficient depth. Recognition of these understudied questions may help to direct attention and resources to addressing them. Here we focus on several issues that arise from taking a developmental, lifespan perspective. This approach is characteristic of mainstream research on language acquisition, which has mainly focused on "mainstream" dialects, to the exclusion of language varieties.

People's knowledge and use of language forms a continuum from acquisition to skilled performance to changes associated with aging. Many aspects of language and cognition (e.g., memory, attention, learning) change over time (Craik & Bialystok, 2006; Sankoff, 2018, 2019). The answers to questions about how language is acquired and used depend on where an individual is on this developmental trajectory. Importantly, people's circumstances also change across the lifespan in ways that affect their language: for example, expectations about language are different in a first grade classroom, a college seminar, and in a corporate workplace.

Language is not just an abstract body of knowledge; it is used in multiple social and institutional contexts to communicate with people from varied backgrounds for a variety of communicative purposes (Lakoff, 1972; Stevens, 1992). These contexts provide additional opportunities to expand knowledge of language and the world; however, they also create conditions in which language is taken as a marker of identity, personality, intelligence, and other characteristics of the speaker. We use language to communicate messages to other people, but our utterances are also taken as providing information about ourselves. Such attributions are not highly accurate but they are ubiquitous (Lippi-Green, 2012; Ruscher, 1998). This fact is particularly relevant if the speaker is a member of a minoritized group (e.g., African American) and speaks a language variety (e.g., AAE). This perspective makes it clear that questions about dialect use are both about language itself and about the impact of language use on the speaker's self and well-being.

2.1 Similarities and Dissimilarities in Dialect Acquisition

The acquisition of AAE from birth follows the same pattern as the acquisition of the more-studied general dialect (Newkirk-Turner et al., 2015, 2016). Young children rapidly acquire a vast amount about the components of the language that are used in comprehension and production. The mechanisms that govern language acquisition are blind to whether the child is learning AAE, GAE, or a particular language. *How* children learn is the same but *what* is learned, as well as the rate of acquisition depends on experience, which varies within and between languages. Much of what children learn from exposure to AAE or GAE is the same because both groups are learning English, not another language. In areas where the dialects differ, children learn dialect-specific ways to express the same thing. For example, both AAE and GAE speakers learn about verb morphology but how grammatical rules are expressed differ in detail between groups. How much children learn about any dialect of a language depends on experience: the frequency and range of expressions to which they are exposed, and the variety of ways that language is used. Each instance of comprehending or producing language is an opportunity for a child to expand their knowledge via implicit, statistical learning procedures that are present from birth (Seidenberg & MacDonald, 2018). The sheer number of such experiences has a large impact on learning and development.

Looking only at properties of the dialects and the mechanisms that govern learning, AAE and GAE are alike in most ways, as they are both American English. However, the conditions under which the dialects are learned and used differ in ways that affect behavior. AAE is a minority dialect spoken by a group identified by race, culture, and community. GAE is the higher prestige dialect used in a much wider range of settings. Whereas AAE speakers need some level of facility with GAE in order to thrive in contexts such as school, the opposite is not true. Similarly, whereas AAE speakers cannot wholly avoid exposure to GAE, GAE speakers rarely experience the same exposure to AAE. This asymmetry creates differences in language learning opportunities and outcomes. These arise from social, cultural, and economic factors, not linguistic properties of the codes. Sooner or later, every AAE speaker participates in a bidialectal language environment.[1]

The primary developmental question that remains unanswered is *how a child who learns AAE from birth eventually engages the second, more mainstream dialect*. The situation is similar but not identical to that of a child who is learning a second language. In both cases the child is learning two linguistic codes. Bilingualism is difficult to characterize because the conditions under which the languages are learned vary along multiple dimensions. Important factors include the timing of exposure to the second language, the amount of exposure to each language, who the child learns each language from (e.g., family members, other caregivers, media such as movies and television), the contexts in which the languages are used (e.g., home

[1] The comedian Dave Chappelle famously observed, "Every black American is bilingual. All of them. We speak street vernacular and we speak 'job interview.'"

vs. school), the range of opportunities to use each language (e.g., talk vs. listen), the structural similarity/dissimilarity of the two languages, and many others (Grosjean & Li, 2013).

These factors are also relevant to second dialect acquisition, though they have not been studied in comparable detail. As with bilinguals the large number of factors makes it difficult to generalize about becoming bidialectal. The interactions among these factors create an enormous range of potential outcomes. Aside from the obvious parallels to bilingualism regarding effects of the timing and amount of exposure to each code, parallels with respect to the degree of similarity between the first and second code are particularly important to note. The languages that bilinguals learn differ in how much they overlap. Degree of similarity falls along a continuum: Mandarin and Italian are very different; Spanish and Italian are much more similar; there are numerous cases in between. Little of what is learned about Mandarin carries over to Italian, whereas learning Spanish greatly facilitates learning the typologically- related Italian. The path to becoming bilingual is affected by the degree of overlap. An analogous situation exists for bidialectal speakers of AAE and GAE, though the typological distance is considerably smaller than across languages. Variability in dialect density creates different degrees of similarity/dissimilarity between a speaker's AAE and the mainstream dialect. As in the bilingual case, this dimension affects the difficulty of learning the second dialect (Siegel, 2010).

The other important parallel between bilingual and bidialectal experiences about which we need to learn much more, concerns the timing of exposure to each code. We know that young children are exceptionally good language learners, picking up information through language exposure and use starting from birth. The ability to learn a second language declines in adulthood for a variety of reasons (Flege et al., 1999; Mayberry & Lock, 2003), and how a second language is learned changes (compare learning Spanish in an English-Spanish preschool vs. learning Spanish in a college class). Learning a second dialect is likely to have similar characteristics, but the issue is not well understood. It is likely that young children could acquire a great deal from early exposure to both home and school dialects, before the child enters school, and that this is an easier path to fluent code-switching than relying on instruction in school. This is an empirical issue that warrants further investigation.

2.2 Who Code-Switches?

A person is said to be bilingual when they know languages well enough to use them communicatively in appropriate contexts. Speaking different languages in different contexts is often called "code-switching." The term is confusing, however, because it also refers to mixing languages within an utterance (e.g., using a Spanish word in a sentence that is otherwise in English). Like bilinguals, speakers who know both AAE and GAE can code-switch in the sense of using each code in different contexts. The ability to use both codes is sometimes seen as a preferred developmental outcome, allowing the speaker to use GAE in contexts that demand it, such as

school, while retaining the culturally-relevant code (Milroy, 1995; Wolfram et al., 1999; Delpit, 2006; Delpit & Dowdy, 2008; Morton, 2014).

In an insightful discussion, Morton (2014) discusses issues of justice and ethics that code- switching entails (Morton, 2014) She acknowledges the perceived need to accommodate the mainstream variety given its importance for health, education, commerce, and employment under existing circumstances but also the threats to personal and cultural integrity that adopting a mainstream code entails. She concludes that being a skilled code-switcher is the most favorable accommodation to non-ideal circumstances. The need for one group to adopt to the language and culture of another in order to thrive is an intrinsic form of inequality, but it is the current reality.

Becoming fully bidialectal may be a desirable goal, but anecdotal and observational evidence suggests that initial acquisition of AAE is associated with several linguistic outcomes. Some children become bidialectal, conversant in both dialects and able to switch between them with different speakers and in different environments. Others remain AAE dominant, with little overt use of GAE; others transition to primary use of GAE, with a reduction in AAE. Other mixtures of code use and code knowledge also exist. However, large-scale descriptive, demographic data about language outcomes among AAE speakers does not exist. We lack systematic data about the range of outcomes and the personal and contextual factors that determine them. In some studies, children's knowledge of GAE is assessed and related to educational progress, but knowledge of AAE and its use in other contexts are not. Increasing knowledge of GAE could therefore reflect either a transition to GAE dominance or progress toward the bidialectal profile. This is a second area for which empirical research is greatly needed, and would not only expand our current thinking, but provide critical knowledge for development of sensitive and specific assessments and interventions that would better serve bidialectal African American learners.

There is a bidialectal ideal, analogous to the bilingual ideal, in which a speaker has equal facility with the two codes and can switch between them depending on the discourse context (the language of the conversational partner; expectations about language in a social or educational setting). Some people exhibit this behavior, but other patterns in which relative facility with each dialect (language) varies also exist. Indeed, these ideal (or idealized) patterns may be relatively rare. Understanding the entire range of language profiles and the factors that influence their emergence is necessary to inform decisions—by families, communities, advocacy organizations, educators, lawmakers—about desired linguistic goals and how to achieve them. Future research in this area could benefit from studies of related bilingual phenomena.

2.3 Cognitive Aspects of Code-Switching

Most research has focused on linguistic aspects of AAE, its relation to GAE, and how relations between the codes affect language development and education. The bilingual literature again points to another area in which research on bidialectal experience is limited: cognitive aspects of code switching. In particular, having acquired some degree of facility in two languages or dialects, the speaker can switch between them as demanded by the context: who is being spoken to, in what type of context, for what communicative purpose. Shifting from one code to the other involves several cognitive processes: evaluating the context, deciding when to switch, accessing knowledge of the other code and using it to formulate and comprehend utterances (Kheder & Kaan, 2021; Kecskes, 2006). This type of task switching has been extensively studied by cognitive scientists and neuroscientists. Much of the research focuses on the "costs" associated with switching from one behavior to another (Litcofsky & Van Hell, 2017; McCluney et al., 2019). There are numerous laboratory studies of bilinguals in which bilingual participants are cued to use one language or another (Sandoval et al., 2010). Typically switching languages interferes with performance on a primary task such as labeling or identifying objects. These findings suggest that the attention and effort involved in switching between codes takes limited cognitive resources away from what is needed to perform the primary task. There is little research on the parallel issue of dialect switching. Are there associated costs with switching from AAE to GAE and back again in real time, particularly in the classroom environment where online processing is critical to success?

Much more research is also needed because factors such as differences in knowledge and use of the two codes modulate performance. The processes of switching from AAE to GAE and from GAE to AAE may differ because one code is more familiar than the other. Moreover, the laboratory results are varied depending upon bilingual experience. Adults who are proficient in two languages report that switching between them is much easier than the laboratory studies suggest (Gollan & Ferreira, 2009). Recent studies have focused on whether the switch between codes is cued (as in most experiments) or voluntary (speakers are encouraged to switch if it will improve performance on the primary task). Cognitive costs are much lower when the code switch is voluntary and automatic.

Rather than extrapolating from studies of bilinguals, the cognitive processes and possible costs associated with switching between dialects, and the range of speaker- and context-related factors that affect performance need to be studied directly. Our main point is that it is necessary to consider not only the speakers' competence in two dialects (i.e., their knowledge of each code) but also performance: facility in using the codes, particularly where switching between them is required. Costs associated with switching between dialects may have a significant but unrecognized impact on a bidialectal speaker's ability to simultaneously engage in primary tasks such as learning from instruction or solving a math word problem.

2.4 Impact of Code-Switching on Health and Well-Being

We have emphasized the need to gain a much deeper understanding of both linguistic and cognitive aspects of bidialectal AAE-GAE experience. Here we consider a third understudied area: the impact of code-switching on health and well-being. Consider again a developmental perspective on language and dialect. For young children who learn AAE from birth, the main issues concern the conditions that affect development of AAE and subsequent engagement with GAE. Very young children are exceptionally good at absorbing language quickly, suggesting that under appropriate conditions, most children can learn to code-switch. However, this has not been the outcome for many African American children, particularly those growing up in poverty. Research suggests that approximately two-thirds of African American children will reduce significantly their use of AAE spontaneously both in writing and in oral language (Thompson et al., 2004; Ivy & Masterson, 2011). This reduction has been interpreted as evidence of code switching. Individual differences in experience and language-learning abilities may modulate these outcomes, but the major factor is how home, community, and school environments affect linguistic growth and language use. Institutional obstacles such as a lack of clear educational goals and practices related to minority dialect use (discussed above) likely loom larger than differences between individuals.

Among individuals who have gained facility with both dialects and who engage in code-switching between contexts such as home and college or workplace an additional aspect of bidialectal experience needs to be investigated: the impact of code switching on the individual over time. AAE is a dialect associated with family and community. Humans have the capacity to learn multiple languages or dialects, and to use them in different contexts for different purposes. AAE is an object of prejudice in the U.S. (Pullum, 1999; Baugh, 2000). Whereas linguists emphasize its continuity with language variation as it occurs in all languages, many others, including some users of the dialect, perceive it as inferior to "standard English" (Baugh, 1999). The judgment that it is a corrupted or degenerate form of "good" English dates from the American slavery era, and is another expression of persistent racial bias. For historical reasons, a different code acts as the mainstream dialect used in business, government, mass media, and education. The prejudices and low prestige attached to AAE, and the higher status assigned to GAE, also affect speakers' use of these dialects, even those who are fluent in both codes.

For bidialectal speakers, using GAE in contexts such as a university classroom or a business office involves both appropriate use of GAE and inhibition of the lower status code, AAE. This too involves cognitive effort: speakers can monitor their own productions to evaluate their appropriateness or self- correct if perceived as necessary; they may actively avoid speaking in fear of producing "nonstandard" expressions; they may engage in mental translation from AAE to GAE before speaking; they may compose utterances to conform to linguistic expectations rather than speaking freely. Anecdotally, African American college students, for whom the switch from AAE to GAE often lacks automaticity, report great concern about

participating in discussions in the college classroom for fear of "saying it wrong." When AAE is the speaker's culturally and personally authentic code, using GAE is an adaptation to external constraints and pressure to assimilate. The use of GAE, therefore, may be "performative" rather than "authentic" (Delpit, 2006; Delpit & Dowdy, 2008). Language is one important component of a larger phenomenon, the minoritized individual's adjustment of behavior to the demands of constructed environments such as a classroom or office. Functioning in these differing contexts creates the "double-consciousness" described by sociologist W. E. B. Du Bois (Bruce, 1992; Du Bois, 2006).

Sociologists use the term "allostatic load" to refer to the cumulative effects of chronic stressors due to poverty or other adverse conditions (McEwen, 1998). Allostatic load has an impact on health and well-being beyond that predicted from other factors such as family size or income (Juster et al., 2010; Korte et al., 2005; Seeman et al., 2002). We surmise that extended experience switching from AAE to GAE in high-stakes contexts such as classrooms and workplaces is a source of allostatic load, even for people who are able match to the bidialectal ideal. That monitoring of the presentation of self, which includes language, carries cognitive and emotional costs (Litcofsky & Van Hell, 2017; McCluney et al., 2019). Cognitively, it is another task to be performed while engaged in other activities. Emotionally, it involves constant self- evaluation, criticism, and correction. Research on this topic is almost nonexistent, but it is a part of the bidialectal experience that needs close attention.

3 Summary

That there are costs of being an impoverished speaker of a low prestige dialect is evident. Many children who speak AAE struggle with literacy, language, and other skills that are dependent upon facility with the mainstream variety. Those who speak the most AAE appear to struggle most. These outcomes have resulted in significant attention to the deficits identified for these children in schools and in the literature.

Our goal in writing this chapter is to acknowledge what we currently know and to highlight the gaps in or knowledge. It is notable that the major gaps relate to our depth of understanding of the dialect itself rather than its impact on other, external areas of function. We contend that we cannot fully understand those impacts without having a deeper knowledge of the sociolinguistic, psycholinguistic and cognitive mechanisms involved in becoming a proficient bidialectal language user. The extant literature contains many studies that highlight the ability, or lack thereof, of African American children to switch from AAE to GAE, but most ignore the GAE to AAE switch as though it is not valuable, or can be taken for granted. The study of AAE users must be bidirectional, shedding light on proficiency in both systems.

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The Sociolinguistics of Diglossia in Switzerland

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1 Multilingualism in Switzerland

Switzerland has a unique language landscape of four national languages. The experience of the state with its diverse languages teaches that this harmony is an enduring value that needs constant protection. Switzerland has managed to develop a political and administrative system that effectively secures diversity, national cohesion and local autonomy. The federal policy with regard to languages is realised according to "the ideology of multilingual Switzerland" defined as "a set of beliefs in the desirability of retaining the multilingual nature of Switzerland and enhancing the ability of the Swiss to communicate with each other across ethnolinguistic boundaries" (Watts, 2001: 303). The Swiss created a complete communication culture where particularly the political sphere necessitates a common language (cf. Stępkowska, 2019). Indeed, the question of language use at the communal, cantonal and federative levels is distinguished by legally sanctioned rules.

Multilingual experience and the traditional Swiss quadrilingualism inform the social system, which is guarded by two complementary rules, namely language freedom and the territoriality principle. Language freedom gives everyone the right to use their mother tongue, which means that federal authorities will respect the official language chosen by individual citizens. In turn, according to the territoriality principle, cantons decide about official languages in formal contexts used within their jurisdiction and territory, by which individuals are obliged to adapt to the language of the canton. The territoriality principle restricts language freedom by specifying that the communication between organs of administration and citizens is carried out in one of the four Swiss national languages, i.e. in the language of the majority group in a given area. It is not the country, but the canton (or commune)

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that determines and executes the territoriality principle. Switzerland is made up of 26 cantons; 17 of them are German-speaking cantons, 4 French-speaking cantons, 3 bilingual cantons (French and German), 1 trilingual (German, Italian and Romansh) and 1 Italian-speaking canton.

Yet the complexity of the Swiss linguistic situation includes much more: the presence of dialects, the revised spelling rules of Standard German, the regional dialects in German-speaking Switzerland, the peculiarity of literary works written in Swiss German dialects and the tensions brought about by the excessive use of dialects, which makes the life of all language groups difficult and insecure. As a country, Switzerland established a culture of maintaining and reconciling diversity (Weilenmann, 1925: 227). The value of linguistic diversity manifests itself in a specific Swiss mentality, which acknowledges the will of the majority as the sovereign authority, but at the same time recognizes the inalienable rights of minorities (Steinberg, 1996: 254). The rare historical pattern that contributed to Swiss multilingualism is a voluntary federation seen as the union of different ethnic groups or states, called cantons, under the political control of one state (Fasold, 1984: 11).

Switzerland has German, French and Italian as official languages, and Romansh as the fourth language of a national status only. But, the multilingualism of Switzerland, as it is quite commonly considered, is not an exception. Switzerland is special as an example of a country that very early in its history ensured constitutional equality for its three, and later on, four languages; however, societal multilingualism is not tantamount to the individual bi- or multilingualism (Sebba, 2011). The type of societal multilingualism in Switzerland describes a country that consists of several monolingual groups (Sridhar, 1996: 47). Those Swiss who speak regularly German or Swiss German amount to over 60%. French is the first language of about 20% of the Swiss. Italian does not go beyond 7% of the population and Romansh does not exceed half a percentage point. Multilingual individuals may function within more than one of these language groups and their language choice is determined by a string of factors, such as the interlocutors, the role relationship, domain, topic, venue, channel of communication, type of interaction and phatic function (Clyne, 1997).

This chapter focuses on diglossia with a special reference to literacy in the Swiss context. The sections that follow are planned to contribute to an overall sociolinguistic picture of German-speaking Switzerland. They accentuate the most original characteristics of this part of the country, such as diglossia with bilingualism, and the ideology of the Swiss German dialect. The use of English in Switzerland is mentioned inasmuch as it resembles the extended diglossia. Next, the situation of literacy is discussed by clarifying issues related to the contexts of dialect acquisition and the schooling of the standard language. Literacy, as regular events, has a role in raising children both at home and in school. It is purposeful to focus on these repeated literacy events to understand better about how children are taught to read and write. Thus, literacy is understood as a type of "communicative practice" (Grillo, 1989: 8) realized by schooled literacy and second language literacy. Finally, the concluding section takes an overview of the effects of diglossia against the wider background of the official multilingualism in Switzerland.

2 German-Speaking Switzerland

German-speaking Switzerland divides into three geographical regions that correspond to the three major dialect groups: Low Alemannic (Basel), High Alemannic (Bern, Zurich and a part of Grisons), and Highest Alemannic (some parts of Valais and Grisons). Each city has its own dialect that, in turn, has its local varieties which further comprise sub-dialects. Despite varied lexicon and phonetics, these varieties remain similar to each other, which enables inter-dialectal communication (Widmer, 2004). The German Swiss are the biggest language group (c. 65%). The main problem in the relations with the other language groups in Switzerland is diglossia which is particularly prominent in the German-speaking area. *Standard German* is often called High German (*Hochdeutsch*) or Written German (*Schriftdeutsch*) since is used mostly in writing, but reluctantly (Strässler, 2001: 956). Next to it, there is *Swiss Standard German* which is a supraregional variety of Standard German and used in education. This standardized variety has a written form and differs from Standard German (in Germany) with regard to its lexicon, orthography and grammar. These two national varieties, Standard German and Swiss Standard German, are mutually intelligible. Swiss Standard German is based on the lexicon of Standard German. In the Swiss German variety of Standard German, there is a discrete group of words, the so-called Helvetisms (*Helvetismen*). These words are used only in Switzerland and not known in Germany or Austria, or are words that in Switzerland take on new meanings (Schläpfer, 1985: 97). The current records of Helvetisms amount to at least thirty thousand, but there are probably many more (cf. Kalberer & Meier, 2019, Troxler & Gsteiger, 2018).

The Swiss speak neither Standard German nor Swiss Standard German. They speak a variety of Swiss German dialects, henceforth *Swiss German*. Swiss German, also referred to as *Mundart* or *Schwyzertütsch*, is a somewhat artificial blanket name for more than thirty dialectal variants from the Alemannic group spoken in Switzerland (Strässler, 2001: 955). Swiss German is widely used in public life and especially in the media (radio and television). The Swiss regard it as their mother tongue, though officially is has no status of a separate language. The most striking curiosities of *Schwyzertütsch* occur in pronunciation and stress that changes the sound of words (cf. Hove, 2013). Helvetisms combined with an ethnic style of speaking that includes prosodic and phonetic variations have become an authentic strategy of the Swiss to differentiate themselves from the Standard German spoken by their neighbours. Swiss German dialects are mutually intelligible. All of them have a two-tense system (present and present perfect) and some tend to follow the word order of French rather than German (Strässler, 2001: 956). In fact, the linguistic distance between any of the Swiss dialects and Standard German makes mutual comprehension difficult or even impossible. The lexical and phonological differences add to the morphological and syntactic ones. These and many other aspects of the differences between Standard German and Swiss German dialects have been tackled in detail by several authors (e.g. Bossong, 1994, Dürscheid & Hefti, 2006, Haas, 2000, Scharloth, 2006, Siebenhaar & Wyler, 1997).

Swiss German dialects enjoy the preferred status within the family domain, where they are used by over 90% of German Swiss (Lüdi & Werlen, 2005: 36). Similarly, dialects remain most popular with nearly 98% of German Swiss communicating in Swiss German at their workplaces. These numbers prove that dialects have permeated virtually all generations and social strata in any type of contact and setting, without exception. The speakers of Swiss German consider using Standard German as inappropriate and unacceptable. Swiss Standard German is used only for writing and for any public address. Therefore, it is quite unusual to refer to a concept of a 'standard language' which is not the standard. As the result, in German-speaking Switzerland the status of the standard language does not correlate with its identification as the language of 'the heart'. Rather, in the context of the generalized use of the dialect, the standard language is perceived as a foreign language. In this perspective, Swiss German is more a social than a linguistic category, because it is defined by the attitude of its speakers towards the dialect and towards Swiss Standard German. Furthermore, Swiss Standard German and Swiss German dialects are in a complicated relationship inscribed in the traditional framework of *diglossia*.

2.1 Bilingualism and Diglossia

In multilingual societies, different languages are usually assigned different tasks. This interrelation of linguistic form and social function has already been examined as a phenomenon labelled *diglossia*. Ferguson first wrote about diglossia in his 1959 article which then became the benchmark for the term. He was intrigued by a special kind of bilingualism in which speakers conditioned the use of a specific language variety by a specific type of circumstances. Another interesting fact was that two language varieties, standard language and regional dialect, coexisted fulfilling clearly disjoint functions throughout a community. The diglossic view of bilingualism makes use of domains which are important in the macro-analysis of functional distribution in multilingual communities (Fishman, 1972: 44). Such communities use two or more languages in intra-societal communication. Diglossia tends to reinforce social distinctions by ascribing languages to discrete domains as "the compartmentalization of varieties" (Romaine, 1994: 47), which leads to a limited access to some domains due to the mismatch of variety with context (cf. Fasold, 1984, Martinet, 1986: 245).

Ferguson described *diglossia* as a type of bilingualism denoting the coexistence of two distinct varieties of the same language. These varieties differ in status according to nine categories, such as function, prestige, literary heritage, acquisition, standardization, stability, grammar, lexicon, and phonology. Diglossia is not the case of the alternate use of the standard and its variety to be chosen at will by an individual; but it is the case where "two distinct (…) languages are used (…) throughout a speech community each with a clearly defined role" (Ferguson, 1959/1972: 233). The standard variety fulfils 'high' functions appropriate for formal contexts, while 'low' functions are linked to dialectal forms used in the private life. Thus, the two

varieties, high (H) and low (L), have separate functions. Another important feature of diglossia is prestige, which relates to the speaker's attitude. The H variety is superior to the L variety in a number of respects, for example with regard to literary heritage. As to acquisition, the L variety is acquired at home whereas the H variety is learnt at school. Standardisation refers to the H variety with norms for orthography, grammar and pronunciation, while stability describes diglossia as a long-lasting phenomenon. As regards grammar, vocabulary and phonology, there are differences that can be noticed between H and L varieties. Though H and L are varieties of the same language, they cannot be linguistically too similar and having differences just in style or register. Diglossia results from a specific social context and not from the social identity of the speaker (Hudson, 2002: 6).

Later on, Fishman (1967) proposed the definition of extended diglossia which differed from Ferguson's original concept in two key aspects, namely the number of languages and the degree of linguistic difference between them. The two linguists agreed on the functional distribution between H and L varieties. Fishman (1967, 1988) broadened his concept of diglossia to include any degree of relatedness between languages and any number of them, but made it clear that it should not be confused with bilingualism. Notably, Fishman's concept of the extended diglossia is applicable on a global scale to refer to English when used for international communication in business and science, thereby confining local vernaculars to private spheres (cf. Phillipson & Skutnabb-Kangas, 1995: 487). There are fears that the prevalent dominance of English may lead to "a process of secondarization of all languages other than English" (Deneire, 1998: 394). In the pattern of a global diglossia, English tends to fulfil the function of the H variety in science, while other languages correspond to L varieties (cf. Mühleisen, 2003). Some recent research on English as a lingua franca in the Swiss context have indicated the signs of its increased presence which cannot as yet be classified as a diglossic relationship of English and the Swiss vernaculars (cf. Stępkowska, 2013).

Ferguson (1959/1972) chose Alemannic Switzerland as one of the "defining cases" of diglossia. German-speaking Switzerland is characterized by an enduring diglossia due to a relative equilibrium between the Swiss Standard German and the Swiss German dialects (Martinet, 1986: 248), also described as the standard-with-dialects 'internal' diglossia (Myhill, 2009, Tollefson, 1983). According to Fishman (1967: 31), the Swiss-German cantons illustrate both diglossia and bilingualism, because Swiss German dialects fulfil all functions and have become parallel to Swiss Standard German. It may be argued that Swiss German dialects ceased to function as the complementary language variety in the diglossic model (Ris, 1990: 42). The progress of this situation was described by Pap (1990: 131) as the one "somewhere half-way between diglossia and bilingualism" (also Watts, 1991: 92, Watts & Smolicz, 1997: 277). Swiss Standard German has been relegated to the position of a second language, thereby moving the whole context towards the bilingual model or "oral bilingualism" (Kolde 1988: 526). Thus, the German Swiss may be regarded as bilinguals who speak a given Swiss German dialect while they read and write Swiss Standard German and, if need be, speak it in formal contexts (Weinreich, 1953/1968: 89, Fasold, 1984: 41). The result is that high German is

subordinated to dialect and serves as the written language and the lingua franca for communication with other Swiss who do not know the Alemannic dialects and with foreigners who can speak German (Dabène, 1994: 55). No Swiss German speaker would ever use Standard German in personal contact with another Swiss from a German-speaking canton (Hudson, 2002: 3, Keller, 1982: 91). In the opinion of some authors (Hogg et al., 1984, Weil & Schneider, 1997, Rash, 1998, Schläpfer, 1994), the expanded use of Swiss German renders the original concept of diglossia less applicable to the German-speaking part of Switzerland. The main problem presents the reception of spoken texts, which is conditioned by the medium and the content formulated either in the standard or dialect form (Kolde, 1986). It is clear, then, that in German-speaking Switzerland the functional diglossia intertwines with a medial diglossia which puts an emphasis on the difference between written and spoken language.

2.2 The Ideology of the Dialect

German-speaking Switzerland presents an impressive concentration of dialects from the High Alemannic family which since 1750 are referred to as *Schwyzertütsch* (McRae, 1983: 68). Swiss German dialects symbolize "Swissness" (Watts, 1999: 75) or "non-Germanness" (Watts, 1999: 83). The use of dialects is perceived as an "in-group signal" (Lüdi, 1992: 56) or "a marker of group identity" (Schmid, 2001: 149), which is to exclude foreigners from getting "inside Switzerland" (Steinberg, 1996: 138). Dialect is the language of the childhood and family of nearly 70% of the Swiss population (Steinberg, 1996: 133). The Swiss German dialects are politically significant as a distinguishing feature between Switzerland and Germany. Swiss German dialects are also meant to stand for "local patriotism, political decentralization, a safeguard against possible outside interference in the affairs of Switzerland and the guardian of tradition" (Watts, 2001: 302). Such attitudes to dialects are not intended against the other language groups in Switzerland, but "against other forms of German" (Watts, 1988: 330). The Alemannic dialects have a meaningful function because "for the Swiss, it is important to make clear to themselves and to others that they are not Germans, but a people apart" (Winter, 1993: 304, cf. Schwander, 1983).

Richard Watts (1999) describes the ideology of the dialect as a set of beliefs about Alemannic dialects. He writes about the higher "symbolic value" of dialects which are "in competition" with the standard, and that in German-speaking Switzerland dialects are "deliberately promoted as having a higher value" (Watts, 1999: 69). One of the peculiar consequences of the "ideology of the dialect" is that native German Swiss treat Swiss Standard German like "the first foreign language" (Watts, 1999: 74) since it is used in the written communication as the language of bureaucracy and formality. Swiss Standard German is used at schools, in the media, literature and most official situations. In turn, Swiss German dialects are spoken by all in the society, regardless of social or geographical background, age, education and profession. In the nationwide context this "ideology of the dialect" is so deeply

embedded that "the German-speaking Swiss would far rather communicate in English to a foreigner than in standard German" (Watts, 1999: 75).

In sum, the functional distinction between the H and L varieties in Switzerland is less clear-cut than originally suggested by Ferguson. His assumption about speakers switching between dialect and standard is based on the belief that, besides their dialect, they are fluent enough in the H variety. Watts observes an increased encroachment of the dialect upon the domains reserved for the standard, such as the media, school or religion. For this reason, Einar Haugen (1972: 332) calls Ferguson's selected L varieties a "mixed bag" and points to Swiss German as "a prideful symbol of Swiss nationality" in which status and intimacy do not necessarily stand in direct contrast.

3 The Overall Concept of Language Education

Although the language situation in the German-speaking cantons of Switzerland has been described as a medial diglossia, this distinction does not do justice to the reality, which is much more complex. Despite the suggested difference between written (Swiss Standard German) and spoken (Swiss German) language, dialects are quite common not only in the spoken format, but also in the written ones, e.g. text messages, e-mails, personal letters and other unofficial texts (Flubacher, 2013: 176). In its spoken form, Swiss German is used regardless of the situation, be it private or public (Lüdi et al., 1995: 32). Dialect is predominantly spoken in governmental institutions, churches, businesses, schools and universities, except for primary schools (Anders, 1990: 24). Swiss Standard German is not the language of choice in social interactions, thereby making room for the dialect in all areas and levels (Schläpfer, 1985). Already in 2000 the federal census indicated that over 90% of Swiss German families speak Swiss German dialects, while about 6% speak both dialect and Standard German. A similar trend of dialect expansion is observed within the professional sphere and reflected in the broadcasting industry. As to its written format, Swiss German dialects have no standard for orthography and grammar. Though the dialects are less literary, they are not considered more vulgar than the standard language. The choice of language for writing is determined by the type of sociocultural interaction, the communication context and the relationship between interlocutors. At present, the disputes concern the function of High German as the written language, because the dialect advances firmly in its written format, and makes headway even if it stays within the private sphere. Swiss German is widely used on electronic media where it may be encountered as text messages, emails, blogs and social networks. Moreover, the popularity of English puts it on a par with the standing of the official language in German-speaking Switzerland. The advantage of this situation allows the German Swiss to conveniently dodge the discomfort of verbalizing the written language (High German) in contact with non-native speakers of Swiss German (Widmer, 2004: 13).

In Switzerland, education and culture fall into the competencies of 26 cantons. It is the Swiss peculiarity that each canton has its own school system and decides which language to offer and at what stage. The federal system of education allows secondary schools to start at different ages in different cantons. This fact was the source of difficulties for school children whose families migrate between cantons, especially with regard to foreign languages. Soon the teachers' union initiated a fundamental reform in the Swiss educational system, which led the Board of Educational Ministers (BEM) to appoint a study group for the co-ordination of foreign language teaching in compulsory education across the country (Strässler, 2001: 962). This reform was only aimed at foreign language teaching; however, it resulted in a better co-ordination of the different school systems from all 26 cantons. The cantonal governments are obliged to provide for the minimal coordination between the schooling systems. From 1897 on, this is the task of BEM which is an assembly of all the governing councils, made up of cantonal ministers. BEM is a partner organization for the federal government in all matters of shared competencies, including optional education, vocational schools and universities. In 1975 BEM proposed that children in obligatory schools should learn a national language as the second language, namely German in the French-speaking cantons, and French in the German-speaking cantons and in the Italian-speaking canton of Ticino.

The recommendations of the BEM to the cantons called for a structural reform, including the reform of methodology and subject matter. As regards structural changes, the second national language courses should start no later than in the fifth grade. Besides, the effort should be made to coordinate the entire teaching process understood as goals, subject matters, course books and study plans up to the end of compulsory education. The subjects should be balanced, i.e. the additional lessons may be added but at the cost of others which should be reduced. Teachers in primary schools should offer second language tuition, which requires extra teacher training and the need to prepare new course material. Many of these structural changes have been implemented and teachers have been offered the methodological guidelines worked out by the study group and recommended by the BEM. The order of introducing languages at school was left to regional or cantonal coordination, which resulted in rather disorderly sequences, yet Zurich was among the most reluctant cantons. Naturally, this turn of events adds not only to the complexity of organizational matters (timetables, exchange programmes, materials, teachers, etc.), but the main tensions resulting from multilingual education are brought about by attitudes towards individual languages, including the dialect.

One such example concerns attitudes towards French classes in Swiss German Switzerland (Ribeaud, 2013: 83). In September 1988 voters in the canton of Zurich rejected the citizens' initiative that aimed to thwart the introduction of French classes in primary schools. The reason for the rejection of French was that it would lead to too much fatigue for pupils and the diminishing significance of French. The latest offensive against French classes in the junior high schools of Zurich occurred in 2012 when a few members of the cantonal council put forward a demand that French for pupils from the 8th and 9th grades should be changed from an obligatory subject to a subject of choice. This time the argument was that pupils would be able

to better concentrate on German classes and that French was not very useful for them. Pupils from French-speaking regions of Switzerland are better off than their peers in the German Swiss regions because they have no problem with dialects. In fact, linguistically, they are almost in the same position as any of their foreign classmates from abroad.

This fact is crucial for the cantonal government, which gives shape to language policy. The solution was the introduction of Swiss Standard German as the universal obligation in kindergartens. In 2003 BEM issued a recommendation to use it in order to improve the language competence of children, starting from kindergartens. In 2008 the official suggestion focused on roughly dividing the language teaching in kindergartens into three parts: one for Swiss Standard German, one for the dialect, and the third part be left to the decision of an individual kindergarten teacher. This solution was not innovative, but rather tangled, as it left much room for interpretation. Yet it was enough to stir up polemics and opposed reactions. Out of 600 kindergarten teachers, who were affected by the council's decision, 480 were against Standard German (Ribeaud, 2013). The protesting kindergarten teachers received support from a bipartisan committee with a right-wing nationalist lead. This, in turn, set in motion an initiative for the dialect called "Yes for *Mundart* in kindergarten" (*Ja zur Mundart im Kindergarten*). It aimed at maintaining the dialect as the basic language, which boiled down to restoring the status *quo ante*, also in cantons other than Zurich.

4 Second Language Literacy

The Swiss model of communication assumes that every Swiss speaks his or her native tongue and is understood by their compatriots from other linguistic backgrounds. Besides the native tongue, a second national language is taught to attain the receptive and productive skills that enable to participate in active communication, whereas a third national language is taught primarily to be understood (Widmer et al., 1987: 101). In theory, the intranational communication of the Swiss is supposed to take the shape of the so-called Partner Language Model (*Partnersprachmodell*) (Dürmüller, 1992). In fact, the bilingual solution promoted by the Swiss educational policy works well only in the case of the two biggest language groups. In a contact situation, one interlocutor will have to demonstrate a full (passive and active) command of the second language. For the conversation to take place, one of the two available languages is chosen for communication. In the contact between the German Swiss and the French Swiss, either of them may use their native tongue (L1). It may be assumed that passive competence in a second language (L2) will allow the interlocutors to carry out a dialogue. And yet this is too optimistic an assumption because most German Swiss do not speak the German that the French Swiss learnt at schools.

The internal communication in multilingual Switzerland according to the above mentioned Partner Language Model stands a chance of functioning when each

interlocutor has in their individual repertoire the three national languages at their disposal. Dürmüller (1989: 5) presents in detail the optimal language combinations in repertoires of the Swiss from each of the three language groups, as well as the potential threat for these combinations in the form of English taking up the L2 position in each language group. In line with the Partner Language Model, the Swiss educational system aims to equip every citizen with at least elementary knowledge of a second national language. The results are different and many people, who complete their education at a secondary or a tertiary level, have at best a passive knowledge of the second national language. Such people may be classified as passive bilinguals who, nevertheless, may find it hard to communicate effectively or freely on every topic. Dürmüller (1994) argues that the Swiss most often grow up as monolinguals and learn the second language only when at school.

The recommendations of the Board of Educational Ministers refer to the choice, the sequence and the number of languages, the aims of foreign language tuition, the age of pupils eligible for the respective tuition, as well as methods and evaluation, including the consequences for teacher training and the improvement of teaching materials. All these issues fall within the competences of the Swiss cantons. The cantons are expected to provide transparent and coherent tuition of foreign language learning across the country by agreeing on binding objectives to be achieved by the end of compulsory education. In the German-speaking cantons, French is usually the second national language, and in the French-speaking part it is German, while the cantons of Ticino and the Grisons take into account the specific circumstances. In line with inter-cantonal agreements to reach the objectives, the cantons offer and decide on the order of the foreign languages.

Proficiency in different languages is not the prime objective of language teaching in compulsory school education. Rather, it is the motivation to further improve one's own individual language competence (Strässler, 2001: 969). All pupils acquire a basic knowledge of languages which they can use immediately and, if necessary, develop further on their own. Thus, school education equips pupils with a competence in language learning. Every graduate can work on a competence in a specific language or learn a new one if needed. It looks like the didactic objectives are essentially focused on skills rather than on knowledge. The teaching of the formal system of a foreign language does not come before the development of skills that enable the effective communication with speakers of other languages. These skills include listening and reading with understanding, plus speaking and writing. Only personal contacts, such as establishing pen friend relationships or email contacts, with speakers of other languages can guarantee positive attitudes. And these can be instilled by class exchanges or school camps in other linguistic regions. School leavers should realize that the limited knowledge they have at their disposal is enough to communicate and that taking part in the linguistic exchange is their own responsibility.

Swiss German dialects are not the subject of formal education; however, they are used for teaching other non-linguistic subjects (Dabène, 1994: 47). The rough characteristics of differences between Swiss German dialects and Swiss Standard German render the former as personal and familiar, while the latter as formal and complicated. Native Swiss German speakers often consider Swiss Standard German

as their first foreign language, which they use only when forced by circumstances, i.e. in contact with Italian or French speaking compatriots or with foreigners who speak Swiss Standard German but do not understand the Swiss dialects, or less frequently in official debates (Hägi & Scharloth, 2005). Such an attitude to Swiss Standard German or dialect seems to be reproduced in the first years of school (Sieber & Sitta, 1986). Swiss Standard German is practically used for the sole purposes of writing and reading, thus maintaining the two language varieties that have clearly diverse social functions.

The structural reform of the Swiss educational system affected the foreign language teaching with regard to the compulsory nine years of education which is a lower secondary level, as well as the upper secondary level and tertiary education. A successful education relies on the presence of both languages in the social environment of children, when both varieties have specific functions and positive social representations (Dabène, 1994: 137). Swiss Standard German is the spoken and written teaching language at the primary level, thereby remaining confined to the school environment. When outside the class, the students are exposed to it in interactions with non-native speakers or in a passive manner, for example through the partial immersion by the broadcasting media. The radio and television cannot be said to be the exclusive domains of Swiss Standard German, because the language extensively used in the media is that of the dialect. Children are exposed to a mix of different German dialects and sociolects as they watch children's programmes or shows. As a rule they do not watch political debates or the news, where Swiss Standard German might be used.

The situation in German-speaking Switzerland has both advantages and disadvantages. On the one hand, the pupils gain a very early experience of foreign language learning. Through the lessons of Swiss Standard German they develop strategies of second language learning and later they use them when they begin to learn their first foreign language. These acquired techniques and strategies are the key to learning a foreign language more efficiently. Otherwise, they would have to acquire these techniques together with the new language at a much later stage (Strässler, 2001: 968). On the other hand, the expansion of Swiss German into primary and secondary schools has its less desirable consequences. At present, most young Swiss people know Swiss Standard German poorly, and the more often the German Swiss use their local dialects, the harder it is for their French- and Italian-speaking compatriots to communicate with them.

Dialects play a considerable role in the educational system particularly in the German-speaking and Romansh regions. Most of the German-speaking cantons have introduced binding directives with regard to the use of Swiss Standard German and dialects in all school subjects (Hutterli, 2012: 93). Children from German-speaking regions at the age of six or seven in primary schools speak only dialect as their L1. German is regarded as a foreign language by many speakers of Swiss German, but its status differs from the status of French, Italian or English. Both children and adults regard Swiss Standard German rather as a kind of quasi-foreign language used readily when needed (cf. Fatmi & Ilhem, 2017: 73, Myhill, 2009). For children in the German-speaking cantons, dialects are the basic tool of

communication, used in the family domain. Children have no chance to acquire Swiss Standard German as their native variety, because their parents never use it with each other, let alone with their children (Keller, 1982: 91). They feel uncomfortable with the H variety, because its native speakers belong to a different speech community. In addition, the use of dialects implies solidarity and thus the dialects are not offered to speakers who are socially distant or superior (Schiffman, 1997: 213).

Children are introduced to Swiss Standard German early on and therefore this variety does not pose learning problems at school. It is so because they are faced with similar forms of German in their natural environment and through television or radio. As a consequence, they acquire some command of such forms, particularly as regards pronunciation. In the primary school, the instruction of Swiss Standard German starts in the first grade and so the pupils need to cope with two different and demanding tasks. The first task is to learn to read and write a new variety of their mother tongue which is a form of Swiss Standard German, also called *Schriftdeutsch* ('written German' or 'German for writing'). The second task is to learn another national language and another foreign language which is predominantly English. The instruction of the second foreign language starts in the fifth grade, and the third language in the seventh grade.

According to many educators, public TV and radio programmes foster the acquisition of Swiss Standard German, and are broadcast daily for children from the ages between 3 and 6 years old. There is also a desire among parents for their children to master better German than their parents. In all likelihood, in German Swiss kindergartens the teacher speaks the dialect form of German to children. For children at school age it is natural to speak Swiss German dialects in a whole range of informal situations other than lessons, such as in the playground, at breaks, at home and amongst each other. Therefore, younger pupils often have negative associations with standard German as a language connected with learning and school. In fact, when the German Swiss talk about their bilinguality they often think about Swiss Standard German and the local dialect, and not the other national languages of Switzerland. In other words, the German Swiss are bilingual within one language (Loetscher, 1986: 28). Some recent studies (e.g. Jekat & Dutoit, 2015) on L2 acquisition of Standard German in Switzerland reveal the influences of Swiss German on the performance of speakers or learners of German as a second language. The participants showing transfer from dialects to Swiss Standard German used more the dialect than standard or more often come into contact with people speaking Swiss German dialects.

According to the language law in Switzerland, cantons are obliged to provide the teaching of one second national language (e.g. French or Italian) and one foreign language (e.g. English) during the period of obligatory schooling. In this way, the classes of a second national language are secured and cannot be crossed out from the school timetable. This language strategy overlaps with the so-called "Model 3/5" which consists in introducing a first foreign language in the third grade and a second foreign language in the fifth grade of primary education. However, the effectiveness of this partner language model has been stretched by the growing

popularity of English gradually ousting second national languages from their positions in the school curriculum (Pap, 1990, Watts, 1991). The Swiss way of life has been pervaded by English (Cheshire & Moser, 1994: 467) and it continues to enjoy favourable attitudes and increased acquisition and use as an additional language, especially in scientific and technological contexts (cf. Stępkowska, 2015). In the opinion of Fishman (1977: 309), the spread of English is likely to contribute to stable patterns of diglossia or even triglossia rather than to stir up linguistic antagonisms such as those from the previous centuries.

Although English is viewed as a foreign language in Switzerland, its status has changed more toward the status of the second language (cf. Stępkowska, 2013). This relates to three functions fulfilled by English in Switzerland today. Although English has no official status, the first function it serves is that of a "neutral" second language in some official or semi-official contexts of everyday life for all language groups (cf. Ronan, 2016). For example, English is present on Swiss passports and on the official timetable of the Swiss Federal Railway. The second function of English is connected with its status as a global international language. Recent regulations governing the two Swiss technical universities – Federal Polytechnic in Zurich and the Lausanne Federal Polytechnic – openly provide for the possibility of teaching in English or, as in the latter case, through the medium of English. In the Federal Polytechnic in Zurich, English is used as a *lingua franca* in business. Some Swiss companies choose English not only for third international business relations but also for communication inside their companies. The third function of English within Switzerland can be observed among younger people. More and more young Swiss choose to speak English with Swiss interlocutors from different language areas. English is currently fashionable and that is why it is so popular among these young people, who not only listen to English language pop music and see English language films, but tend to use it for several expressive purposes, like short exclamations, swearing, or for short direct exchanges of information (Dürmüller, 1986, 1992).

5 Summary: Challenges and Perspectives

The expansion of dialects in Switzerland continues to develop and their popularity in educational institutions of all levels is the source of concern for linguists and complicates the task of language planners and language policy makers (Annen-Ruf, 1990: 132). Many voices are explicitly sceptical about the consequences of dialects becoming self-dependent, notably in multilingual communities. Haugen (1972: 245) argues that "if dialects are about to turn into languages, they may acquire disruptive potential due to their strong appeal to local loyalty". Indeed, the expansion of diglossia generates difficulties in the communication among the Swiss from different linguistic backgrounds and maximizes the isolation of German-speaking Swiss from the German culture. The linguistic features of Swiss German varieties, displaying clear grammatical and lexical dissimilarities in comparison to Swiss

Standard German, lead to a total incomprehension of the dialects even by a large majority of native speakers of Standard German. Watts (2001: 313) writes about "the counter-ideology to the ideology of dialect" represented mainly by the French-speaking Swiss. According to this counter-ideology, the German-speaking Swiss betrayed the idea of a multilingual country and thus cannot be regarded as Swiss patriots as opposed to the speakers of French. In a more measurable scenario, as suggested by Schmid (2001: 149), the continuing spread of Swiss German may indeed cut off the German part of Switzerland from the rest of the German-speaking world.

At the same time, the intra-national communication has become a serious challenge growing to the point of a linguistic blockade. Swiss German dialects already prevail and Swiss Standard German turns into a foreign language. Swiss German is on a winning streak and everyone gives in to this pressure. This trend hardens the barriers between the two biggest language communities – the German Swiss and the French Swiss. In the long run, this situation may lead to a complete deadlock in communication between them and thereby ruin their relations for a long time. The exclusive focus on Swiss German dialects in contact with French Swiss and Italian Swiss tends to be interpreted not as impoliteness, but as an actual refusal to communicate. Insisting on dialects and demanding English as a *lingua franca* for communication between the language regions of Switzerland is unacceptable for many, because such a solution would exclude large parts of the population from the dialogue.

Swiss German dialects belong to the German-speaking cultural area and, in a way, contribute to the development of Swiss Standard German, following the concept of German as a pluricentric language (Dürscheid & Businger, 2006). As a multilingual country, the Swiss Federation fulfils its official duties towards all national languages and the languages of migration. Such language policies reinforce the protection of Swiss Standard German in the German-speaking parts of Switzerland. In turn, the exceptional condition of a fully developed diglossia (*ausgebauten Diglossie*) (Haas, 2004: 101) encourages the respect for the dialects which maintain the status of vernaculars in the Swiss German cantons.

The consistent use of the H variety at school, namely the H variety as a rule and the L variety as an evident exception to this rule, has turned into a challenge (Sieber & Sitta, 1986; Neugebauer & Bachmann, 2006). The fact that it is important to speak and understand Swiss Standard German is unquestionable and German in Switzerland does not need to be denied. In fact, it becomes a meaningful testimony of bilingualism within one language. This bilingualism points to higher demands regarding the language skills of the Swiss society. The linguistic situation in the German-speaking Switzerland clearly indicates the necessity of strengthening language skills in the fluent use of Swiss Standard German, which is the prerequisite of educational and professional success. The 2000 census revealed a new language barrier between those who spoke only dialect and those who used dialects and the standard. Contrasting the L variety with the H variety is not enriching but impoverishing, particularly when the largest speech community of about five million people in Swiss German Switzerland can hardly speak any other language except for the

dialect. If so, then the multilingualism which used to be a reality, now may become a mere demand. A support of dialects in kindergartens and schools is urgent for their early contribution to an independent and reliable culture of Swiss Standard German in Switzerland. Such a culture is directed not against dialects, but serves equally for language protection and cultural exchange in Switzerland and beyond.

What strikes most is the affinity for the dialect to the point of becoming a hindrance. The insecurity of Swiss German speakers has both its cause and effect in their unwillingness to use the high variety. This insecurity comes from the lack of practice in Standard German, thereby turning Swiss Standard German into a rusty version of the language. Language repertoires evolve and when insecurity increases it contributes to maintaining negative representations towards the language. The German-speaking Swiss are compelled to use their skills, which leads to a high level of language insecurity. This situation results in a complete lack of identification with the national language, i.e. Swiss Standard German which is inscribed in the Swiss Federal Constitution. Instead, Swiss German dialects are considered as representative of the German-speaking Switzerland.

A commonplace opinion about Switzerland as a multilingual country where different national language groups, including immigrants, live together in harmony, has been recently more and more critically analyzed. Described by the motto "unity in diversity" and derived from a long tradition of contact between different language groups, the model of Swiss society was eventually formed in the first half of the twentieth century. Apparently now, this model has been put to the test. The regional (territorial) quadrilingualism of Switzerland ceases to correspond with the reality due to several irreversible changes on the macro scale. The social processes related to language issues – to name a few – include the growing mobility of the Swiss society within the country, innovative communication techniques affecting language socialization, the progressing decline of Romansh, the ever weaker knowledge of Swiss national languages apart from one's own, and the loss of prestige of national languages for the sake of English.

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Literacy Development in Cyprus: Exploring the Effects of Diglossia and Bilectalism

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1 By Way of Introduction: The (Socio)linguistic Situation in Cyprus

The island of Cyprus, located in the south-east Mediterranean Sea, has a long and interesting linguistic history, which is reflected in its current (socio)linguistic situation. Greek has had a long and continuous presence on the island, as Mycenaean Greeks settled in Cyprus as early as the 12th century BCE. Other languages that are part of the linguistic history of Cyprus are Medieval French (Provençal), following Frankish settlement after the 3rd Crusade (1192–1489), (Ottoman) Turkish (1571–1878), and English, as Cyprus was a Crown Colony from 1878 to 1960. Currently, the two largest population groups of the island are Greek Cypriots and Turkish Cypriots (Hadjioannou et al., 2011; Statistical Service, 2013). The languages now spoken on the island are Cypriot Greek and Cypriot Turkish—and the respective standard varieties, Standard Modern Greek and Standard Turkish. Armenian, Sanna (Cypriot Maronite Arabic, which is an endangered language), and Kurbetcha (Romani) are also spoken by smaller population groups and at different levels of fluency. This chapter focuses on the (socio)linguistic situation in the Republic of Cyprus, which involves language contact and *diglossia* between Cypriot

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and Standard Greek, and on its relevance for language acquisition and literacy learning.

Cypriot Greek belongs to the south-eastern Greek dialect zone (Trudgill, 2003; Tsiplakou, 2006). As most Modern Greek dialects, it developed out of the Hellenistic Koiné in the Middle Ages; its emergence may arguably range as far back as the 11th or even the 10th century, but written texts in Cypriot Greek can only be dated back to the 14th or 15th century (Holton et al., 2019). Contemporary Cypriot Greek still retains features of Medieval Greek (notably in aspects of its verbal morphology and clitic placement in the syntax); lexical borrowings from Arabic, Frankish, Venetian, Turkish, and English abound as well (see Appendix for a list of some major phonological, morphological, and syntactic properties of Cypriot Greek).

Within Cypriot Greek there is geographical (horizontal) and social (vertical) variation, although in recent years there is a marked shift from the former to the latter, combined with both leveling of local subvarieties and the emergence of a pancypriot *koiné* (Tsiplakou et al., 2006, 2016). The term dialect leveling refers to (gradual) loss of dialectal forms, especially more geographically contained or sociolinguistically marked ones; extensive leveling may lead to *convergence* among dialects and the concomitant emergence of a *koiné* (Trudgill, 2004; Kerswill, 2013; Cerruti & Tsiplakou, 2020). A valuable early source of geographical variation in Cyprus was Newton (1972). Newton presents data he collected during the 1960s from 128 villages (Newton, 1972: 177–185), which show significant phonological variation across different areas of the island (see also Contosopoulos, 1969: 105; Terkourafi, 2005: 372). In later work, he also made reference to sociolinguistic or stylistic variation (Newton, 1983); in his description of *registers* of Cypriot Greek, local subvarieties are collectively termed *xorkátika* 'peasanty' and he also mentions an 'urban' or 'metropolitan' variety ("town speech"), which was purportedly closer to Standard Modern Greek (and which we subsequently refer to just as 'Standard Greek'). This suggests that geographical and sociolinguistic variation must have both been at play and that Newton's "town speech" could well have been an early *koiné* (cf. Terkourafi, 2005).

Recent research indicates a shift from horizontal to vertical variation: On the one hand, leveling of extant local subvarieties—or at least of some of their most marked, basilectal features—is going strong; on the other hand, features which were formerly part of geographical basilects now index 'lower' registers of the dialect and aspects of the social identity of speakers rather than geographical provenance. The two processes go hand in hand; the result is a shift from a geographical to a social (or register/stylistic) continuum (Tsiplakou et al., 2016).

As regards dialect leveling, the geopolitical situation in Cyprus was a key factor in spurring on and expediting the process. The war of 1974 led to the *de facto* division of the island and Greek-speaking populations living in the north of Cyprus were forcibly moved south. This resulted in contact among populations from different areas of the island and, conceivably, the dismantling of extant social networks and the building of new ones. Social mobility, increased contact among social groups, internal migration, and urbanization as well as the spread of literacy were significant contributing factors to leveling, that is, the abandonment of local features

for purposes of mutual intelligibility and as a result of mutual accommodation among social groups. This process arguably emerged within the space of a single generation, as is indicated by the differences in the linguistic production of pre- and post-war generations (Tsiplakou et al., 2016).

Research on leveling of some of the dialect features of a southeastern Cypriot variety is presented in Tsiplakou & Kontogiorgi (2016). The study examined the status of four marked basilectal variants in Kokkinohoria, the 'Red Villages' of the Larnaca and Famagusta districts. These villages were chosen because they are traditionally perceived as belonging to a distinct dialect group, with its own marked basilectal features, prominent among which is the local palatal [ç] vs. the pancypriot palatoalveolar [ʃ] before the front vowels [i] and [e] (e.g. in [ˈeçi] vs. [ˈeʃi] 'has'). The other variants examined were local [x]/[ç] vs. pancypriot [θ] (e.g. in [ˈçelo] vs. [ˈθelo] 'I want' or [xoˈro] vs. [θoˈro] 'I see') and the type of consonant cluster resulting from the hardening of underlying /i/ to [k]/[c]: There is variation between simplification and non-simplification of the cluster (e.g. /ˈθios/ > [θcos] or [cos] 'uncle'); the full cluster is the pancypriot one, while the simplified one is the local/basilectal one. Results are shown in Fig. 1. The 45 participants in the study (21 women and 24 men) were of different ages and educational levels, and they were all born, raised, and living in the area. Data were collected with a word elicitation tool and through sociolinguistic interviews. The quantitative analysis clearly shows leveling of the variants examined on a large scale.

These results were then correlated with social factors: Age, gender, sex, education, and social class (determined by the profession of the participants in this study) were all shown to be contributing factors affecting leveling. The principal innovators were younger, educated, middle-class women, while older, male speakers still used the local variants, albeit to a limited extent. Moreover, speakers displayed full

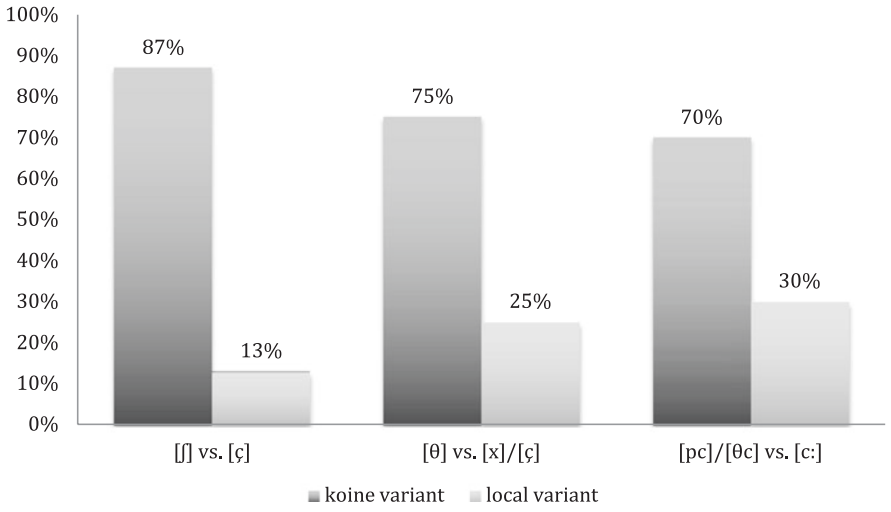

Fig. 1 Leveling of [ç], [x], and [c] in Kokkinohoria. (From Tsiplakou & Kontogiorgi, 2016: 461)

metalinguistic awareness of the properties and social indexicalities of the variants, which indicates that the choice of the pancypriot over the local variants is an instance of 'change from above' (Labov, 2001).

2 Cypriot Greek(s)—A Mixed *Koiné*?

Dialect leveling as a result of contact among local subvarieties of Cypriot Greek goes hand in hand with (i) the preponderance of dialect features which are pancypriot (i.e. not identifiable as geographically bounded) and (ii) the emergence of a *koiné,* an intermediate, 'compromise' variety (Trudgill, 1986; Kerswill & Trudgill, 2005; Kerswill, 2013), which is also structurally affected by intense contact with the standard variety; see also Trudgill (2004) on properties of the emergence of new dialects or varieties. It is an intermediate variety, in a sense, the end product of partial *advergence* to the standard (on the term *advergence* see Mattheier, 1996; cf. also Kühl & Braunmüller, 2014; Tsiplakou, 2014a, b; Cerruti & Tsiplakou, 2020), that is, the convergence of a dialect to the standard language. This results in new, often hybrid, pancypriot structures (Tsiplakou et al., 2006, 2016). The *koiné* is by now a 'co-overt' prestige variety (Rowe & Grohmann, 2013, 2014), arguably due to its distinctiveness from local, basilectal, marked subvarieties but also because of its hybrid, structurally mixed nature. This term is meant as a juxtaposition of overt (Bourdieu, 1993) and covert prestige (Trudgill, 1972). This means that local and standard-like features co-occur in a form of a sociolinguistically driven 'compromise' that allows for the survival and the visibility of both standard and dialect (Tsiplakou, 2014b: 164).

The examples below illustrate that mixing takes place on all levels:

(1)	ˈexumen	**c**e	paraθiˈraci		na	metaciniˈθumen
	have.PRES.1PL	and	window.DIM.SG.ACC		MOD	move.PERF.1PL
	tʃaˈme ðen	piˈrazi	**tʃ**e	ðaˈme	en	oˈcʰːei
	there NEG	matter. PRES.3S	and	here	be.PRES.3SG	OK

'We have a little window, too. Should we move over there? It doesn't matter, it's OK here too.'

In (1) the speaker uses both the more standard-like variant [c] and the Cypriot Greek variant [tʃ] in tokens of the same word, [ce]/[tʃe] 'and' (see Appendix for more examples from phonology). The production is otherwise in dialect, as is evidenced, for example, by the Cypriot Greek lexical items [tʃaˈme] 'there' and [ðaˈme] 'here', the Cypriot Greek word-final [n] in [ˈexumen] 'we have' and [metaciniˈθumen] 'we move', and the Cypriot Greek 3rd person copula [en] 'is'. It is therefore hard to

argue that the use of the standard-like variant [c] in [ce] 'and' is an instance of code-switching to Standard Greek, as it is hard to see what that 'switch' indexes—for example, there is no change in the setting or the participants, in footing or alignment , or a topic shift of any kind (cf. Auer, 1995; Tsiplakou, 2009). The alternative is then to consider the possibility that the phonological system of the *koiné* is becoming mixed.

The same argument can be made for morphosyntax, that is, certain aspects of the morphological and syntactic systems (some illustrated in the Appendix). A case in point from the syntactic system is exceptional clitic placement or unexpected proclisis (Pappas, 2014; Tsiplakou et al., 2016; Leivada et al., 2017c; Tsiplakou, 2017; Grohmann et al., to appear). In Standard Greek, pronominal object clitics appear immediately to the left of the verb if the verb form has tense features, but they appear in the immediately postverbal position if the verb form is an imperative or a gerund; Cypriot Greek displays clitic-second effects (cf. Tsiplakou, 2006; see Appendix). However, almost free alternation between standard-like proclisis and dialectal enclisis may occur in spontaneous, otherwise dialectal production, as in (2):

(2) **ta** ekat ˈaferes stavrulːa
them.CL.ACC make.PAST.PERF.2SG Stavroula.VOC
ˈivres **to**
find.PAST.PERF.2SG it.CL.ACC
'Did you make it, Stavroula? Did you find it?'

The same arguments against treating such cases as code-switching to Standard Greek as those presented above for the phonological alternation apply here as well. Exceptional clitic placement then occurs in otherwise dialectal phonological and morphological environments, which suggests that it may well be on its way to becoming part of the grammatical system of the *koiné*.

A striking case of morphosyntactic and semantic hybridity in the *koiné* is that of the innovative periphrastic perfect tenses. In contrast to Standard Greek, in older Cypriot Greek there were no periphrastic tenses; Simple Past also functioned as Present and Past Perfect (Menardos, 1925/1969). Recent research indicates that innovative periphrastic tenses are fast seeping into the *koiné* (Melissaropoulou et al., 2013; Tsiplakou et al., 2016, 2019). However, examples such as (3)–(4) show that these innovative periphrastic tenses are not standard-like at all as regards their semantics: The tense in (3) does not mean "perfect in the present", nor does the tense in (4) mean "past in the past", as do the equivalent forms in Standard Greek (Tsiplakou et al., 2019; data from Tsiplakou et al., 2016: 15):

(3) ˈexo afipireˈtisi ton ˈavɣusto
have.PRES.1SG retire.PERF the August.ACC
'I have retired (: retired) last August.'

(4) eˈkaman mu ˈintʰ:ervju tʃe ˈixa
do.PAST.3PL me.CL.DAT interview and have.PAST.1SG
tus anaˈferi tin ˈerevnan pu ˈekama
them.CL.DAT mention.PERF the research.ACC that do.PAST.PERF.1SG
'They interviewed me, and I had mentioned (: mentioned) to them the research I did (: had done).'

The innovative Present Perfect in example (3) is used *in lieu of* Simple Past; note that the sentence would be ungrammatical in Standard Greek because of the co-occurrence of the Present Perfect and the past tense adverbial [ton ˈavɣusto] 'last August'. Similarly, (4) contains an innovative periphrastic Past Perfect, which does not mean "past in the past"; it is used as a semantically, but not pragmatically, equivalent variant of the Simple Past—with an additional focalizing function (Tsiplakou et al., 2016; see Tsiplakou et al., 2019 for an analysis of quantitative data supporting this hypothesis).

In recent research (Tsiplakou et al., 2016), data were collected via sociolinguistic interviews from 57 participants (28 women and 29 men), whose ages ranged from 26 to 90. The study analyzed rates of occurrence of phonological, syntactic, and semantic variants which have already been mentioned here: (i) standard-like palatal [c] and [ç] vs. Cypriot palatoalveolar [tʃ] and [ʃ]; (ii) standard-like unexpected proclisis vs. enclisis; and (iii) standard-like periphrastic Present and Past Perfect vs. Simple Past. Figure 2 presents the results from the sociolinguistic interviews:

The data show that palatals, proclisis, and periphrastic tenses occur spontaneously in oral production in the *koiné*; arguably, such standard-like elements and structures may account for the fact that the *koiné* is a (c)overt prestige variety (Rowe & Grohmann, 2013, 2014) and also for why this mixed, hybrid form of the dialect—with partial advergence to the standard variety—may act as a buffer against full advergence and full dedialectalization (Tsiplakou, 2011). In other words, the dialect has not yet fully evolved to resemble the standard variety.

By the same token, the data also show that *diglossia* between Standard and Cypriot Greek is still going strong (Papapavlou, 1998; Papapavlou & Sophocleous, 2009; Arvaniti, 2010; Tsiplakou, 2011). The *koiné* is part of the Cypriot dialect continuum, be that horizontal or vertical (or possibly both); although the data may be taken to indicate an ongoing move towards Type C *diaglossia* (Bellmann, 1998; Auer, 2005, 2011; see also Rowe & Grohmann, 2014)—i.e. the development of a mixed, hybrid system, and the concomitant resolution of the diglossic

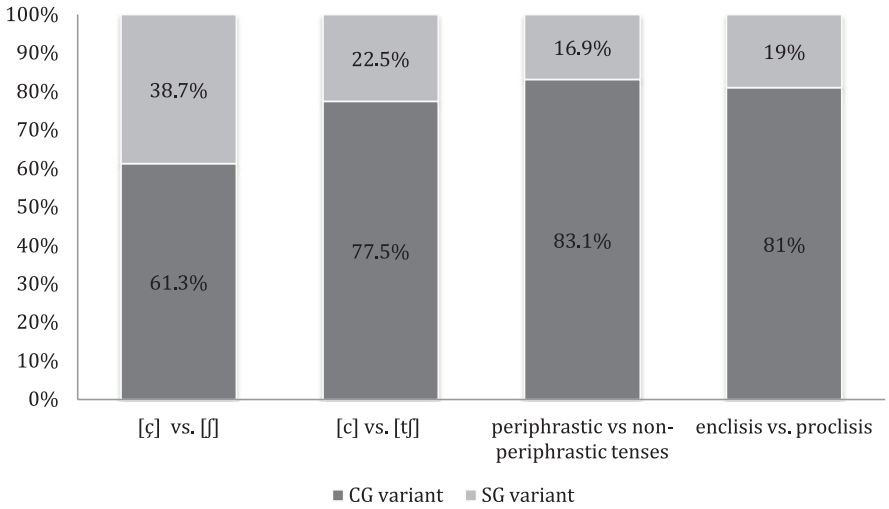

Fig. 2 Structural innovation in the Cypriot Greek koiné—palatals, proclisis, and periphrastic tenses. (From Tsiplakou et al., 2016: 17)

situation—Standard Greek still by and large remains a continuum-external variety; the partial advergence of the *koiné* to the standard variety, as described in this section, suggests gradient bi(dia)lectalism and imperfect second dialect acquisition, possibly dependent on the area of the grammar (cf. Grohmann, 2014b; Grohmann et al., 2016, 2017; Tsiplakou, 2017). As regards the dynamics of the sociolinguistic situation, despite the (c)overt prestige of the *koiné*, the continuum-external, standard variety overall remains the 'H' variety. An obvious consequence of this state of affairs is the possibility of competing grammars, which we will pick up in the next section in the context of language acquisition and development.

3 A Perspective from Child Language Acquisition and Development

The complex linguistic situation in Cyprus laid out above has immediate consequences for the study of first language acquisition in environments in which children acquire an unofficial, not recognized, and/or non-codified language (Leivada & Grohmann, 2017). We illustrate the added difficulty by reporting on one aspect of grammatical development that has been investigated in the Cyprus Acquisition Team (CAT) Lab for a good decade. While a comprehensive formal description of Cypriot Greek syntax is still waiting to be compiled, a well-documented morpho-syntactic property is pronominal object clitic placement (cf. Terzi, 1999a, b; Agouraki, 2001; see also Chatzikyriakidis, 2010 for comparative and Pappas 2010 for diachronic discussion).

As already mentioned in Sect. 2, this is among the more salient differences between the two varieties of Greek. In Standard Greek, pronominal object clitics appear immediately to the left of the verb (proclisis) if the verb form has tense features, but they appear in the immediately postverbal position if the verb form is an imperative or a gerund; in contrast, Cypriot Greek displays clitic-second effects, that is, object clitics appear to the right of the verb (enclisis) if the verb comes first in the clause, but they appear to the left of the verb if there is a preceding element such as a *wh*-expression, negation, or mood marker (cf. Appendix). The findings from a picture-based elicitation task reported below allow us to pinpoint the development of metalinguistic awareness in bilectal language acquisition, and the emergence of issues of context-appropriateness, identity, attitude, and other motivations that spark the process of acquiring competing grammars (Tsiplakou, 2007a). These factors can be captured by the Socio-Syntax of Development Hypothesis underlying the process of language acquisition in multilingual environments which involve the co-existence of an 'H' and an 'L' variety, as is typical of diglossic speech communities.

In a first series of studies (starting with Grohmann, 2011, summarized in Grohmann, 2014a, and expanded on in Grohmann et al., 2017), Greek Cypriot children were administered a sentence completion task which aimed at the production of verb–clitic sequences. In parallel, a second study by Leivada et al. (2010) examined other native Greek-speaking child populations in Cyprus (discussed and put in context in Leivada & Grohmann, 2017). This production task was intended to prompt for a 3rd person singular accusative object clitic within syntactic islands in order to ensure production (with object drop illicit in this context). The clitic-in-islands task thus tracked both production of a clitic (as opposed to ungrammatical omission or substitution by a full nominal expression) and placement (enclisis or proclisis).

The original participant groups, reported in Fig. 3 below, included 24 children aged 5–6 (13 girls, 11 boys), 10 younger children with ages ranging from 3;2 to 4;11 (5 girls, 5 boys), and 8 adults as a control group (4 female, 4 male), although the tool was designed by native speakers of Cypriot Greek who deemed enclisis the most

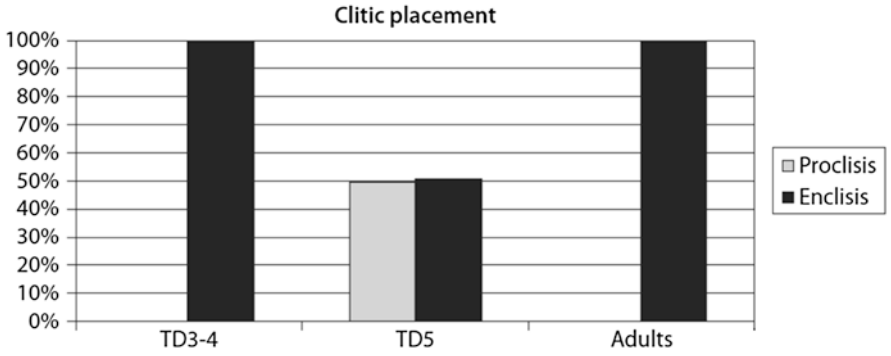

Fig. 3 Clitic placement in clitics-in-islands task—all tested groups (from Grohmann. 2011: 196)

suitable response for each of the 12 target structures. In subsequent research, we added substantially to the overall number of child participants as well as to different age groups. For the same tool, Grohmann et al. (2017), for example, report data collected from 431 bilectal children with typical language development aged 2;8 to 8;11; see Grohmann (2014a) for the full range of participants.

Figure 3 captures two remarkable findings, which we will untangle in the remainder of this section:

First, the results clearly show that enclisis is both the target placement for adults in Cypriot Greek indicatives and the acquired strategy for young children. This suggests, then, that the Cypriot Greek verb–clitic order in these syntactic contexts indeed becomes part of children's original linguistic repertoire. In other words, Greek Cypriot bilectal children acquire as their native language the local variety, Cypriot Greek. The at first glance surprising finding that 5- year-old children seem to employ both enclisis and proclisis gave rise to a lot of discussion and additional testing. For starters, it is not the case that 5-year-olds simply mix enclisis and proclisis. Rather, these children can be further distinguished into three groups—children that predominantly use enclisis, children that predominantly use proclisis, and children that mix the two more or less equally (with no other factors such as gender, geographic origin, socio- economic background, and so on, influencing their choices).

This brings us to the second finding, stemming from subsequent research with many more children in finer-grained age groups (Grohmann, 2014a; Grohmann et al., 2017; Leivada & Grohmann, 2017). It turns out that the initial acquisition of enclisis gives way to increasing use of proclisis as children undergo schooling. That is, kindergartners show some signs of proclisis, first-graders some more, and second-graders even more. Subsequently, the use of proclisis decreases and enclisis is again predominant after third grade. What is remarkable about this finding, in particular in the context of the present volume on the development of literacy in diglossic and dialectal contexts, is that schooling maximizes exposure to Standard Greek, the formal language, the 'H' variety, the official language of the country, as this is also the language used to teach reading and writing skills; in the syntactic environment tested, the standard variety only accepts proclisis as the grammatical option for sentence completion. That is, performance in clitic placement is influenced by exposure to the standard language.

Grohmann (2011) formulated the Socio-Syntax of Development Hypothesis to help explain these changes in clitic placement, an aspect of grammar that is acquired very early and usually not accompanied by misplacement in typical language development. Once core grammar is acquired, subsequent syntactic development may be influenced by sociolinguistic or grammar-external factors. In the case of Cypriot Greek clitic placement, schooling in the medium of Standard Greek may constitute one such factor. However, schooling need not be the only factor. Leivada & Grohmann (2017) outline a model of competition in bilectalism which heavily draws on the development of metalinguistic awareness, a process with a well-known high level of individual variation. In addition, it may also be the case that Cypriot Greek itself is undergoing further change. The above-mentioned Cypriot

dialect continuum may thus give rise to competing grammars, which the young child needs to navigate and negotiate (cf. Tsiplakou et al., 2016; Tsiplakou, 2017; Grohmann et al., to appear).

The Socio-Syntax of Development Hypothesis may indeed provide a framework for investigating language acquisition beyond the critical period in not strictly monolingual as well as multi- or plurilingual contexts, especially for speakers who share their linguistic space with superimposed majority languages. Leivada et al. (2019) demonstrate how difficult it is to collect data for non-codified and/or understudied languages. They discuss a number of factors, including the absence of an agreed-upon orthography to support literacy. As a final note, before addressing the relevance of child language research for the development of literacy in Cyprus, we would like to point to other aspects of child language development that can be informed by the line of research sketched above—and have, at least in part, been tackled by our research group in the CAT Lab over the past decade. These fall into three areas of growing widespread research: infant and toddler development of language (say, before the age of 3 years), early diagnosis of potential developmental language difficulties (with relevance to pathology), and the connection between bilingualism and cognition (viz. executive control).

Concerning global efforts to trace very early language acquisition, Taxitari et al. (2015) report our group's adaptation of the MacArthur-Bates Communicative Development Inventory (CDI; Fenson et al., 1994). This was the first study investigating early language in bilectal children and as such set a milestone for investigations of the CDI format for dialects and other understudied language varieties. Such research allows tracking influence from standard/majority languages on the lexical and early grammatical development (see the CDI website at https://mb-cdi.stanford.edu/adaptations.html for all available adaptations).

Based on Theodorou (2013), who developed the first diagnostic battery for Cypriot Greek, Theodorou et al. (2014, 2016) confirmed the validity of these tools for an accurate diagnosis of specific language impairment (SLI), a developmental language disorder. This line of research was followed up by employing a sentence repetition task in the search for clinical markers (Theodorou et al., 2017), and there are further extensions. For example, Kambanaros et al. (2013) describe differences in the linguistic profiles of bilectal vs. 'true' multilingual children with SLI, while Kambanaros et al. (2019) utilized a compounding task as a means to inform about language impairment in bilectal children with autism spectrum disorder. Other than of use to local speech–language pathologists, this research agenda constitutes an important basis for defining and assessing the role of dialects in early education and schooling.

And lastly, with respect to the often purported relationship between bilingualism and enhanced executive control, Antoniou et al. (2016) reported a first study of immediate relevance for a more gradient framework of comparative bilingualism such as the one assumed here (in the sense of Grohmann, 2014b; see also Grohmann & Kambanaros, 2016; and Grohmann et al., 2016): The results from a number of tasks tapping into different executive functions administered to monolingual children (residing and tested in Greece) as well as Cypriot–Standard Greek bilectal and

Greek–English bilingual children (in Cyprus) suggest that bilectal children behave more like their bilingual rather than their monolingual peers. These research findings have unfortunately as yet not been capitalized on by national language policy agents or curriculum developers.

4 Literacy Learning

Despite the fact that multilingualism and linguistic variation have always been an integral part of the Cypriot context, the two major communities have two separate education systems, both ultimately monolingual and monocultural (Hadjioannou et al., 2011). Official education policies do not formally allow the use of the dialect nor do they provide any space for translanguaging practices; teachers are strongly advised to use exclusively the target variety, Standard Greek, and to correct the 'improper' oral use of dialect by students by repeating their utterances in 'correct Greek'. In practice, however, teachers and students switch between dialect and standard, but this informal presence of the dialect in the classroom may often serve to buttress language hierarchies and work against metalinguistic awareness, language equity, and the honing of critical literacy skills.

4.1 Sociopolitical Framework and Educational Policies

The Republic of Cyprus, which was established in 1959, only had a very brief bicommunal, bilingual period. Intercommunal clashes in the 1960s and early 1970s, and the Turkish invasion in 1974 following a military coup in Cyprus led by the junta of Greece, led to the *de facto* partition of the island. The language and educational policies of the Greek Cypriot and the Turkish Cypriot communities are 'outward-looking', copying the respective policies of the 'motherlands' for the purpose of fostering national unity and national identity. Coupled with standard language ideologies, this has serious repercussions for language and literacy learning.

Overall, the Republic of Cyprus has been following faithfully the language education models of Greece—for national as well as practical reasons (Persianis, 1981). Curricula and textbooks, especially in language arts, have always been imported from Greece (in fact, the language textbooks for all grades of compulsory education were donated by Greece to Cyprus up until 2010), even after Cyprus started producing its own textbooks for school subjects other than Greek. The only locally produced textbooks for language arts are the *Cypriot Anthologies*, which contain literary texts by Cypriot authors and poets, a small percentage of which is in dialect—and these texts are usually not taught. Standard Greek is the language of literacy almost by definition.

As was already mentioned, the reasons for this prolonged situation have to do with the coupling of national concerns with standard language ideologies

(Tsiplakou, 2007b; Ioannidou, 2012). In the years that followed the establishment of the Republic of Cyprus, Cyprus adopted all the education reforms introduced in Greece. The 1964 educational reform in Greece provided for the teaching and use of *dhimotikí*, the spoken 'L' variety in Greece (arguably the Modern Greek *koiné*), accompanied by new textbooks; Cyprus adopted all these changes enthusiastically. In 1967, the military junta in Greece brought back *katharévousa* (the artificial, written, archaizing 'H' variety of Greece) and the previous textbooks. Cyprus, although not under the military junta, adopted all these changes (Ioannidou 2012). The unstable political context in the years that followed and, crucially, the war and the partition of the island strengthened nationalist ideologies and the purported link between language and national identity, which was to be fostered through education—and primarily through language teaching (Ioannidou, 2012).

4.2 Language Ideologies and Attitudes

Standard language ideologies play an equally important role in the shaping of language education policies and practices. Standard Modern Greek is a written variety that is deemed the only one suitable for the public domain and for formal or academic registers. Standard Greek is the variety of overt prestige: It is typically characterized as *evjeniká* 'polite', as 'aesthetically superior', and as the only suitable vehicle for abstract and complex thinking (Papapavlou, 1998; Tsiplakou, 2011). In contrast, the dialect, which is used primarily in oral interaction, is not standardized, there is no official writing system (although it is written in various ways since the 15th century), and it is typically associated with informality, humor, and authenticity of affect (Coupland, 2003). At the same time, Cypriot Greek is also characterized as *xorkátika* 'peasanty', aesthetically inferior (*varetá* 'heavy'), rude, and unsuitable for education and literacy learning at large. Educators reflect these attitudes, characterizing the dialect as "impoverished" and often bemoaning Cypriot students' 'language deficit' (data from Tsiplakou, 2007b, 2011):

(5) "Of course we love Cypriot, it's in our hearts. But it is not appropriate for education It is impoverished." (high school teacher, 57)

(6) "If a child in Greece asks his mother why, for example, the traffic lights in the street go on and off, the mother will explain in many words. If a similar thing happens in Cyprus, the mother will answer in one word." (primary school teacher, 40)

4.3 Linguistic Variation in Classroom Discourse

Cypriot Greek is not taught in Cypriot schools—neither formally nor informally. However, our research has shown that the dialect is present in the school classroom: Students typically use different linguistic resources, including dialect, to index their positioning either towards more hierarchical school structures or within solidarity-based networks. Also, they may use the dialect as a learning resource, for example to foster comprehension and meaning-making (Tsiplakou, 2007b, 2016; Ioannidou, 2009; Ioannidou & Sophocleous, 2010; Tsiplakou et al., 2018). However, the Cypriot classroom still remains a normative space. Ethnographic research findings show that teachers typically intervene to correct the use of the dialect by the students, thereby implicitly creating a value system where the standard is the language of authority and power; moreover, the clash between the variety of school literacy and the home variety of the students may have potentially serious educational implications (see also Leivada et al., 2017a, b for more formal investigations into teacher and student competence in Standard Greek, briefly summarized below).

Quantitative research has shown that teachers are aware that they code-switch from Standard Greek to dialect when performing discourse acts that are peripheral to the content of the 'lesson proper', i.e. in order to restore order, to joke, to address individual students on issues that are not relevant to the lesson, and so on (Pavlou & Papapavlou, 2004). These quantitative findings are confirmed by ethnographic research on classroom interaction (Ioannidou, 2009; Ioannidou & Sophocleous, 2010; Tsiplakou et al., 2018; data from Tsiplakou et al., 2018):

(7) Teacher: ʝa na ˈfame mas voiˈθa to ˈstoma e
ˈate re ˈvarte ton nu sas na ˈðulepsi ˈliɣo
In eating, is it the mouth that helps us, eh?
Come on, gang. Put your mind to work a bit.

(Cypriot Greek is underlined)

In what follows, we discuss data from a Cypriot Greek class (Grade 5); this particular case was chosen because the teacher claimed to have positive attitudes towards linguistic variation and acknowledged its importance for teaching and learning. Data were collected with ethnographic tools, namely silent participant observation, field notes, audio recordings of lessons, and phonetic transcriptions in which all instances of dialect–standard alternation or translanguaging were noted.

In the data, there were some instances of use of the dialect for pedagogical purposes. In the first example, the students are discussing the characters of Greek shadow theater; the teacher uses a paraphrase in Cypriot Greek to elicit the adjective she is looking for (Tsiplakou, 2007b, 2016):

(8)	Teacher:	ðilaˈði me ˈliɣa ˈloʝa pite mu ˈenan eˈpiθeto
		pu ˈðixni pos parusiˈazete o karaˈⁿʝozis
	Student:	çumoristiˈkos
	Teacher:	ne aˈlːa ˈtuton pu ˈalːa tu len
		ʧ ˈalːa katalaˈveni ʧ ˈalːa tus lei
		pu ˈlemen sta cipriaˈka ˈpezi ton peˈlːo
	Student:	aˈnikseros
	Teacher:	ˈkamni ton aˈniksero ˈetsi?
		en katalaˈveni ˈiⁿda m bu tu ˈlesin
	Teacher:	So, in short, tell me an adjective
		which shows how Karaghiozis is presented.
	Student:	Humorous.
	Teacher:	Yes, but what about when they tell him one thing
		and he understands another and then he says something else.
		When he plays dumb, as we say in Cypriot.
	Student:	Clueless.
	Teacher:	He pretends to be clueless, right?
		He doesn't understand what they say to him.

Such instances aside, most cases of code-switching in the data indicate that the choice of variety is not ideology-free. In the example below, the switching to dialect is *participant-oriented* (Auer, 1995) in the sense that it indexes the onset of interaction between teacher and student(s) that lies outside the remit of the 'lesson proper'; conversely, the switching from dialect to standard indexes a return to, or a re-establishment of, the frame of 'lesson' or 'content-oriented' discourse. The directionality of the switch therefore also carries indexical value (Tsiplakou, 2007b):

(9)	Teacher:	ˈine sti seˈliða oɣðoⁿdaˈeksi peˈðʝa ce i tris ce ta tria tu ta peˈðʝa
		ˈivrete ta
		ta tria tu peˈðʝa
		They're on page eighty-six, kids, all three of them,
		all his three children.
		Did you find them?
		His three children.

This kind of code alternation allows for some space for the dialect in the lesson; however, it delimits this space rigidly, reproducing macro-level hierarchical distinctions between the standard and the non-standard variety: The dialect is marginalized as the language of personal communication, which is associated exclusively with a limited set of discourse acts and is not valued either as a learning tool or as a learning objective.

Significantly, our data show that in several IRE (Initiation–Response–Evaluation) sequences, the teacher accepts as correct answers which are inaccurate in terms of content but are uttered in Standard Greek. The ideologically driven message that comes across is eminently clear: Literacy learning ultimately only means proficiency in the standard variety; content knowledge expressed in dialect and linguistic competence in the dialect remain implicitly unacknowledged.

In addition, there is reasonable doubt that the 'standard variety' used and enforced in classrooms is indeed Standard Modern Greek, that is, the official language of the country and the standard language spoken in Greece. Leivada et al. (2017a) carried out a first formal investigation into bilectal Greek Cypriots' competence in Standard Greek and their ability to spot dialect elements or 'Cypriotisms' in Cypriot Greek speakers' Standard Greek production (see also Leivada et al., 2017b). The study examined whether Greek Cypriot teachers can accurately identify lexical, morphological, phonological, syntactic, and semantic dialect elements that were included in otherwise Standard Greek tokens in a written variety-judgment task. This task thus tested the (meta)linguistic skills of teachers from Cyprus; the results were then compared to those of teachers from Greece in the same task. The findings reveal statistically significant differences in performance between the two groups investigated, bilectal Greek Cypriot teachers and monolingual Hellenic Greek teachers. The Cypriots identified the dialectal elements in the test stimuli less accurately than their Greek colleagues across all levels of linguistic analysis, pointing to a sharp discrepancy between what counts as 'standard' in Cyprus and what the Cypriot teachers' actual performance in the standard variety really is.

While focusing on the school environment like previous studies on the topic, Leivada and colleagues approached the issue from the teachers' perspective, as opposed to assessing students' linguistic abilities. The reasoning is that the teachers' language in the classroom cannot count as *bona fide* Standard Greek input for the students unless they demonstrate (near) native proficiency in Standard Greek—which they do not. The above-mentioned schooling factor for language development in Cyprus is thus more complex than what the terms 'bi-*x*' (Grohmann, 2011; Grohmann & Leivada, 2012) or '(discrete) bilectalism' (Rowe & Grohmann, 2013) would imply; besides the Cypriot Greek–Standard Greek dichotomy, there seems to also exist a second standard variety. In other words, the linguistic reality of Cyprus involves not only the co-existence of two varieties—what linguists typically refer to as Standard (Modern) Greek and Cypriot Greek, respectively—but also an emerging Cypriot Standard Greek (to use the term coined by Arvaniti, 2010). If further research can verify this assessment, it would mean that there are, in fact, three varieties being used in Greek-speaking classrooms across Cyprus (Leivada et al., 2017a: 12): "Standard Modern Greek through textbooks, Cypriot Greek through

student–student interaction, and Cypriot Standard Greek through teacher–student interaction" (excepting the cases where teachers switch to dialect to index departures from the 'lesson proper', as outlined above).

On the whole, mainstream education does not capitalize on language variation and diversity in order to create a 'third space' (García & Li Wei, 2014; Tsiplakou, 2019) for learning. The students' linguistic capital and the value of linguistic diversity are not acknowledged as resources for literacy learning. Standard Greek is constructed as the dominant language of formal learning and as the only legitimate target variety, while the students' native dialect is assigned ancillary, peripheral roles. Crucially, when students use the dialect in content-related oral production, their linguistic production is implicitly devalued or discouraged. A set of pedagogically potentially interesting and useful quasi- translanguaging teacher practices paradoxically ends up affirming linguistic hierarchies and prescriptive linguistic ideologies, which are dominant at the macro-level.

4.4 The Curricular Reform of 2010: Variation and Critical Literacy

The short-lived 2010 National Curriculum (MoEC, 2010) was the first of its kind in the Greek-speaking world in that it sought to capitalize on the diglossic situation in Cyprus to cultivate students' metalinguistic and sociolinguistic awareness; it recommended the active integration of Cypriot Greek—and of geographical and sociolinguistic variation at large—in language teaching and learning in the Republic of Cyprus. The assumption was that more effective language learning and higher levels of competence in the standard would be achieved through systematic contrastive teaching of the two varieties as well as of hybrid forms involving code-switching, code-mixing, and through capitalizing on these in pedagogy via translanguaging as conscious deployment of all aspects of the students' linguistic and semiotic repertoires. In the words of the curriculum:

> Critical literacy involves understanding and capitalizing on the ideological dimension of language; it involves the ability to investigate the ways in which various aspects of language (grammar, vocabulary, genres, information structure in texts) contribute to the creation of social relations, the construction of political and cultural values, the perpetuation of stereotypes or the reversal of relations of power and inequality among social groups. […] [L]iterate students are aware that social relations, gendered identities and ideologies are constructed not only through the content of language/of texts but, crucially, through the form of language, through genre and also through practices of production and reception of texts in particular communities. […] Students are expected to acquire a full overview of the structure of Standard Greek and of the Cypriot Greek variety (phonetics and phonology, inflectional and derivational morphology, syntax); […] to realize that various aspects of grammar perform specific language functions, depending on genre and communicative situation […] to be able to analyze a range of hybrid texts produced through code-switching and language alternation in a multilingual and multicultural society such as that of Cyprus. (MoEC, 2010: 1–2)

Interestingly, in the context of the communicative turn in language teaching, the 1999 Greek Program of Studies for Language (PS, 1999), which is still in use today, states that language teaching aims to foster communicative appropriateness, part of which is awareness of variation:

> In the course of language teaching the teacher and the student will gain awareness of the linguistic varieties with which language functions [sic] [...] [Language] spreads horizontally in space and creates geographical linguistic varieties ('idioms', dialects) or it diversifies vertically and yields sociolects.
>
> (PS, 1999: 7242)

However, in a rather self-contradictory way, it ultimately does not opt for the teaching of variation:

> One of these linguistic varieties is the one that we cultivate in school. It is the linguistic variety in which school books, student projects/compositions, etc. are written. *It is in this variety that teaching takes place and it is correlated* [sic] *to the language spoken in the urban centers of the country and used by canonical Greek writers*. (PS, 1999: 7244–7245, emphasis added)

In stark contrast, the 2010 Cyprus National Curriculum opts for the incorporation of the teaching of non-standard varieties, as this is a direct outcome of its orientation towards critical pedagogy (Freire, 1970) and critical literacy (Baynham, 1995; Kalantzis & Cope, 2012; Gee, 2015):

> A critically literate person […] explores the ways in which various aspects of language (grammatical phenomena, vocabulary, genres, the organization of information in texts) contribute to the establishment of social relations, the construction of political and cultural values, the reproduction of stereotypes or the subversion of relations of power and inequality among social groups. Critically literate students know that social relationships, gender identities and ideologies are constructed not only through linguistic/textual content of the language but also through linguistic form, genre, and through habits or practices of textual production and consumption in particular communities.
>
> (MoEC, 2010: 10)

Importantly, language is approached as embedded in particular social and cultural micro- and macro-contexts, in which data from multiple, complex linguistic repertoires are deployed to produce various kinds of socioculturally localized meanings, to perform various acts of identity, to engage in symbolic negotiations of values, to articulate alternative 'voices', discourses, and ideologies, and so on. Not merely acknowledging but capitalizing on linguistic variation for pedagogical purposes is therefore treated as central to a critical approach to language as a mechanism for building meanings and identities, to a critical 'reading' of the relationship between language and different social realities, and to a critical understanding of the ideological dimensions of language forms and contents as well as their creative subversion, with the ultimate goal of effecting social change.

In Cyprus' still diglossic context, contrastive teaching of the standard and the non- standard variety was thus expected to serve a number of purposes: (i) fostering metalinguistic awareness and, consequently, literacy skills in both varieties; (ii) doing away with negative attitudes regarding the dialect, not via the cultivation of emotive attitudes regarding its 'aesthetic' value or its value as 'heritage', but by

making students aware that the dialect displays systematicity; and (iii) the development of stylistic and sociolinguistic awareness, which is central to the critical literacy project by definition. In the words of the 2010 National Curriculum (MoeC, 2010: 10): "If we aim to teach in a functional manner the ways in which sociolinguistic/stylistic variation indexes social relations and cultural practices, we cannot do so in a vacuum, without taking into account the students' linguistic reality."

The 2010 National Curriculum was short-lived because of fierce opposition from a new conservative government, nationalist circles, and the Church of Cyprus. However, related pedagogical interventions (Tsiplakou & Hadjioannou, 2010; Tsiplakou et al., 2018; Papanicola & Tsiplakou, 2019; Ioannidou et al., 2020) show that the integration of non- standard varieties in a manner that is consistent with the overarching premises of the pedagogical framework may serve the above purposes and make for better, more effective, critical literacy learning. Likewise, teachers appear to hold positive attitudes towards their native variety as a tool for cognitive development as well as for buttressing the cultural identity and the self-esteem of Greek Cypriot bilectal students (Sophocleous & Wilks, 2010).

5 Conclusion

Critical literacy learning projects and practices in a context of linguistic variation are multiply useful: They help the educational framework acknowledge that non-standard speakers bring into the learning process alternative linguistic and semiotic capital, 'voices', and knowledge produced outside hegemonic paradigms. They also capitalize on such cognitive and cultural capital. Such endeavors encourage cooperation and respect for all varieties in the classroom, and they foster the assumption of responsibility by students for structuring collaboratively the processes of language and content learning, with the teacher playing the role of coordinator or facilitator of the process, as an equal member of the learning community; this leads to a transformation of the conventional educational process. Crucially, critical literacy learning projects and practices in a context of linguistic variation treat language as a complex semiotic resource, as an indexical of social structures, aspects of culture, discourses, and ideological constructs of 'reality'. Linguistic variation, be it geographical variation, social variation, or multi-/plurilingualism, may become the object of conscious metalinguistic analysis and negotiation in a genuinely critical educational context.

This paper synthesized existing research on diglossia and bi(dia)lectalism in the Republic of Cyprus, focusing on language acquisition and pedagogy. It was shown that while a Cypriot Greek *koiné* with hybrid structural properties is emerging as a (c)overt prestige variety, advergence to Standard Greek is far from complete, the diglossic situation still remains stable, and, concomitantly, bidialectalism is gradient (i.e. multilectal). Mixed linguistic input has interesting effects on child language acquisition, best captured by the Socio-Syntax of Development Hypothesis, which

predicts that children's grammars will include elements of the standard variety as a result of literacy learning in Standard Greek.

It was further shown (i) that the rich and varied linguistic context of Cyprus is not taken into account by official education policies in literacy learning; (ii) that linguistic variation, either geographical or social, has not as yet become the object of study in Greek Cypriot education; and, crucially, (iii) that that is not capitalized on for the purpose of honing critical literacy skills. Critical literacy learning projects and practices in contexts of linguistic variation are multiply useful: They help the educational framework acknowledge that non-standard speakers bring into the learning process alternative linguistic and semiotic capital, 'voices', and knowledge produced outside hegemonic paradigms, and they also capitalize on such cognitive and cultural capital. Although research findings indicate very clearly that language variation and translanguaging can be harnessed to hone both metalinguistic awareness and critical literacy skills, Greek education in Cyprus still remains (at least ideologically) monolectal.

Appendix: Phonology, Morphology, and Syntax of Cypriot Greek

Phonology			
Standard Greek	Cypriot Greek	Translation	Cypriot Greek feature
[ce]	[tʃe]	'and'	affrication of [c] before the front vowels [i] and [e]
[çiˈmonas]	[ʃiˈmonas]	'winter'	palatoalveolar [ʃ] before the front vowels [i] and [e]
[baˈbas]	[paˈpas]	'dad'	absence of voiced stops [b], [d], [g]/[ɟ] (unless prenasalized)
[ˈpe$^{(n)}$de]	[ˈpe^{n}de]	'five'	
[maɣaˈʒja]	[mɛxɛˈʒɐ]	'shops'	palatoalvelolar [ʒ]
[ˈalo]	[ˈalːo]	'other'	geminate consonants
[poˈte]	[poˈt^{h}e]	'never'	aspirated voiceless plosives
[ˈktima]	[ˈxtima]	'plot of land'	spirantization of voiceless plosives in clusters
[ceˈri]	[ˈtʃerin]	'candle'	word-final [n]
/ˈpsaria/ > [ˈpsaɾja]	/ˈpsaria/ > [ˈpsarka]	'fishes'	*synizesis*, hardening of unstressed [i] before another vowel
[koˈruða]	[koˈrua]	'girl'	intervocalic fricative elision (subject to leveling)
[ˈθelo]	[ˈθelo] [ˈçelo]	'I want'	[θ]~[x]/[ç] allophony (subject to leveling)
[xoˈr{a}o]	[f oˈro] [xoˈro]	'I fit'	[f]~[x] allophony (subject to leveling)
[ɐˈ$^{(n)}$ɟizo]	[ˈ^{n}dʒizo]	'I touch'	affrication of [ɟ] (subject to leveling)

Morphology		
Standard Greek	Cypriot Greek	Cypriot Greek feature
[tis] 'the(m).ACC.FEM.PL'	[tes]	a different determiner form for the feminine accusative plural and the object clitic pronoun
[ˈeksoði] 'exit.NOM.PL'	[eˈksoði]	penultimate stress in the nominative plural of 2nd declension nouns
[koˈron] 'girl.GEN.PL'	[ˈkoron]	penultimate stress in the genitive plural of 1st declension nouns
[ton ˈfilon] 'the friend.GEN.PL'	[tus ˈfilus] the friend.ACC.PL	accusative morphology in the genitive plural of 2nd declension masculine nouns (subject to leveling)
[ɟi] 'son.NOM/ACC.PL'	[ɟuˈðes]	Cypriot-specific plural morphemes
[ˈtuto] 'this'	[tun]	a Cypriot-specific proximal demonstrative pronoun
[ˈexun] 'have.3PL'	[ˈexusin]	Cypriot-specific 3rd person plural morphemes in present & past tenses
[ˈixan] 'had.3PL'	[ˈixasin]	
[ˈkanate] 'did.2PL'	[eˈkamete]	syllabic augment [e] in the past tenses
[ˈkanate] 'did.2PL'	[eˈkamete]	a Cypriot-specific 2nd person plural morpheme in the past tenses
[θa] *future marker*	[ˈena]	a Cypriot-specific future marker
[mi{n}] *negation marker*	[men]	Cypriot-specific negation marker in non-indicative mood

Syntax		
Standard Greek	Cypriot Greek	Cypriot Greek feature
[to ˈiðes]	[ˈiðes to]	clitic-second
it.CL.ACC saw.2S 'You saw it.'	saw.2S it.CL.ACC 'You saw it.'	(Wackernagel) effects
[ðen to ˈiðes] NEG it.CL.ACC saw.2S 'You didn't see it.'	[en to ˈiðes] NEG it.CL.ACC saw.2S 'You didn't see it.'	
[ˈpote to ˈiðes] when it.CL.ACC saw.2S 'When did you see it?'	[ˈpote to ˈiðes] when it.CL.ACC saw.2S	no clitic-second effects in
	[ˈen ʧe ˈiðes to] NEG FOC saw.2S it.CL.ACC 'You DIDN'T see it.'	emphatic negation with Cypriot Greek *en ʧe*
[ti ˈiðes]	[ˈiⁿda m bu ˈiðes]	obligatory clefting in *wh-*
what.ACC saw.2S	what is that saw.2S	questions introduced by
'What did you see?'	'What is it that you saw?'	*inda* 'what'

Syntax		
Standard Greek	Cypriot Greek	Cypriot Greek feature
[pçon ˈiðes]	[pcon {em bu} ˈiðes]	optional clefting in *wh-*
who.ACC saw.2S 'Who did you see?'	who {is that} saw.2S 'Who is it that you saw?'	questions
[tin ˈkseɲa ˈiðes]	[en tin ˈksenian pu ˈiðes]	focus clefts (no syntactic
XENIA.ACC saw.2s 'You saw XENIA.'	is XENIA.ACC that saw.2s 'It's XENIA that you saw.'	focus movement)
[fere to mu]	[fer mu to]	Indirect Object > Direct
bring.IMP it.ACC me.GEN	bring.IMP me.GEN it.ACC	Object order with post-
'Bring it to me.'	'Bring me it.'	verbal object clitics
	or [fere mu to] bring.IMP me.GEN it.ACC 'Bring me it.'	

NB: Only a broad phonetic transcription is provided ; see Arvaniti (1999) for further details on the phonetics of Cypriot Greek. All data are adapted from Hadjioannou et al. (2011: 65–67)

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Diglossia and Children's Literacy Acquisition in South Africa

Michelle Pascoe

1 Introduction

There is a crisis in the South African education system (Jordaan, 2015; Spaull, 2019). The causes of this situation are as complex and multifaceted as the effects, but there is probably no starker way of indicating the detrimental outcomes than by considering the low literacy levels of learners. Spaull (2019) observes:

> Learning to read for meaning is the most critical skill children learn in primary school. It is the skill upon which all other skills depend. The South African curriculum stipulates that children should "learn to read" in Grades 1-3 and then "read to learn" in Grade 4 onwards. Thus they should be able to read for meaning by the end of Grade 3 in their home-language and in English. The recent Progress in International Reading Literacy (Mullis et al., 2017) study showed that 78% of South African Grade 4 children could not read for meaning in any language, that is they could not "locate and retrieve an explicitly stated detail." Comparable figures in other countries are 64% (Morocco), 35% (Iran), 13% (Chile), and 3% (United Kingdom) (Mullis et al., 2017).[1]

These poor performance rates are a cause for immense concern, as literacy skills impact learning and achievement across academic subjects; further, a literate, well-educated population is essential for a nation's functioning and success (Fleisch, 2008). Juxtaposed against a failing, impoverished education system is South Africa's rich diversity of spoken and written languages and language varieties – a national asset of which many South Africans are justifiably proud. Understanding this diversity, its place in – and potential influence on – the educational system, may offer insights to address the significant challenges of literacy learning in the country.

[1] https://nicspaull.com/category/education/

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South Africa's constitution recognizes eleven official languages, and a twelfth – South African Sign Language– will shortly be added to this list. Approximately 25% of the population speaks isiZulu as a home language, followed by 15% who speak isiXhosa and 12% Afrikaans as their home languages. English is home language to an estimated 8% of the population, but it is widely spoken outside of the home as most South Africans are multilingual, especially in the cities. In addition to the languages named in our progressive constitution, a range of other languages are spoken including other indigenous languages of Southern Africa, languages from further north in Africa, Indian languages, Portuguese and French. Although much has been written about linguistic diversity in South Africa, there is less information about diglossia in this context, and in particular, what it means for a child to be acquiring literacy in a diglossic (and likely multilingual) situation. The impact of diglossia in South African classrooms cannot be understood without consideration of the education system and its many challenges for teachers and learners. In turn, the educational crisis (Desai, 2010) must be viewed in the context of the country's political and historical background. This chapter starts by focusing on the sociolinguistic context of South Africa, outlining policy, historical, political and educational factors essential for an understanding of the complex diglossic situation. The second part of the chapter describes a scoping review which was undertaken to answer questions about diglossia and its impact in South African classrooms. Specifically, the following questions are addressed: (1) How do authors conceptualize the diglossic situation in South African schools? and (2) What are the main findings of studies focusing on diglossia in South African classrooms? The final section of the paper discusses these findings in relation to the international literature on diglossia and literacy development, and attempts to describe implications for practice, and future research arising from these findings, against the backdrop of a failing education system and poor national literacy results.

2 South Africa: The Sociolinguistic Context

South Africa is a low–middle income country with high levels of unemployment and poverty. Schools operate in a resource-constrained environment characterized by a quadruple burden of disease: the HIV/AIDS epidemic together with a high burden of tuberculosis; high maternal and child mortality; high levels of violence and injuries; and a growing burden of non-communicable diseases. Other challenges include unsafe schools, schools without libraries, poor teacher training, low teacher literacy levels, high absenteeism, high rates of bullying, substance abuse, hunger, and health conditions in children (Fleisch, 2008; Hoadley, 2012; Howie et al., 2017; Modisaotsile, 2012; Mullis et al., 2017; Taylor & von Fintel, 2016; van Staden & Bosker, 2014).

More positively, South Africa is a country of rich language and cultural diversity. The constitution recognises eleven official languages which include the indigenous Bantu languages of isiZulu, isiXhosa, Sepedi, Setswana, Sesotho,

XiTsonga, siSwati, Tshivenda, and isiNdebele, as well as English and Afrikaans. Multilingualism is typical, with languages and combinations of languages spoken by individuals varying based on the different regions where they live and work. English is widely considered to be the *lingua franca* of South Africa, although this position is also the subject of some debate (van der Walt & Evans, 2017). The important role of English in education and the workplace means that many families encourage their children to speak English alongside the family home language from a young age, with a view to maximizing perceived life opportunities for them. Thus, English is used in formal domains while African languages are often used in informal settings and spoken extensively in communities and families (Van der Walt & Evans, 2017). Some authors consider this situation as a diglossic one with English as the High (H) variety and the local indigenous language/s as the Low (L) variety. Others conceive diglossia, in the South African context, to be the functional social distribution of two dialects in one particular speech community (Kaschula & Anthonissen, 1995).

Although South Africa's apartheid regime ended in 1994, the legacy of inequality still persists more than 25 years later and the pace of transformation in the country has been slow. Underpinned by a progressive constitution, the policy framework around language and education is sound, but implementation of policies is not always feasible. In terms of languages, for example, the constitution states that all the official languages should have parity of esteem. However, this ideal is often not realized since English is widely favored, and, for many of the languages, there are few educational resources available. The South African Schools Act allows school governing bodies to select their school's language of learning and teaching (Lear, 2018) but final school leaving examinations can only be written in English or Afrikaans; English is the main language of learning and teaching in higher education (Taylor & von Fintel, 2016).

The Language in Education Policy promotes additive bilingualism, where a learner's home language is maintained and used as the language of learning and teaching until grade three before a supported transition is made to English or Afrikaans instruction in grade four. Most schools in rural areas and townships follow this approach (Lear, 2018; Nadler-Nir & Pascoe, 2016; Taylor & von Fintel, 2016) with very few opting to extend the home language, e.g. isiXhosa, as a medium of instruction beyond Grade 3. Where schools have done so there are frequent complaints about the lack of textbooks in isiXhosa (or other African languages) as publishers are often not prepared to produce materials in languages for which there is minimal demand. In contrast, some schools choose to instruct in English from the outset of formal schooling (Nadler-Nir & Pascoe, 2016; Taylor & von Fintel, 2016). Both approaches are problematic because many children are exposed to a number of languages at home and in the community before they are exposed to English. English is not necessarily their second language, but may well be the fourth or fifth language. Learners are expected to learn in English without having had the opportunity to develop sufficient competence, and they have little or no exposure to English as a subject before the transition is made in grade four: In grades 0 to three (approximately ages 5–8) learners are typically taught English conversational skills

which does not prepare them to learn core curriculum subjects in English (Heugh, 2005; Jordaan, 2011). Hence, despite the language-related law and policy changes post-apartheid, additional language factors play a role in South African children's educational outcomes. In this context, literacy, in particular, presents challenges for learners. Some of the reasons contributing to the challenge are now introduced in relation to what is known more generally about literacy acquisition.

2.1 Humans Are Not Designed for Literacy; It Must Be Taught

Typically developing children will start to develop spoken language from the time they are born. It is acquired naturally with no need for formal instruction, simply through everyday exposure to language in the environment. Literacy development, however, requires formal instruction. The human brain is designed to process and produce spoken language, but has not yet fully evolved for reading and writing so that explicit instruction is needed if literacy is to be acquired (Liberman et al., 1989). This means that teaching –and the quality of that teaching– is very important if literacy is to be successfully achieved.

2.2 Literacy Must Stand on a Foundation of Oral Language

Children who have a solid foundation of oral language (or languages) will typically respond well to being taught to read and write in that language (or those languages). They already know what to expect to find in terms of vocabulary, sentence structure and the phonology of their language (Nadler-Nir & Pascoe, 2016). South African children coming to school to learn to read will bring oral language abilities in one or more languages and language varieties. Whatever they bring must be considered the foundation on which their literacy is built. The link between early language and later literacy development is widely-acknowledged (Nation et al., 2010; Snowling & Hulme, 2012; Wolf, 2008), so that many children arriving at school with language development that is less than optimal are already at risk for difficulties with formal literacy instruction.

2.3 A Lack of Resources

Top down vs. bottom up approaches to reading instruction are often contrasted with each other as two alternative approaches. Top down approaches focus more on sight-reading and children's ability to decode high frequency words in meaningful texts. Bottom-up approaches emphasize the sound structure (phonics) that underpins printed and spoken words. Irrespective of the approach that is used for literacy

instruction, resources are required to facilitate the learning: reading books that are age-, culturally- and linguistically appropriate. We need many carefully graded books in the relevant languages to give learners opportunities to develop their reading skills and keep on practicing these in an engaged and relevant way. Similarly, when focusing on phonics/phonological awareness, materials are also required based on all the local languages, and a solid understanding of their sound structure.

These points are returned to in the discussion section of the chapter where insights from our review contribute to some potential solutions to the challenges of literacy learning in South African classrooms. While much has been written about multilingualism in South African schools, there is little information about diglossia –typically defined as the societal phenomenon where two distinct varieties of a language are spoken by one speech community– in this context. Is there a diglossic situation in South African classrooms, and if so, what form does this take? Which language variety is acquired naturally as a mother tongue and which one/s are taught at school? What does diglossia mean for children acquiring literacy in an already problematic education system? How similar or different are the two varieties of the language/s?

3 Methodology

A scoping review was undertaken following Arksey and O'Malley's (2005) framework. A scoping review aims to map the crucial concepts underpinning a research area, the main sources and types of evidence available, and can be initiated as a stand-alone project in its own right, particularly where an area is complex or has not been reviewed comprehensively before. Arksey and O'Malley (2005) suggest six key phases of a scoping review. These include identifying the review aims, identifying relevant studies, data collection, charting the data, data analysis, and, lastly, reporting results, challenges and recommendations for future research.

The research aimed to describe the way in which diglossia is understood in the context of South African schools. Two specific aspects that were investigated were the following: How do authors conceptualize diglossia in South African schools? And what are the main findings of studies that have investigated diglossia in South African schools? A search strategy was devised to guide the process and set parameters for research that would be included in the review.

3.1 Search Strategy

Databases (GoogleScholar, ERIC and CINAHL) were searched for papers using combinations of the following key terms: "South Africa, diglossia, dialects, education, literacy, schools" using the Boolean operator "AND". Papers that were included in the review were required to meet the following four inclusion criteria: 1. They had to focus primarily on school age children in South Africa; 2. Diglossia, or a

situation in which two forms of one language are used, had to be central to the paper. 3. The search was limited to papers that could be accessed in full, published from 2000 until the present time, and 4. They needed to be available in English. The time limit was chosen to be large enough (20 years) to yield a substantial body of work but at the same time relatively recent and reflective of post-apartheid South Africa with its increased awareness of language rights in the new constitution. The use of peer-reviewed articles improved the quality of the study, but because the number of relevant papers was small, unpublished masters and doctoral dissertations that were available online were also included.

Three steps were followed in the literature search. First, an initial search was undertaken using the search terms and databases described. These papers were then scrutinized more thoroughly to determine if the four inclusion criteria stated above were met. Papers that did not meet the criteria were excluded from the review. Second, papers which did meet the criteria were then studied more closely, and key information from each one was charted onto an excel spreadsheet specifically created for this purpose. Information was entered about each paper (authors, date of publication, conceptualization of diglossia, age of participants, location of school, languages and dialects involved; and main findings). Third, the reference lists of these papers were then used to indicate other studies, including student dissertations that might also be relevant. Further studies were then added to the spreadsheet if they met the stated criteria. The information gathered in the spreadsheet was then used to respond to the two questions posed.

4 Results

A total of 24 relevant items were found: twelve peer-reviewed journal papers; seven dissertations, and five book chapters. These items are indicated in the reference list at the end of this chapter. The initial search based on screening of titles and abstracts had revealed 56 potential items, which, following full text reading, was reduced to the subset of 24. Papers were excluded if they had been published before 2000; focused on adults rather than children; were set in countries other than South Africa, and did not include explicit discussion of diglossia, defined broadly as the societal phenomenon where two distinct varieties of a language are spoken by one speech community.

(1) ***How do authors conceptualize or define the diglossic situation in South African schools?***

The language situation in South African schools –and South Africa in general– is complex, and authors define and understand diglossia in different ways. Most authors emphasized, either through their empirical investigations, own personal experiences, or literature review, the high status and dominant role of English –as has already been mentioned in the opening section of this chapter. Diglossia was conceptualized in two main ways: (1) English as the high (H) variety and other

languages as low (L) varieties; and (2) Varieties of one language were contrasted with each other, e.g. Standard isiXhosa vs. isiXhosa spoken at home. This latter situation meets Ferguson's (1972) classic definition of diglossia, i.e. the specific relationship between two or more varieties of the same language in use in a speech community for different functions. Ferguson's definition was later extended by authors such as Fishman (1964) and Gumperz and Hernandez-Chavez (1972), who considered that two totally different languages could also be contrasted with each other and considered to be diglossic in nature when their use varies based on function and domain. This extended definition fits with our situation (1). There are many contexts in the world where children learn a different language in school from that used at home. However, a bilingual situation is not necessarily a diglossic one; that is, a child can be exposed to and acquire multiple languages in a situation that would not be considered diglossic. To meet the definition of diglossia, the two languages (or language varieties) need to be different in terms of perceived status (high vs. low) and used in different ways by a speech community based on function and domain. Fishman (1964) described four types of language situations: namely diglossia with bilingualism; diglossia without bilingualism; bilingualism without diglossia, and a monolingual society (with neither bilingualism or diglossia). Diglossia with bilingualism is where almost everyone in a society is able to use both languages, and use varies depending on context and function. Diglossia without bilingualism is typical in countries where a standard (H) variety is the majority language, usually a language associated with power and privilege, and the L variety is the minority language spoken by those at the opposite end of the social spectrum. Bilingualism without diglossia means that most people are bilingual but the use of the languages is not restricted to a specific set of social purposes.

Most definitions of diglossia contrast varieties of the same language, rather than two distinct languages. Given the relatively large body of work that has focused on multilingualism in South Africa, this chapter will focus more on diglossia from the perspective of contrasting varieties of the same language. But let us start by briefly considering the situation in which English and an/other language/s are viewed as being diglossic.

English as the high (H) variety and other languages as low (L) varieties

For some authors the high (H) status of English and the lower (L) status of other indigenous languages constitute a diglossic situation. Ntombela (2016), Sutton (2006) and Holmarsdottir (2005) follow such a conceptualization noting that South Africa effectively has a diglossic situation, with English as the high variety and all other languages as the low variety, despite the fact that the constitution suggests all languages have equal esteem. This situation fits with the extended definition of diglossia from Fishman (1964) and Gumperz and Hernandez-Chavez (1972). The individuals acquiring these languages are bi- or multilingual, but Ntombela (2016), Sutton (2006) and Holmarsdottir (2005) further contend that the way in which the languages are used by the relevant speech communities fits with descriptors of a diglossic situation.

Holmarsdottir (2005), in her study of the implementation of the Language in Education policy in South African schools, describes the way in which these different languages are acquired in different locations and through different institutional support systems. The low variety is usually acquired at home and used in family situations – in South Africa this could be any of the languages (but not English). Holmarsdottir focused on isiXhosa as L as her project was undertaken in Cape Town where this is one of the main languages spoken. As H, English is acquired outside the home and is related to, and supported by institutions outside of the home. Similarly Busch (2010) describes a common situation where English, through its high prestige, is chosen over a child's home language:

> The school compels parents and children to choose only one language for teaching and learning. Because in many cases this will be the language of higher status – namely English – children find themselves in a diglossic situation: one language is limited to oral communication within the circle of family and friends, while another becomes the sole language for use in 'higher' domains, i.e. those linked to print (p. 290).

Thus, South Africa is an example of a diglossic community from this perspective where languages are viewed in a compartmentalized way and entry to formal institutions, such as schools, requires knowledge of the H variety. Holmarsdottir's analysis suggested that the Language in Education policy was maintaining the diglossic situation, with English being used in public domains and isiXhosa used for informal situations and initial literacy only.

Sutton (2006) used Fishman's conceptualization of extended diglossia to understand the South African situation, suggesting that the situation in South Africa is a mix of the first two categories: diglossia with bilingualism and diglossia without bilingualism. She suggests that these categories are problematic for South Africa since English may be the dominant language in terms of prestige but it is not the majority language of the country. She notes:

> It would appear that if one is a speaker of an African language and upper class or lives in an urban area where speakers engage in a number of different roles, where access to several roles is encouraged by powerful social institutions, and where the roles are clearly differentiated, then one is in a situation of diglossia with bilingualism. However, if one speaks an African language and is of a lower class or lives in a rural area where economic underdevelopment and immobilization is commonplace, then one is in a situation of diglossia without bilingualism. (p.32).

It is clear from these authors and the examples they present that this extended definition of diglossia can be applied to South Africa in terms of the languages spoken. The findings from this component of the review are summarized in Table 1.

Table 1 Diglossia with English (H) contrasted with other languages

Authors	Languages contrasted 'High' (H) vs. 'Low' (L)
Ntombela (2016)	English vs. isiZulu
Sutton (2006)	English vs. isiXhosa
Holmarsdottir (2005)	English vs. isiXhosa
Busch (2010)	English vs. Afrikaans

Reverting to the classic definition of diglossia and focusing on varieties of a language, let us now consider further how diglossia is conceptualized in South African schools.

4.1 Varieties of a language

The scoping review revealed a greater number of authors focusing on one language and describing the relationship between two different forms of that language. This was done for a range of languages that included isiZulu (Makoe & McKinney, 2014; Rudwick, 2005); isiXhosa (Maqam, 2015; Mtsatse & Combrinck, 2018; Spofana, 2011); Setswana (Cook, 2009); Sepedi (Nkosi, 2008); Afrikaans (Busch, 2010; Dyers, 2008a, b); and English (Blommaert et al., 2005). These papers are summarized in Table 2.

Content analysis of these papers (Table 2) in terms of how diglossia is understood and the nature of the two language varieties, revealed five main themes: (a) language use; (b) language differences; (c) language attitudes; (d) arbitrary nature, and (e) educational challenges. The varieties contrasted are considered to be examples of diglossia rather than merely bi-dialectal use, because of the systematic differences between the varieties used within particular speech communities in South Africa, as discussed in greater detail in the sections that follow.

(a) Language use

The main differences between the varieties for each language are related to use – as is noted in definitions of diglossia including Ferguson's (1972) classic definition. For example, Cook (2009) describes two varieties of Setswana: School Setswana, a formal, standardized variety that is taught in schools (the H variety) and Street Setswana, the variety that is used in informal daily conversation with

Table 2 Diglossia with two different language varieties contrasted

Language	Authors	Varieties contrasted 'High' (H) vs. 'Low' (L)
isiZulu	Makoe and McKinney (2014) Rudwick (2005)	Standard vs. vernacular Standard vs. 'isiTsotsi'
isiXhosa	Maqam (2015) Mtsatse and Combrinck (2018) Spofana (2011)	Standard vs. isiMpondo Standard vs. other Standard vs. non-standard
Setswana	Cook (2009)	School Setswana vs. Street Setswana
Sepedi	Nkosi (2008) Pretorius and Mokhwesana (2009)	Sesotho sa Leboa vs. non-standard Sesotho sa Leboa vs. Sesotho sa Pretoria
Afrikaans	Busch (2010) Dyers (2004, 2008a, b)	Standard Afrikaans vs. Kaaps (L)
English	Blommaert et al. (2005)	Standard vs. non-standard South African English

family, neighbors, at the shops, and on public transport. Standard varieties are reserved for formal situations, such as school – and in particular, literacy aspects, while non-standard varieties are for spoken purposes and communication in home, family and informal settings, creating solidarity, and shared identity and culture.

(b) Language differences

The language varieties that comprise the diglossic situation are described as mutually intelligible in most cases, to most speakers. Hurst (2015) notes that a pattern of two varieties that differ in terms of lexical and morphophonemic items between formal and informal settings is common, especially in urban settings. Rudwick (2005) analysed the relationship between two varieties of isiZulu spoken in the Umlazi township near Durban in the Kwa-Zulu Natal province of South Africa: the variety called 'isiTsotsi', and the 'standard' isiZulu of the region. Drawing on concepts of diglossia in her analysis, she argues that in the township domain, standard isiZulu is the high variety, while isiTsotsi is the low variety. These two varieties are mutually intelligible but characterized by significant lexical variation. Similarly, Cook (2009) notes that the two varieties of Setswana described in his paper are very similar in terms of syntax, but have semantic and morphophonemic differences with "many otherwise distinct sounds" being combined in Street Setswana.

(c) Language attitudes

Makoe and McKinney (2014) focused on varieties of isiZulu in their study, noting how the non-standard isiZulu spoken outside of the classroom differs from standard isiZulu. The teachers in their study regarded the non-standard variety as inferior, describing it as 'pidgin' Zulu and no longer 'pure.' Makoe and McKinney comment on this devaluing and de-legitimising as a great loss of what could potentially be a valuable classroom resource. Busch (2010) makes a similar point about Afrikaans, contrasting the standard variety taught in schools with Kaaps, the informal variety spoken widely in Cape Town. She reported that teachers in her study often used a deficit model, pointing out that learners could not speak and write (standard) Afrikaans proficiently. The varieties of the language were not viewed on a continuum or as a resource that could be drawn on in the classroom. Maqam (2015), focusing on isiMpondo –a non-standard variety of isiXhosa– notes:

> … learners tend to write the way they speak, but their speech is not acceptable in written form. Educators… are not happy and they fight against the use of isiMpondo. The use of isiMpondo by the pupils cannot however be avoided. The pupils then get punished due to the use of this non-standard language… (p. 68).

Brock-Utne (2010) describes the relationship between diglossic varieties in the African context as conflicting rather than complementary, something which was strongly borne out in many of the papers in this review.

(d) Arbitrary nature

Mtsatse and Combrinck (2018), Ntombela (2016) and Spofana (2011) raise an important issue: the way in which standard varieties of languages came about. In South Africa, the choice of one dialect to be the standardised dialect is a product of colonialism or historical co-incidence. For example, Mtsatse and Combrinck (2018) focus on the case of isiXhosa, describing the way in which early European missionaries selected some varieties of isiXhosa to be the standard ones. Theodorus van der Kemp from the London Missionary Society lived with a tribe of isiXhosa people in 1799, and it was logical for him to learn the Ngqika dialect spoken by the tribe that he lived with. He was instrumental in developing a written form of this dialect and then translating the bible into this variety of isiXhosa (Nyamende, 1994). The Thembu and Ndlambe dialects are closely related to the Ngqika variety, and together this group are now privileged as the standard varieties of isiXhosa while other dialects are regarded as non-standard or L varieties. This arbitrary way of classifying languages and differentially privileging them was problematic and upsetting for many of the authors of papers in our review, unsurprising in a country where classification and categorisation has a long and bitter history associated with the apartheid regime and inequality. However, the scepticism over what 'standard' variety really means was limited largely to authors and researchers, as many teachers who participated in the research projects expressed negative attitudes towards the use of non-standard varieties in classrooms. There is however, some evidence of increasing acceptance of non-standard varieties in classrooms in recent years (Makalela, 2015, 2018) and ways in which non-standard forms could be used as a classroom resource are discussed in further detail in Section 2.

(e) Educational challenges

From a sociolinguistic perspective, Dyers (2008b) notes that the use of one variety or language for high functions will not necessarily mean that vernacular languages disappear from other domains, as long as those vernaculars remain as symbols of solidarity between speakers and have social value in a community. However, from an educational perspective, challenges remain because the varieties of language that children speak at home are absent from the classroom especially in terms of written resources, and sometimes in terms of spoken language too. Many children will be learning to read and write in a variety of their language that is unfamiliar to them – or in a language unfamiliar to them. Probyn (2009) talks of "smuggling the vernacular into the classroom" (p.123) and notes further the educational challenges where the language of learning and teaching is not the home language of the learners, so that teachers are faced with the twin goals of content and language teaching.

In this first part of the chapter I investigated how authors have conceptualised diglossia in South African schools. Diglossia was considered to occur in two different ways: when two different languages are used by speech communities for different purposes (Table 1), and when two varieties of the same language are used in different ways (Table 2). These situations may include bi-/multilingualism and

bidialectalism, but are viewed as diglossic due to the specific and systematic ways the languages/varieties are used for different purposes and viewed by the speech communities. English dominates as a high status language, and many children will be required to learn in this language either from Grade 1 or from Grade 4 despite limited exposure to the language and teachers who themselves may not be first language speakers of English. Standard varieties of the languages are often used in classrooms and for classroom resources, and for many children these varieties will stand in contrast to the spoken variety of the language used at home. These issues will be explored in greater detail in the following section of the chapter which focuses on the main findings of research papers in terms of diglossia in South African classrooms.

(2) ***What are the main findings of studies focusing on diglossia in South African classrooms?***

Table 3 provides an overview of the empirical studies found through the scoping review. Review papers or opinion pieces were not included here which means that this section is based on the 19 papers listed in the table.

The papers focused on a wide range of learners in terms of age and grade. Approximately half of the studies focused on primary schools –their learners and teachers– and the other half on high school classrooms. At the younger end of the age range, Maqam (2015) focused on Grade 0 learners, the year prior to the start of formal schooling in Grade 1, and Pretorius and Mokhwesana (2009) targeted their literacy intervention at Grade 1 learners. Holmarsdottir (2005) focused on Grade 4 learners, since this is the stage of junior school at which many schools change to using English as their medium of instruction. Almost all ages and grades of primary school were included in this group of studies, with the grades selected varying depending on the research questions posed. Most of the official languages of the country were addressed in this group of papers and this was also reflected in the wide geographical spread of data collection sites. Most of the studies used qualitative methods to investigate teacher and learner attitudes and experiences. Mixed method approaches were common with many studies using a combination of individual interviews, focus groups, classroom observations and analysis of written data samples. Mtsatse and Combrinck (2018) and Pretorius and Mokhwesana (2009) were exceptions here as they used specially developed test batteries to evaluate outcomes with a more quantitative focus. Table 4 provides further information about the studies, questions posed and their main findings.

Blommaert et al. (2005), Mtsatse and Combrinck (2018), Pretorius and Mokhwesana (2009), Nkosi (2008) and Spofana (2011) posed questions particularly pertinent to literacy. Blommaert et al. (2005), for example, were interested in multilingual children from low socio-economic status (SES) backgrounds and their ability to develop literacy. A basic or 'grassroots' literacy was observed with systematic errors in writing being noted to the extent that these errors could be considered as typical in this context. The errors included erratic use of capitals; difficulties marking singular and plural forms; and difficulties with verb inflection especially plural and tense marking. The errors were shared by both teachers and learners, with

Table 3 Overview of empirical studies focusing on diglossia in South African classrooms

Authors[a]	Age/ grades of children	Languages	Location	Methodology
Blommaert et al. (2005)	14 to 17 years	First language speakers of Afrikaans, isiXhosa and Sesotho.	Cape Town	Ethnographic: mindmaps and writing assignments
Busch (2010)	13 to 15 years	English and Afrikaans	Western Cape	Biographic and topological multimodal approaches
Cook (2009)	Grades 5 and 6	Setswana	Northwest province	Mixed methods; qualitative.
Dyers (2004)	14 years	isiXhosa, English and Afrikaans	Cape Town	Free writing, mindmaps and classroom conversations
Dyers (2008a,b)	Grades 8 to 10	Afrikaans	Cape Town	Questionnaire data; written responses, focus groups and individual interviews
Hendricks (2009)	Grade 7	isiXhosa, Afrikaans and English	Eastern Cape	Analysis of writing samples
Holmarsdottir (2005)	Grade 4	isiXhosa	Western Cape	Ethnographic study. Data from interviews, observations, reading comprehension task, document analysis
Mabiletja (2015)	Grade 5	Afrikaans, English, Sepedi, Tshivenda and Xitsonga	Limpopo	Mixed methods
Makoe and McKinney (2014)	Grade 1 and Grade 10 classes	English, Afrikaans and isiZulu	Gauteng	Ethnography – observations of lessons, assemblies and extra mural activities
Maqam (2015)	Grade 0, 8 and 12	isiXhosa	Eastern Cape	Qualitative, mixed methods
Mtsatse and Combrinck (2018)	Grade 1	IsiXhosa, English and Afrikaans	Western Cape	Formal assessment using standardized isiXhosa
Nkosi (2008)	Grades 10–12	Northern Sotho/ Sepedi	Pretoria	Mixed methods: interviews, questionnaires, essays
Ntombela (2016)	8 years of age	English, Afrikaans and isiZulu	KwaZulu Natal	Ethnographic study
Pretorius and Mokhwesana (2009)	Grade 1 learners	Northern Sotho/ Sepedi	Gauteng	Intervention study over 4 years. Outcomes measured using a test battery of Northern Sotho language, literacy and phonological awareness tests.

(continued)

Table 3 (continued)

Authors[a]	Age/ grades of children	Languages	Location	Methodology
Probyn (2009)	High school learners	IsiXhosa, English and Afrikaans	Eastern and Western Cape	Mixed methods: interviews and classrooms observations
Rudwick (2005)	High school learners	isiZulu	Kwazulu-Natal	Questionnaires, interviews and observations
Spofana (2011)	Grade 8 and 9 learners	isiXhosa	Eastern Cape	Analysis of written samples
Sutton (2006)	Two teachers of Grade 2 classes	isiXhosa, English and Afrikaans	Eastern Cape	Qualitative, ethnographic, case study

[a]Review papers that were included in the scoping review but omitted from this table included: Hurst, 2015; Desai, 2010; Murray, 2012; Ribeiro, 2010; and Brock-Utne, 2010

Blommaert et al. (2005) challenging readers to consider these features as a productive, positive mechanism of this marginalized group, rather than simply 'errors'. The features were also noted to occur across a range of languages used, not limited purely to English.

Spofana (2011), in response to the question: "How do different isiXhosa language varieties influence English (and vice versa)?" noted great complexities since there are many different non-standard forms of isiXhosa that make writing and speaking of standard isiXhosa a challenge, further complicated when English –an unfamiliar language for many learners– is introduced into the mix. Spofana (2011) calls for the development of more reading materials in isiXhosa and suggests that schools in South Africa would do well to create an atmosphere where learners could be free to use either an African language or English. He considers that writing is not part of traditional isiXhosa culture so that learners often come to school with a great need for exposure to written language and writing.

> The skill of writing must be practiced and learned through experience. Writing in itself involves composing, conducting research about the topic given, developing ideas, analyzing those ideas, writing the first draft, editing and writing the final draft. It has to be emphasized for these to be mastered by the learners; learners need to be taught thoroughly. In academic contexts the problem lies with the composing part as the learners struggle to come up with something that can be understood (Spofana, 2011, p.174).

Most of the papers in the dataset, although not focusing specifically on literacy, mentioned literacy as a part of their analysis since literacy is an important component of most classrooms. Dyers (2008a, b) noted that while at least a third of the learners in her study could communicate effectively in coherent Afrikaans, many struggled with written aspects such as spelling and punctuation. "They wrote exactly as they spoke, in their colloquial variant of Afrikaans." (p.14). Similarly, Mabiletja

Table 4 Empirical studies focusing on diglossia in South African classrooms – research questions and main findings

Authors	Research question / aims	Main findings
Blommaert et al. (2005)	Classroom practices in a township school – how do children from diverse multilingual backgrounds confront English literacy?	The prestige of English is high, but is a challenge for learners and teachers when it is not their home language. The 'errors' made were analyzed and show signs of 'grassroots' literacy, i.e. specific, systematic errors that may be normal in this particular context.
Busch (2010)	The role of language profiles in a speaker-centered approach to school-language policy.	A speaker-centered school language policy will draw on all the languages resources in a school.
Cook (2009)	How are non-standard varieties of a language (in this case Setswana) managed in classrooms?	Standard Setswana is promoted in the classroom. Many children are not able to learn with this form of the language that is unfamiliar to them, especially in written forms.
Dyers (2004)	How do South African school children feel about themselves as part of specific groups and what is the role of language in their socio-cultural identities?	The status of English remains high in comparison to that of African languages. Code mixing is a frequent occurrence in English written passages; and use of standard Afrikaans is limited.
Dyers (2008a,b)	How do high school learners report on their use and attitudes to their first language, Afrikaans?	Learners have a strong emotional attachment to their language; but their inability to perform well in both languages (English and Afrikaans) at school contributes to overall academic challenges. The required competence in the standard language/s is lacking particularly for reading and writing.
Hendricks (2009)	How is curriculum time spread across three languages (English, Afrikaans and isiXhosa) and how does this relate to language policy?	Implementation of language policy at schools reflects the unequal balance of power between languages. IsiXhosa is undervalued and learners with isiXhosa as their home language are disadvantaged as they struggle to access the curriculum.
Holmarsdottir (2005)	Analysis of language-in-education policy in South Africa: How has the implementation of the policy influenced the classroom situation?	Lack of learner support materials; 'foreign medium of instruction' introduced in Grade 4 requires specific coping strategies from learners and teachers; teachers focus on content more than language.
Mabiletja (2015)	Analysis of multilingual education and the language-in-education policy in South Africa.	The language-in-education policy is poorly understood and not well implemented in South African schools; learners are disadvantaged by the poor implementation of the policy and lack of resources.

(continued)

Table 4 (continued)

Authors	Research question / aims	Main findings
Makoe and McKinney (2014)	How does the past inform the present in terms of language policy implementation in South African schools?	Multilingualism and plurilingualism should be used as resources in formal education.
Maqam (2015)	What are the experiences of isiMpondo speakers in learning standard isiXhosa in the formal school system?	The children come to school with isiMpondo as their first language; it is not accommodated and learners suffer and struggle, particularly in their written work, as a result.
Mtsatse and Combrinck (2018)	What effect do dialects and code-switching have on Grade 1 learner's literacy and numeracy outcomes?	Dialects and code-switching have a significant negative effect on literacy and numeracy scores of isiXhosa speakers.
Nkosi (2008)	Is there a difference between spoken and written Sepedi? Is Sepedi valued in the classroom?	Yes: standard Sepedi is taught but most learners do not speak the standard form. No: learners and teachers do not appear to value the language; code-switching and use of other languages is common.
Ntombela (2016)	What are the different English language offerings available to learners in schools, and how does English co-exist with other languages taught in the classroom?	Indigenous languages should be promoted; English should be taught in a more standardized and equal way across schools.
Pretorius and Mokhwesana (2009)	Can a reading intervention improve Sepedi literacy development of Grade 1 learners?	Reading improvements can occur as a result of improved instructional practices, resource and capacity building.
Probyn (2009)	How is code switching used in classrooms?	Code switching is common in South African classrooms where learners and teacher often share a common language, even though the medium of instruction is another language such as English which is not a language spoken at home by the children or teacher.
Rudwick (2005)	What is the relationship between standard isiZulu used in classrooms and other varieties?	Learners who do not use standard varieties of isiZulu face challenges in the classroom
Spofana (2011)	With a focus on written language, what is the influence of different isiXhosa language varieties on English (and vice versa)?	There is a great need for further focus on written language – how it is taught; and how learners can maximize their learning opportunities.

(continued)

Table 4 (continued)

Authors	Research question / aims	Main findings
Sutton (2006)	How do teachers construct the culture of their classrooms in multilingual/multicultural South Africa?	The culture is distinctly Western and underpinned by two assumptions: Lack of exposure to English is the primary cause of language problems; and children's home language/s do not need to be maintained or promoted at school. These problematic assumptions need to be addressed through in-service training.

(2015) noted the challenges of academic language by contrasting spoken language vs. written forms. A teacher interviewed in this study noted:

> When coming to teaching they can understand but when they have to write that is where they have barriers, but I don't think it can be because of English because they understand. It becomes a difficult thing when you give a learner a question paper to work on it becomes a problem (Mabiletja, 2015, p.160).

The difficulties with writing were not only limited to lack of familiarity with English. Of course, children, whose first language is not English, performed poorly when assessed in English, unsurprising given their lack of experience and exposure to English. However, when tested in their first languages they did as poorly, suggesting problems with written language more generally. Mabiletja (2015) emphasizes the importance of informed and evidence-based reading instruction together with a need for knowledge about the implications for agglutinating languages: children need to develop decoding skills in the early grades to chunk complex morphosyntax underlying orthography. In early grades there should be a strong focus on decoding processes involving a combination of orthographic, phonological, lexical, morphological and syntactic skills, and plenty of opportunities to practice.

Many of the authors, like Spofana (2011), decried the lack of resources even for standard forms of local languages such as isiXhosa (Mabiletja, 2015; Maqam, 2015; Sutton, 2006). In many schools there are insufficient textbooks so that books must be shared; often, there are no school libraries, outdated books, and books that are problematic in terms of cultural representations and children's life experiences.

Several studies set out to describe what was actually happening in classrooms in relation to ideals laid out in the language policies. Holmarsdottir (2005) described the coping strategies used in classrooms as learners and teachers struggle to attain teaching and learning outcomes. Strategies for learners include waiting for a mother tongue explanation from the teacher, seeking peer assistance and use of the mother tongue or guesswork. Waiting for a mother tongue explanation was usually the most successful approach, and through this method, learners were usually able to achieve their objectives. Teachers used code-mixing, code-switching and full translation to support learners. Cook (2009) also describes how teachers in her study frequently switched from Standard Setswana (H) –which was poorly understood by children– into street Setswana (L) or English.

A smaller set of papers focused on the attitudes of learners (Dyers, 2004, 2008a, b) and teachers in multilingual/diglossic classrooms. The teachers interviewed in Sutton's (2006) project evaluated the effect of the L1 on the L2 in a negative way or using what can be described as a deficit model. For example one teacher noted:

> Xhosa has a huge impact on reading, creative writing and encoding of words. And because they write like they speak, instead of saying 'bat' it will be 'bet'… so they have problems when it comes to phonics… when I mark a book, I can tell what language that child speaks before I turn back… to see their name, because you just pick it up as how they speak… Also the 'she's'… everything is 'she' no matter if it's a 'he' or 'her' or anything else (Sutton, 2006; p.105).

There was consensus from the dataset that English enjoys high prestige in contrast to the lower value placed on indigenous African languages despite the progressive language policies and constitution stating otherwise. Challenges with the dominance of English are numerous but include the fact that many teachers themselves do not have English as a first language; where learners are taught in an unfamiliar language, access to the content of the curriculum immediately becomes problematic. Literacy poses specific problems because most learners will have had little exposure to formal written English (or standard varieties of other languages). Children are required to learn literacy and access a written curriculum when they do not have a strong base of oral language on which to build literacy. There are many challenges in understanding what is taught and producing output –both spoken and written– for subjects such as English and mathematics. Processing speed is greatly slowed and available cognitive resources that should be used for learning and grasping concepts are instead taken up with translating what is said first.

Some of the papers offered suggestions for a way forward such as use of a speaker-centered approach (Busch, 2010), a more equitable offering for English teaching (Ntombela, 2016), use of multilingualism as a resource that can be openly acknowledged, and further teacher training. A speaker-centred approach advocates for a more individualized approach to learners and acknowledgment that each learner will have their own strengths and weaknesses. In the current educational system, English is either offered as a first language or as a first additional language/second language where it is taught almost as if it were a foreign language (Ntombela, 2016). This effectively creates a two-tier system that ultimately disadvantages learners who are not being taught English as a first language. Ntombela (2016) suggests that improving the quality of English teaching for all learners is an important step in improving the education system. Ultimately it appears that the complex and dynamic language environment requires strategies that acknowledge and embrace the complexity, rather than trying to stifle it, and reduces communication to clear-cut linguistic categories that are at odds with everyday experiences.

The papers included in this scoping review suggested that code-switching has been viewed in several different ways by authors and participants of the studies. Although some participants spoke negatively of code-switching and some authors considered its negative effect on language and literacy acquisition, others felt that it was an important strategy to help learners cope with accessing the curriculum and that it should not be framed as a problem at all. Probyn (2009) noted that although

teachers feel that code-switching is not allowed (and will often not code-switch when being recorded or observed for research) they use it to achieve specific learning goals and help learners who would otherwise not understand the content of the lesson. Probyn notes:

> Despite the tension and conflicts in classroom language use, several experienced teachers were able to negotiate understanding with learners by utilizing the linguistic resources of the classroom in a manner that was finely tuned to the needs of the learners (p.133).

Here there is optimism about the skilled and natural way in which educators draw on their own resources to do their work, although many teachers do not feel that this strategy is appropriate or legitimate. As many of the papers noted, there is a great need for resource building in South African schools. This should extend beyond just needing more books, as human resources and empowerment of educators are also required to support teachers to work with what they have to support learners.

This second part of the review collated information from nineteen papers that focused on diglossia and literacy acquisition in South African classrooms. Studies varied in terms of methodologies used, location of schools investigated, and languages used in the schools. However, there were common themes emerging from the body of work. Most papers alluded to a gap between ideals of the language policies and what actually occurs in practice. English was found to dominate over all other languages, and the quality of English language teaching often questioned. Indigenous African languages were a source of pride and solidarity for some, but often perceived as undervalued with their place in educational settings not always clear-cut. Standard and non-standard varieties of each of the languages add complexity to the situation, especially when the arbitrary, colonial imposition of these terms is considered. Teachers face enormous challenges in helping learners access the curriculum, and many have developed strategies of translating or code switching to support learners –a skill which they do not feel is a proper or legitimate part of their job.

5 Discussion

Scoping reviews are useful for obtaining a broad overview about what is known about a particular area. The review revealed a relatively small body of knowledge about diglossia in South African classrooms, some gaps in the knowledge, and some lines for further research. Diglossia was conceptualized in two distinct ways that mirror the evolution of the term in literature more broadly. Some authors compared two varieties of a language (typically a standard variety with another one). These studies (Table 2) showed research into six of South Africa's eleven official languages, although it should be noted that the scoping review was limited to school-age children and there may be other studies that have investigated this issue beyond a school setting. Nevertheless, it seems clear that this is an under-researched domain.

Pretorius and Mokhwesana (2009) noted a virtual absence of research into literacy in the African languages. Other authors considered diglossia in relation to two different languages where English was typically seen as the high variety and contrasted with another language (Table 1).

Acquisition of reading and writing present great challenges for many learners in South African classrooms. I now return to some of the literacy challenges presented at the outset of the chapter, revisiting these in light of contributions from the studies reviewed.

5.1 Humans Are Not Designed for Literacy; It Must Be Taught

Snow and Matthews (2016) suggest that high quality teaching and creation of a rich learning environment will support acquisition of literacy skills. In particular these authors note:

> …quality of teachers' talk influences students' opportunities to learn… the unconstrained language and content skills relevant to literacy. Children whose preschool teachers use more sophisticated vocabulary, engage them more actively in talk about books, and use more complex syntax themselves show larger vocabularies, more complex grammar and better reading skills even as late as fourth grade (p.69).

In South Africa this means that whatever language children are learning to read in, they need to be taught through a programme of sustained high quality teaching, and the language use and language model that the teacher provides should be considered as central to the literacy learning process. This does not necessarily mean that teachers must only speak the standard language or variety of a language –in many cases it would be limiting and problematic for them to do so when their learners will not understand what they say. It is rather to suggest that the teacher's language use (his or her strengths and abilities in different languages and varieties of languages) should be explicitly considered and used to the best effect to achieve the aims of the classroom.

5.2 Literacy Must Stand on a Foundation of Oral Language

South African children coming to school to learn to read will arrive with oral language abilities in one or more languages and language varieties. Whatever they bring must be considered the foundation on which their literacy is built. It would therefore be important to be clear about what their oral language competence is, and the differences between the languages in terms of what the child is bringing to school vs. what s/he will learn. Katz and Rees (2019) embarked on a detailed comparison of literacy elements of English with languages from the Nguni (e.g., isiXhosa, isiZulu) and Sotho families (e.g., Setswana and Sesotho), comparing the

languages in terms of vowel sounds, consonants, word structures, prefixes, plurals, prepositions and other aspects. Where children come to school with limited oral language proficiency in the languages of the classroom, the focus should first be on development of spoken language competence. This relationship between early language and later literacy development is widely-acknowledged (Nation et al., 2010; Snowling & Hulme, 2012; Wolf, 2008), so that many children arriving at school with language development that is less than optimal are already at risk for difficulties with formal literacy instruction. There is therefore an urgent need to strengthen oral language in the preschool years before the start of formal schooling, ideally in a child's home language.

5.3 A Lack of Resources

The authors in our dataset frequently cited a lack of resources as a problematic aspect of South Africa's multilingual and/or diglossic classrooms. There are some excellent local initiatives in place to address these challenges. The non-profit organization (NPO), Book Dash relies on teams of creative volunteer experts (writers, editors, artists etc.) to bypass publishing houses and produce children's books after a 12-hour collaborative workshop or 'bookdash.' The books are freely distributed using an open licence in all of the local languages. Similarly, Wordworks, another NPO focuses on developing resources for developing phonics in the local languages through the use of games and other interactive activities. Developers of these and other materials will enter into frequent debates about standard versus non standard forms. Dowling and Whitelaw (2018) describe early development work on an isiXhosa lexical assessment tool (the isiXhosa Communicative Development Inventory or CDI) and comment on the overlap between children's languages:

> A number of English words for everyday objects … were favoured over their Xhosa counterparts: i-fish instead of intlanzi "fish," … The existence of these English adoptives in children's lexicons does not automatically make them bilingual, but the increasing use of English (and words from other languages) in the average Xhosa speaker's lexicon … needs to be recognised… we hope we can eventually combine monolingual CDIs of different languages (for example Xhosa and South African English) to create a mixed inventory that may be more appropriate for the manifold linguistic skills observed in South African children (p.50).

It is clear from the scoping review that neat, categorical descriptions of linguistic skills are seldom appropriate for South African children (or their teachers). Dowling and Whitelaw allude to this problem of categorization in their paper, and taken a step further, it could also be applied to the different varieties of languages. The binary distinction between high and low varieties of languages is perhaps too simplistic and fails to take into account the complexity of the language situation in South Africa. Diglossia does not account for dynamic situations in which languages are freely mixed and rapidly changing in diverse contexts of great instability. A growing body of literature emphasises the role of translanguaging and argues for a

more fluid view of languages and language variety rather than holding onto established notions of separate languages (Dowling & Krause, 2019; Makalela, 2015). Translanguaging has been defined as: "the use of multiple languages, modalities and other meaning-making tools for supporting literacy learning among multilingual learners" (Daniel et al., 2019, p. 2). The languages of a learner are viewed as being part of an interconnected system in a discursive process that is about making meaning. Translanguaging is a fluid communicative language practice where the languages (and varieties of languages) of input and output are purposefully juxtaposed. The translanguaging approach fits well with the "speaker-centered school language policy" suggested by Busch (2010), and Makoe and McKinney's call to draw on multilingualism and plurilingualism as resources in formal education, rather than considering having many languages a problem. Wider recognition of the value of translanguaging would mean that educators would not have to smuggle the vernacular into the classroom (as Probyn, 2009 described) and learners would not be 'problematized' but rather seen as systematic in their use of patterns as described by Blommaert et al. (2005). They could be encouraged by skilled educators who are able to negotiate understanding with their learners (Probyn, 2009). Probyn's description of skilled educators is similar to a paper by Dowling and Krause (2019) who describe a Grade Four teacher who used translanguaging to effectively convey her message:

> [She] is not held back by the perceived boundaries dividing named languages. Instead she employs language in creative and goal-directed ways that we believe have not received enough focused linguistic attention in scholarship… Our main aim here is to focus on the presence of powerful language resources, rather than their absence, in such a highly scrutinised, purportedly deficient educational setting (p.205).

The intuitive appeal of moving away from language categories or neatly delineated varieties of languages is not hard to understand, especially in a country where unnecessary divisions have caused great suffering and still impact on the lives of many today. Makalela (2018) draws on the African value system of ubuntu, describing 'ubuntu translanguaging' as a process through which all languages, language varieties and literacies are seen as interlinked and dependent on one another. He calls for us to consider African sociolinguistic contexts before the advent of European colonialism and to consider the value that is placed on monolingualism and separateness, suggesting that by doing so in African classrooms we then devalue what learners and educators can do and the rich resources and cultural competences that they bring.

Diglossia is evidently an integral part of many South African classrooms, but attention on diglossia *per se* has been limited in classroom-based research given the range of other complexities (multilingualism, lack of resources, challenges implementing language policies etc.) many of which were described in this chapter. It appears that diglossia is all too often lost against the bigger complexities of our education system and its challenges. One of the limitations of the review is that 'diglossia' was used as a key search term. Many authors do not use this term and may have been describing diglossic situations that would have added to this review,

without their projects being located in the search. Therefore the review cannot be seen as fully representative of the literature on the topic but rather provides a selective review of some keys aspects related to diglossia. Nevertheless, the chapter contributes some specific insights regarding diglossia against a backdrop of broader educational and linguistic challenges. The diglossic lens is a useful analytical tool to help make sense of some of the dynamics of South African classrooms. It is clear that there is a great need for further studies of diglossia and its influence in classrooms. Particular lines of future research include a more detailed focus on translanguaging and the way in which language varieties may be used as scaffolding to support literacy learning. Speech and language therapists have an important role to play in supporting educators in South African classrooms and their understanding and support of translanguaging will also be key for future projects.

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Linguistic Diversity: Basic Concepts and Implications for Reading Research

Natalia V. Rakhlin and Elena L. Grigorenko

1 Introduction

The world we live in is constantly changing, creating, and responding to newly acquired features, such as technological advances, climate change, societal upheavals, pandemics, and shifting boundaries between cultures, religions, and languages. It took Columbus 3 months to get from Spain (Castille) to the Americas (the Bahamas); now, a flight from Madrid to Nassau is only about 13 h. Years ago, the professional occupation of an explorer existed; today there are no more unexplored areas left on the planet. Ever increasing global interconnectedness has led to an acceleration of advancements in science and technology and enabled a dramatic expansion of educational and economic opportunity in many developing countries. However, it has also intensified environmental destruction, consolidation of wealth and power in the hands of fewer and fewer corporations (often transnational, not accountable to any nation state), and a widening of the gap between economically and politically powerful individuals and societies and those that lack power.

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Along with such changes brought about by globalization, there have also been changes in the expectations of what a modern member of this world should be capable of doing, including what skills he or she should master to enter the global labor market and succeed in it. Knowing how to read is, without a doubt, one of the most crucial of such skills, and any difficulties encountered during the acquisition of reading may jeopardize an individual's potential for success in today's global society. In recognition of the importance of literacy as a survival skill and empowerment tool, UNESCO designated 2003–2012 as the United Nations Literacy Decade and sponsored the Literacy Initiative For Empowerment (LIFE) to improve literacy in countries with high literacy needs (Richmond et al., 2008). Although much progress in improving global literacy rates has been made, substantial challenges remain, particularly in some regions (e.g., sub-Saharan Africa, South and West Asia) that are the most linguistically diverse on the planet.

There are important ways in which societal multilingualism affects language choices of individuals and their educational outcomes. For example, globally, there are 50–57 million marginalized children not enrolled in school (Ball, 2015). One of the factors that drives these numbers is linguistic: children whose mother tongue is not the language of instruction are at a higher risk for early school failure or drop out (Bühmann & Trudell, 2008). A better understanding of the linguistic landscapes in which children around the world learn to read is thus necessary for improving the lives of millions of children and further advancing the scientific study of reading.

While cognitive science has been quite successful in mapping out the neurocognitive architecture of the reading brain and its genetic underpinnings, most reading acquisition research does not address the issue of linguistic diversity. The majority of studies tacitly assume a scenario in which children learn to read in one of the world's mega languages, their mother tongue, spoken in a linguistically fairly homogeneous community. In reality, for many children around the world, the situation is quite different. While only 12 languages account for almost half of the world's population, there are 7117 languages spoken in the world today (Simons & Fennig, 2018).[1] Most of these are subnational, co-existing with multiple other languages within a country's border and often competing with a more dominant – in terms of demography and political clout – language(s). Furthermore, only roughly half of the world languages have developed a writing system (Simons & Fennig, 2018). For example, 80% of African languages lack a writing system (https://livingtongues.org). Even if a writing system for a language has been developed, it may not be widely used.

Literacy instruction for speakers of such languages, by some estimates 40% of the world population (UNESCO, 2016a), but substantially higher in regions of the highest linguistic diversity, such as Sub-Saharan Africa, is provided in a language that is not their mother tongue. Evidently, literacy under this condition is a process quite different from what is encountered by children learning to read in their native English and a handful of its European relatives, the languages almost all reading

[1] This number includes 144 sign languages used by Deaf communities throughout the world.

research focuses on. Understanding how linguistic diversity and language ecology in general influences literacy acquisition is thus an important research goal.

In this chapter, we take a look at literacy acquisition through the multifaceted lens of linguistic diversity. We will discuss some of the key issues that arise in multilingual societies and provide various examples illustrating some of these issues, including forms of societal multilingualism, dialect continua, power dynamics in multilingual societies, and diglossia. We also take a look at the effects of linguistic diversity on literacy by examining correlations between countries' level of linguistic diversity and literacy rate. We conclude by discussing implications of this relationship for educational policy.

2 Forms of Societal Multilingualism

Shifts in the global economic and political order have dramatic effects on the world's linguistic landscape. One stark consequence of such shifts has been the rise of a few "big" languages that compete for global influence. Some of them acquired the status of international, e.g., English, French, Spanish, Russian, Arabic, and Chinese – used for international transactions and taught and/or used as a medium of instruction in schools outside their countries of origin. At the same time, a massive number of "small" languages are threatened with extinction, being crowded out and replaced by bigger languages (Harrison, 2008). In fact, up to 90% of the languages that exist today face disappearance (Graddol, 2004), leading to an erosion of the human knowledge base, dents in human civilization, and a permanent loss of unique actualizations of the human nature encoded in these languages.

Because a small number of mega languages account for the majority of all speakers, most of the several thousand languages that still exist today are spoken by small groups of people, often in remote rural areas, making them hard to study. Under some estimates, the median size for a language spoken today is only 7500 speakers (Pereltsvaig, 2017). Many of these languages have rich oral traditions but no written language.

Thus, on the one hand, we are witnessing a trend towards a dramatic reduction of linguistic diversity – many languages, especially small tribal languages spoken in rural areas, are being marginalized and gradually replaced by a small number of dominant mega languages. On the other hand, the growing influence of "big languages" has made bilingualism and multilingualism a norm across the world. For example, English, once a small tribal language limited to parts of an island and dominated by a more prestigious language of the conquering elite (Norman French), is now spoken in some form in 165 countries by over a billion people, including 753,000,000 people using English as a second or third language (Simons & Fennig, 2018).

Although linguistic diversity is common throughout the world, it is unevenly distributed. Furthermore, there seems to be a link between high levels of linguistic diversity and language endangerment. Just as there are biodiversity "hot spots,"

areas with highly concentrated levels of the diversity of species, many of which face extinction, there are linguistic hotspots, areas with a high concentration of diverse language families and high level of language endangerment (https://livingtongues.org). What's more, there is a high degree of overlap between biodiversity and linguistic diversity (Gorenflo et al., 2012), a relationship still poorly understood.

Europe, whose languages are the most thoroughly researched, is among the least linguistically diverse regions, as it is home to only 4% of the world languages, compared to Asia's 32% and Africa's 30% (Simons & Fennig, 2018). The most linguistically diverse country, Papua New Guinea, alone has 840 languages, more than twice the number of languages spoken in Europe. It is followed by Indonesia--710 languages, Nigeria--524 languages, and India--453 languages (Simons & Fennig, 2018).

Multilingual societies also vary with respect to the form of linguistic diversity. Linguistically diverse societies, in which all members are balanced bi- or multilinguals with a native or native-like proficiency in the languages spoken in their community, are rather uncommon, as are countries that are strictly monolingual. For example, countries that officially recognize multiple languages within their boundaries contain sizable monolingual populations (e.g., Russia, Brazil, Canada), and countries considered monolingual may have sizable multi-lingual populations (e.g., Turkey, France). Thus, most societies fall somewhere along a spectrum between "territorial" and "individual" multilingualism (Grosjean, 1982), defined below.

On one end of the spectrum of societal multilingualism are situations of territorial multilingualism, i.e., when multiple language groups coexist within a national boundary, and the country, on the whole, is linguistically diverse but comprised of individuals, who, to a large extent, are not multilingual (i.e., the majority of individuals are native speakers of one of the languages). These situations may be characterized by ethnic and linguistic fractionalization, particularly severe in many parts of Sub-Saharan Africa, which is one of the most linguistically diverse part of the world, where the population is about 1 billion people speaking over 2100 languages (Pereltsvaig, 2017). Only about 75 of these languages have more than one million speakers. The rest are spoken by populations ranging from a few hundred to several hundred thousand speakers. Sixteen countries in the region have 50 or more languages each, including the most linguistically diverse Nigeria (520 languages), Cameroon (279), Tanzania (125), Kenya (67), Mali (66), Congo (62), and Benin (55 languages). In addition, 17 countries with smaller populations where 10–20 languages are spoken can also be classified as highly linguistically diverse, based on the criterion of having 200,000 or fewer speakers per language (Pereltsvaig, 2017).

Such an amount of linguistic diversity has been argued to lead to ethno-linguistic fractionalization, presenting an obstacle for economic and social development in that region (Easterly & Levine, 1997) and is detrimental to efforts in improving literacy. A difficult issue that such societies must grapple with is whether to try to bridge the linguistic divide and strengthen the national identity by imposing primary and secondary education in a national language or to provide (at least primary) education to all children in their mother tongue, as the most optimal form of literacy education (Ball, 2010).

This issue also exists in situations of linguistic diversity arising from international migration, when minority languages of immigrant groups co-exist with the socially and culturally dominant majority language in a society of predominantly monolingual speakers. As an example, one can cite New York City (USA) public schools, where nearly half of all students come from homes where a language other than English is spoken, representing more than 150 languages, in contrast to ≈75% of the New York City population, who identify as speakers of English. In this situation, similar to the situation of regional multilingualism, students may have only limited experience with the language of literacy instruction prior to starting schooling, and their plight with literacy acquisition is similar to students from linguistically diverse regions where mother tongue education is unavailable. These students also have the added issue of potentially limited community support for their home language, resulting in an erosion of home language competence while acquiring the majority language (McBride, 2016).

The issue may be ameliorated in linguistically diverse societies structured on the "personality principle," i.e., multilingualism at the level of individuals (Grosjean, 1982). Personal bi- and multilingualism has been characterized as a positive force, with cognitive, social, educational and psychological benefits, particularly for minority groups (Bialystok, 2011; Mehisto & Marsh, 2011; Mohanty & Perregaux, 1997; Mohanty, 2019). Bilingual education has been found to provide substantial benefits for disadvantaged indigenous populations, as investment in human capital (Benson, 2002; García, 2011; Patrinos & Velez, 2009). Given the complex and interconnected state of our world, monolingual education was pronounced to be "utterly inappropriate" (p.16; García, 2011).

India is usually given as the quintessential example of this form of linguistic diversity (Bhatia & Ritchie, 2004; Sridhar, 1988), where at least three languages are used by many speakers: a mother tongue – a language (or languages) of the region, the official language of the country, Hindi, and English, each associated with different functions (Sridhar, 1996). Large urban centers, attracting residents and commercial activity from diverse regions, are particularly linguistically diverse, as "a Gujarati spice merchant in Bombay uses Kathiawadi (his dialect of Gujarati) with his family, Marathi (the local language) in the vegetable market, Kacchi and Konkani in trading circles, Hindi with the milkman and at the train station, and even English on formal occasions" (Pandit, 1972, p. 79). Tri-lingualism (with a majority local language plus Hindi and English taught as the first, second, and third languages) is the official policy adopted for India's education system (Three-language Formula) (Mohanty, 2019; Vaish, 2008). However, this implies more uniformity than actually exists in a country with 22 constitutionally recognized ("scheduled") languages and hundreds of "unscheduled" languages (representing 6 language families). Thus, only 53.6% of the population listed Hindi and 10% English as their first, second, or third language in the 2011 national survey of India (https://censusindia.gov).

Indian educational programs have been criticized as not sufficiently supporting multilingualism and ignoring children's needs of mother tongue education, instead furthering soft assimilation (Mohanty, 2006). In the colorful linguistic mosaic that is Indian society, where so many languages coexist, unfortunately, there is entrenched

linguistic inequality: some languages are privileged in terms of prestige and access to resources, while others are neglected, and their speakers are discriminated against. Many (potentially 80% of) Indian languages are endangered (Mohanty, 2010).

Linguistic power imbalance is an important issue to consider. In many (or even most) multilingual communities, languages command differential levels of power and prestige and are not equally valued, based on the domains associated with each language use and the status of its native speakers. Language attitudes in society generally reflect economic stratification: linguistic codes of the groups associated with more central and profitable economic sectors enjoy prestige, translating into the gradual expansion of their functional range overtime, while groups associated with less central and less profitable economic spheres lack prestige, often facing stigma and discrimination, and are likely to reduce its functional range and weaken overtime (Philips, 2004). Thus, languages associated with international commerce, the legal system and administration, religious institutions, higher education, science and technology, as well as pop culture – often former colonial languages – are typically perceived as more important and highly valued than languages associated with other, non-official domains because they are associated with upward mobility.

However, issues associated with tribal, ethnic, cultural, or religious identity complicate the linguistic power dynamic in multilingual societies, and many countries have seen a push to increase the recognition of indigenous languages, expand the domain of their use, while restricting the use of the culturally dominant language competing with them. The support for mother tongue-based bilingual (or multilingual) education has been expressed and reaffirmed by UNESCO since 1951, which acknowledged that it is most beneficial for children to receive initial education, continued for as long as possible, in their mother tongue (Ball, 2010; Bühmann & Trudell, 2008). Research confirmed that best practice for children in linguistically diverse societies is to start their education in their mother tongue, which provides a foundation to which a second (and third) language should be added (Benson, 2005; Cummins, 2001; Dutcher, 2003; Foley, 2001; Orekan, 2011; UNESCO, 2016b).

The argument for "mother tongue education" is that teaching literacy in a familiar language facilitates learning of the correspondences between the orthographic symbols and the corresponding linguistic units because the newly learned symbols are mapped onto elements that are already familiar, and children can use psycholinguistic strategies for "self-teaching," proposed as the *sine qua non* of reading acquisition (Share, 1995). Learning to read in the mother tongue also allows students to discover meaning in what they are reading and communicate through writing much earlier than in submersion programs, which teach decoding in an unfamiliar language (Benson, 2005; Cummins & Swain, 2014). Unfortunately, there are factors (outside of the political and economic ones) that may work together against the implementation of mother tongue education (Benrabah, 2007; Gupta, 1997). One such issue is difficulty defining the mother tongue, particularly in situations of a dialect continuum. Another one is diglossia, when a language variety spoken in the community is in full complementarity with the written language. We will discuss these two phenomena in the following section.

3 Dialect Continua

Even for "big" national languages, i.e., those used at the national level for education, mass media, and government, there is a considerable amount of variation. The regional language varieties spoken within a national border that are uncodified, unwritten, and typically associated with the speech of lower classes are commonly referred to by the public as "dialects," a label connoting a lower status and divergence from what is viewed as the standard. However, in reality, "language" versus "dialect" is largely a political construct.

A "language" is generally defined as a collection of mutually intelligible dialects (Chambers & Trudgill, 1998). However, the linguistic principle of intelligibility of delimiting dialects from languages is generally overruled by political geography and political economy; even closely related language varieties are considered distinct languages if they are associated with a separate political entity (an independent state or an autonomous region), but are viewed as dialects otherwise, even if they are considerably distinct from each other. Small subnational language varieties are more likely to lack a distinct writing system, a written literary tradition, dictionaries codifying their linguistic norms, and are less likely to be a medium for language education. This further reinforces their substandard status as merely "dialects" of the standard language variety, while the standard variety is thought of as "language" rather than one of the existing dialects, as viewed by linguists.

For example, there are at least 10 distinct language varieties spoken in France listed as "languages" by Ethnologue (e.g., Gascon, Provençal, Breton, Piedmontese) that are commonly perceived as "dialects" of French because of the French national identity of the speakers, and the perception of these languages is that of rural and "lower class" (Blanchet & Armstrong, 2006). Their speakers face stigma and discrimination by French institutions, especially in schools.

Language varieties that comprise the Chinese branch of the Sino-Tibetan language family (main varieties, e.g., Cantonese, Hakka, Gan, Min, Xiang, Wu, and hundreds of smaller ones) are as distinct from each other as Romance languages are (e.g., French, Italian, Spanish, and Romanian), but these are considered "dialects" of the Modern Standard Mandarin (Chappell, 2001). On the other hand, closely related language varieties once considered to be dialects become codified as distinct languages if the territory where they are spoken acquires independent statehood (as was the case with Serbo-Croatian splitting into Serbian, Croatian, Bosnian and Montenegrin after the dissolution of Yugoslavia, Czechoslovakian splitting into Czech and Slovak after the breakup of Czechoslovakia, or Hindustani splitting into Hindi and Urdu after the partition of India).

Another issue that makes it difficult to differentiate language from dialect is the phenomenon known as dialect continuum, an observation that linguistic differences accumulate gradually over geographic distance, which makes it often difficult to establish sharp boundaries between language varieties. One common example of this is Continental West Germanic continuum, encompassing the territory of Austria, the German-speaking part of Switzerland, Liechtenstein, Germany, Luxembourg,

the Netherlands, the northern half of Belgium (Flanders), and South Tyrol (northern Italy). The language varieties in this region have substantial distinctions in phonological, morphological, and lexical features. However, it was observed that "one could start from the far south of the German-speaking area and move to the far west of the Dutch- speaking area without encountering any sharp boundary across which mutual intelligibility is broken; but the two end points of this chain are speech varieties so different from one another that there is no mutual intelligibility possible" (p. 3; Comrie, 2009). The German dialects spoken in the North are thus closer to the Dutch dialects than they are to some German dialects, but speakers of these dialects are nevertheless educated in Standard German, a dialect that would be considered a different language if the borders were drawn differently. Similar dialectal continua are found in many parts of the world, including countries where Southern and Eastern Slavic languages are spoken, many parts of Africa, the Arab countries, Western Australia, China, and other locals, further complicating the picture.

4 Diglossia

Diglossia has been defined as a relatively stable linguistic situation, in which the primary dialect(s) of a language coexists with a substantially divergent, highly codified (often grammatically more complex) superimposed variety (Ferguson, 1959). The superimposed (or High; H) variety usually comes from a pre-existing highly respected body of written texts, is learned via formal schooling, and is reserved for most written and formal spoken purposes. The vernacular (Low; L) form is used by all members of the community for every-day communication, including in child-directed speech, and is acquired by children naturally as their L1 with the H variety being, essentially, an L2.

Ferguson illustrated the concept of diglossia with four examples: Classical (H) and Colloquial Arabic (L) used in parallel throughout the Arab world, Standard (H) and Swiss German (L) in Switzerland, Katharevousa (H) and Dhimotiki (L) in Greece, and French (H) and Haitian Creole (L) in Haiti. The concept of diglossia has since been extended and applied to multilingual communities (Fishman, 1972) where there exists a dichotomy between H and L languages, analogous to the classic diglossia described by Ferguson. For example, in Zaire, French functions as an H form (used in prestige domains, such as higher education, law, and administration), while indigenous languages function as L forms, used in everyday communication.

Such functional specialization between H and L varieties, with only a slight overlap between them, is the key characteristic of diglossia. For example, the H variety of Arabic (Classical Arabic or its modern form, Modern Standard Arabic) is used in religious sermons, government communiques, academia, news media, and literature (especially poetry). On the other hand, the L variety is used for speaking to service providers (waiters, servants), in personal conversations with friends and

family, "low brow" TV programming, such as soap operas, captions on political cartoons, and folklore.

Among the important features associated with diglossia, as noted by Ferguson in 1959, was that literacy would be restricted to a small elite group, a situation antithetical to goals of modern societies. Although literacy is no longer limited to the elites in most of the world, historically, associations between the literary language and social and cultural elites, and between the vernacular language and commoners, has led to a situation that is still wide-spread in diglossic communities, where H varieties are invariably regarded as superior to L varieties. This was illustrated by a study that used a survey of language attitudes (Benrabah, 2007; Zeggagh, 2017) among young adults in Algeria (n = 1051) in which they were asked to identify their language preferences among Algerian Arabic, Literary Arabic, French, and Tamazight (Berber). Preference was strongly expressed for Literary Arabic and French over the two vernacular languages. For example, the majority or plurality of the respondents chose Literary Arabic as the "richest language" (75%), "most beautiful language" (45%), "language of religious and moral values" (80%), and the "language that allows me to understand the past" (51%). The majority of respondents chose French as the "language I like the most" (44%), "language that I like to learn in" (55.3%), "language of science and technology" (85%), "most modern" (82%) and "most useful language" (58%). Negative attitudes were reserved for Tamazight (with over 70% of respondents choosing it as the "language I like the least," "the language incapable of progress," "most difficult," and "the least pure language").

Because of the entrenched cultural preference for the H variety in diglossic societies, speakers of L varieties often fail to acknowledge it as a legitimate language. Instead, it is often regarded as "slang" or as improper or incorrect speech. Such an attitude presents an obstacle to the principle of mother tongue education; the obstacle increases with greater linguistic distance between H and L varieties. In Arabic, the linguistic distance between H and L Arabic varieties is particularly acute in phonology and morpho-syntax, including phonemic inventories, syllabic structure, phonotactic constraints, stress patterns, and inflectional categories (Aoun et al., 2010; Aoun et al., 1994). Modern Standard Arabic has a richer system of agreement, compared to a less differentiated system in most spoken varieties, Verb Subject Object word order (rather than a more flexible word order, with the pragmatically neutral order of Subject Verb Object of spoken varieties), different distribution and frequency of verbal patterns, passivization, and nominal constructions. Lexically, Modern Standard Arabic and the spoken variety overlap only partially, with 80% of the lexicon of young children consisting of words with divergent forms in spoken and formal Arabic (Saiegh-Haddad, 2018).

Because of the linguistic distance between H and L varieties of Arabic, diglossia creates challenges to literacy acquisition that go beyond what children in linguistically homogeneous societies may experience. Studies of literacy acquisition in Arabic have confirmed that reading in Arabic presents special challenges, manifested as both lower reading speeds among skilled readers and slower reading acquisition among children (Eviatar & Ibrahim, 2014; Ibrahim et al., 2002;

Saiegh-Haddad, 2017). Because of the linguistic distance between Modern Standard Arabic and spoken Arabic, learning Modern Standard Arabic in school may be akin to learning a second language. For example, one study (Ibrahim & Aharon-Peretz, 2005) demonstrated that Arabic-speaking students faced with a lexical decision task in spoken Arabic exhibited priming effects only when primed with a spoken Arabic word and not with Modern Standard Arabic words or Hebrew, a language the children did not speak. This suggests that for Arabic-speaking children, literacy acquisition is complicated by having to learn it in a language in which they are not yet proficient.

5 Global Literacy Rates and Territorial Linguistic Diversity

Countries with the highest levels of linguistic diversity have persistent and often seemingly intractable problems in meeting educational and literacy needs of their people, in comparison with linguistically more homogeneous societies. As linguistic diversity and economic disadvantage (personal and societal) so often overlap, one can ask to what extent linguistic diversity, independently from economic factors, contributes to educational disadvantage. If linguistic diversity is shown to be an independent source of educational disadvantage, it is important to consider what solutions are most appropriate to mitigate the challenges presented by societal multilingualism.

To test the hypothesis that societal linguistic diversity is an independent (from economic wealth) source of variance in literacy achievement across countries, we used global adult literacy data (age 15 and above), reported by the UNESCO Institute of Statistics, as the measure of societal literacy achievement, vis-à-vis Gross National Income (GNI) per Capita data reported by the World Bank, and countries' territorial language diversity data measured by Greenburg's Language Diversity Index (LDI) (Greenberg, 1956) reported by the Ethnologue (Simons & Fennig, 2018). LDI ranges between 0 and 1, where 0 would indicate perfect regional monolingualism, and 1 indicates a hypothetical situation in which no two randomly selected individuals in the country would speak the same language. The mean LDI varied from 0.00 to .988 (Mean = 0.48; SD = 0.31). On one end of the diversity spectrum is Haiti with an LDI of 0.000, and on the opposite end is Papua New Guinea with an LDI of 0.988. GNI per Capita ranged from 280 to 78,320 USD (M = 8754.53; SD = 11,955.07). Global literacy rate varied widely from 22.31% to 99.99% (Mean = 83.54; SD = 19.22). Only the countries for which all three indicators were available were included in the analyses (n = 151)[2].

[2] Literacy data were for 2018 or the latest available since 2000. Available literacy data did not include the countries of Western Europe, Scandinavia, US, Canada, Australia, South Korea, and Japan. In addition, countries for which no recent GNI per capita was reported were also excluded (e.g., Syria, Zimbabwe, North Korea).

Table 1 Correlations between global literacy rates, economic wealth, linguistic diversity and population size

	GNI per Capita	LDI	Population size
Literacy rate	.421***	−.509**	−.007
GNI per Capita		−.143	−.169
LDI			.122

Note. GNI per Capita: Gross National product per capita; LDI: Linguistic Diversity Index.
*** $p < .001$; ** $p < .01$

First, we examined bivariate correlations between literacy rates, GNI per Capita, and LDI. In this analysis we also included population size (as of 2018) as one may suppose that it may be an additional factor related to either economic development, linguistic diversity, or literacy achievement. These results showed that the global literacy rates were significantly, but only moderately, positively correlated with GNI per capita ($r = 0.421$; $p < .001$) and negatively correlated with LDI ($r = -0.509$, $p < .001$). No other significant correlations were found, suggesting that linguistic diversity, economic development, and the size of the population were not significantly related to each other (see Table 1 for these results).

Next, we attempted to tease apart the respective contributions of the countries' economic development level and their linguistic diversity on literacy rate. To this end, we conducted partial correlations between literacy rate and GNI per Capita while controlling for LDI and vice versa. Here, we found that when controlling for GNI per Capita, the correlation between literacy rate and LDI remained significant and its strength was essentially unchanged ($r = -.500$; $p < .001$). Similarly, when controlling for linguistic diversity, the correlation between literacy rates and GNI per Capita also remained significant ($r = -.409$; $p < .001$). Thus, it appears that economic wealth of the country and its linguistic diversity level are independently related to its literacy rate.

To further examine the relationship between linguistic diversity and literacy rate, we separated the countries into linguistic diversity groups: high LDI – with LDI of at least 1 SD above the mean (0.79 or above); moderately high LDI – with LDI within 1 SD above the mean (LDI = 0.48 to 0.78); moderately low LDI – with an LDI within 1 SD below the mean (LDI = 0.47 to 0.18); and low LDI -more than 1 SD below the mean (LDI = 0.17 or below). We compared these groupings on GNI per Capita and literacy rates, using a one-way ANOVA (see Table 2 for the results). We found a significant effect of group on both GNI per capita [$F(3146) = 3.24$, $p < .05$] and literacy rate [$F(3146) = 19.61$, $p < .001$]. Post hoc comparisons showed that the groups with low and moderately low levels of linguistic diversity did not differ from each other, but both had significantly higher literacy rates than countries with moderately high and high LDI, which also significantly differed from each other. The countries in the highest level of LDI were significantly below all other groups on literacy levels, p's < .05 (see Fig. 1). The comparisons on the economic indicator showed that the group with the highest level of linguistic diversity was significantly different from the other groups ($p < .05$; see Fig. 1b), with no other significant pairwise comparisons.

Table 2 Mean literacy rates and GNI per Capita in groups of countries with various levels of linguistic diversity

LDI Group	High LDI (n = 33)	Moderately high LDI (n = 44)	Moderately low LDI (n = 39)	Low LDI (n = 34)
Literacy rate	66.11% (SD = 20.58)	82.03% (SD = 20.51)	92.98% (SD = 10.59)	91.60% (SD = 10.03)
GNI per Capita	3515.15 (SD = 10,466.13)	9,432,27 (SD = 12,908.99)	11,926.67 (SD = 14.208.74)	9324.12 (7013.90)

Note. LDI: Linguistic Diversity Index; GNI per Capita: Gross National Income in US dollars

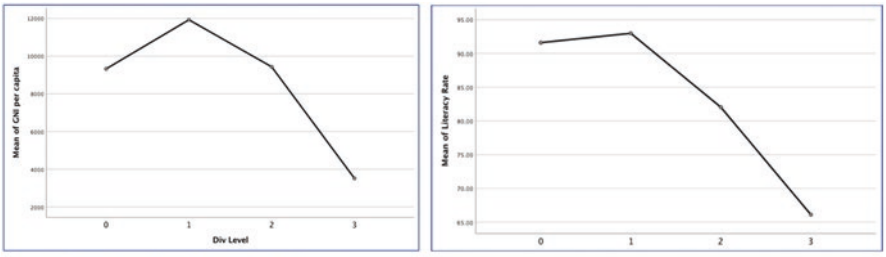


Fig. 1 (**a**, **b**) Comparison of countries with various levels of linguistic diversity on income and literacy levels
Note. X-axis indicates linguistic diversity groups: 0 – low LDI, 1 – moderately low, 2 – moderately, 3 – high LDI

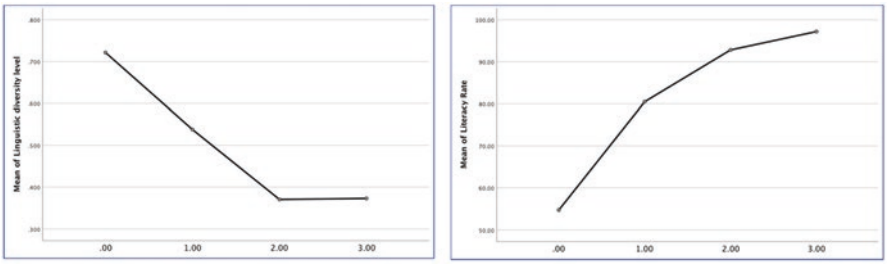
Finally, we grouped the countries by their income level based on the World Bank designation of Low, Low-Middle, Upper-Middle, and High Income and compared them on literacy rates and linguistic diversity levels (see Table 3 for the results). Not surprisingly, we found a significant effect of group on both indicators [$F(3146) = 11.391$; $p < .001$ for linguistic diversity] and [$F(3146) = 74.267$; $p < .001$ for literacy]. Post hoc pair-wise comparisons showed that with respect to the LDI, the two lower income groups and the two higher income groups were not significantly different from one another. However, the two lower income groups had significantly higher LDIs relative to the two upper income groups ($p < .05$). With respect to literacy, the two upper income groups did not differ significantly from each other, but both lower income groups were significantly different from each other and from the two upper income groups ($p < .05$). Figure 2b shows differences between income groups on territorial linguistic diversity and literacy rates.

In order to gain a better idea as to why higher linguistic diversity seems to be associated with lower societal literacy levels, one can look more closely at the countries comprising each of the income groups. Not surprisingly, we found that High Income countries had uniformly high literacy rates (M = 97.7, SD = 2.30) and low levels of territorial linguistic diversity (Mean LDI = 0.033; SD = .24), i.e., over 1.5 SD, falling below the mean for the total sample (Mean LDI = 0.479; SD = 0.30). Upper Middle Income countries also had high literacy rates (M = 93.67, SD = 8.18)

Table 3 Mean literacy rates and linguistic diversity in groups of countries with various income levels

Income group	High (n = 33)	Upper-middle (n = 49)	Low-middle (n = 41)	Low (n = 27)	Total (n = 150)
Literacy rate	97.20% (SD = 2.30)	92.82% (SD = 10.06)	80.48% (SD = 14.06)	54.68% (SD = 18.45%)	83.55% (SD = 19.22)
LDI	.37 (SD = .25)	.37 (SD = .26)	.54 (SD = .32)	.72 (SD = .29)	.48 (SD = .31)

Note. LDI: Linguistic Diversity Index



Note. X-axis indicates countries' economic development level:
0 – low income, 1 – low middle income, 2 – upper middle income, 3 – high income

Fig. 2 (**a**, **b**) Comparison of countries with various levels of income levels (GNI per capita) on linguistic diversity and literacy rate
Note. X-axis indicates countries' economic development level: 0 – low income, 1 – low middle income, 2 – upper middle income, 3 – high income

and relatively low average LDI (M = 0.361, SD = 0.25). However, there were several countries in this group that underperformed relative to their economic peers and had literacy rates below 85% (i.e., over 1 SD below this group's mean): Algeria (80.2%), Guatemala (81.5%), Iraq (79.7%), Namibia (81.9%), and Gabon (83.2%). Three of these countries share the characteristic of having a high level of territorial linguistic diversity (approaching 0.77 or higher): Iraq (LDI = .761), Gabon (LDI = 0.846) and Namibia (LDI = over 0.779), making these among the most linguistically diverse countries in the world. For example, Gabon (population ≈2 million) has 42 spoken languages. Namibia (population ≈2.5 million) has 23 indigenous spoken languages (plus former colonial languages--English, German, and Afrikaans). Guatemala has a somewhat lower level of linguistic diversity (LDI = .518); however, it is still very substantial, with 40% of its population (the largest indigenous population in Central America) speaking 23 indigenous languages and many speakers not fully proficient in the official language, Spanish. The indigenous languages were not officially recognized in Guatemala until 2003, when, for the first time in the history of that country, the Language Law decreed that no restrictions should be placed on the use of 22 indigenous languages, including in the educational and academic spheres. However, as the poorest country in Central America, Guatemala has faced major economic challenges in implementing tangible measures toward elevating the status of the indigenous languages, such as

providing mother tongue education for children who speak these languages, thus limiting literacy achievement in its population.

Algeria, although it has a relatively low LDI (0.360), represents a linguistically complex situation of moderate language diversity paired with diglossia (or rather multi-glossia). In the past, French, the language of the colonial era, dominated the educational system and is still widely regarded as a vehicle for upward mobility. Literary Arabic was strictly imposed in schools (and bilingual education eventually discontinued at all levels) during the post-colonial period of Arabization, between the 1960 and late 1990s, in a country where only a small proportion of the people (300,000 out of 1,300,000 literate people) could read Classical Arabic. Subsequently, a majority of the population were in favor of returning to the French-Arabic bilingual model of education as many consider the existing educational system a failure (Benrabah, 2007), but plans for such reforms had been scrapped for political reasons, and a reintroduction of French into the school system did not begin until 2008.

One reason for the inadequacy of the Algerian educational system after the strict Arabization is that diglossia, although present throughout the Arab world, has an even more pronounced effect on literacy in countries like Algeria, where Algerian Arabic is even more divergent from literary Arabic than other spoken Arabic varieties. It belongs to the Maghrebi group (which also includes Arabic varieties spoken in Morocco, Tunisia, Libya, Western Sahara, and Mauritania), languages heavily influenced by Berber, Turkish, and French. The issue is summed up as follows: "Today the linguistic situation in Algeria is dominated by multiple discourses and positions. The language spoken at home and in the street remains a mixture of Algerian dialect and French words. In this case, every language has become a source of frustration: classical Arabic is still not mastered even at higher educational levels; dialectical Arabic cannot express things in writing. Contact with the French culture has left the Algerians with a vitiated language and resulted in a profound linguistic alienation. This situation condemned many Algerian writers either to silence or to exile" (p.87; Maamri, 2009).

What the quote above does not mention is that a large proportion of the Algerian population are speakers Tamazight, a member of the Berber branch of Afro-Asiatic language family, distinct from the languages of the Semitic branch, which includes Arabic. The reported proportion of Berber speakers varies anywhere from 25% (Brett, 2019) to 40% – 60% (Saib, 2001). Such a large discrepancy is due to the suppression of census data regarding the Berber-speaking population from the time of the country's independence in 1956, for political reasons. If the estimate of 60% Berber speakers turns out to be correct, this would mean that a majority language became "minorized" (Saib, 2001), and, as the discussion of language attitudes in Algeria in the previous section showed, stigmatized. Most Tamazight publications in Algiers use the Berber Latin or Arabic scripts, even though there is an ancient traditional Berber script – Tifinagh, suppressed until recently. The repression of Berber languages led to political unrest at different points in history (e.g., "Berber Spring" in 1980 and "Black Spring" in 2001). Political activism has led to the recognition of Tamazight as a national language in 2002 and teaching in this language was allowed in 2003. However, Modern Standard Arabic continues to be the most common language of instruction.

Next, we look in more detail at the two low income groups of countries. Low Middle Income countries had a lower average literacy rate (M = 79.79%, SD = 14.57) and higher linguistic diversity (M = 0.47; SD = 3.18). Countries with low literacy rates (literacy of 65% or below) included Mauritania (LDI = .228), Sudan (LDI = .307), Comoros (LDI = .551), Angola (LDI = .748), Pakistan (LDI = .752), Senegal (LDI = .778), Nigeria (LDI = .890), Ivory Coast (LDI = .900), and Papua New Guinea (LDI = .988). The country with the lowest LDI on this list is Mauritania, a country where two thirds of the population are Moors who speak Ḥassāniyyah Arabic, while the remaining third of the population is comprised of members of other ethnic groups who speak Niger-Congo languages (Fula, Wolof, and Soninke are recognized as official). However, (Literary) Arabic is the official language, and since 1980 it has been the language of instruction in schools. Thus, for the majority, it represents a situation of diglossia. The relatively low LDI of Sudan obscures the fact that it is a country of approximately 70 indigenous languages that come from diverse language families (multiple branches of Afro-Asiatic, Nilo-Saharan, and Niger-Congo language families). Sudanese Arabic, the most widely spoken language, has been heavily influenced by the indigenous languages of the area. Despite this diversity, Arabic and English are the only official languages. Thus, it appears that for all of the countries in this group, the economic disadvantage is paired with a complex linguistic situation, with each factor likely contributing to the low literacy rates.

Finally, Low Income countries have lower literacy rates than countries of higher income groups, ranging from 22.31 (Chad) to 77.89% (Tanzania; M = 54.68, SD = 18.45). These countries also have the highest levels of territorial linguistic diversity (Mean LDI = .72, SD = .28) among all income groups. Looking at exceptions here may also be instructive. One notable exception to low literacy in this income group is Tajikistan, the country with the GDP per Capita of merely 1010 USD but which has a reported literacy rate of 99.8%. This is similar to what is observed for High Income Countries (defined as GNI per Capita of above 12,375 USD), the highest literacy rate among Low Income Countries. The country that directly followed Tajikistan in literacy in this income group was Tanzania, (literacy rate of 77.89%). One may ask what can account for the disparity in literacy between the two countries since they have a similar level of national income (1010 and 1020 USD, respectively). Although there may be various explanations for this disparity, differences in territorial linguistic diversity and educational language policy differences between Tajikistan and Tanzania may offer a potential (at least partial) explanation.

According to Ethnologue, Tanzania (LDI = .871) is home to 126 languages, representing multiple language families, including the Bantu branch of Niger-Congo, Cushitic branch of Afro-Asiatic, Nilotic branch of Nilo-Sharan, and Khoisan (the latter are the click languages spoken in Botswana and Namibia, which may come from the same stock as two of Tanzanian languages, Hadza and Sandawe). None of these are spoken natively by the majority or even a plurality of the population. Swahili, a Bantu language used as a lingua franca, is the language in which primary education is administered and literacy is taught (English is also used for this

purpose), but only 10% of the population speak Swahili as their native language, and fluency in Swahili as a second language varies among the adult population (Ammon et al., 2006). Thus, many children may not have sufficient exposure to this language prior to the start of schooling. In contrast, 84% of the population of Tajikistan (LDI = .276) are speakers of Tajik, an Iranian language with a writing system based on the Cyrillic alphabet (introduced in 1940), which has the status of a national language, and in which the majority of children are educated. Although Tajikistan has a substantial language minority population (≈15% of the population are an Uzbek-speaking minority, in addition to small numbers of Russian speakers and speakers of other languages of the former Soviet Union, who communicate in Russian), they have an option to attend schools where education is administered in their home language (Uzbek- or Russian language schools) where they can acquire literacy in their home language while learning Tajik and Tajik writing as a second language. Thus, not only is the level of linguistic diversity in Tajikistan significantly lower than in Tanzania, but for the vast majority of individuals, literacy instruction in their native language is available.

Another Low Income country that overperforms on literacy rate relative to its economic peers is Burundi, with a literacy rate of 68.38% (similar to Tanzania), despite having the lowest in the world GNI per capita of only 280 US dollars compared to Tanzania's 1020. Burundi is reported to have a higher literacy rate than Nigeria, a country with a much larger economy (GNI per capita 1960; literacy rate 62.02). It is an outlier among countries of Sub-Saharan Africa in having a single indigenous language, Kirundi, shared by 98% of the population and recognized as an official language. While Nigeria (LDI = .890) is a global leader in linguistic diversity, with over 500 spoken languages, Burundi is the only African country with an LDI below .01 (LDI = .007). Once again, we can see how the complexity of the linguistic topography, quite independently from economic factors, is associated with depressed levels of literacy.

6 Concluding Thoughts

The issues and examples we have discussed throughout the chapter all illustrate the idea that linguistic landscapes in multilingual societies are complex and often fraught with challenges that inevitably arise out of an intricate web of interrelationships between languages, their speakers, and the institutions, cutting across economic, political, and social lines and reflecting long and often difficult histories. The above analyses are undoubtedly quite simplistic and are not meant to represent the full complexity of factors that influence literacy development across continents and countries with an array of diverse peoples, cultures, economies, and political systems. However, one striking observation emerges too consistently to be ignored: for countries with linguistically diverse populations attaining universal literacy and expanding educational and economic opportunity is a more complicated proposition than for linguistically homogeneous societies. In the face of these challenges,

maintenance of local languages all too often is not seen as a priority by the institutions in charge. Multilingual countries often resort to policies of homogenization and subtractive bilingualism for the minority language speakers. Their languages are devalued, denigrated and excluded from education, making it more likely that speakers of these languages drop out of school or fail to learn. The reasons for this may be political (e.g., nationalism, institutional racism), economic (lack of resources for language development and teacher training for speakers of diverse languages), demographic (many indigenous languages are spoken by small rural populations), and linguistic (e.g., difficulty to establish which local linguistic varieties constitute "languages," a lack of language documentation, standardization, and/or writing system.)

The value of bilingualism or multilingualism is now widely acknowledged, at least for middle class inhabitants of economically advanced countries and a small number of the world's mega languages. Languages that lack the power and overt prestige (i.e., most of the world's 7117 languages) deserve to be equally valued. Elevating the status of these languages and promoting additive bilingualism (or active bilingualism, in more recent conceptualization) and biliteracy (or multilingualism and multi-literacy) represents the best practice for language education of linguistically and culturally diverse students (Cummins, 2001, 2017). Children learn best when their home languages are maintained and strengthened as the foundation for learning the second language, and a national language is added as a second language instead of replacing the first (Alvear, 2019; Cenoz & Valencia, 1994; Cummins, 2017; Koch et al., 2009; Landry & Allard, 1992; Orekan, 2011). Unfortunately, implementing these forms of education requires radically changing coercive power relations entrenched in many societies across the globe, a task that goes far beyond the academic, but without which closing the proverbial achievement gap will continue to be illusive.

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Diglossia in Chinese? It's Complicated

Leo Man-Lit Cheang and Catherine McBride

1 Introduction

The effects and nature of diglossia are widespread worldwide. For example, the ability to speak in a particular language sometimes forms the basis of a collective identity that is unavailable to others. For example, the regional dialects Limburgish in the Netherlands is often linked to a context of familiarity and informality, such that Standard Dutch would generally be considered as instructional, formal, and hierarchical (Cornips, 2018). In a recent comparison between early learners speaking the Swiss-German dialect and standard German, exposure to Swiss-German Swiss German or Standard German? was associated with improved early metalinguistic skills, especially for phonological awareness and spelling of phonetically-correct invented words (Bühler et al., 2018), which highlights the influence of spoken dialect on both spoken standard language and written standard language.

Similar to the Dutch and German languages, variations and dialects were also developed in Chinese. In its thousand-year history, Chinese language was spread across its wide territory, leading to the development of regional variations. Today, prominent variations of the language include Mandarin, Cantonese, and Hokkien, among others. These variations of the language differ in grammar, syntax, and vocabulary. Some of these variations are further from the written standard than others. That is, Chinese speakers of certain variations of Chinese learn to read and write in a language almost identical to their spoken language, whereas speakers of other variations tend to struggle with a mismatch between their spoken language and the language of text. The present chapter aims to review research studies regarding this diglossic situation in Chinese, and attempts to shed light on the possible impact of different spoken languages on the literacy development of Chinese learners.

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1.1 Variations of the Chinese Language

Mandarin and Cantonese are the two most influential spoken variations of the Chinese language. Mandarin refers to a group of Chinese languages historically spoken in Northern and Southwestern China. Standard Mandarin refers to a variation of Mandarin based on the dialect of Beijing citizens, and is officially promoted across different regions of China as a standard of spoken Chinese in Mainland China. Cantonese, on the other hand, is the language commonly spoken by people in the Southern region of China, especially in the Guangdong province (previously known as Canton). Cantonese has also been used in many Chinese diasporas across the globe (e.g., the famous Chinatown in Los Angeles), since many early Chinese immigrants were from the Southern region of China. Cantonese still remains the commonly spoken language in Hong Kong; 88.9% of its citizens claimed Cantonese as their native language as of 2016.

Major differences between Mandarin and Cantonese include their tonal system, vocabulary, and grammatical structure. Both Mandarin and Cantonese are tonal languages. In a tonal language, the lexical tones of pronunciations determine the word. For example, the pronunciation /maa/[1] in Cantonese can refer to the noun "mother" ("媽"), the noun "horse" ("馬"), or the verb "to scold" ("罵") when pronounced in the first (/maa1/), fifth (/maa5/) or the sixth (/maa6/) lexical tones, respectively. Although both Mandarin and Cantonese are tonal languages, Mandarin has four lexical tones and Cantonese has at least six major lexical tones. There are substantial differences between the tonal systems of Mandarin and Cantonese, and it is often difficult for native Mandarin speakers to master the tonal system in Cantonese. Mandarin also has more homophones than Cantonese. Chow et al. (2008) suggested that each syllable in Mandarin has around five homophones, whereas each syllable in Cantonese has only around three homophones.

Mandarin and Cantonese also differ in their vocabulary. For example, the verb "to sleep" is commonly orally labeled as "睡覺" (/shuì jiào/) in Mandarin, but it is referred to as "瞓覺" (/fan3 gaau3/) in Cantonese. Despite referring to the same idea, the words used in the two languages are different and it is often difficult for a native Mandarin speaker to understand Cantonese vocabulary. In addition, because of the cultural background of Cantonese users, many vocabulary words were created through transliteration from English. For example, the word "strawberry" is transliterated into "士多啤梨" /si6 do1 be1 lei2/ in Cantonese, but it is usually referred to as "草莓" in Standard Mandarin. In terms of lexical compounding, Cantonese speakers often place the adjective behind the noun to be described. For example, a rooster (male chicken) is often referred to as "雞公" (literally translated as "chicken-male") in Cantonese, where the adjective "male" follows the noun

[1] Unless otherwise specified, all phonetic transcriptions of Cantonese pronunciations of Chinese characters are in Jyutping, all phonetic transcriptions of Mandarin pronunciations of Chinese characters are in Pinyin, and all phonetic transcriptions of English pronunciations are in IPA.

"chicken," but is expressed as "公雞" (literally translated as "male-chicken") in Mandarin, where the adjective "male" precedes the noun "chicken."

Mandarin and Cantonese also differ in terms of grammatical structure. To begin, adverbs in Cantonese usually follow the verb, instead of preceding the verb, as in Mandarin. For example, the phrase "you walk before me" in Cantonese is expressed as "你走先", literally translated as "you-walk-first," in which the verb "walk" precedes the adverb "first." In Standard Mandarin, the same phrase will be "你先走" or "you-first-walk," in which the verb "walk" follows the adverb "first." In addition, grammatical modifiers in Cantonese are often ignored, but not in Mandarin. For example, the sentence "that dog will bite people" is expressed as "那隻狗會咬人" in Mandarin, in which the Chinese character "那" denotes the modifier "that." In Cantonese, however, the same sentence is expressed as "隻狗會咬人", where the modifier "那" ("that") is implied but not stated.

Mandarin and Cantonese differ in ways beyond the above discussion. Despite these differences, speakers of the two languages are able to understand each another at least through written communication. This is because written Chinese has been standardized to *Baihua* ("白話"), or standard written Chinese, since early twentieth century. The vocabulary, grammatical structure, and syntax of standard written Chinese are almost identical to that in Mandarin but not in Cantonese. As a result, there is a mismatch between the oral language and the language of text for native Cantonese speakers, and the mismatch might create a challenge to reading similar to that observed in other diglossic and dialectal contexts worldwide. Since Hong Kong and Beijing are densely populated by native speakers of Cantonese and Mandarin, a comparison of literacy development between learners from the two cities can partly help to reveal the impact of this mismatch. However, qualifications must be made to such a comparison, since learning experiences for speakers in the two cities vary in ways beyond their spoken languages.

1.2 Differences in Literacy- and Language-Learning between Hong Kong and Beijing

The differences between the Chinese literacy- and language-learning experiences in Hong Kong and Beijing are complicated. Cantonese is used in most broadcasting channels in Hong Kong and in the Chinese lessons of many classrooms, with a fluctuating number of schools currently experimenting with Mandarin as their medium of instruction in Chinese lessons. Depending on the schools' curriculum, Mandarin is sometimes taught separately in another lesson focusing on oral communications. In Beijing, Standard Mandarin is used in most broadcasting channels and in Chinese lessons of most classrooms. However, it should be noted that, since Beijing is densely populated with immigrants, the language of daily communications may vary from one citizen to another, depending on their families of origin. Typical learners in the two cities recite reading materials in their own languages, namely, Cantonese in Hong Kong and Standard Mandarin in Beijing. Since the language of

text is standardized in standard written Chinese, the vocabulary, syntax and grammar of the text is more distant for Hong Kong learners than Beijing learners. For example, to use the verb "to sleep" ("睡覺") as an example, from printed text, learners in Beijing can readily understand this in written form as soon as they read aloud the printed word. For learners in Hong Kong, however, additional explanation from teachers is often required because the Cantonese pronunciation of the verb "睡覺," /seoi6 gaau3/, is different from the pronunciation of the verb "瞓覺," /fan3 gaau3/, as used colloquially to represent the verb "to sleep."

In addition, the two cities used different versions of the Chinese script. Publications in Hong Kong mostly adopt the Traditional (Standard) script, while the Simplified script is used in Beijing. Chinese characters are conventionally classified by the methods of forming or deriving characters. The major method of character formation was traditionally phonetic-semantic compounding, in which a phonetic radical, i.e. a sub-character unit representing phonological information, and a semantic radical, i.e. a sub-character unit representing semantic information are combined to form a Chinese character. Characters with the same phonetic radicals sometimes share the same pronunciation or the same onset or rime, and characters with the same semantic radicals sometimes are related semantically. Other major methods of word formation include pictographs and ideographs, in which the form of the character loosely resembles an object or indicates abstract ideas. The Traditional script used in Hong Kong retains most of these meaningful units, while the Simplified script replaced complex radicals with simpler signs and sometimes eliminated the phonetic-semantic structure in characters. For example, the character "幹" ("to work") was simplified to the character "干," and the character "導" ("to direct") was simplified to the character "导". The extent to which such differences in the composition of the basic unit of literacy in Chinese, the character affect literacy learning is still being explored (for a review, see Zhang & McBride-Chang, 2011).

Another difference in literacy-learning between the two cities lies in the availability of a phonological coding system to aid in early literacy learning. Although phonetic radicals are available in some Chinese characters, only around a quarter of these characters has an identical pronunciation to their phonetic radicals (Fan et al., 1984), rendering phonetic radicals unreliable in cueing pronunciations of Chinese characters. For learners in Beijing, Pinyin, a phonological coding system in Mandarin, is available in most reading materials for children. For example, the Mandarin Pinyin /zǎo ān/ is printed on top of the characters "早安" ("good morning") to assist students in reading the characters aloud. Many learners in Beijing are also taught explicitly about the onset-rime structure of Chinese characters in the early stage of reading acquisition. For learners in Hong Kong, however, similar phonological coding systems are rarely used to aid children's reading development.

The comparison is further complicated by differences in the cultural experiences and learning environments for Hong Kong and Beijing learners. In Hong Kong, most learners begin literacy training as they enter kindergarten at 3 years of age, although many begin to write characters only in their second- or third-year in kindergarten (at ages 4 to 5 years old). In contrast, in Beijing, most learners begin

formal literacy training in primary school at age 6. As a consequence, it is difficult to explicitly compare Hong Kong and Beijing children on language-related tasks and word writing (generally referred to as dictation or spelling). Nevertheless, a series of studies we have conducted over the years may be helpful in revealing some of the differences between the two groups may in relation to the potential effects of the diglossic context of Chinese language and literacy learning.

1.3 Psycholinguistic Correlates of Word Reading and Word Writing

Across Chinese societies, the psycholinguistic correlates of word reading and word writing ability tend to overlap. For struggling Chinese learners, core difficulties include morphological awareness, phonological sensitivity, visual-orthographic processing skills, and rapid automated naming (or fluency of reading). In some studies of dyslexia, phonological sensitivity is less strongly associated with reading than the other three correlates (Huang & Hanley, 1995; McBride-Chang et al., 2003; Pan et al., 2011).

Morphological awareness is the awareness of and access to morphemes, the smallest unit of meaning in a word. This awareness can sometimes help to disambiguate a newly learned word, and one way to measure this awareness is through a child's ability to create words through lexical compounding. For example, the Chinese character "人" ("person"), is sometimes combined with the character "大" ("big") to form the two-character word "大人" to represent "adult." The character "人" could also be combined with the character "女" ("female") as "女人" to represent "woman." Examples of lexical compounding in English are the words *sunglasses* and *sunrise*, which were formed by combining the roots *sun* and *glasses* and the roots *sun* and *rise* respectively. Phonological sensitivity refers to the implicit awareness of the onset-rime structure, the syllabic structure, and the lexical tones as Chinese characters and words are pronounced. All of these types of phonological sensitivity contribute to variability in Chinese word reading in different studies (Pan et al., 2011; Shu et al., 2008; Siok & Fletcher, 2001).

When morphological awareness, phonological sensitivity, and vocabulary knowledge were used to explain variance in word reading performance of second graders in the same model across Hong Kong and Beijing, morphological awareness but not phonological sensitivity was a significant contributing factor in both Chinese societies (McBride-Chang et al., 2005). This may be due to the fact that Chinese word recognition only requires readers to be phonologically sensitive at the syllable and onset-rime levels, levels of sensitivity most readers have developed before they reach second grade. While there is evidence of phonological difficulties in those learning to read Chinese, such difficulties are often relatively subtle as compared to other cognitive-linguistic abilities in some studies (e.g., Ho et al., 2007). Other differences between Hong Kong and Beijing literacy development from our own work

include the ways in which parents teach Chinese word writing to their children (e.g., maternal mediation), the overlap of word reading development in Chinese and English, reading comprehension, and essay writing in Chinese. Each of these ideas are addressed below.

1.4 Maternal Mediation

Most of the research on the topic of how parents scaffold their children in learning to write so far has focused on mothers specifically, despite the fact that both parents presumably help to scaffold their children in learning to read and write. Maternal mediation refers to the strategies that mothers or caregivers adopt to assist children in this learning. Following Neitzel and Stright (2003)'s theoretical framework of maternal scaffolding, Lin et al. (2012) studied the mother-child interactions as mothers were helping their children to write Chinese words. The interactions were videotaped and rated according to various categories. Overall, mediation strategies such as direct guidance and encouraging autonomy were positively correlated with the quality of writing outcomes. Both similarities and differences were observed in the mediation strategies adopted by mothers in Beijing as compared to Hong Kong. These are important to consider in light of language and literacy differences across the two locations. First, mothers from both samples generally focused on the semantic radicals within a character and rarely emphasized the phonetic function of radicals. Mothers in both groups also tended to encourage their children to copy the entire character repeatedly to facilitate memorization of its orthographic structure. These strategies are unique in Chinese learning and rarely seen in mother-child interactions when learning alphabetical writing (e.g., Aram & Levin, 2001, 2004). Moreover, these characteristics are plausibly attributable to the low reliability of phonetic radicals in cueing pronunciations of the Chinese characters as well as the complexity of the Chinese script, which includes thousands of unique characters. A comparison of mothers' strategies from the two samples highlighted the fact that the Beijing group tended to use more mediation strategies at the character level. For example, in guiding their children to write the character "早" ("morning"), Beijing mothers would often say that it is the same "早" as in the phrase "早安" ("good morning"). The differential use of character level guidance might be due to the fact that the spoken language in Beijing, Mandarin, has more homophones per syllable than Cantonese, the spoken language in Hong Kong. Other differences in mothers' strategies in helping their children to learn to write were more linked to script differences between Beijing and Hong Kong.

1.5 Word Reading in Chinese and English

Another example of some differences between children from Beijing and Hong Kong concerns their own word reading. Using a statistically representative sample of children in Hong Kong and Beijing, McBride-Chang et al. (2013) tested the overlap of children showing poor reading skills as reflected in their Chinese word reading and English word reading performances. Using the lower quartile (bottom 25%) as the threshold for poor reading skills, McBride-Chang et al. (2013) found an overlap of 40% students struggling in both Chinese and English word reading in Beijing, but only an overlap of 32% of students in Hong Kong. The higher proportion of overlap across the two languages for readers in Beijing suggested that mechanisms of word reading in Chinese and in English were more comparable for Beijing readers than for Hong Kong readers. It also appeared that readers in Beijing might rely more on phonological processing skills for word reading of both Chinese and English when compared to Hong Kong students. The reason for this difference could be due to the fact that Cantonese is more linguistically distant from standard written Chinese relative to Standard Mandarin, rendering phonological recoding mechanism a less effective reading strategy for Cantonese speakers.

1.6 Reading Comprehension

Turning from individual word skills to broader comprehension skills in literacy, we have also explored similarities and differences in children from Beijing and Hong Kong in their reading comprehension in Chinese. Reading comprehension in Chinese differs from that in English because of the contrasting features between the two languages. To begin with, while a considerable number of English words can be decoded through grapheme-phoneme mapping efficiently, the phonological components in Chinese characters are often less reliable (Fan et al., 1984). Novel words in Chinese are frequently created through lexical compounding, or the combination of existing morphemes to represent new meanings. The phonological structure of Chinese includes lexical tones (e.g., the syllable /ma/ can refer to *mother* or *horse* depending on the tone of pronunciation), which is not a linguistic feature of English at all. Also, Chinese has more homophones (characters pronounced identically but with distinct meanings) when compared to English. Moreover, indicators of grammatical information, such as marking time with *-ing* and *-ed*, and the subject of actions with *-s* or *-es* are absent in Chinese. Therefore, readers of Chinese have to frequently infer the time of actions by making inferences using additional information before and after the verb.

Zhang et al. (2014) compared good comprehenders to poor comprehenders in both Hong Kong and Beijing. Across the two Chinese societies, Chinese word reading ability at an early age (at ages 5–6), morphological compounding ability (at ages 7–8), vocabulary knowledge (at ages 7–8), and phonological sensitivity to

onset-rime structures (at ages 5–8) were all uniquely predictive of subsequent reading comprehension ability (at ages 9–10). In addition to these predictors, sensitivity to grammatical indicators in written phrases at an early age (at age 5) and the ability to discriminate lexical tones (at ages 5–9) were both predictive of reading comprehension ability for the Hong Kong sample, but the same prediction was not significant for the Beijing sample. A plausible explanation for the significance of grammatical sensitivity could be the fact that the spoken language, Cantonese, is linguistically distant from the written language, which again is standard written Chinese for learners in Hong Kong. As previously discussed, certain grammatical indicators are frequently neglected in Cantonese, and speakers often have to infer the grammatical information by inferring from clues within adjacent words and the overall context of communication. However, these indicators of grammar are explicit in both Standard Mandarin and standard written Chinese. As a result of these differences between written and spoken language, Hong Kong readers have to learn a new set of grammatical rules as they learn to read, unlike their Beijing counterparts.

The importance of lexical tone discrimination in reading comprehension may be a result of the difference in tonal systems across the two languages, where Mandarin has four tones and Cantonese has at least six tones. It could also be a result of differences in instructional methods between the two societies. Beijing learners receive direct instruction on blending onsets and rimes to read Chinese characters, and tones are explicitly indicated in the widely available phonological coding system (Pinyin). As a result of these instructional differences, explicit awareness of lexical tones might be stronger for learners in Beijing and weaker in Hong Kong.

1.7 Essay Writing

Perhaps the most complicated aspect of literacy acquisition is that of writing composition. Our lab has explored essay writing across children in Beijing and Hong Kong as well in an attempt to understand the processes involved in advanced writing composition for both groups. In fact, the overall quality of writing composition of learners reflects both lower-level developmental literacy skills and higher-order thinking skills (Berninger et al., 1992). In an attempt to assess the quality of writing composition of Chinese learners across different Chinese societies, Tong et al. (2014) invited 11-year-old learners from Hong Kong and Beijing to write a short essay within a 10-minute timeframe. These researchers assessed each essay according to its organization, intelligibility, quality of contents, and numbers and types of mechanical errors. Tong et al. (2014) found that essays written by the Hong Kong sample contained more mechanical errors than those written by the Beijing sample. Specifically, these mechanical errors fell into two major categories, including "word-order chaos," or the misplacement of words within a statement, and "misnomers," or the misuse of vocabulary in their writing. Although both Cantonese and standard written Chinese mostly adhere to the subject-verb-object structure, the

orders of supplemental words (e.g. adverbs) differ in ways discussed in earlier sections. These finer differences in sentence structure between the spoken language and the language of text might have resulted in more word-order chaos on essays written by these learners. In addition, the vocabulary words adopted in Cantonese differ from those in standard written Chinese due to regional vocabulary, transliteration, and lexical compounding. All of these factors might have influenced learners' choice of words in writing and might have led to the higher number of misnomers in essays written by learners from Hong Kong than those from Beijing.

1.8 Conclusion: It's Complicated

Due to the diversity in learning and cultural experiences, direct comparisons between Hong Kong and Beijing children's performance are impossible. Despite this limitation, however, different research studies in this text have suggested that Hong Kong learners tend to experience a mismatch between their spoken language, Cantonese, and their written language, standard written Chinese, resulting in challenges to their literacy learning. Perhaps as a result of this mismatch, sensitivities to grammatical indicators and lexical tones have emerged in studies from our lab as more important to text comprehension for learners in Hong Kong; children in Hong Kong, as compared to those in Beijing, have also tended to make more mistakes related to word orders and word choices in writing composition.

In response to this diglossic situation, a number of primary and secondary schools in Hong Kong have begun switching to Standard Mandarin as its medium of instruction to minimize the differences between spoken and written languages and to enhance written expressions. Some schools have even pushed further and have forbidden the use of Cantonese (the student's native spoken language) in their respective schools. Since medium of instruction is only one element in the ecological system of literacy acquisition (Bronfenbrenner, 1979) and Cantonese remains the language of daily communications in Hong Kong, the effectiveness of these changes on literacy development remain unclear. Further research to directly compare literacy development of learners using Standard Mandarin and Cantonese as their media of instruction in the same society might reveal the effectiveness of these changes.

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A Psycholinguistic-Developmental Approach to the Study of Reading in Arabic Diglossia: Assumptions, Methods, Findings and Educational Implications

Elinor Saiegh-Haddad

1 Introduction

To study reading acquisition in diglossia is to study reading at the intersection of psycholinguistics and sociolinguistics. In a diglossic context, sociolinguistic variables imbue the process of first language literacy acquisition with a host of variables that are not squarely pertinent to other first language reading contexts. These factors include mode of acquisition, age of acquisition, domains and functions of use, linguistic distance, amount and type of language exposure (passive, active), input (quality, quantity), cross-lectal transfer of skills, schooling, attitudes, prestige and other experiential and affective variables. The contribution of these factors to the acquisition of first language reading in this context is, thus, an issue of scientific merit and of educational import.

Diglossia also infuses the linguistic environment of the language acquirer with immense linguistic variation. Linguistic variation in the environment of children yields enhanced metalinguistic awareness (Bialystok, 2001; DeLucaa et al., 2019). At the same time, distributed exposure and use between two languages impacts language 'exposure' (Carroll, 2017), 'language input environment' (De Houwer, 2018), or the 'language intake' (Wijnen, 2000), namely the "data base children use to derive hypotheses on the structure of the target grammar" (p. 174), and this has implications for patterns of language acquisition. As reading is grafted onto oral language skills (Gough & Tunmer, 1986; Perfetti, 2007), exposure and input variables should influence reading acquisition as well. Despite its pervasiveness, the role of linguistic variation, and of related input and exposure variables in language and literacy acquisition in diglossic and in dialectal contexts has not yet attracted sufficient empirical attention (however see, e.g., Bühler et al., 2017, 2018; Brown

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et al. 2015; Jalil & Rickard Liow, 2008; Snell & Andrews 2017; Treiman et al., 1997; Washington & Craig, 1994). This contrasts with a rather fervent study of these factors in bilingual contexts (e.g., Carroll, 2017; Cornips, 2018; De Houwer, 2018).

2 Setting the Scene: The Role of Oral Language Skills in Learning to Read and the Case of Arabic Diglossia

Perhaps one of the most important achievements of psycholinguistic research during the past few decades has been in discovering the linkage between oral language skills and reading ability (Perfetti, 2007; Stanovich, 2000). This linkage is captured, among other models and hypotheses, by the *Simple View of Reading* (SVR) (Gough & Tunmer, 1986), which proposes that reading comprehension (R) is the product of decoding (D) and language comprehension (C), namely R = DXC. In several empirical examinations of the SVR in various languages, word decoding (often tested using an isolated word reading task or a pseudo word decoding task) and language comprehension skills (often tested using a listening comprehension task or a general measure of vocabulary knowledge) uniquely predicted differences between individuals in reading comprehension. Moreover, the contribution of each of the two components to reading was found to be dynamic and to change with development. As such, decoding is a particularly strong early predictor of reading comprehension, but this factor gradually gives way to language comprehension as children grow older and develop stronger language and literacy skills (e.g., Catts et al., 2005; Chen & Vellutino, 1997; Vellutino et al., 2007).

The SVR model has been validated in a number of English-language studies (e.g., Joshi & Aaron, 2000; Oakhill & Cain, 2012; Ouellette & Beers, 2010), and in other alphabetic (e.g., Megherbi et al., 2006; Protopapas et al., 2007) and non-alphabetic writing systems (Joshi et al., 2012) including Semitic Hebrew (Joshi et al., 2015). Altogether, these studies showed that the developmental relevance of decoding and language comprehension to reading comprehension depends on the architecture of the orthography, and specifically on orthographic depth. In other words, *in deep orthographies*, and unlike shallow orthographies: (a) word decoding shows a developmentally more extended impact on reading development; and (b) both listening comprehension and word decoding contribute strongly to reading comprehension, even in young children (Florit & Cain, 2011; Tobia & Bonifacci, 2015).

The SVR has also been tested in Arabic (Asadi & Ibrahim, 2018; Asadi et al., 2017). This research showed that even though the amount of variance explained by the SVR components varies in the two orthographies of Arabic, vowelized shallow and unvowelized deep, the early contributions of listening comprehension and decoding to reading in the shallow vowelized orthography are equally strong. This somewhat unexpected finding suggests the early involvement of diglossia in reading development in Arabic. In other words, even though the vowelized orthography is phonologically complete and transparent, it is functionally psycholinguistically opaque (Daniels & Share, 2018; Saiegh-Haddad, 2018) because it encodes

linguistic units (phonological, morphological, morpho-syntactic, and lexical) that are not within the spoken dialect of readers. This increases the contribution of oral language measures, alongside word decoding, to reading comprehension. The SVR model also suggests phonological recoding to be the primary mechanism used by beginning readers in decoding words. This highlights yet again the role of oral language skills, including sub-lexical (phonological and morphological) and lexical representation and processing (Perfetti, 2007) in helping children build up the connections between speech and print (Seidenberg, 2017).

The SVR model is grounded in the assumption that, by the time children commence reading in their first language, they have already acquired the age-appropriate oral language skills that are necessary for word decoding and for comprehension in that language. This assumption cannot be directly applied to diglossia. The question that follows then pertains to the way in which children develop first language reading in a diglossic context in which reading is first acquired in a language that shows a remarkable linguistic distance from the language of speech. Specifically, how does linguistic distance between the spoken language and the standard written language factor into the acquisition of first language word decoding and of the sub-lexical and lexical mechanisms that underlie it. Furthermore, how does diglossia factor into performance on cognitive measures that utilize oral language, such as phonological memory and phonological awareness. By the same token, how does diglossia affect acquisition of top-level comprehension skills which develop first in the oral language, such as lexical integration, propositional encoding, and inferencing? The research synthesized in this chapter is a first-step investigation of *some* of these questions among native speakers of dialects of Palestinian Arabic (PA) spoken in Israel and who acquire and use (Modern) Standard Arabic (MSA, StA) for reading/writing and for other formal language functions and domains. It addresses five questions:

1. Does diglossia impact the acquisition of basic reading skills in children?
2. Is the impact of diglossia the same across dialects?
3. Does the impact of diglossia decrease with increased exposure to the standard?
4. Does the impact of diglossia interact with developmental and environmental risk factors?
5. Does reading development in diglossia show a cross-lectal transfer of skills?

3 Key Sociolinguistic Features of Arabic Diglossia

Diglossia represents "the separate adaptation of related speech communities to their different sociocultural environments" (Maamouri, 1998, p. 32). [1]According to Ferguson (1959), a diglossic context is characterized by a stable co-existence of two linguistically-related language varieties, a High (H) variety which is held in high

[1] Here we adopt Ferguson's (1959) definition of diglossia as encompassing varieties of the same language rather than different languages.

esteem and used for conventional written communication and formal speech, and a Low (L) variety used for everyday speech[2]. Such rigid socio-functional complementarity, it is argued, gives way only to slight and insignificant overlap (Maamouri, 1998). In a diglossic context, no section of the community uses the High variety for ordinary conversation. This is arguably, "the most important factor in a diglossic situation and one that makes for relative stability" (Keller, 1982, p. 90).

In diglossia, “it is context, not class, or other group membership, that controls use” Hudson, 2002, p. 6). In Arabic diglossia, for instance, no section of the community uses Standard Arabic for ordinary conversation and it is, therefore, nobody’s mother tongue. Instead, spoken Arabic dialects are used by *all speakers,* literate and illiterate, educated and uneducated, young and old, for everyday speech. Because selection of language variety is primarily context-based rather than speaker-based, the spheres of use of the two varieties are in sharp complementary distribution. Nonetheless, it is noteworthy that the reality of Arabic diglossia today reveals some signs of overlap in domains of use, and consequently some changes are underway in key features of diglossia as it applies to Arabic, including age of exposure to the standard language and, in turn, mode of acquisition of this variety (For more see, Albirini, 2016).

The sociolinguistic features of diglossia explicated above have at least three important psycholinguistic consequences for linguistic proficiency and literacy attainment in the standard variety. Firstly, because contexts and domains of use are distributed between the standard and the spoken variety, speakers have limited exposure to and active use of the standard variety, and this hampers attainment of proficiency in this variety. Secondly, because no segment of the speech community regularly uses the standard variety as a medium of ordinary conversation, “any attempt to do so is felt to be … pedantic and artificial” (Ferguson, 1959, p. 337) and is often received with mockery (Suleiman, 1994). This reduces even further opportunities for language exposure and practice. Thirdly, because selection of language variety is primarily not speaker-based, neither does it regularly signify individual speaker-based attributes of education, ethnic background, social class, economic status, power, or other individual or social group identity differences; there is little social pressure for speakers to acquire proficiency in the standard variety.

Another unique feature of diglossia that has direct ramifications for reading development is the process of acquisition; specifically, the mode and age of acquisition. All Arab children first acquire the ambient local dialect naturally as their mother tongue. Standard Arabic, however, is acquired often sequentially later, starting in the preschool years from passive exposure via caregiver-child book reading and TV, and later more intensively and actively through schooling and formal

[2]Though Ferguson proposes a dichotomy between the spoken and written varieties, he himself recognizes that this is just an abstraction. The much more complex linguistic situation in diglossia has been subsequently described in terms of levels, or a continuum (Badawi, 1973; Bassiouney, 2009; Blanc, 1960; Meiseles, 1980). We shall continue to use the well-established term ‘diglossia’ and its derivatives, understanding it in this modern conceptual framework as a continuum along which shifting, switching, and mixing constantly occur.

literacy education (Ayari, 1996). This means that, according to the standard definition of the term, Standard Arabic is nobody's mother tongue as no speaker acquires this language variety naturally from the oral language input available in the environment (Coulmas, 1987). Arabic speakers are also different from simultaneous bilinguals who naturally acquire two languages simultaneously, and from early sequential bilinguals. Moreover, unlike bilinguals, Arabic speakers never achieve comparable levels of proficiency in their two language varieties even after years of exposure to the standard variety, neither do they ever become more competent in the standard variety than in their first acquired spoken dialect. Hudson (2002) argues that the fact that the functional distribution of codes in a diglossic context protects the role of the spoken variety as the only natively learned variety is what distinguishes diglossia from other interlingual or intralingual situational alternation.

A third feature of diglossia and one that has implications for acquisition of language is linguistic distance between StA and the SpA dialects. While all spoken Arabic vernaculars are related to the standard variety in all language domains, they are all linguistically different from it; no spoken dialect has the exact same set of linguistic units (e.g. phonemes, morphemes, words) and structure as the standard variety, and the standard is often structurally more complex than the spoken dialects (Saiegh-Haddad & Henkin-Roitfarb, 2014). According to Kaye (2001), "MSA marks many more categories of grammar: nominative, genitive, and accusative cases, duality in the pronoun, verb, and adjective, and so on. *No Arabic dialect has retained these grammatical categories, which have been lost over time"* (p. 124, italics added). At the same time, it is to be remembered that linguistic distance is a gradient property of the relationship between the spoken dialects and the standard because some features of grammar were retained or alternatively lost in some dialects but not in others. This means that different dialects differ in degree of distance from the standard both within the same linguistic domain and across language domains. This makes it difficult to characterize or quantify linguistic distance across dialects.

4 Issues in the Study of Reading Acquisition in Arabic Diglossia

Despite a long lasting stable diglossic reality, starting at least with the standardization of Arabic in the eighth century, with the early Arabic grammarians laying out the prescriptive rules of *Classical Arabic* from which (Modern) *Standard Arabic* has descended, research into the structure of the spoken dialects remains scarce. This is partly due to culturally-embedded denial of the spoken dialects. Maamouri (1998) proclaims: "The cultural perception of"Arabic" in the Arab region plays a dominant role in the linguistic behavior of Arabs who seem to easily gloss out variation and diversity for the ideology of validating and preserving the cultural and historical uniqueness of their prestige variety (p. 38)". Moreover, Arabs despise the

spoken colloquial forms and even deny that they use them because they consider the colloquials they speak as 'degraded' and corrupt forms of the language" (p. 39).

Studying the psycholinguistics of reading acquisition in diglossia requires a detailed description of the structure of the spoken dialects and of the linguistic distance between Standard Arabic and the different spoken dialects (e.g., Bateson, 2003; Blanc, 1970; Henkin, 2010; Eid, 1990; Levin, 1995; Versteegh, 1997, 2001; Watson, 2002). This task has been counteracted by the aforementioned 'attitudinal blindness' (Maamouri, 1998) in favor of the standard, as well as by the large number of spoken dialects, their heterogeneity, and their dynamic and changeable relationship with the standard (Kaye, 2001). Moreover, studying the role of diglossia in reading requires a psycholinguistic-developmental approach to this question and one that does not use an abstract form of the standard as it is captured by the codified prescriptive rules of grammar as a benchmark. Rather, it refers to language as it is actually used by native speakers today (e.g., Laks & Berman, 2014; Laks et al., 2019). Recent evidence reveals the merits of this approach to understanding the psycholinguistic reality morphological structure, for instance. As such, an analysis of Arabic as it is used by adult native speakers today reveals that word patterns and roots are inter-dependent units that are constrained in their distribution across the morphological paradigm (Laks et al., 2019). Similarly, an analysis of child Spoken Arabic reveals that many roots are hosted in just one verbal pattern (Tallas et al., in preparation) and that many nouns are not morphologically complex (Shalhoub-Awwad & Khamis-Joubran, 2020). These results imply that a psycholinguistic-developmental approach that studies language as it actually used by speakers, and as it unfolds over time can better inform theories of reading acquisition in diglossic Arabic (Saiegh-Haddad, 2012).

5 A Psycholinguistic-Developmental Approach to the Study of Reading Acquisition in Arabic Diglossia

Maamouri (1998) states, "The superiority that Arabs bestow on their heritage language leads to a quasi-general denial of the existence of a home language, in this case colloquial [Spoken] Arabic … "this 'attitudinal blindness' in favor of the standard language is "represented in the experience of the Arab children when they first face linguistic discontinuity in the formal school setting… *We still look forward to an early child psychology study of the problems caused by diglossia in school or pre-school. Only such a study can fully confirm any claims that fall outside of the accepted definitional norms of linguistics"* (ibid, p. 35, emphasis added). Even though more than twenty years have elapsed, Maamouri's proclamation is still as valid today as it has even been. The field is still sorely lacking in psycholinguistic-developmental research into the acquisition of Spoken Arabic in general, and even more so into the role of diglossia in language and reading acquisition in school and in pre-school. The research synthesized in this chapter is one step in this direction.

5.1 Basic Assumptions, Concepts and Methods in the Psycholinguistic-Developmental Study of Reading Acquisition in Arabic Diglossia

5.1.1 Assumptions and Concepts

The psycholinguistic-developmental approach to the study of reading in Arabic diglossia is grounded in two general and widely acceptable assumptions about reading. The first is that reading is *psycholinguistic,* and it maintains that the individual child's oral language skills and their mental representations of language are intricately implicated with reading; therefore, the study of reading and of the impact of diglossia on reading should be conducted from the perspective of the individual child's mental representations and processing of oral language. Because in Arabic diglossia, the oral language skills that children first develop are in a spoken vernacular, which is remarkably different from the language encoded in print, a psycholinguistic approach to the study of reading in diglossia should address first and foremost language representations and processing in the spoken vernacular, and then also in the oral form of StA. This approach should also study the relationship between oral language representation and processing skills in SpA and StA, and their relationships with reading. The second assumption is that reading is *developmental* and it reasons that the mental representation and processing of oral language are dynamic and they grow with the child's developing cognitive and linguistic skills; therefore, the study of reading in diglossia should take a developmental perspective. Because in Arabic diglossia, StA language skills start to peak when children are exposed to StA, and because exposure to StA happens primarily at school and via experience in reading and writing, a developmental approach to the study of reading acquisition in diglossia should be sensitive to grade -level development, and it should address oral language and literacy skills as they unfold and interact with each other over time.

Within a psycholinguistic-developmental approach to reading acquisition in diglossia, early oral language skills in Spoken Arabic are assumed to play a critical role in reading because they are the foundation upon which reading is grafted (Elbro, 1996, 1998; Goswami, 2000; Perfetti, 2007). In turn, it is assumed that linguistic distance between the child's spoken dialect and the language encoded in print makes the acquisition of early first language reading more difficult (Saiegh-Haddad, 2018). This is because linguistic distance burdens the reading acquisition process with structural language learning, in addition to learning the orthographic system that maps language. In Arabic, linguistic distance requires that children perceive, access and understand a language variety the does not match the language they speak in phonology, morphology, syntax, and lexicon. This distance features even in the phonological structure of high-frequency content and function words, in the syntactic formation of basic structures, like question formation and negation, and in the lexical form of basic functors like prepositions and pronouns. This linguistic distance is expected to confront the beginning reader with a remarkable challenge learning the mappings from print to sound and meaning (Seidenberg, 2017).

Ferguson (1959), in describing Arabic diglossia, argues: "the bulk of the vocabulary of H and L variety is shared, of course with variations in form and with differences of use and meaning" (p.334). This shared vocabulary store, according to Ferguson, consists in 'paired items,' namely "fairly common concepts frequently used in both H and L, where the range of meaning of the two items is roughly the same, and the use of one or the other immediately stamps the utterance or written sequence as H or L". (p. 334). In a psycholinguistic study of the lexicon of children, Saiegh-Haddad and Spolsky (2014)[3] show indeed that among 5-year-old kindergarteners, around 60% of the words are 'shared', using Ferguson's definition. However, Saiegh-Haddad & Spolsky (2014) also show that, from a psycholinguistic-developmental perspective, it is important to distinguish between two types of 'shared words': identical words, which keep an identical form in SpA and in StA (e.g., (e.g., */na:m/* 'sleep', */janu:b/* 'south') and cognate words which overlap partially in form (e.g., SpA */waqa/*use the same sign that is used at the end of the next transcribed word versus */wiʔiʕ/* 'fall'; SpA */dahab* /versus StA */ðahab/* 'gold'). They also reveal that identical and cognate words differ in their distribution in the lexicon of young Arabic speakers with identical words making up 21.2% of the words whereas cognate words making up 40.6%. The remaining words in the lexicon of these young children (38.2%) consist of (unshared) unique SpA words, which are not used in StA at all and, thus, do not have a conventional spelling form (SpA */natt/ 'jump'* ; */ʃanta/* 'school bag'). Figure 1 below depicts the composition of the lexicon of young Arabic speakers from the psycholinguistic perspective of the child[4].

The question that follows from the discussion above is whether the different types of words in the lexicon of children: identical, cognate, and unique vary in representational accuracy in the mental lexicon, and whether these representations are altered with development and exposure to StA. These questions are critical to a psycholinguistic-developmental study of reading in diglossia. Saiegh-Haddad & Haj (2018) investigated the quality of the lexical representation of identical, cognate, and unique standard words in kindergarten, first grade, second grade, and sixth grade children. The study also tested the representational quality of different types of cognate words that varied in degree of phonological distance from the spoken dialect. Using a task modeled after Elbro's (1996) 'poor puppet' paradigm, a computerized pronunciation accuracy decision task was constructed that asked children to decide whether an orally presented word, accompanied by a picture depicting the word, was accurate or not. This task showed that, across age groups, the quality of lexical representation varied together with the type of word, with identical words

[3] The language that 5-year-old Palestinian Arabic (PA) speaking children produced in interactions with peers and teachers at school was recorded. The data consisted of 17,499 word tokens and 4,408 word types. The analysis showed that 93 % of the total word types produced by children were in Spoken Arabic, and 5% were Standard Arabic forms that were used when children were singing or reciting poems in Standard Arabic. Importantly, only 2% of the words were code-switched Hebrew words.

[4] Note that StA mood and case inflections on words were not taken into account.

showing the most accurate representation, followed by cognate, followed by unique StA words. The study also showed that the quality of the phonological representation of cognate words also varied with the degree of phonological distance from the spoken dialect. These results are summarized in Fig. 2 below (ovals represent lexical categories that were not statistically different within a given grade-level group).

The results summarized in Fig. 2 above underscore a crucial difference between structural linguistic accounts of language , on the one hand, and the psycholinguistic-developmental reality of language as it is reflected in actual linguistic behavior. As such, whereas structurally speaking it is possible to refer to three lexical categories in Arabic diglossia: identical, cognate and unique words, the results show that this classification is not always psycholinguistically-developmentally upheld. As such, in kindergarten and in the first grade, only two types of words are representationally statistically distinct in the lexicons of children; these are identical words and cognates distant by a single vowel, on the one hand, versus all other words including all types of cognates and unique StA words. In the second grade, we start to see three distinct categories of words emerging; yet these do not entirely align with the structural division of identical, cognate, and unique. Instead, identical words and cognates different by just one vowel form one class, followed by cognates different by a single consonant, followed by the rest of the cognates and the unique StA words. In the 6th grade, the lexicon is restructured yet again and two classes of words

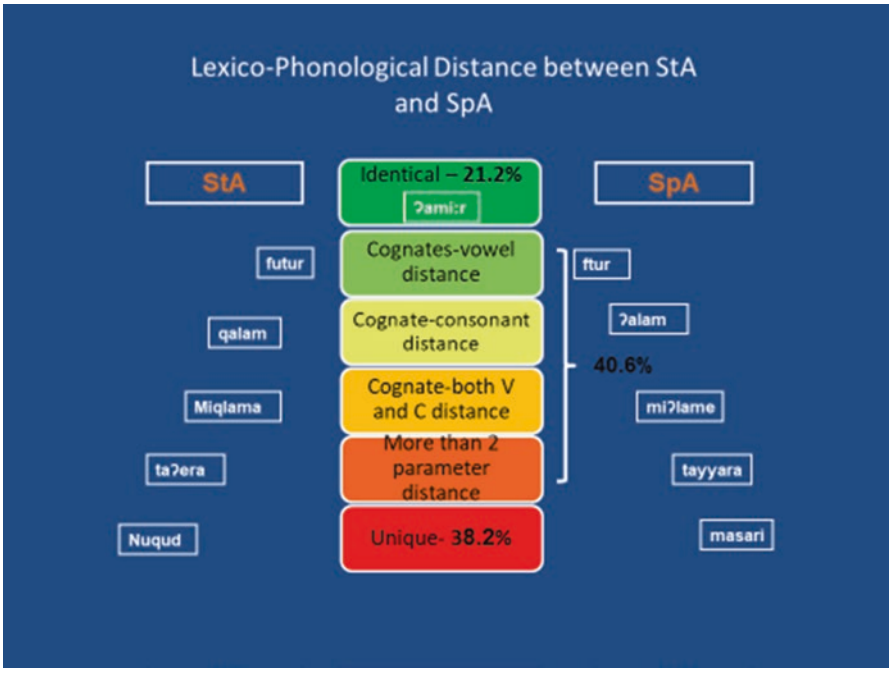

Fig. 1 Linguistic distance in the lexicon of Arabic-speaking children. (Based on Saiegh-Haddad & Spolsky, 2014)

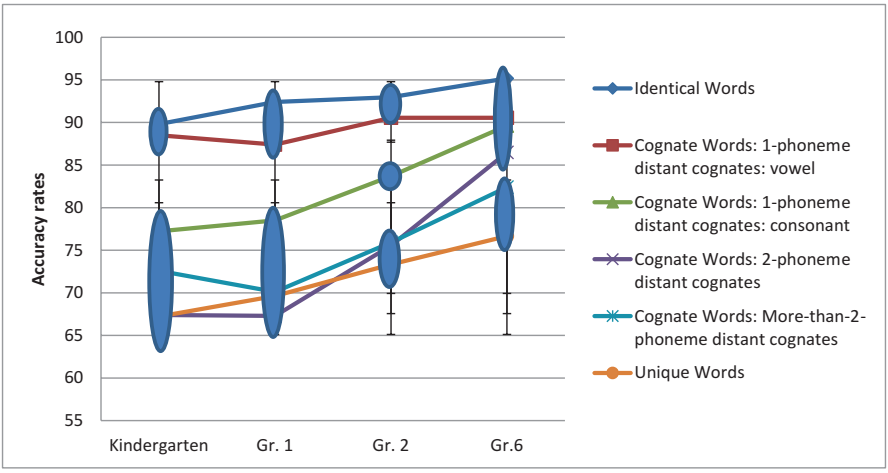

Fig. 2 Pronunciation accuracy judgement by grade-level and lexical-phonological distance (N = 120). (Based on Saiegh-Haddad and Haj 2018)

emerge: identical and all cognates distant by fewer than 2 phonological parameters, on the one hand, and cognates distant by 2 or more phonological parameters plus unique StA words, on the other. This continuous restructuring of lexical representations requires an equally dynamic psycholinguistic developmental approach to the reading of these words and to the role of input and exposure in lexical representations and processing (Metsala & Walley, 1998). It seems that the restructuring of the lexicon observed in Fig. 2 is mainly a byproduct of grade-level development and increased exposure to StA and input to the mental lexicon. It is equally plausible, though, that lexical restructuring is due to maturation and to higher metalinguistic skills, enabling children to note structural similarities and differences between word forms in SpA and StA. The most compelling finding that the figure above shows is that the lexicons of young children represent most cognates, even those that are systematically and predictably related in SpA and StA, to the same degree of quality as unique StA words, which are completely different in form in SpA and StA. This finding does not only inform views of the lexicon of children in diglossia but it also has important educational implications (Saiegh-Haddad, 2017; Saiegh-Haddad & Everatt, 2017).

Language exposure and input to the language acquirer impact phonological representations, which in turn impact phonological processing in memory (Baddeley, 2003). In a previous study, we investigated whether the lexical and phonological distance between standard Arabic and the child's spoken dialect impacted phonological processing in memory using word and nonword repetition tasks among kindergarten and first grade Arabic-speaking children (Saiegh-Haddad & Ghawi-Dakwar, 2017). The results showed that unique and cognate words produced lower repetition accuracy scores than identical words. Furthermore, stronger and more consistent effects were obtained from the repetition of nonwords manipulating

phonological distance: Nonwords encoding SpA phonemes were significantly easier to repeat than nonwords, otherwise similar in length and syllabic structure, but which encode just one StA phoneme each. These results imply that linguistic distance in Arabic diglossia affect not only linguistic representations in long-term memory (Saiegh-Haddad & Haj, 2018) but also linguistic processing in working memory.

5.1.2 Methods

The research discussed in this chapter is part of a programmatic research project that aims to understand the role of diglossia in reading acquisition. This research project uses a methodological design that manipulates features of the linguistic distance between StA and the specific SpA dialect spoken by children. It investigates the effect of linguistic distance by systematically comparing parallel linguistic structures (e.g., words, phonemes, morphemes) in StA and SpA. Given that the ultimate aim of this project is to understand reading acquisition in Arabic diglossia, unique SpA structures which are only used in the spoken dialect but never in StA are not targeted. Instead, SpA structures in this design refer to identical structures that keep an identical form in StA and SpA. These structures are compared with StA structures, which can have either a related (cognate) or a completely different form in StA (unique). This design has demonstrated that the linguistic distance between SpA and StA reliably predicts differences in linguistic processing (phonological, morphological, and lexical) in favor of SpA over StA as explicated in the following section.

The aforementioned differences in phonological and lexical representation and processing in favor of SpA over StA structures explicated above (Saiegh-Haddad & Ghawi-Dakwar, 2017; Saiegh-Haddad & Haj, 2018) are expected to affect word reading too. How can this question be tested? How can reading be tested in SpA if SpA does not have a conventional spelling system? The design we adopted in testing the impact of linguistic distance on reading is comparable to the design explicated above and which was used in testing the role of linguistic distance in linguistic processing. Namely, we compared each child's reading for *two types of words*: The first is words that have an identical form in SpA and StA; these are referred to as SpA words because they are also used in the SpA dialect of children. The second is StA words whose form is different from their parallel forms in SpA; these are referred to as StA words and they can be of two types: cognates, which have a phonological variant in SpA (e.g., SpA */dahab/*-StA */ðahab/* 'gold) and unique StA words, which have a lexical variant in SpA (e.g., SpA */ʃanta/*- StA */ħaqi:bah/* 'school bag'). In doing so, we dispensed with the problem associated with creating orthographic representations for words that do not have a uniform conventional written form, and relatedly with the effect of the novel orthographic representation of these words on reading. Further, by testing reading for identical SpA words we have experimentally neutralized diglossia and matched words on linguistic distance. Finally, because identical SpA words, like StA words, vary in frequency and their

ratio in the lexicons of children increase with grade-level and with increasing familiarity with StA, this methodology has made it possible to test reading skill in young as well as in older children and adolescents.

Our research project follows a within-subject design that aims to detect intrapersonal differences in linguistic representation and processing that can be reliably attributed to diglossia, or what is called the 'linguistic affiliation constraint' (Saiegh-Haddad, 2007), namely, affiliation with StA versus SpA. Put differently, it aims to tap into the 'diglossia effect' (Saiegh-Haddad, 2018), namely, the processing disadvantage or cost that is observed in processing StA over SpA. These diglossia effects can then be compared in different grades, different dialects different child populations, and in their interaction with other within-subject and between-subject variables.

As the major aim is to test the role of linguistic affiliation and compare the processing of SpA versus StA structures, it is important that other linguistic and distributional properties of the stimuli targeted be controlled for. These properties include linguistic structure features and complexity (phonological length, clusterhood, syllabic structure, morphological structure), as well as frequency and familiarity (functional frequency). Similarly, it is important that child-related attributes be matched too, such as age, grade-level and socioeconomic status, especially as in a diglossic context these factors are strongly associated with input and exposure to StA (Aram et al., 2013; Korat et al., 2014; Saiegh-Haddad et al., 2020). Finally, variations among children in general cognitive traits should also be accounted for, including verbal memory and speed of retrieval. At the same time, because in diglossia exposure to StA is more context-based than individual-child-based, it is expected that observed variations in linguistic processing between StA and SpA will be more strongly related to variety-related effects, or to linguistic distance, than to individual child-related factors. That is, we predict that, within a given grade-level group, there will be stronger variety-related linguistic distance effects than child-related effects (Saiegh-Haddad & Haj, 2018). This hypothesis is for future research to pursue.

5.2 Findings from the Study of Reading in Arabic Diglossia

Below, we summarize the main findings we have so far accumulated from our research into the role of diglossia in reading skills development in Arabic. The section is organized in five sections that attempt to address key questions about the role of diglossia in reading development.

5.2.1 Does Diglossia Impact the Acquisition of Basic Reading Skills in Arabic?

In our research, we focused on the role of linguistic distance between Standard Arabic and the spoken dialect of the child in order to understand the role of diglossia in reading development. Specific parameters of linguistic distance in the different

domains of language were identified. Then, the effect of linguistic distance on acquisition of several components of the reading system was investigated. This was conducted by comparing the processing of StA linguistic structures (namely, distant structures that are not within the spoken dialect) with parallel SpA structures (namely those that have an identical form in the spoken dialect and in StA). This design was implemented among native monolingual speakers of dialects of Palestinian Arabic residing in rural villages and towns in northern and central Israel. None of the children tested came from mixed cities or had natural exposure to Hebrew (except perhaps from occasional exposure via TV or from visiting malls or shops in nearby Jewish cities). All children enrolled in Arab schools in which Arabic is the sole medium of instruction (including in science and math classes) and in which Hebrew is introduced as a foreign language first in the third grade.

As explained in Sect. 2, the linguistic distance between StA and SpA was expected to impact acquisition of both components of the SVR: decoding and language comprehension, as well as the underlying underpinnings of each one of these two proximal components, including quality of the underlying phonological representations and related linguistic processing and awareness skills. Implementing the design explicated in Sect. 5.1.2 in which parallel SpA and StA linguistic structures are compared, our research demonstrated, as explained in Sect. 5.1.2, that the phonological distance between StA and SpA affects children's ability to establish accurate and stable *phonological representations* in long-term memory as reflected in their ability to make decisions regarding word pronunciation accuracy (Saiegh-Haddad & Haj, 2018). Our research also demonstrated a reliable impact of phonological distance on phonological processing in working memory as reflected in word and nonword repetition tasks (Saiegh-Haddad & Ghawi-Dakwar, 2017) (See Sect. 5.1.1). These effects should have consequences for reading and reading-related linguistic awareness skills as we explain below.

Given the centrality of phonological awareness in reading development, a major question that we addressed was the impact of the phonological distance between SpA and StA on the development of phonological awareness skills in children. Using a variety of tasks that varied in size of the phonological unit targeted (phoneme, syllable), linguistic context and position of the target phonological unit (initial, final, clustered, singleton), and type of phonological operation (recognition, isolation, blending, segmentation, deletion), we have shown that phonological distance hinders the development of phonological awareness in young kindergarteners as well as in elementary school children across all tasks, positions, and operations, of course with varying degrees of strength. Moreover, the impact of phonological distance was observed in middle school and early high school on some tasks. All this implies that phonological distance is an independent and an additional phonological complexity factor that impacts phonological awareness development in children, besides other task-related factors of phonological operation, unit size, and linguistic context (Saiegh-Haddad, 2003, 2004, 2007; Saiegh-Haddad et al., 2011, 2020).

For example, Saiegh-Haddad (2003) targeted two aspects of the phonological distance between SpA and StA, namely, the phoneme and the syllabic structure. As such, we asked whether StA phonemes were more difficult for children to access

than SpA phonemes (despite proper articulation) and whether phonemes embedded within StA syllabic structures were more difficult than those embedded within SpA syllables. The results showed that both types of phonological distance had an impact on young children's phonemic awareness: StA phonemes were harder for both kindergarten and first grade children to isolate than SpA phonemes, and all phonemes were harder for kindergarten children to isolate when they were embedded within StA syllables. Saiegh-Haddad et al. (2011) showed that these results were upheld even when a recognition task that does not require phonological production was used. Saiegh-Haddad (2004) targeted lexical distance and asked whether awareness of phonemes embedded within StA words was harder than within SpA words or pseudo words. The results aligned with the results explicated above in showing that lexical distance is another added layer of difficulty impacting phonemic awareness. All this suggests that features of the linguistic distance between StA and SpA at all levels: the phoneme, the syllable, and the word converge in making children's ability to access and manipulate the phonemic structure of words more difficult. This effect was termed the 'linguistic affiliation constraint' (Saiegh-Haddad, 2007) or more recently a 'diglossia-effect' (Saiegh-Haddad, 2018), and it has been attributed to difficulty on the part of children to develop high-quality representations for the phonological and lexical units that are not within their spoken dialect (Elbro, 1996, 1998; Goswami, 2000; Perfetti, 2007). Low-quality phonological representations, namely, inaccurate, fuzzy, and unstable phonological representations, hinder the ability of children to access and maintain phonological representations in memory, and this disrupts the ability to operate on these representations (Saiegh-Haddad et al., 2011; Saiegh-Haddad, 2019). At the same time, this effect may be attributed to a direct effect of linguistic distance on metalinguistic awareness development per se and on the ability to analyze phonological structures. As the independent role of phonological representations versus metalinguistic ability per se on phonological awareness is hard to tease apart, the specific mechanisms by which phonological distance impacts phonological awareness remain open (Russak & Saiegh-Haddad, 2017, Saiegh-Haddad, 2019). In Saiegh-Haddad (2007) we compared phonological awareness in two dialects, one in which four consonantal phonemes were StA phonemes (referred to as the diglossic group) and another in which the same target phonemes were SpA phonemes (referred to as the non-diglossic group). Comparing phonological awareness in the two groups revealed that children in the non-diglossic group showed generally higher phonological awareness scores, even when awareness of SpA phonemes only was compared, suggesting generally higher phonological awareness skills in this group. This finding supports the hypothesis that phonological distance might negatively impact the development of phonological awareness per se, in addition to its effect on the establishment of high-quality phonological representations for StA phonological structures (Saiegh-Haddad & Haj, 2018). Note, however, that in this study the children in the two groups were not matched on general cognitive or language skills, such as vocabulary; therefore, differences between children in these abilities might have had an undetected effect on their phonological awareness performance. Also note that children were in grades 1-3 and facility in the acquisition of decoding skill in the non-diglossic group, given

that the graphemes of the written orthography all map spoken phonemes, might have boosted the development of phonological awareness in this group.

The role of linguistic distance was also tested in the domain of morphology by comparing morphological awareness for identical SpA inflectional and derivational structures versus unique StA structures not within SpA. This research showed that both inflectional and derivational awareness developed more easily when the morphological unit was also available in SpA in both young elementary school children and in middle school students. (Schiff & Saiegh-Haddad, 2018; Shahbari-Kassem et al., submitted).

The direct contribution of linguistic distance to the acquisition of word-reading skill was tested in a number of studies using real and pseudo word reading tasks and investigating indices of accuracy and fluency (Saiegh-Haddad, 2003, Saiegh-Haddad & Schiff, 2016; Schiff & Saiegh-Haddad, 2018). These studies showed that both word and pseudo word decoding was impacted by the linguistic distance (phonological and lexical) of the written word, namely, whether it encodes letters representing phonemes not within the spoken vernacular of children and whether it has a unique lexical form in Standard Arabic that is not within SpA. This effect was reflected in less accurate and in slower reading.

The role of linguistic distance was also found to interact with orthographic depth. Saiegh-Haddad & Schiff (2016) compared the impact of linguistic distance on the reading of vowelized (shallow) versus unvowelized (deep) words. The results showed a stronger effect of distance on reading fluency of words in the fully vowelized orthography than in the unvowelized orthography, suggesting that the fully vowelized orthography, which encodes the complete StA phonological form of the word, triggers bottom-up phonological recoding mechanisms that block the use of SpA-based morpho-orthographic and lexical processes (Saiegh-Haddad & Schiff, 2016). Managing the competition between small-size phoneme-based decoding and large-size morpho-orthographic and lexical recoding is a critical aspect of the development of word reading in Arabic (Saiegh-Haddad, 2018). It seems that presenting words in the vowelized orthography does not help beginning readers in managing this competition because it graphically encodes phonological information that readers can well recover from the letter-based morphologically transparent form of the word (roots and word patterns) and without the redundant encoding of the vowel diacritics. This competition is manifest in less fluent reading of the vowelized orthography.

5.2.2 Is the Impact of Diglossia the Same Across Dialects?

A critical question in the study of the impact of linguistic distance on linguistic processing and reading in the standard language is the question of the age of onset of exposure to and acquisition of a given linguistic structure in the spoken dialect of children and in standard Arabic (Carrol, 2017; Tsimpli, 2014). Linguistic structures that are acquired later are harder for children to access and to process. Further, in testing the impact of linguistic distance on linguistic processing, including

linguistic awareness, it is critical to take into account the linguistic properties of the target linguistic unit. This is because some linguistic units (phonological, morphological, syntactic) are simpler and are in turn inherently easier to access than others (McBride-Chang, 1995; Saiegh-Haddad, 2019; Saiegh-Haddad & Elouti, 2019). With these two factors in mind, in one study we used a cross-dialectal design and compared phonological awareness using initial and final phoneme isolation tasks in two groups of children speaking two different dialects: one group (referred to as the diglossic group) in which three StA consonantal phonemes were unique and not available in the spoken dialect, and another group(referred to as the non-diglossic group) in which the same phonemes were all within the spoken dialect (Saiegh-Haddad, 2007). Phonological awareness for these target phonemes as against other phonemes that are shared in both dialects was compared in the two child dialect groups. The results showed that, even though final phonemes were easier to access than initial phonemes in both groups supporting the cohesion of the CV unit in Arabic (Saiegh-Haddad, 2003, 2007; Abu-Ahmad & Share, forthcoming), significant differences in phonological awareness for the same set of phonemes were observed between the two groups of children depending on whether the phonemes were within their specific spoken dialect or not. These results are summarized in Fig. 3 below. The results depicted in Fig. 3 below provide cross-dialectal external evidence for the 'linguistic affiliation constraint' (2007), or the 'diglossia effect' (Saiegh-Haddad, 2018) and show that the same set of phonemes may be associated with different degrees of accessibility in metalinguistic awareness tasks depending on whether they are within the spoken dialect of children or not. These results also imply that while the linguistic affiliation constraint may be common and functional in all dialects, as all dialects reveal linguistic differences from the standard, its effect will vary in different dialects depending on the nature of linguistic distance, namely, the specific structures that are shared versus non-shared, and in turn on age of onset of exposure and acquisition of the linguistic structure under question.

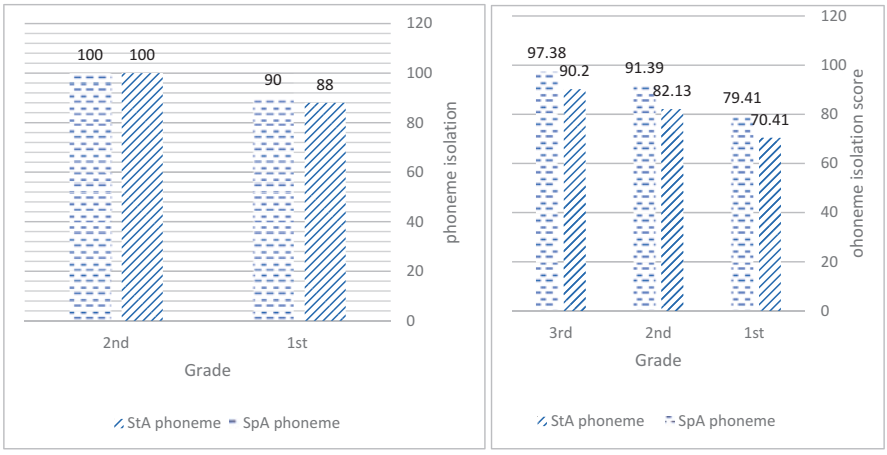

Fig. 3 Phoneme isolation for StA versus SpA phonemes in the diglossic group (right panel, N = 202) versus the non-diglossic group (right panel, N = 54) by grade. (Based on Saiegh-Haddad 2007)

5.2.3 Does the Impact of Diglossia Decrease with Increased Exposure to the Standard?

Whereas linguistic distance as a property of the structural disparity between the standard linguistic form and the spoken dialect is a rather stable property, at least within the same spoken dialect, its impact on reading is expected to be dynamic and developmental in nature. Because exposure to Standard Arabic comes primarily from children's exposure to the Standard language through reading and schooling, we expect to see a developmental progression in StA processing over time and smaller differences between SpA and StA processing (i.e., a smaller diglossia-effect) as children grow older. Indeed, a marked effect of grade-level and related exposure to StA on the processing of SpA versus StA structures has been observed. For instance, in one study, we tested phonological awareness in 2nd through 10th graders for syllables and phonemes (Saiegh-Haddad et al., 2020). The results showed that, when syllable awareness was tested, the impact of diglossia (significant difference between SpA and StA) was only evident in the youngest second graders (among mid-high SES children) and only on the most demanding syllable deletion task (but not on the segmentation and blending tasks). In contrast, the impact of diglossia on phonemic awareness was more prominent with differences in favor of StA over SpA significant in 2nd and 4th graders on the blending and segmentation tasks, and also in 6th graders on the deletion task, but falling below significance in higher grades on all tasks. This implies that the gap in phonological awareness between awareness of SpA versus StA phonemes can be as large as 4-6 years. Similar results were reported for morphological awareness with differences between SpA versus StA observed in younger children but decreasing in higher grades both in derivational morphology and in inflectional morphology (Saiegh-Haddad & Schiff, 2016; Shahbari-Kassem et al., submitted). These developmental patterns are interpreted as reflecting the role of input and exposure in mitigating the impact of linguistic distance on metalinguistic awareness (Saiegh-Haddad, 2019).

The dynamic and developmental nature of the impact of distance has been demonstrated for reading accuracy and reading fluency too. Yet, unlike metalinguistic awareness, exposure to StA over time, as reflected in differences in grade-level, was not found to alleviate the impact of linguistic distance neither in reading accuracy nor in reading fluency. Saiegh-Haddad and Schiff (2016) examined the cross-sectional developmental trajectory of the impact of linguistic distance on reading accuracy and fluency and showed that while developmental growth in reading was observed in reading in both StA and SpA, the difference between SpA and StA did not wane and it remained stable over time, both in the shallow vowelized orthography and in the unvowelized orthography. Figure 4 below depicts this finding from the reading fluency tasks.

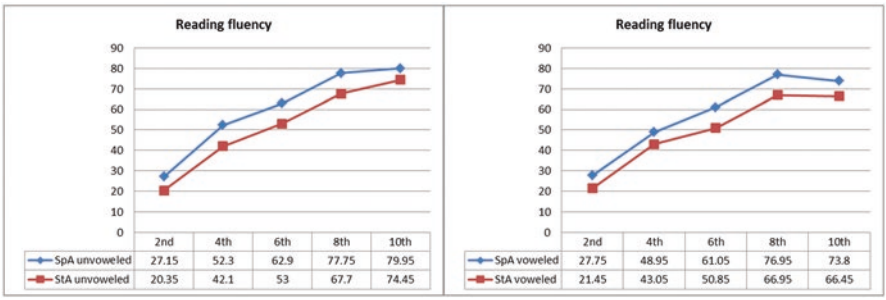

Fig. 4 Reading fluency of vowelized (right panel) and unvowelized (left panel) SpA words (blue lines) and StA words (red lines) by grade (N = 100). (Based on Saiegh-Haddad and Schiff 2016)

5.2.4 Does the Impact of Diglossia Interact with Developmental and Environmental Risk Factors?

Another question that was addressed in our research pertains to whether the impact of diglossia varies in children presenting with developmental risk factors such as developmental language and reading risks, referred to here as Developmental Reading Disability (DRD) and Developmental Language Disorder (DLD). It was reasoned that because children presenting with DRD and DLD show deficits in basic linguistic processing skills, including phonological processing deficits (Archibald & Gathercole, 2006; Claessen et al., 2013; McCardle et al., 2001; Vellutino et al., 2004) they might be particularly vulnerable to the effect of diglossia, hence revealing a stronger impact of linguistic distance (Saiegh-Haddad & Armon-Lotem, forthcoming). In one study of 3rd and 5th grade children with DRD, we targeted phonological memory using a non-word repetition task (Hanna-Irsheid, 2018; Saiegh-Haddad, 2020). The results showed that while in typically developing children nonword repetition for nonwords depicting StA phonemes was not significantly lower than that for nonwords composed of SpA phonemes only, either in the 3rd grade or in the 5th grade, it was significant in the children with DRD in both grades. This suggests a more prominent and persistent effect of phonological distance in children with DRD than their age-matched TLD peers. A similar conclusion was reached based on a study of word reading in children with DRD. Schiff and Saiegh-Haddad (2017) tested word reading accuracy and fluency in 6th grade children with DRD compared with a younger reading matched control group and an age-matched control group. The study showed that while typically developing children's word reading accuracy of SpA words over StA words was large and significant in the 2nd grade but decreased significantly in the 4th grade, especially when words were presented in the vowelized orthography, the difference in reading between SpA and StA was huge in the children with DRD even in the 6th grade. This result might well also reflect the children's history of reading disability, but it also shows that children with DRD continue to show difficulties decoding words that are not within their spoken dialect, even when accuracy is tested and even when words are presented in the vowelized shallow orthography.

The impact of linguistic distance on phonological processing and reading in children with DLD lend weight to the conclusion that the impact of linguistic distance is more prominent in this group. Moreover, results show that, while in typically developing children, the effect of linguistic distance decreases over time and children might be able bridge the gap between SpA and StA linguistic structures, children with DLD require more time (Saiegh-Haddad & Ghawi-Dakwar, 2017; Saiegh-Haddad & Armon-Lotem, forthcoming).

The interaction of linguistic distance with other risk factors was also tested in children with an environmental disadvantage or low SES (Saiegh-Haddad et al., 2020). Environmentally disadvantaged children who come from low SES are generally also linguistically disadvantaged and show lower language and metalinguistic awareness skills (e.g., Hoff, 2013; Kieffer, 2010; McDowell et al., 2007). Moreover, in the Arabic context, they are less exposed to StA because of more impoverished informal literacy support at home (Aram, et al., 2013; Korat, et al., 2014). These two factors suggest a stronger impact of linguistic distance in this group. In one study, we compared children's phonological awareness across phoneme and syllable awareness tasks as well as blending, segmentation and deletion tasks in the 2nd through the 10th grades. We compared two groups: mid-high SES and low SES (Saiegh-Haddad et al., 2020). The results showed that while the impact of linguistic distance was observed in both SES groups, children from low SES fared significantly more poorly on all tasks, and the role of phonological distance was developmentally more persistent in this group of children, especially on linguistically and cognitively demanding tasks. Figure 5 below illustrates these results from the phoneme segmentation and deletion tasks. Similar results were obtained from a study of morphological awareness in children from mid-high versus low SES (Kassem-Shahbari et al., submitted).

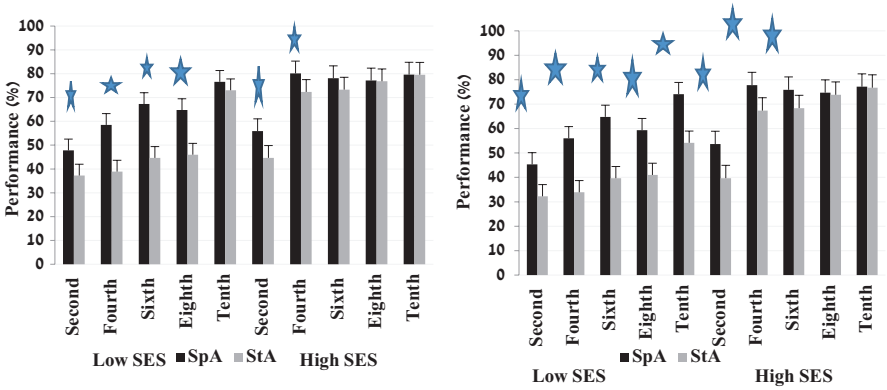

Fig. 5 Phoneme segmentation (right panel) and deletion (left panel) by language variety (SpA, StA), grade and SES (N = 200). (Based on Saiegh-Haddad et al., 2020)

5.2.5 Does Reading Development In Diglossia Show Cross-Lectal Transfer of Skills?

There is ample evidence suggesting that reading in bilingual children evidences cross-linguistic transfer of skills (August & Shanahan, 2006; Chung et al., 2014; Koda & Zehler, 2008). A logical next question is whether reading development in diglossia reveals similar cross-dialectal inter-relationships. A case in point is whether enhanced metalinguistic skills in the spoken dialect can facilitate the acquisition of metalinguistic skills and reading in the standard variety, the ultimate aim of literacy education in Arabic.

In Schiff & Saiegh-Haddad (2018) we tested school students in 2nd, 4th, 6th, 8th, and 10th grade on measures of phonological awareness, morphological awareness, and reading both in SpA and in StA and we asked whether metalinguistic skills in SpA show cross-lectal transfer and predict reading in StA. Significant positive correlations were found between phonological and morphological awareness in SpA, on the one hand, and StA vowelized and unvowelized reading accuracy and fluency, on the other. These correlations are shown in Table 1 below.

Next, we conducted four hierarchical regression analyses, two analyses for the prediction of performance on the vowelized and unvowelized reading accuracy tests and two analyses for the prediction of performance on the vowelized and unvowelized reading fluency tests. In the first step, grade was entered; In the second step, SpA phonological awareness was entered; In the third step, SpA morphological awareness was entered. The results showed positive beta coefficient of grade, SpA phonological awareness, and SpA morphological awareness scores to the prediction of vowelized and the unvowelized StA word reading accuracy and fluency scores indicating that as grade, SpA phonological awareness, and SpA morphological awareness increased, StA word accuracy and fluency in the vowelized and unvowelized orthography also increased.

Schiff & Saiegh-Haddad (2017) asked whether SpA word reading accuracy and fluency predicted similar skills in StA. This question was asked using regression

Table 1 Correlations between SpA metalinguistic awareness (phonological and morphological) and StA word reading accuracy and fluency (vowelized and unvowelized). Based on Schiff & Saiegh-Haddad (2018)

		SpA Phonological awareness	SpA Morphological awareness
StA Reading Accuracy	Vowelized Unvowelized Vowelized and unvowelized should appear in two separate lines	.70*** .66***	.75*** .75***
StA Reading Fluency	Vowelized Unvowelized same here	.62*** .60***	.68*** .66***

*** $p < .001$

analysis in two groups of typically developing children in the 2nd and 4th grade, and in a group of children with reading disability in the 6th grade. The results showed that all the independent variables used were predicted with positive betas, indicating that higher performance on the SpA word reading accuracy and fluency tasks were associated with higher performance on the parallel StA word reading tasks. In other words, reading accuracy in StA was predicted by reading accuracy in SpA and reading fluency in StA was predicted by reading fluency in SpA.

6 Conclusions and Educational Implications

In a diglossic context, sociolinguistic factors imbue the process of first language literacy acquisition with a host of variables that are not central for other first language contexts. These include context-related language variation, linguistic distance from the language of speech, age and mode of acquisition, exposure, input and others. This chapter focused on linguistic distance and addressed its effect on reading skills development. The results discussed in this chapter converge in showing that linguistic distance is an independent complexity factor that makes the acquisition of basic reading skills more challenging for children. The linguistic distance factor appears to be independent of other risk factors, such as environmental disadvantage or low SES, and developmental risk factors such as reading and language disorders. Yet, the combination of distance with disadvantage or distance with disability predicts more prominent and developmentally more extended difficulties in reading skills development and puts children at greater risk of lagging behind their age-matched peers.

The MAWRID model (Model of Word Reading In Development, Saiegh-Haddad, 2018) places diglossia and the linguistic distance between the spoken language of children and the standard at the heart of reading theory and practice in Arabic. In line with the MAWRID model, the evidence synthesized in this chapter demonstrates that the scientific study of reading development in Arabic will be lacking unless it places diglossia at the center of conceptualization, design, and interpretation of data. Moreover, it argues that language and reading practice can only be effective if it places diglossia and the linguistic distance between the language of print and the language of the child at the forefront of assessment, diagnosis, instruction and intervention (Khamis-Dakwar, 2020; Khamis-Dakwar & Makhoul, 2014; Saiegh-Haddad & Everatt, 2017; Saiegh-Haddad & Armon-Lotem, forthcoming). Addressing the role of diglossia in instruction and intervention can take different forms. The first constitutes in raising children's explicit awareness of the linguistic distance vis-à-vis proximity between the structure of words and sentences in their automatically and naturally used spoken dialect versus in the standard language boosting, hence, positive transfer in the case of shared structures and counteracting negative transfer in the case of linguistic differences. Yet, raising explicit awareness of diglossia should not entail only procedures for raising general awareness of the

co-existence of the two varieties. Rather, it should entail procedures for enhancing awareness and understanding of the specific manifestations of linguistic distance, including awareness of the regular patterns of transformations between the two varieties, as well as the irregular and unpredictable differences. While the former may be easier to train, the latter is more difficult, takes more time and requires more structured and intensive exposure to the standard (Saiegh-Haddad & Haj, 2018).

The second form which diglossia can take in informing education constitutes in the design of diglossia-centered reading curricula and intervention programs. That is, structured programs that take the SpA dialect of the child as stepping-stones in leveraging language and literacy development in the standard, namely starting from the structures that the shared and identical between the two varieties and progress systematically and gradually into the different structures (Saiegh-Haddad & Spolsky, 2014; Haj et al., forthcoming). Informed progression from the shared to the unique can be applied to all domains of language and literacy including phonological awareness, morphological awareness, syntactic awareness, letter knowledge, word decoding, and word spelling. For instance, in teaching phonological awareness, programs should start with words that have an identical form in the SpA dialect of the children and progress gradually into words encoding StA phonemes; Phonological awareness difficulties can result from one of two, or both sources: difficulty achieving the metalinguistic insight that words may be broken down into discrete-point phonological units, or difficulty representing the phonological structure of the word with sufficient clarity and accuracy (McBride-Chang, 1995; Saiegh-Haddad, 2019). Because difficulties in phonological awareness for words encoding StA structures can result from problems in the accuracy with which such StA structures are represented, instruction and intervention must first allow for such structures to be trained so that their representation in memory is crystalized and robust.

Another example pertains to the teaching of letters. Instructional programs for the teaching of the Arabic letters should not follow the order of the letters as they appear in the Arabic alphabet, rather they should start with the letters that encode SpA phonemes (with place and manner of articulation properties taken into account) and only later progress into the letters that encode StA phonemes. This is again because the latter represent less familiar phonemic categories and this makes the learning of the letter-sound relationship more difficult. Similar guidelines should be considered in assessment and diagnosis of language and reading difficulties. For instance, we have shown that phonological distance makes phonological awareness of StA phonological structures more difficult than SpA structures among typically developing children, and this is an important criterion to consider when designing assessment tasks just as it is important in designing instructional methods (Saiegh-Haddad & Everatt, 2017). Yet, it is to be remembered that children with developmental language and reading disorders find even structures within their SpA dialect more difficult than their age-matched typically developing peers, whereas StA structures are at floor levels and less clearly differentiated in the two groups. This implies that StA structures may not be good targets for diagnosis of developmental disorders and that assessment in these groups should be based on SpA structures (Saiegh-Haddad & Armon-Lotem, forthcoming; Saiegh-Haddad, 2020).

Finally, developing good reading skill in StA is the ultimate goal of all Arabic literacy programs. The results reported in this chapter show that StA reading accuracy and fluency may be statistically concurrently predicted by metalinguistic skills in SpA,; Also StA word reading accuracy and fluency is predicted by the same skills in SpA. If reading develops earlier and more efficiently in SpA, as we explicated in the previous section, and if metalinguistic and reading skills in SpA are associated with the development of StA reading, it follows that initial reading instruction should happen first in SpA. This can mean using structured graded materials as suggested by the Exposure-thorough-Reading Program (Saiegh-Haddad & Spolsky, 2014), which provide procedures for structured gradual progression from identical words that keep the same form in SpA and StA first and moving into words that are partially overlapping (cognates) to unique words. Alternatively, this conclusion can be extended to mean teaching reading first using a written version of the spoken dialect. This conclusion has not yet been empirically tested but it accords with earlier reports of the effectiveness of initial literacy in the vernacular in learning to read in any other language (e.g., Modiano, 1973, 1988; Rosier & Holm, 1980; Spolsky & Holm, 1973; Spolsky, 1975) and with programs that provide initial instruction in the native language (Hull & Hernandez, 2008; King & Benson, 2008; Reaser & Adger, 2008; Reyes & Moll, 2008). According to this view, a written version of the spoken dialect might be used in preschool and in the early elementary grades to help children develop the alphabetic principle, phonemic awareness, learn the sounds and shapes of letters ,and develop automaticity in using basic phonological recoding skills for identifying words. Once children acquire these foundational skills, StA would be introduced using the target Arabic orthography. Given the remarkable lexical, morphological and syntactic distance between SpA and StA, training children to read first in SpA eases the brunt of structural language learning on the part of children. It also enables readers to become independent readers and train productive reading habits (Daquila 2020; Shendy, forthcoming). Nonetheless, the proposal to start reading instruction in SpA requires an attitudinal change and a change in the readiness of the society to add literacy functions to the vernacular (Maamouri, 1998; Saiegh-Haddad & Spolsky, 2014).

The results reported in this chapter underscore the role of diglossia in understanding the factors that affect learning to read in Arabic. Yet, instructional factors should also be considered (Vellutino et al., 2003), including ineffective instructional methods, and the teachers' knowledge about language and structure (e.g., Piasta et al., 2009). For instance, even though use of Phonics in the teaching of reading is mandatory in all schools across the country, given a long history of whole-language, whole-word teaching approaches in Israeli Arab schools, the new Phonics-based reading curriculum introduced in 2009 might not have yet succeeded in wiping away old conceptions and practices regarding the best way to teach reading (Saiegh-Haddad & Everatt, 2017).

Environmental factors, such as home literacy constitute another possible factor. Many kids come to formal schooling with no prior knowledge of StA or of the Arabic orthography (Saiegh-Haddad, 2012; Levin et al., 2008) and this might have an enormous effect on their developing literacy skills. For instance, Korat et al.

(2014) found that home literacy explained 20% of the variance in Arab children's literacy development (also see, Aram et al., 2013). A poor start at reading brings about cascaded 'Mathew effects' that makes it hard for children to bridge the gap with their peers (Stanovich, 1986).

In his seminal work, Maamouri (1998) proclaims "*We still look forward to an early child psychology study of the problems caused by diglossia in school or pre-school. Only such a study can fully confirm any claims that fall outside of the accepted definitional norms of linguistics"* (italics added). The research synthesized in this chapter is just a first step in this direction. Future research is needed to attempt to replicate the findings and conclusions outlined in this chapter, as well as to extend the design of this research to include longitudinal studies as well as cross-national studies of children in different Arabic speaking regions, and to intervention studies of language and literacy development.

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Part II
Psycholinguistic and Neurolinguistic Studies of Specific Effects of Dialect on Language and Literacy Acquisition

Literacy Acquisition in a German Dialect: A Behavioral and EEG Study in Swiss-German and Standard German Speaking Children

Jessica C. Bühler and Urs Maurer

1 Introduction

The focus of this chapter lies on how children speaking a German dialect develop literacy competencies for German although their spoken language variety does not directly correspond to the standardized language form used for reading and spelling. In languages with alphabetic orthographies, children typically begin to read and spell by matching aspects of written language to oral language skills, which they previously have acquired (Mann & Wimmer, 2002). Within this process, graphemic patterns of the written language are gradually mapped onto orthography that is driven by a speaker's native phonology, morphology, and meaning (Henderson, 1984; Joshi, 2010). Although a vast amount of research exists on how children *generally* learn to read and spell, little is known about the direct effects of speaking a dialect on early literacy acquisition. When dialect-speaking children set off to acquire literacy, their learning process not only involves the matching of phonological units onto printed letters. Rather, dialect speaking children need to establish at least some understanding of differences between their spoken dialect and the spoken and written form of the standard language (cf. Fig. 1). Depending on the language and/or language variety, the degree to which a word *in dialect* differs from *the standard language* may vary largely: Some dialects only differ slightly from the

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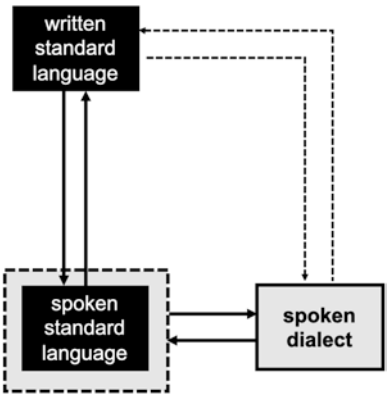

Fig. 1 Direct vs. indirect model of spoken and written language mapping

standard language (e.g. in some forms of vowel and/or consonant pronunciation) but others encompass strong linguistic differences across phonological, lexical as well as grammatical units. Even within a particular dialect some vocabulary items may vary only slightly from the standard language, while other words entail immense (phonological or even lexical) differences. Knowing about the linguistic differences should facilitate the mapping of spoken language to the written domain. However, this knowledge is often lacking at the time when dialect speaking children commence reading and spelling instruction.

If a dialect-native child attempts to spell a word with only slight differences (compared to the standard language form) and maps the spoken dialect word directly onto the written standard language, this likely adds extra challenges during the mapping process of spoken and written language, similar to orthographic depth. Also, if words deviate strongly, then the dialect-native child needs to obtain specific knowledge of the "new and yet unfamiliar" word form of the spoken standard language directly in parallel to the basic literacy learning process (Fig. 1).

Black boxes with direct solid reciprocal connections represent the conventional pathways for language mapping in non-dialect speakers via correspondence between *spoken* and *written* standard language. Dialect-speaking children follow an extended pathway, as they first need to match spoken dialect with the spoken standard language (grey boxes) and only then can they progress to match *written* with *spoken* standard language. This creates an indirect reciprocal pathway of spoken and written language mapping in dialect-speakers.

The fact that dialect-speaking children need to acquire the specific *spoken* standard language for reading and spelling also makes this kind of literacy learning different from learning to read and spell within a deep orthography. Also, literacy acquisition while speaking a dialect is not directly comparable with literacy acquisition in bilingual children (Lallier et al., 2016), where a direct mapping between spoken L1 and written L2 is typically not possible and where the direct acquisition of spoken L2 is required. Nonetheless, where bilingual children may use grapheme-phoneme conversion strategies to acquire vocabulary in their less dominant second language (e.g., (Kroll & Stewart, 1994)), dialect speaking children may use a

similar method in reading to acquire vocabulary in the standard language. However, studies in bilingual children have also shown that exposure to more than one language may increase metalinguistic skills, such as phonological awareness, in bilingual children ((Vygotsky, 1962); but see also (Bialystok et al., 2003) for some limitations). Thus, it theoretically could be possible that children speaking a dialect may also show higher metalinguistic skills, which, in turn, could influence literacy acquisition in a positive manner.

Dialect mismatch occurs for many children around the world and thus is not such a unique issue. Effects of dialect mismatch are oftentimes examined in children from low-socioeconomic status (SES), where families speak a non-standard dialect at home while the language of instruction in school is the standardized language form. In the U.S., for example, many African American children from low-SES families speak African American English (AAE) at home, but are instructed in the school context in Standard American English. This dialect mismatch between the *colloquial and formal spoken language form* has shown to negatively impact literacy outcomes for AAE-speaking children (e.g., (Brown et al., 2015; Charity et al., 2004; Craig & Washington, 2004; Terry et al., 2010, 2012)). Similar effects of a dialect's negative impact on early literacy learning have also been reported in the Arabic language context (e.g., (Saiegh-Haddad, 2012)). However, dialect mismatch also seems to occur even without SES confounds, e.g. in the German-speaking part of Switzerland where children speak Swiss-German at home, but where the language of instruction at school is Standard German. In the following, we will first elaborate on the German-Swiss language situation in more detail. We will then summarize two previously published studies about how speaking the colloquial German dialect of Swiss-German impacts pre-school language and literacy-related processes as well as early reading and spelling outcome in school (study 1; (Bühler et al., 2018)), and about how speaking a dialect relates to familiarity-specific effects of neural processing in the standard language (study 2; (Bühler et al., 2017)). In the end, we will present a novel analysis that combines the behavioral and neural approaches reported in the first two studies with the central aim to predict reading and spelling learning at school based on behavioral and neural measures from preschool (study 3).

2 Language Situation in the German-Speaking Part of Switzerland and Its Implications for the School Context

In the German-speaking part of Switzerland there exists a diglossic language situation (cf. (Ferguson, 1959)): Swiss-German is the primary language variety spoken in everyday life. Hence, dialect is spoken on playgrounds, in grocery stores, post offices, banks and any other public place. In contrast, official governmental reports and media broadcasts are communicated in Standard German, which is the standardized German language variety that strongly corresponds to the German "book

language". Thus, Swiss-German and Standard German both occur as spoken language varieties in Switzerland, but are used in highly different contexts (formal vs. informal). Despite the geographic closeness, there is a very different approach to dialect usage in Germany, as most spoken dialects nowadays closely resemble linguistic approximations of Standard German (Elspass, 2007) and thus show a much smaller linguistic distance from the standardized German language variety than Swiss-German.

Within the German-Swiss diglossic language situation (Ferguson, 1959), native Swiss-German speaking individuals manage both German language varieties alongside each other. This is not always an easy task. In Kindergarten, children speak Swiss-German dialect (based on popular vote in the Canton of Zurich which commenced in autumn 2012). However, the Swiss educational system requires school to be taught in Standard German and thus aims at matching "the spoken language of instruction" to the written German language form. Hence, as soon as German-Swiss children enter the elementary school system, they are required to switch from predominantly speaking dialect to speaking Standard German in the school context. Because German-Swiss children have rather little (structured) knowledge of Standard German when they enter elementary school in Grade 1 – where they first learn to read and spell – it is hypothesized that speaking "dialect" may likely burden early German reading and spelling acquisition in German-Swiss children. There is some indication that speaking a dialect may impact *reading comprehension* in a negative manner. In particular, PISA exam results in 2009 and 2015 revealed that German-speaking Swiss Grade 9 students showed slightly weaker reading comprehension skills than their same-aged counterparts living in Germany (OECD, 2016; Werlen, 2010). Moreover, a recent study examining spelling abilities in Swiss-German primary school children could show that, throughout Grades 2 to 6, children showed substandard spelling skill in German (i.e., scores below the norms of a standardized spelling task compared with a norm-sample entailing German and Austrian same-aged children) for words with irregular spellings (Hartmann et al., 2018). However, this was not the case for words with high letter-to-speech sound correspondences. Relatively weak spelling skills are rather common in Switzerland and this especially makes sense when considering that only about half of the words in German are spelled the way that they are spoken (Wimmer & Hummer, 1990). This is also why Swiss school psychologists have begun to employ Swiss- specific norms for the SLRT-II spelling evaluation in order to avoid too many false-positive diagnoses for spelling difficulties in terms of dyslexia in German-Swiss children (Salzburger Lese-/Rechtschreibtest; Bernese norms of the SLRT-II; (Moll & Landerl, 2010)), because they hold less stringent norms than the standardized original ones. Indeed, more research is needed to thoroughly investigate whether and to what extent dialect use influences reading and spelling acquisition, particularly in the first year(s) of school. The amount of research on Swiss-German dialect-specific influences on early literacy acquisition has to date not been comprehensive enough.

3 How Speaking a Dialect Influences Pre-school Literacy-Related Skills and Early Reading and Spelling Acquisition in German-Speaking Children (Study 1)

The first study (Bühler et al., 2018) that we summarize here aimed at examining whether and how speaking a dialect affects reading and spelling abilities in Grade 1, when accounting for preschool literacy-related skills prior to school enrollment. The reason to include preschool literacy-related skills in the analysis was based on results consistently showing that children with strong vocabulary and phonological awareness skills *before* formal schooling have better chances at becoming good spellers and readers (Ennenmoser et al., 2012; Niklas et al., 2016).

To this end, we examined 71 children (meanage: 7.61y; from an original subject pool of 78 children, as two failed to participate in all tasks and time-points, four dropped out, and one child received an ADHD-diagnosis during the study) with a differing degree of exposure to Swiss- German dialect in three groups. In particular, we tested 36 native Swiss-German (SwissG) speaking children in Switzerland, 19 native Standard German speaking children in Switzerland (StG in Switzerland), and 16 native Standard German speaking children in Germany (StG in Germany). All children examined in Switzerland grew up in the vicinity of the city of Zurich. StG native children in Germany all originated from Magdeburg. We chose this German city, as age of school enrollment matched well to the minimum age for enrollment into Grade 1 in Zurich. Furthermore, Magdeburg's geographical location lays in northern Germany. As dialect use occurs less frequently in northern German federal states but tends to be spoken more widely in Southern ones (e.g., Bavaria), this city with its spoken language oriented towards Standard German was well suited for the purpose of this study.

An important issue to note is that the Swiss school system differs from the German school in various ways. In Switzerland, attending 2 years of Kindergarten is mandatory and children receive a low-level introduction into letter-to-sound matching skills shortly before school enrollment. However, Kindergarten is not mandatory for children in Germany, and there is no standardized curriculum in place in German daycare centers (e.g., (Spiess et al., 2003)). In consequence, children growing up in Germany are only formally instructed in letter acquisition in Grade 1 (e.g., (Fricke et al., 2008)). Also, teachers in the Swiss and German school system employ different approaches as to how literacy is taught. Thus, individual communities and schools may employ different strategies for Grade 1 German literacy instruction, however, variations in methodology seems to differ in a similar manner between the two countries. Nonetheless, both school systems often employ a letter-by- sound blending phonics approach.

Due to these differences in school system, we speculated that children living in Switzerland (irrespective of whether they were growing up with SwissG or StG) were likely to show more strongly developed literacy-related skills before school enrollment compared to StG native children growing up in Germany. Distinct differences in preschool literacy-related scores however may impact Grade 1 reading and

spelling outcomes. We specifically aimed at disentangling effects of single-or-dual German language variety exposure and schooling on Grade 1 reading and spelling outcomes. Hence, we conducted a *univariate analysis of variance* to compare skill differences between the 3 groups. Additionally, we also employed *structural equation modeling* to examine the individual direct effects of (1) degree of SwissG versus StG exposure before school enrollment, (2) school system, and (3) preschool literacy-related skills onto Grade 1 reading and spelling.

All children were tested at two points in time. During the first examination shortly before school enrollment (T1 data collection), we examined predictor abilities for literacy, i.e. preschool literacy-related skills (phonological awareness, letter knowledge, invented spelling). At the end of Grade 1 (T2 data collection), early literacy abilities were tested using standardized reading and spelling tests. While the measures are introduced below, more details about subtests and psychometric properties can be found in Bühler et al. (Bühler et al., 2018). Descriptive statistics of the groups including background variables are reported in Table 1.

Phonological awareness (PA, T1). PA skills were tested using TEPHOBE (*Test zur Erfassung der phonologischen Bewusstheit und der Benennungsgeschwindigkeit* [Test to Register Phono- logical Awareness and Naming Speed], (Mayer, 2011)). TEPHOBE is a standardised test battery where children need to select correct items. It measures the ability to manipulate linguistic units at the level of phonemes, syllables, and onset-rimes.

Letter knowledge (T1). We tested upper- and lower-case letter knowledge by having children name and produce the corresponding speech sound of all 26 letters used in the German alphabet in a randomized order. Letter naming was rated as correct when either the letter name or the letter sound were produced by the child. A similar procedure has previously been used by Maurer, Bucher, Brem, and Brandeis (Maurer et al., 2003).

Invented spelling (T1). To assess children's level of phoneme-to-letter knowledge application prior to formal instruction in school, we administered a self-developed invented spelling task (adapted from (Tangel & Blachman, 1995). Children were required to spell out simple nouns the best they could. Scoring considered the number and accuracy of presented phonemes and the resemblance of the child's orthographic output to that of the target spelling. Invented spelling shows high correlations with Phonological Awareness tasks and is - despite its name - a better predictor of reading than spelling skills (McBride-Chang, 1998).

SwissG vs. StG exposure ratio. Parents (or primary caregivers) were asked to fill out a questionnaire regarding the amount of SwissG and/or StG their child was exposed to in everyday life. We received parental questionnaire information from all 71 children reported in this analysis (i.e., response rate = 100%). We were particularly interested in exposure to two different settings of language-varieties use.

Firstly, we focused on *storytelling* settings at home. Here we asked parents to estimate how often (in %) their child heard stories (e.g., via book-reading storytelling, audiobooks, television and similar) in SwissG, StG or any other language.

Table 1 Descriptive statistics and tests of between-group effects (using CPM IQ score as covariate) for literacy-related skills, Grade 1 literacy, and StG grammar scores

Study participant details	SwissG in CH		StG in D (StGd)		StG in CH (StGch)		F-values
	N = 36		*N* = 16		*N* = 19		
Sex (♂:♀)	18:18		6:10		11:8		0.714
	M	**SD**	**M**	**SD**	**M**	**SD**	
Age (grade 1: In years)	7.58	.32	7.60	.32	7.67	.40	0.397
SwissG vs. StG ratio[a] *Storytelling*	.42	53.70	−96.63	6.96	−81..84	23.52	43.411***
SwissG vs. StG ratio[a] *On the playground*	74.14	16.51	−89.69	13.92	24.21	16.51	275.39***
SES[b] (range: 1.83 to 4.50)	3.10	.69	3.08	.64	3.54	.72	2.315
Non-verbal IQ (grade 1: Raven's CPM)	121	9.01	118	7.48	115	10.31	2.817
T1 testing: Before school enrollment	**M**	**SD**	**M**	**SD**	**M**	**SD**	
Letter knowledge: *Uppercase* (max. 26)	19.69	6.64	12.69	8.35	15.68	6.82	5.270**
Letter knowledge: *Lowercase* (max. 26)	15.28	7.40	7.94	7.13	11.21	7.74	5.146**
Phonological awareness: *TEPHOBE total* [PR]	64.87	25.24	31.38	24.24	51.98	27.16	9.589***
Invented spelling[c] (max. 60)	38.64	17.20	13.81	12.05	26.05	16.51	12.899***
T2 testing: Grade 1	**M**	**SD**	**M**	**SD**	**M**	**SD**	
Phonological awareness: *BAKO* [PR]	85.39	15.92	63.69	27.95	79.68	24.03	5.811**
Reading							
SLRT-II: *Words* [PR]	79.24	17.66	81.03	21.62	77.82	22.95	0.085
SLRT-II: *Pseudowords* [PR]	70.91	19.07	73.81	24.03	72.08	24.42	0.157
SLS reading IQ	98.78	15.01	101.50	14.52	99.74	13.92	0.350
Spelling							
DRT-1 [PR]	60.22	22.76	47.31	25.71	63.79	26.73	2.567
SLRT-II: *Spelling* [PR]	63.68	19.40	56.37	32.69	58.45	27.23	0.305

Adapted from Bühler et al. (2018)
*$p < .05$, **$p < .01$, ***$p < .001$
[a]Range of SwissG vs. StG ratio from +100 (only SwissG) to −100 (only StG)
[b]SES was calculated using the mean of both parents' education, income and current employment status (calculated as (SESfather + SESmother)/2)
[c]The invented spelling task encompassed 10 German words based on the English words used by Tangel and Blachman (1995)

Subsequently, we determine a *storytelling* exposure ratio for SwissG vs. StG by calculating %-SwissG *minus* %-StG, in order to determine a value range of SwissG vs. StG exposure from +100 (i.e. *only* SwissG) to −100 (i.e. *only* StG). The second

setting of interest was a child's language-variety exposure outside of the family (i.e. any setting outside the family except kindergarten, such as on the playground, in the community, with a nanny, in daycare, etc.). Again, parents estimated how much exposure their child had to SwissG (in %), StG (in %) or any other language (in %). We calculated %-SwissG *minus* %-StG, to determine a value range of SwissG vs. StG exposure from +100 (i.e. *only* SwissG) to −100 (i.e. *only* StG).

For the SEM analysis reported in the following section, an average score across both SwissG vs. StG exposure variables was computed and named *degree of SwissG vs. StG dialect exposure*. ***Phonological awareness (T2).*** PA skill assessment was repeated with the slightly more challenging standardised BAKO 1–4 test battery (*Basiskompetenzen für Lese- Rechtschreibleistungen für Klassen 1–4*, [Basic Competencies for Reading and Spelling for Grades 1–4], (Stock et al., 2003)). BAKO 1–4 entails several intricate oral linguistic manipulation tasks (e.g., vowel substitution, phoneme transposition, vowel-length estimation, speaking words reversed) and uses words and non-words.

Reading (T2). Reading fluency skills were tested with the timed (1 min) word and pseudoword reading lists from the standardised SLRT-II test battery *(Salzburger Lese- und Rechtschreibtest II,* [Salzburger Reading and Spelling Test II], (Moll & Landerl, 2010)) and the standardised timed (3 min) sentence SLS 1–4 reading task (*Salzburger Lese-Screening,* [Salzburger Reading Screening], (Mayringer & Wimmer, 2003)). In the SLS 1–4, children are required to mark correct and faulty sentences during silent reading.

Spelling (T2). Grade 1 spelling was assessed with the DRT-1 (*Diagnostischer Rechtschreibtest*, [Diagnostic Spelling Test], (Müller, 2003)), as well as the spelling test of the SLRT-II test battery (Moll & Landerl, 2010; von Suchodoletz, 2013). During testing all words and sentences were spoken in StG irrespective of whether the children were SwissG or StG natives. This was done to keep testing methodology constant over all groups, and to accommodate the diglossic language situation (as there are no standardized spelling conventions for SwissG).

IQ (T2). We investigated non-verbal IQ scores using the standardised Raven's Colored Progressive Matrices task (Raven et al., 1956)).

Descriptive results for T1 and T2 testing. As can be seen in Table 1, mean values for gender, age, non-verbal IQ and parent-specific SES did not differ significantly for the 3 groups investigated. We did however find highly significant group differences regarding the SwissG vs. StG ratio used for storytelling and speaking on playgrounds. Moreover, the non-verbal IQ task revealed a trend-like value ($p = .067$), which does not rule out the possibility of group differences in non-verbal IQ. In order to account for potential effects of group-specific non-verbal IQ differences on the (preschool) literacy-related tasks and Grade 1 reading and spelling outcome, we conducted a univariate analysis of covariance (ANCOVA) for all examined test variables.

After statistically controlling for effects of non-verbal IQ, we found significant group differences for all preschool literacy-related tasks (i.e., upper- and lower-case

letter knowledge, total TEPHOBE PA scores, and T1 invented spelling). SwissG native speakers outperformed all StG native subjects on these scores.

We also were able to determine some significant group difference for PA skills at the end of Grade 1 (i.e. T2; BAKO 1-4: $F(2,68) = 5.811$, $p < .01$). SwissG native children performed the best, followed by StG native children in Switzerland (cf. Table 1). Yet, PA scores in StG natives and StG natives in Germany only differed on a trend level. Notwithstanding, Grade 1 reading scores did not differ across groups ($F(2,68) < .31$, see Table 1 for details) and there were no significant group differences for Grade 1 spelling scores ($F(2,68) < .35$), either. However, closer inspection of Grade 1 spelling outputs revealed significant effects of spelling errors based on dialect-specific pronunciation similar to effects reported by Schmidlin (Schmidlin, 2003), who examined early spelling outputs of German-speaking 7-year olds with different dialect-based backgrounds of German (SwissG, StG and a southern Bavarian German dialect).

Predicting Grade 1 Reading and Spelling Outcomes Using Structural Equation Modeling (SEM) We built two independent SEM models to examine the specific impact of *preschool literacy-related skills*, *degree of SwissG vs. StG dialect exposure* and *school system* onto Grade 1 reading and spelling, respectively. Detailed information on the construction principles and composition of these variables as well as specifications regarding model structure are provided in detail in Bühler et al. (Bühler et al., 2018). In order to best understand the results reported below a couple of important issues need to be addressed beforehand: Specifically, the variable *degree of SwissG vs. StG dialect exposure* is the mean value of both SwissG vs. StG exposure ratios (i.e. (SwissG vs. StG ratio storytelling + SwissG vs. StG ratio playground/2)). Accordingly, each participant holds an independent value for this variable and SEM analysis is thus run over the entire participant sample (and not as a multi-group analysis). Moreover, SEM analysis was conducted using the free computer software Ωnyx created by von Oertzen, Brandmaier, and Tsang (von Oertzen et al., 2015) which employs an innovative interactive approach for parameter estimation and provides a simultaneous graphical visualization of the analyzed model. Independent variable values were computed into unweighted T-scores to facilitate composite score construction and all observed variable values were mean-centered before being entered into the respective models.

In order to summarize the findings of that study (Bühler et al., 2018), we concatenated the results of the two SEM models into one single diagram (Fig. 2, see below). The benefit of this procedure is that both models and variable-specific values of significance can be contrasted, instantaneously.

SEM model-specific variable connections (e.g., *preschool literacy-related skills* ➔ *Grade 1 reading*) produced a z-score, with which we determined a two-tailed level of significance. A two-tailed hypothesis testing was chosen because speaking a dialect oftentimes is reported as having a negative impact on early literacy acquisition (e.g., (Brown et al., 2015; Charity et al., 2004); Craig et al., 2004; (Saiegh-Haddad, 2012; Terry et al., 2010, 2012). However, speaking a dialect could possibly also have a positive impact on Grade 1 literacy scores based on metalinguistic

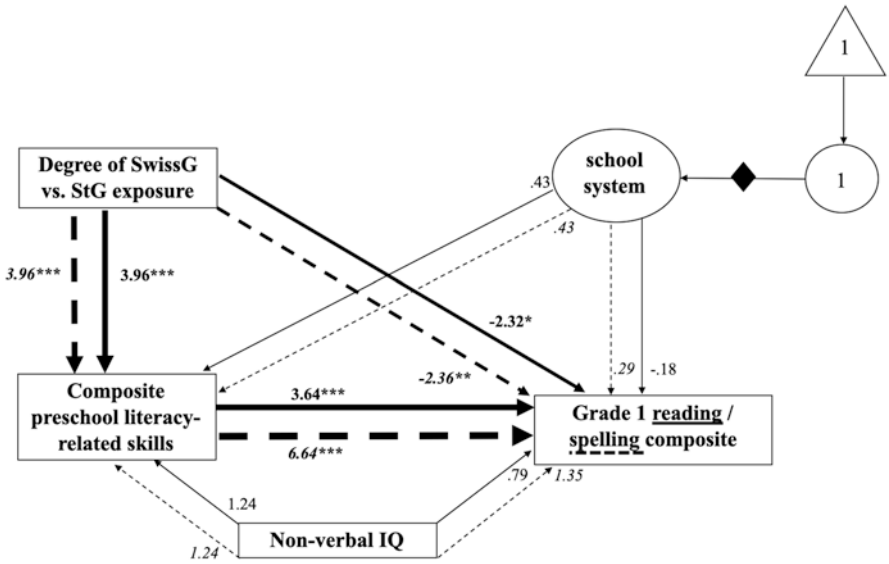

Fig. 2 Combined SEM prediction model for Grade 1 reading and spelling

cognition skills as seen in some research with bilingual children (cf. details specified on page 3 of this chapter).

The full *reading model* (depicted in Fig. 2 with solid lines) showed a good fit to the data ($X^2 = 1.499$, df = 6, CFI = 1.0, TLI = 1.0, RMSEA < .001; see (Bühler et al., 2018) for details). The model revealed a significant positive connection between *preschool literacy-related skills* and Grade 1 reading and hence indicates that preschool literacy-related skills predicted reading abilities at the end of Grade 1. The direct path between *degree of SwissG vs. StG exposure* and *Grade 1 reading* was also significant but negative. As such, being exposed to a higher degree of SwissG dialect had a statistically significant negative impact on Grade 1 reading skills, when the variable *preschool literacy-related skills* was factored in. *Degree of SwissG vs. StG exposure* also had a significantly positive effect on *preschool literacy-related skills*, which coincides with differences in letter-to-sound matching training strategies in Switzerland and Germany. However, *school system* did not show any significant effects. *Non-verbal IQ* also had no significant effect on Grade 1 reading nor on *preschool literacy-related skills*. For the purpose of validating the significant impact of *preschool literacy-related skills* and *degree of dialect exposure* onto Grade 1 reading, we conducted a hierarchical multiple regression analysis post- hoc, where we found similar levels of significance for all reported effects (for details see (Bühler et al., 2018)).

The full *spelling model* (depicted in Fig. 2 in dotes lines) showed satisfactory fit to the data ($X^2 = 1.444$, df = 6, CFI = 1.0, TLI = 1.0, RMSEA < .001; see (Bühler et al., 2018) for details). It revealed very similar effects as the reading model. However, the predictive value of *preschool literacy-related skills* onto *Grade 1*

spelling was even more pronounced,; this is possibly linked to more consistent letter-to-sound matching for reading than for spelling in German ((Wimmer & Hummer, 1990); see also discussion below). The model reflects that better established preschool literacy-related skills provide both German and Swiss-German speaking children with the necessary tools for successful spelling strategies in Grade 1. Further, the direct path from *degree of SwissG vs. StG exposure* onto *Grade 1 spelling* was slightly more negative and significant. Hence growing up with higher exposure to the Swiss dialect had a strong negative impact on Grade 1 spelling when *preschool literacy-related skills* were considered. However, *school system* and *non-verbal IQ* had no significant effect in the full spelling model.

Again, a hierarchical regression analysis was conducted after SEM analysis to validate the significant impact of *preschool literacy-related skills* and *degree of dialect* (again see (Bühler et al., 2018) for details).

Independent Grade 1 reading and spelling models are collapsed into a single figure to improve comparability of effects of dialect and precursor skills on the specific scholastic competencies. Predictive effects of *degree of SwissG vs. StG exposure*, *school system*, *non-verbal IQ* and *preschool literacy-related skills* for the reading model are depicted by solid lines, dotted lines indicate effects for the spelling model. Paths with significant z-scores (two-tailed) are marked as $*p < .05$, $**p < .01$, $***p < .005$ (see (Bühler et al., 2018) for details on the independent models).

To summarize, we found in this study that speaking a dialect had a negative influence on learning to read and spell, even though children speaking a dialect showed comparable reading and spelling skills as children who grew up speaking the standard language. This apparent contradiction can be explained by the higher preschool literacy-related skills in the children speaking dialect, and by the inclusion of these measures into the SEM model. In other words, children speaking dialect achieved lower reading and spelling scores in first grade than what could be expected based on their preschool literacy-related skills. This discrepancy can be explained by the negative effect of dialect use on reading and spelling in the SEM model. Thus, the SEM results revealed that the Swiss diglossic language situation seems to entail both disadvantages and advantages for young literacy learners. Indeed, SwissG speaking children encounter some additional difficulties in the literacy learning process than StG native children due to the dialect-based linguistic mismatch, as they are less able to take advantage of print-to- sound mapping strategies for words entailing pronunciation differences when producing reading and spelling outputs. In such a manner, they encounter a situation somewhat comparable to literacy learning within a deep orthography. Moreover, SwissG native children first need to learn StG specific lexical equivalents of vocabulary items they are familiar with in their native dialect in order to apply letter-to-sound mapping strategies.

Given that children in Swiss kindergartens receive some low level introduction into letter-sound matching skills, it could have been expected that the school system would increase preschool literacy-related skills. However, this is not what we found in the SEM results. Due to the inclusion of Standard German speaking children who visited Swiss kindergartens, SEM was able to differentiate between effects on

preschool literacy-related skills that were driven by speaking a dialect vs. effects stemming from the school system. As the results showed, the SEM analysis attributed the positive effect on preschool literacy-related skills to speaking dialect rather than the school system. We speculate that exposure to two different language varieties from a very young age on may heighten sensibility for phonemic variations and/or manipulations and thus may increase metalinguistic skills in the likes of phonological awareness, similar to benefits reported for bilinguals (Bialystok et al., 2005; Craig et al., 2009). Most probably, elevated metalinguistic skills in dialect speaking children may help to buffer difficulties that arise during reading and spelling learning and may even aid to compensate for disadvantages.

As a limitation of the study, the relatively small group size needs to be mentioned. However, both SEM models in this study demonstrated a highly satisfactory fit, and the model was well able to replicate the expected associations between preschool literacy-related skills and later reading and spelling, thus lending further credibility to the results. Moreover, some literature on SEM suggests that SEM can be computed even with a small number of participants, if enough information is available (Voelkle et al., 2012). Nonetheless, it would be important to replicate the findings in a larger sample in the future.

4 How Dialect-Based Differences in Vocabulary and Pronunciation Impact Audio-Visual Semantic Integration in Young Swiss and German Children (Study 2)

The second study (Bühler et al., 2017) that we summarize here sought to determine to what extent a child's dialect-specific background would influence semantic processing at the neural level. We specifically were interested whether higher familiarity with native compared to non- native vocabulary and pronunciation produced differential neural measures for semantic processing in native SwissG and StG children. In order to examine this question, we tested 35 SwissG native children (18 boys, 17 girls; meanage: 6.55y) in Switzerland and 18 native StG children (7 boys, 11 girls; meanage: 6.57y) in Germany, shortly before they entered elementary school. SwissG and StG native children belonged to the same longitudinal study sample reported in study 1, but the groups of the SwissG and StG children were slightly different, because one SwissG native child and two StG native children failed to complete neurophysiological assessment (study 2) while still completing behavioral testing (study 1).

Based on the German-Swiss language context, SwissG native Kindergarten-aged children were highly familiar with SwissG but not with StG. In contrast, StG native children were only familiar with their native German language variety. Unlike in study 1, we only examined language groups at the end points of the SwissG – StG

continuum in study 2. The group of StG native children growing up in Switzerland was excluded, because classifying their native/dominant German language variety was more difficult which likely would have influenced how these children processed dialect vs. standard language stimuli at the neural level.

Our principle objective was to investigate if and how neural processing differences occurred when SwissG and StG native children encountered vocabulary and/or pronunciation variants that did not corresponded to their native language variety although the stimulus itself was semantically salient in the non-native vocabulary and/or pronunciation.

We employed a "spoken word-picture pair" paradigm, within which we manipulated 'spoken word-picture congruity' for dialect-specific differences in vocabulary and pronunciation. In the *SwissG vs. StG vocabulary contrast*, visually presented stimuli entailed significantly different word names in SwissG than in StG. For example, we paired a black-and-white drawn image of a *child with the hiccups* with the auditory stimulus in Swiss-German "Hitzgi" (spoken as ['hɪtsgɪ]) or with the Standard German equivalent "Schluckauf" (spoken as ['ʃlʊkʔauf])). In the *SwissG vs. StG pronunciation contrast*, words were used that hold a short vowel in the word- initial syllable in SwissG, but which are articulated as long vowels in StG. For example, a black- and-white drawn image of a *porcupine* was paired with the auditory stimulus spoken in Swiss-German as [ɪgl] or with the Standard German pronunciation [iːgl] with its long initial vowel).

Additionally, we incorporated an audio-visual mismatch *control contrast* independent of the listener's German language variety background to examine effects that were *exclusively* due to semantic incongruity detection, but not based on dialect-specific linguistic differences (see Fig. 3c, above section). With the control condition, we further sought to verify that the experiment measured neural response patterns similar to the ones found in other studies that examined semantic anomaly detection tasks in children (e.g., (Friedrich & Friederici, 2004; Friedrich & Friederici, 2006)). The children were asked to detect rare visual or auditory targets that were excluded from the analysis. The experimental details including a full list of the stimuli can be found in Bühler et al. (Bühler et al., 2017).

While the children were viewing and hearing the stimuli, neural activity was recorded using electroencephalography (EEG). EEG measures the temporal dynamics of electrical activity at the scalp that is produced by different brain structures. Due to its excellent temporal (from tens to hundreds of milliseconds) and moderate spatial resolution, EEG is a commonly used method for investigating brain activity for e.g., visual and auditory stimuli and finds use in a vast number of experimental paradigms (Quinonez, 1998; Teplan et al., 2006). In the brain, semantic processing is assessed by examining the modulation of two different components of the event-related potential (ERP): The first of these ERP components refers to semantic incongruity detection and is called *N400* because it is represented by a negative-going neural response ca. 400 ms post-stimulus presentation (for a review on N400 modulation see (Kutas & Federmeier, 2011)). The N400 is often followed by a positive-going neural deflection called *late positive complex* (LPC). LPC indicates

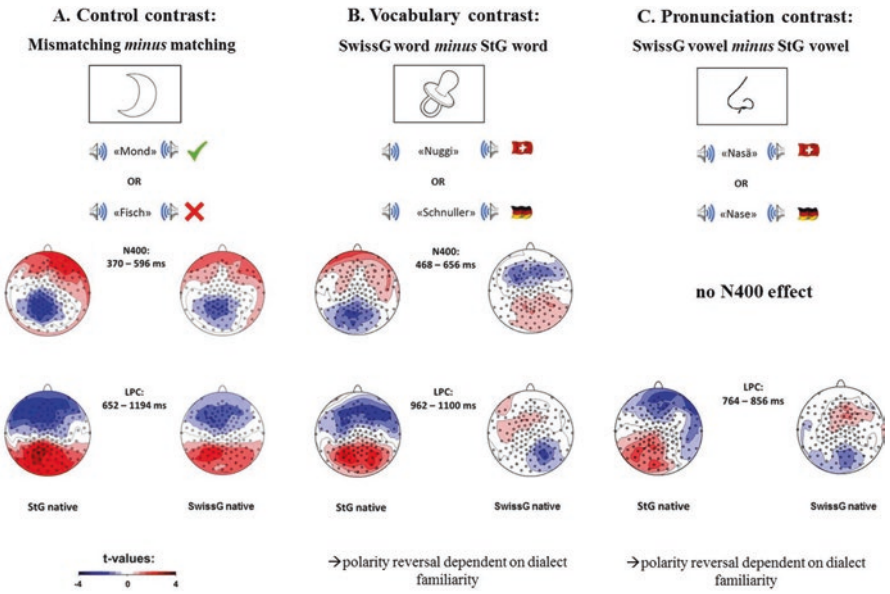

Fig. 3 Dialect-free and -specific semantic and phonological mismatch detection experiment **Above:** Simultaneous audio-visual presentation of congruent or incongruent spoken word – image pairings. (**a**) Control condition with same semantic (mis)match for both SwissG & StG dialectal varieties. (**b**) Language-variety specific vocabulary difference for SwissG vs. StG. (**c**) Vowel-duration specific difference for SwissG vs. StG. **Below:** Congruity effects and congruity-by-language variety group interactions in the ERPs were tested by data-driven Topographic Analyses of Variance (TANOVA) without having to pre-define a subset of electrodes or time frames. TANOVA was computed with Randomization Graphical User interface (RAGU) software ((Koenig et al., 2011); adapted from (Bühler et al., 2017)).

a mechanism for higher-order congruity judgment in terms of detecting faulty sentence structures or ill-formed words (e.g., (Fitzpatrick & Indefrey, 2014; Kutas & Federmeier, 2011)).

Our main hypotheses were as following: (1) the dialect-independent control contrast would elicit significant N400-LPC effects with the same direction for both groups based on semantic incongruity detection. (2) Similarly in the dialect-specific vocabulary condition, unfamiliar (incongruent) words would elicit significant N400-LPC effects, but with an opposite direction in word pairs due to a familiarity reversal of the particular words. (3) In the dialect-specific pronunciation condition, we expected an LPC effect due to the familiarity reversal and the idea that the LPC reflects congruity judgment that may also be affected by differences at the level of pronunciation. We also thought it plausible to find an earlier effect in the range of the N400, as some previous studies have reported a phonological mapping negativity (PMN) that seemed to reflect phonological constraints during semantic processing (Connolly & Phillips, 1994).

Correspondent with our anticipations, we found two significant time-windows for semantic incongruity detection in the dialect-independent *control contrast*, where congruity was defined by audio-visual semantic (mis)match. Visual inspection of the topographies revealed N400 and LPC effects for both groups. In the *SwissG vs. StG vocabulary contrast*, we also found two significant time-windows, however, this time as a congruity-by-language variety group interaction effect. Topographies revealed the presence of both an N400- and LPC-effect, however, with reversed polarity depending on the familiarity with the presented dialect words. As such, the unfamiliar dialect-specific vocabulary seems to have elicited effects comparable to the processing of semantically incongruous stimulus material and to ERPs elicited by paradigms involving pseudowords (e.g., (Domahs et al., 2009; Friedrich & Friederici, 2004; Friedrich & Friederici, 2006; Kutas & Federmeier, 2011)) – most likely because a violation of stimulus expectancy was triggered by the non-native linguistic material and because lexical integration of the unfamiliar content requires more neural effort (Fig. 3b, below section).

In the *SwissG vs. StG pronunciation contrast*, we also found a congruity-by-language variety group interaction effect which resulted in a topography reversal depending on dialect familiarity, however, only for the second ERP component, i.e. the LPC – but not for the N400 or any other earlier component. The reason for the absence of an N400 effect is probably that non-native word variants differed only slightly in terms of vowel duration, but not in lexicality (e.g., (Brunellière et al., 2009; Lanwermeyer et al., 2016)). As expected, the larger LPC ERPs for word stimuli pronounced in the alternative (i.e. non-native) dialect seem to have triggered higher-order control mechanisms for congruity judgment – similar to late ERP effects for sudden physical stimulus changes (e.g., by altering a speaker's voice as in (McCallum et al., 1984) or by manipulating font size of visual stimuli as in (Kutas & Hillyard, 1980)).

To sum up, results of study 2 suggest that when Kindergarten-aged children, who are highly familiar with only one of two examined German language varieties, attempt to process non- native (i.e. unfamiliar) words, they strongly activate neural mechanisms for semantic processing. This could be seen in the modulation of the N400-LPC effect in the *SwissG vs. StG vocabulary condition*, where neural processing mechanisms were highly comparable to those found for the *dialect-independent control condition*. In contrast, non-native and thus unfamiliar pronunciation variants did not show a N400-effect in the *SwissG vs. StG pronunciation condition*, likely because semantic integration was still possible although the non-native auditory stimuli entailed minor (unexpected) articulatory alterations. However, these slight articulatory changes still triggered later processing mechanisms for higher-order congruity judgment that ultimately resulted in the elicitation of the LPC.

Most probably, due to the more rapid access of visual information, the visually presented stimuli acted as primers and triggered specific expectations of linguistic units (phonological and/or lexical) that children held in their native mental lexicon (Aitchison, 2001). Such a brain response pattern likely indicates that SwissG native children have not (yet) formed robust mental representations of StG vocabulary and pronunciation before they enter into Grade 1 of elementary school. Indeed, SwissG

native children are primarily exposed to their native dialect (but only minimally to StG) in Kindergarten, and only begin to receive formal instruction into spoken and written StG in school classrooms. Mere exposure to StG caused by the Swiss diglossic language situation thus does not seem sufficient to provide SwissG native children with the necessary tools to form strong mental representations of StG before school enrollment.

5 Predicting Grade 1 Reading and Spelling Outcome Using Neural Measures for (Dialect- Independent and/or Dialect-Specific) Language Processing (Study 3)

Speaking a dialect impels children to learn lexico-semantic and phonological instances, which differ from the linguistic representations that are found in the standardized language variety used for reading and spelling. Dialect-speaking children thus establish and manifest a mental lexicon that is substantially different from the one found in non-dialect (i.e., standard language) speaking children. In study 2, this resulted in young dialect-speaking children showing brain- specific familiarity effects for native vs. non-native pronunciations and vocabulary during audio-visual integration. Moreover, we showed in study 1 that the dialect-based linguistic mismatch between spoken and written language seems to create a greater level of difficulty for reading and spelling acquisition, when accounting for preschool literacy-related skills. However, the question still remains unanswered whether and to what extent neural processing of native vs. non-native (phonological and vocabulary-specific) linguistic instances assessed before formal education impacts later reading and spelling abilities in school. By combining the approaches used in studies 1 and 2, we aimed at addressing this question.

In this novel analysis, we included all participants from studies 1 and 2 for whom we had neural and (longitudinal) behavioral data. To this end, 62 children (meanage: 7.61y) with different SwissG vs. StG exposure were examined. However, a total of 9 children (3 SwissG, 3 StG in Switzerland and 3 StG in Germany) from study 1 were excluded because they either did not complete the EEG experiment or had noisy EEG data. This left us with 33 native Swiss-German (SwissG) speaking children (meanage: 7.57y), 13 native Standard German speaking children in Switzerland (StG in Switzerland; meanage: 7.73y), and 16 native Standard German speaking children in Germany (StG in Germany; meanage: 7.60y).

We computed difference ERP measures for dialect-specific semantic and phonological mismatch. However, differently from study 2, where we computed the contrasts based on the stimulus conditions, we computed the differences here based on familiarity, i.e. by calculating "*mismatch* minus *match"* differences. For SwissG natives, SwissG vocabulary and pronunciation were considered to be "matching" (and StG vocabulary and pronunciation to be "mismatching"), whereas StG vocabulary and pronunciation were considered to be "matching" for StG native children

living in Germany and Switzerland.[1] This methodology allowed us to eliminate any polarity reversals that could influence the interpretation of effects determined in the structural equation modeling (SEM) analysis.

As in the SEM analyses reported in study 1, variables of interest included *dialect*, *school system*, *preschool literacy-related skills* and *IQ*. The current analysis, however, also incorporated effects of *preschool neural measures* for language variety-independent as well as language variety-specific mismatch detection to expand our research question of to what extent *preschool neural measures* can account for Grade 1 reading and spelling outcome. We created a model for each of the three ERP contrasts and its effect onto Grade 1 reading and spelling, independently. As such, the first model entailed information of (A) the N400 ERP explaining the neural processing difference between mismatching and matching audio-visual stimulus pairings in the dialect-independent control condition. The second entailed data of (B) the N400 ERP for semantic mismatch based on dialect-dependent vocabulary differences. And the third model (C) encompassed information regarding the LPC ERP effect for higher-order incongruity detection based on dialect-specific pronunciation differences (cf. Fig. 4a–c for reading and Fig. 5a–c for spelling). Model fit and path significance are reported in the legend of Figs. 4 and 5, respectively.

Although our sample size was smaller in study 3 compared to study 1, we found a corresponding predictive effect of *preschool literacy-related skills* onto Grade 1 reading and spelling outcome, which again was larger for spelling (cf. Fig. 5a–c) than for reading over all models (Fig. 4a–c). A somewhat higher relevance of preschool literacy-related skills for spelling in the German language context thus seems to be a robust effect (for a detailed interpretation of this effect please see study 1).

Only in the reading models did we find a significant (negative) effect of SwissG vs. StG dialect exposure onto Grade 1 literacy skills, when accounting for *preschool literacy-related skills*, *schooling*, *IQ*, as well as *neural phonological and semantic processing* in terms of mismatch detection. This effect contrasts with findings reported in study 1, where both Grade 1 reading and spelling were negatively associated with speaking a dialect. Inserting an additional term into the model (and thus reducing the number of error degrees of freedom), as well as reducing the sample size may explain the non-significance for Grade 1 spelling in the current analysis. Moreover, based on the weaker transparency of German spelling, we likely had a larger variability in spelling abilities across our study sample, because orthographic output in German requires more than just basic letter-to-sound mapping skills. As such, additional variables aside from dialect exposure likely impacted the Grade 1 spelling models – rendering the direct effect of dialect, in these novel analyses, as nonsignificant for Grade 1 spelling outcome (although the effect still was negative).

[1] All StG native children had contact to the StG language variety from birth on, although the extent of exposure varied slightly across this group of children (e.g. StG-speaking mother but SwissG-speaking father vs. StG-only speaking parents).

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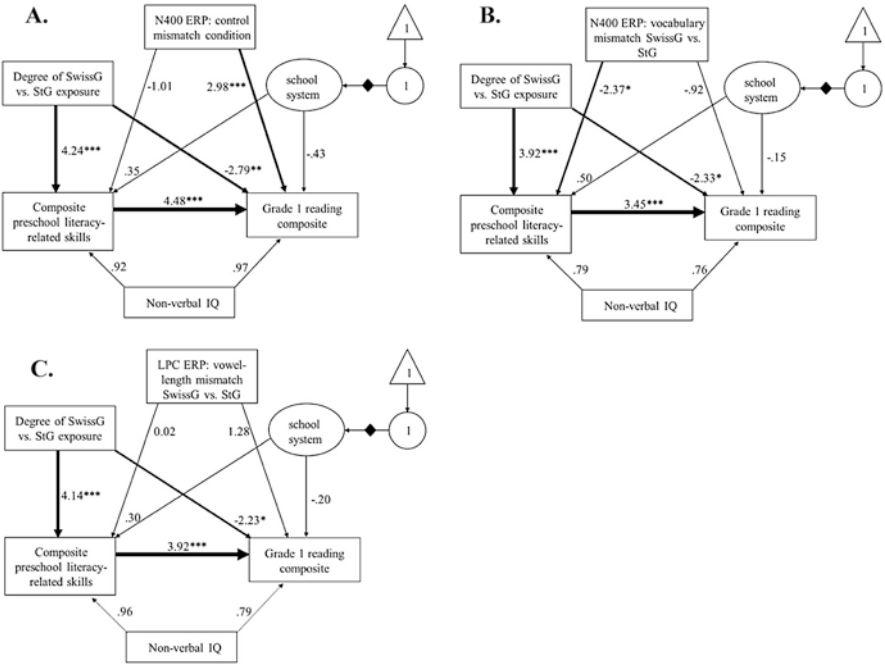

Fig. 4 Linking neural processing measures and behavioral reading outcome using SEM. Paths with significant z-scores (two-tailed) are marked as *p < .05, **p < .01, ***p < .005. (**a**) Impact of *dialect-free semantic mismatch* N400 ERP on Grade 1 reading (model fit: Minus 2 Log Likelihood fit = 2237.81, X^2 = 2.75, df = 10, CFI = 1.0, TLI = 1.0, RMSEA < .001). (**b**) Impact of *dialect-dependent vocabulary-specific* N400 ERP on Grade 1 reading (model fit: Minus 2 Log Likelihood fit = 2260.46, X^2 = 4.14, df = 10, CFI = 1.0, TLI = 1.0, RMSEA < .001). (**c**) Impact of *dialect-dependent pronunciation-specific* LPC ERP on Grade 1 reading (model fit: Minus 2 Log Likelihood fit = 2254.69, X^2 = 3.00, df = 10, CFI = 1.0, TLI = 1.0, RMSEA < .001)

In the *dialect-independent audio-visual semantic mismatch* control condition, N400 ERP effects obtained before formal schooling positively and significantly predicted Grade 1 reading outcome (cf. Fig. 4a). Thus, children who showed smaller N400 effects, as determined by the difference ERP between mismatching and matching audio-visual pairings, later became better readers. This effect is somewhat surprising as more negative semantic mismatch N400 ERP effects were linked to stronger incongruity detection (Kuhl, 2009) and to better reading performance (Coch & Holcomb, 2003; Schulz et al., 2008) in previous studies. Considering that semantic processing is highly relevant *for* as well as *during* the act of reading (e.g. (Landi & Perfetti, 2007; Nation & Snowling, 1998)), it could have been expected that children with stronger negative N400 effects might show better later reading outcomes, because they might make semantic links more easily. However, the opposite effect in our study (cf. Fig. 6) suggests that at an early stage of reading development in German a strong link to semantic processing may *not yet* be required, because (at this low level of complexity) the task can easily be solved by simple

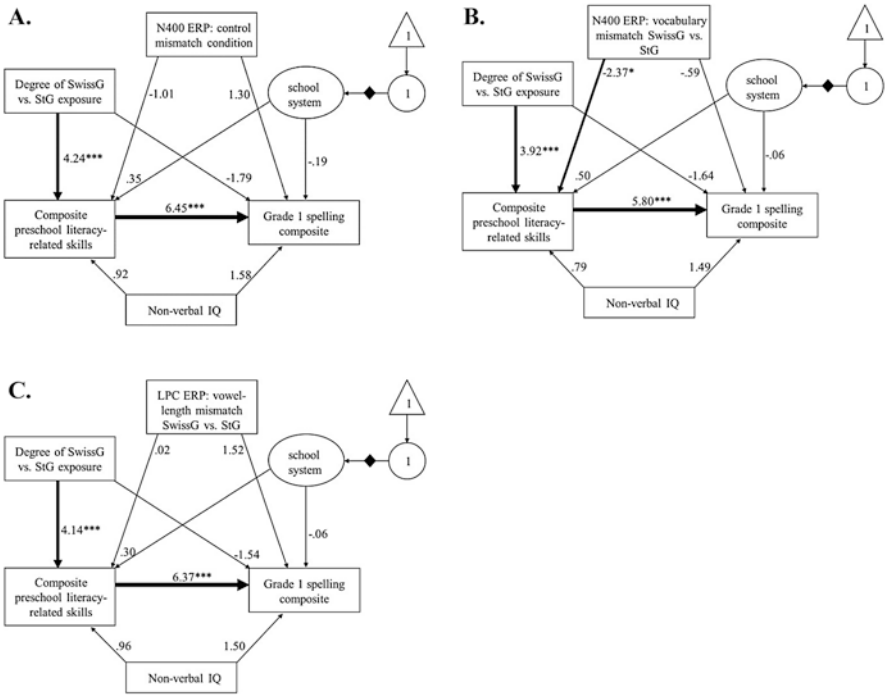

Fig. 5 Linking neural processing measures and behavioral spelling outcome using SEM. Paths with significant z-scores (two-tailed) are marked as *p < .05, **p < .01, ***p < .005. (**a**) Impact of *dialect-free semantic mismatch* N400 ERP on Grade 1 spelling (model fit: Minus 2 Log Likelihood fit = 2207.21, X^2 = 2.89, df = 10, CFI = 1.0, TLI = 1.0, RMSEA <.001). (**b**) Impact of *dialect-dependent vocabulary-specific* N400 ERP on Grade 1 spelling (model fit: Minus 2 Log Likelihood fit = 2223.71, X^2 = 4.16, df = 10, CFI = 1.0, TLI = 1.0, RMSEA < .001). (**c**) Impact of *dialect-dependent pronunciation-specific* LPC ERP on Grade 1 spelling (model fit: Minus 2 Log Likelihood fit = 2216.79, X^2 = 3.03, df = 10, CFI = 1.0, TLI = 1.0, RMSEA < .001)

letter-to-speech sound decoding. However, at a later point in time, when reading tasks become more difficult and encompass more information that requires a large amount of semantic processing, such an effect may very well come into play. In this sense, children who show a smaller incongruence effect at an early age may better be able to disengage from semantic processing and to focus on simple decoding strategies in early reading.

In *the N400 ERP dialect-specific vocabulary condition*, the N400 ERP had no significant effect on Grade 1 reading or spelling (cf. Figs. 4b and 5b). However, the path from *N400 ERP dialect- specific vocabulary condition* onto *preschool literacy-related skills* was significant and negative. As such, both novel SEM reading and spelling models indicated that children who showed large (i.e. more negative-going) *dialect-based vocabulary-specific N400 effects* while integrating SwissG and StG vocabulary within the same image context performed better in the preschool literacy-related tasks (cf. Fig. 7). Interestingly, the relation between the

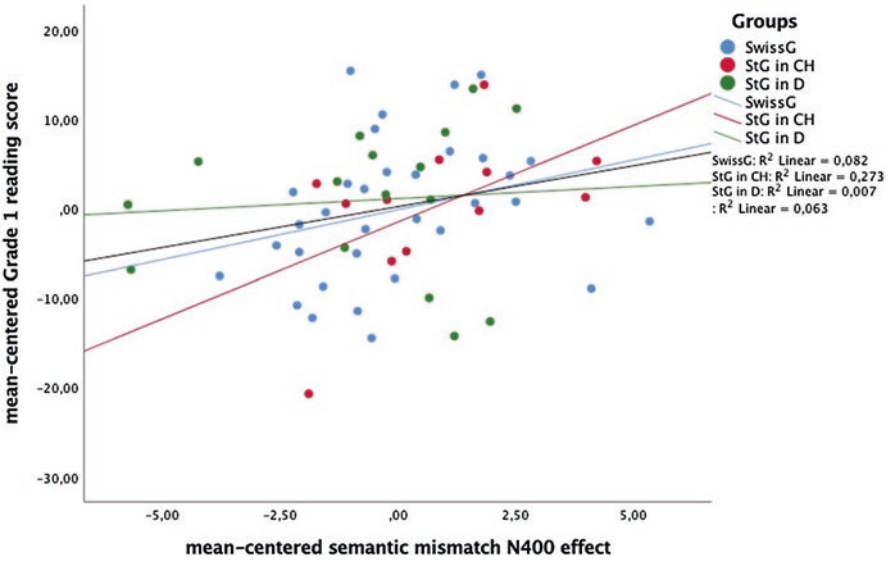

Fig. 6 Scatterplot with squared correlation coefficients (lines) for effects of dialect- independent semantic mismatch effect and Grade 1 reading outcome

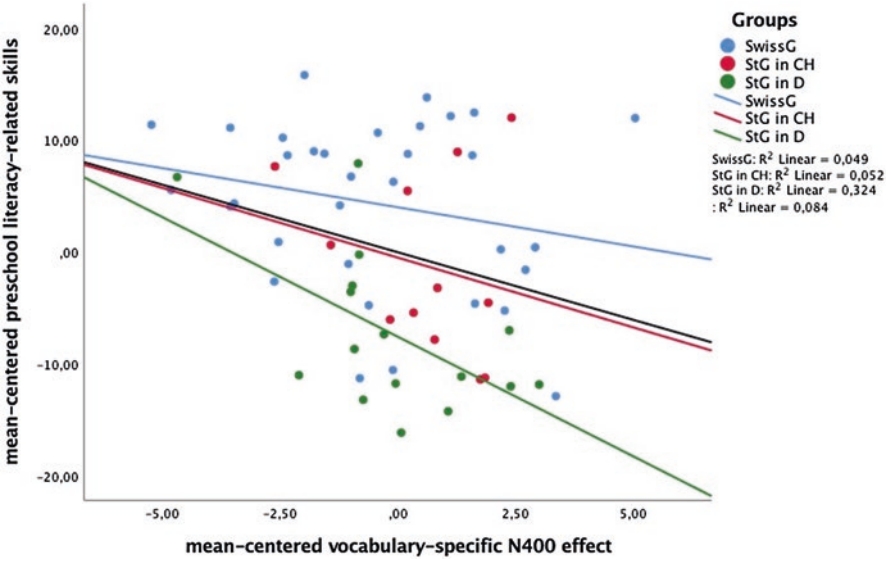

Fig. 7 Scatterplot with squared correlation coefficients (lines) for effects of (dialect- based) vocabulary-specific semantic mismatch effect and preschool literacy-related skills

dialect- specific N400 effect and preschool literacy-related skills was negative, whereas it was positive between the dialect-independent N400 effect and reading. This suggests that neural processing of non-native lexical items required slightly different and/or additional processing mechanisms than neural processing of native ones.

One possible explanation for the inverted significant effect in the relation between dialect- specific N400 effect and preschool literacy-related skills can be found by looking at the StG native children's sample who grew up in Germany. These children (assumedly) have no understanding of the differential SwissG lexical item names that match the same concept. Hence when analyzing the SwissG word regarding whether (or not) it corresponds with expectancy at the "word level", the children with larger N400 effects likely not only involved semantic but also some sort of phonological processing mechanisms for mismatch determination. As phonological mechanisms are a key concept examined within the preschool literacy-related skills tasks (e.g. phonological awareness), this could explain why children with less negative N400 effects also show weaker preschool literacy-related skill scores. We found a similar pattern of larger N400 effect for better preschool literacy-related skills also for StG natives in Switzerland. These results could also be determined for SwissG natives (here regarding the mismatch pertaining to non-native StG lexical concepts; green line), however, this effect was the weakest but in the same direction, nonetheless. Alternatively, it can be hypothesized that children who showed larger dialect-specific N400 effects were more attentive to linguistic instances compared to those with smaller or more positive N400 effects. Previous research has shown that in early childhood cognitive stepping stones to early literacy strongly rely on attention, and in particular on effortful control (Steele et al., 2012) and that cognitive control has been found to significantly predict concurrent letter and vocabulary knowledge (Bull et al., 2011). This may also explain why we only found a significant N400 ERP effect for dialect- specific semantic mismatches and not for the dialect-independent ones. Non-native lexical entities that matched the corresponding image likely required additional and more extensive stimulus analysis until the "matching vs. mismatching decision" was made at the neural level, compared to when the mismatching lexical item name was known.

Furthermore, the *dialect-specific pronunciation condition* did not reveal any LPC ERP-specific effects on Grade 1 reading or spelling outcome nor on *preschool literacy-related skills* (cf. Figs. 5c and 6c). Thus, neural measures for higher-order congruity judgments based on phonological processing differences of SwissG vs. StG vowel-duration changes before school enrollment *alone* were not predictive for later reading and spelling success, nor for preschool literacy-related-skills.

In all prediction models encompassing neural processing measures for (dialect-independent or -specific) semantic and/or pronunciation mismatch detection, *school system* and *IQ* did not impact *preschool literacy-related skills* nor Grade 1 reading and spelling scores, replicating effects found in the SEM reading and spelling models of study 1. Moreover, the latent variable *preschool literacy-related skills* was not significantly influenced by the dialect-independent semantic mismatch N400 ERP, both in the reading and spelling SEM model.

All SEM models (Figs. 4a–c and 5a–c) replicated the effect found in study 1 that higher *preschool literacy-related scores* were associated with more proficient Grade 1 reading and spelling, even though we had added an additional variable into the model and reduced the sample size.

Taken together, the present analysis is one of the first studies on dialect use that reports how neural measures of dialect-specific and language-general processing impacts concurrent and prospective literacy or literacy-related skills. The results highlight the feasibility and potential of including brain-based measures in models of reading development. Even though the findings reported here are highly promising it would be important to try and replicate these finding within a larger data sample.

6 Overall Summary and Discussion

In this chapter, we have reported our research on how the use of Swiss-German dialect impacts learning to read and spell in children at the behavioral as well as neural level. Here we summarize the main findings and conclusions.

In a first study, SEM analyses showed that speaking SwissG dialect (and the linguistic mismatch associated with it) had a negative effect on literacy acquisition, even though children speaking dialect did not differ in reading and writing from children speaking standard language. This could be explained by the positive effect of dialect speaking on preschool literacy-related skills, and the positive effect of the latter on literacy skills. In other words, dialect speaking children underperformed on their literacy skills, given their higher preschool literacy-related skills. This lower-than-expected performance was explained by a negative effect of speaking dialect (rather than the school system) in the SEM model. This suggests that speaking a dialect affects literacy acquisition in rather complex ways. While *speaking* a dialect seems to have negative effect both on reading and spelling acquisition due to the linguistic mismatch, *being exposed* to different varieties of the same language may also have benefits, for example by honing awareness of certain language features and thereby increasing meta-linguistic skills that in turn facilitate literacy acquisition. On a note regarding research praxis, the positive and negative effects in our study suggest that literacy-related skills should be included to get a more comprehensive picture of dialect-specific effects on literacy acquisition.

In a second study, our data revealed that higher familiarity with one German language variety (compared with another) affected neural processing indicated by N400 and LPC effects in the ERPs. The effects, however, were distinct for words that were specific for a dialect (different vocabulary) from those that showed a different pronunciation (long vs. short vowels). Unfamiliar words induced an N400 effect reflecting processing at the lexico-semantic level, in addition to a later LPC effect presumably reflecting congruity judgment. Words with an unfamiliar vowel-length only elicited an LPC effect, but no N400 effect, suggesting that semantic processing of the words was still possible despite different pronunciation.

In a novel analysis as part of study 3, we combined preschool neural processing mechanisms for semantic (and phonological) mismatch from study 2 together with *preschool literacy-related skills* and reading and spelling measures at school age. In similar SEM analyses as in study 1, we found that smaller N400 effects for dialect-independent semantic mismatch in preschool was associated with better reading outcomes at the end of Grade 1. We speculate that this reflects an ability to focus on non-semantic or maybe task relevant aspects (given that children were not asked to match words and pictures explicitly) that may benefit more low- level aspects of word decoding, particularly early in reading development. In addition, the results showed that children with stronger dialect-specific N400 effects had higher concurrent literacy-related skills. This could suggest that these children were more sensitive towards linguistic features requiring more control regarding congruity judgement during the experiment, but also leading to stronger development of literacy-related skills at preschool age. To our knowledge this is one of the first studies that shows the feasibility of using neural markers of dialect processing at preschool to predict concurrent literacy-related skills and later literacy acquisition.

Taken together, this line of research has revealed several results relevant for the topic of literacy acquisition in children who speak a dialect, be it that literacy-related skills are important for investigating the effect of dialect use on literacy acquisition, that neural markers of dialect- related mismatch are distinct for vocabulary and pronunciation differences, or that neural markers of dialect-related and dialect-general mismatch predict literacy and literacy-related skills. At the same time, we note that the use of neuroimaging methods, such as EEG, is very demanding, which resulted in relatively small sample sizes in the current study. Despite the good model fit, this might be a limitation of the SEM analyses in our studies, and replication of the findings in future studies may be warranted. Such studies may also include other dialects, even though studying effects in Swiss-German has the advantage that dialect use is not confounded by SES. Additionally, older children should also be included in such studies, in order to determine whether the balance between dialect-based advantages and disadvantages changes later on at school, particularly when semantic aspects gain importance in a transition from “learning to read” to “reading to learn”.

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About the Neural Basis of Arabic Diglossia: Behavioral and Event- Related Potential Analysis of Word Processing in Spoken and Literary Arabic

Asaid Khateb and Raphiq Ibrahim

1 Introduction

The question of whether or not the language acquired first in life (L1) and a second language (L2) learnt later in life are represented (i.e., managed, processed etc…) in the same/or different brain regions in bilinguals has stimulated a huge amount of research during the last two decades (Mouthon et al., 2013; Perani & Abutalebi, 2005). Clinical aphasic manifestations in bilinguals following brain damage had initially suggested that L1 and L2 might be managed by different brain areas in the bilingual brain (Albert & Obler, 1978; Fabbro, 2001a, b; Ibrahim, 2009; Junque et al., 1995; Paradis, 1977, 1983, 1998). In addition, experimental observations based on intraoperative electro-cortical stimulations had suggested that while some left brain regions could be involved either in L1 or L2 processing, other areas were involved equally in both languages (Ojemann, 1983; Ojemann & Whitaker, 1978). In line with such views, some early functional imaging studies in bilinguals had concluded that some areas might contribute differently to the two languages processing while others are shared between languages (see, De Bleser et al., 2003; Klein et al., 1994; Marian & Kaushanskaya, 2007). Later on, other studies conducted with bilinguals who were more proficient in L2 failed to demonstrate differences in brain language networks, in particular when classical language areas were considered (e.g., Chee et al., 2001; Hernandez et al., 2001). Hence, recent views about the brain's represevntation of L1 and L2 tend to assume that the bilinguals' different languages rely on a common brain network for their processing but that differences in activation observed during functional studies are explainable by other

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factors (Mouthon et al., 2013). Among these, the age of acquisition of L2, the level of proficiency in L2 and the exposure to/and the patterns of use of L2 appear to have cumulative effects together influencing the bilingual's general cognitive-linguistic functioning (see Abutalebi, 2008; Abutalebi & Green, 2007; Bloch et al., 2009; Hernandez, 2009; Hernandez & Li, 2007; Perani & Abutalebi, 2005; Perani et al., 2003).

In the Arabic language, the diglossic situation is seen by some authors as a particular form of bilingualism (see, Eviatar & Ibrahim, 2000; Ibrahim, 2009; Ibrahim & Aharon-Peretz, 2005) or as a context inducing processing patterns akin to those seen in bilinguals (Saiegh-Haddad, 2003; Saiegh-Haddad et al., 2011). Diglossia as first defined by Ferguson (1959) refers to a stable socio-linguistic state that includes different spoken dialects and a remarkably different, grammatically more complex standardized language version. In Arabic, diglossia is defined by the existence of two main varieties of Arabic: (i) a low form which is the spoken version that is acquired naturally and used in everyday conversation and informal communication purposes (referred to hereafter as Spoken Arabic or SA) and (ii) a highly codified form, referred to as Literary Arabic (hereafter LA, referred to also Modern Standard Arabic or MSA, see Saiegh-Haddad & Joshi, 2014). LA is acquired mainly formally at school for reading and writing[1] and used in official contexts, such as media (written media and news broadcasts), speeches, religious sermons and formal discourses (Saiegh-Haddad, 2012; Saiegh-Haddad & Henkin-Roitfarb, 2014). LA differs from SA in almost all its linguistic aspects including the grammatical, syntactic, morphological, phonological and lexical aspects. Due to the distance between SA and LA and the fact that the written Arabic does not represent the spoken language (where various structures are different from LA structures), researchers suggest that diglossia impacts significantly reading and writing acquisition (Mahfoudhi et al., 2011; Saiegh-Haddad, 2003, 2004, 2018; Saiegh-Haddad & Schiff, 2016). Different studies pointed to the difficulty that the Arabic children encounter in the construction of phonological representation and processing for words and sub-lexical units in LA (Saiegh-Hadda & Haj, 2018; Saiegh-Haddad et al., 2020). In fact, at the beginning of their learning to read process, children are practically asked to acquire two systems simultaneously: a linguistic-auditory system (that normally exists in pre-school children in non diglossic situations) and an orthographic-visual system which happens regularly at the start of the school life (Ibrahim et al., 2002; Saiegh-Haddad, 2004).

On the basis of a series of psycholinguistic studies, Saiegh-Haddad and colleagues have shown that the linguistic distance between SA and LA impacts a variety of linguistic processing skills in LA (For a review see, Saiegh-Haddad, 2018;

[1] Because SA serves strictly for oral communication, it did not exist in the written form, until the recent emergence of "electronically mediated communication". The ability to exchange messages that tend to be of an informal nature has resulted in the emergence of written messages in SA. In the beginning and due to technical limitations, electronic communication used Roman characters (e.g., Palfreyman & Khalil, 2003; Warschauer et al., 2002), a phenomenon, referred to as "Arabizi". In recent years, thanks to the advent of smart phones which enable writing messages using the Arabic keyboard, this phenomenon has almost completely disappeared.

Saiegh- Haddad in this collection). For instance, at the syntactic level, word order in LA sentences is usually VSO (verb-subject-object) while in SA the common word order is SVO. Also, despite a certain overlapping, the phonological systems of LA and SA are quite different, with some LA phonemes being absent in certain SA dialects. Finally, although SA and LA share many words in common (often with certain phonological nuances), SA and LA may also have different words for the same referents. In this regard, Saiegh-Haddad and Spolsky (2014) analyzed the lexicon of young 5 year children and reported that 40% of the words consisting of nonstandard words that have no conventional written form, another 40% consisting of SA-LA cognates and only 20% of the words had identical forms in SA and LA. Also, phonological distance between SA and LA had been suggested to be at the origin of the difficulties in reading acquisition among Arabic native children (Saiegh-Haddad, 2007). For instance, in one study (Saiegh-Haddad et al., 2011) that used a picture selection task for words beginning with the same phoneme, the authors reported that the children's recognition of LA phonemes was poorer than that of SA ones. This finding suggested difficulty in the phonological representations for LA words, to which children are generally exposed for the first time at the moment of their entry to school.[2] In an earlier study, the same author (Saiegh-Haddad, 2003) investigated reading processes in children (kindergarten and first grade) and compared their performance on phonemic awareness and word syllabic structure between LA and SA words. She suggested that diglossic variables influenced the children's performance in phoneme isolation and pseudoword decoding. In line with the assumption that diglossia might delay (or lead to difficulties in) reading acquisition among Arabic native children, different studies have also suggested that early exposure of native Arabic speaking children to LA might improve their reading abilities in the early grades (Abu-Rabia, 2000; Feitelson et al., 1993).

During the last two decades, several researchers have also sought to assess the extent to which SA and LA behave as real L1 and L2 in the cognitive system of literate Arabic speakers, as in more classical forms of bilingualism. To address this question, researchers compared the processing of SA and LA words in different language tasks using behavioral measures (reaction times, performance) or compared the performance of native Arabic speakers with the performance of bilinguals (Eviatar & Ibrahim, 2000; Ibrahim, 2009; Ibrahim & Aharon-Peretz, 2005; Ibrahim et al., 2007). For instance, Eviatar and Ibrahim (2000) assessed the metalinguistic abilities in Arabic speaking children (kindergarten and first grade) who were exposed to both SA and LA and compared their performance to Russian-Hebrew bilinguals and to Hebrew-speaking monolingual children. The results indicated that the Russian- Hebrew bilinguals displayed the classical pattern of early bilingualism (as attested by higher meta-linguistic abilities, but with lower vocabulary compared to monolinguals), and Arabic-speaking children's behavior mimicked that of the

[2] Although the formal exposure to the standard language occurs when children go to school, they are however exposed to various extent to LA through media and TV programs for children and through oral storytelling by parents at home and by educators in kindergartens (see a discussion on this issues in Saiegh-Haddad & Spolsky, 2014).

Russian-Hebrew bilinguals but differed from the Hebrew monolinguals (see also Ibrahim et al., 2007). Based on such results, the authors suggested that since Arabic native speakers behaved as bilinguals, they could be considered as bilinguals (Eviatar & Ibrahim, 2000). In another study, Ibrahim and Aharon-Peretz (2005) examined intra- and inter-language (semantic) priming effects in auditory lexical decision in 11th and 12th grade native Arabic speaking students, who were L2 speakers of Hebrew. Presentation of stimuli in Hebrew, in addition to SA and LA, enabled comparisons between SA and LA, the processing of which was in the focus of the studies, as well as comparisons of both language varieties to Hebrew, their formal second a language. In this first study (Ibrahim & Aharon-Peretz, 2005), the authors reported that priming effects were larger when prime words were in SA and target words were either in LA or in Hebrew than when presentation was the other way around (primes in LA or Hebrew and targets in SA). Further, the magnitude of the priming effects for LA and for Hebrew were indistinguishable, suggesting that both languages behaved as second languages in the diglossic situation. In another study (Ibrahim, 2009), primes in SA yielded greater and longer lasting priming effects on decisions regarding targets in SA than did primes in either LA or Hebrew. Here again, effects of primes in LA did not differ from those in Hebrew. The priming effects observed by Ibrahim and colleagues resembled to previous observations in bilinguals (Gollan et al., 1997; Keatley et al., 1994), where forward priming (from the dominant L1 to the less dominant L2) are larger than priming in the opposite direction (from L2 to L1: backward priming). This asymmetry has been taken to indicate that words in L1 more readily initiate conceptual processing than words in L2 (Kroll & Tokowicz, 2001). Based on such results, it was suggested that the two varieties of Arabic are represented in the cognitive system in two separately organised lexicons and that literate speakers of Arabic behave as bilinguals, with SA as their first language (L1) and LA as their second language. This conclusion seemed to hold at least as far as auditory stimuli were concerned. Actually, in a previous study using visual presentation of words from LA, SA and Hebrew, Bentin and Ibrahim (1996) using lexical decision and word naming (reading aloud) tasks showed that the processing of written SA words was slower than that of LA words, with SA ones being processed like LA low frequency words. Altogether, these behavioral data suggested that processing of SA and LA words depends on the modality of presentation of the stimuli with SA showing a pattern of response dominance in the auditory modality and LA words showing a pattern of response dominance in the visual written modality. In order to test this assumption and to shed light into the neural basis of diglossia, a series of studies have been conducted using electrophysiological (event-related potential: ERP), behavioral and functional magnetic resonance imaging (fMRI) measures.

Actually, until very recently little research has been conducted on written Arabic and on the Arabic language and diglossic situation more generally using functional brain imaging (Bourisly et al., 2013) or electrophysiological methods. Few studies have investigated word processing in Arabic in general (Al-Hamouri et al., 2005; Boudelaa et al., 2010; Mountaj et al., 2015; Pratt et al., 2013a, b; Simon et al., 2006; Taha et al., 2013; Taha & Khateb, 2013) with ERPs and only one addressed the

question of diglossia (Khamis Dakwar & Froud, 2007) in particular. To give some examples, Boudelaa and colleagues (Boudelaa et al., 2010) for instance conducted a study which focused mainly on written LA word to assess morphemic processing using ERP analysis. In another study, Al-Hamouri and colleagues (Al-Hamouri et al., 2005) examined the spatiotemporal pattern of brain activity during reading in Arabic and Spanish by means of magneto-encephalographic recordings (MEG). They found no difference between the two languages between 200 and 500 ms after stimulus onset, but found that Arabic enhanced right hemisphere activity beyond 500 ms. Simon and colleagues (Simon et al., 2006) used ERP measures to analyze orthographic transparency effects in Arabic and French subjects. They observed that the N320 component, which is related to phonological transcription, was elicited only in French subjects while reading their L1. In another study, Taha and colleagues (Taha et al., 2013) assessed the effects of word letters' connectedness and reported that fully connected words were processed more efficiently than non-connected ones as attested by RT and ERP measures. As for studies addressing the diglossia question, the only study found here assessed language code-switching between SA and LA (and semantic anomaly processing) using auditory sentence presentations in only 5 subjects (Khamis Dakwar & Froud, 2007). Although the results of this last study must be considered with caution due to the very limited experimental sample, the authors concluded that the diglossic switches in their experiment between the two varieties of Arabic elicited the pattern of ERP responses predicted from previous studies investigating code-switching between two different languages. The authors claimed that these results support the view that the two language varieties involve distinct and separate lexical stores.

In this chapter, we describe the beginnings and some conclusions of a series of studies that sought to shed light on the neural underpinnings of the diglossic situation in the Arabic language. In fact, diglossia is a complex sociolinguistic situation that had only poorly been studied using brain research methods. While being aware of the need to address the question of the brain basis of diglossia from various angles (word recognition, comprehension, production etc…), we first choose to rely on the previous findings within this research domain. Namely, we relied on tasks using single word recognition in the auditory and the visual modalities during lexical decision paradigms. Based on the hypothesis that the two varieties of Arabic might be processed in the brain of Arabic native literate speakers as two different languages, the objective was to characterize the neural responses differentiating SA and LA word processing by means of event-related potential (ERP) analysis in adult subjects. Contrary to previous investigations which used only behavioral analysis, the use of electrophysiological measures allow to investigate in real time the brain responses involved in word recognition in the two forms of Arabic and to compare them to Hebrew, the participants formal second language. The combination of ERP and behavioral analysis allows correlating brain activity with response time patterns and define time periods during the stream of information processing where the two varieties could converge and where they could diverge. Indexes of convergence and divergence were hypothesized to be reflected in the ERPs. Hence, on the basis of the assumption that SA might be processed as an L1 in the auditory modality, we

predicted that auditorily presented SA words will be processed faster than LA ones. We expected to find ERP differences between SA and LA that reflect the RT differences. Furthermore, in line with the assumption and previous literature that LA words might be processed as L1 in the visual written modality, it was predicted that written LA words will be processed faster than SA ones. Similarly, we expected to find ERP differences between LA and SA that reflect such RT differences. In all cases, and in both the auditory and visual modality, the processing of Hebrew words, the participants' formal second language will be used as a control condition. Also, this study relied on the fact that there are lexical items that differ completely between LA and SA (Saiegh-Haddad & Spolsky, 2014), but designate the same referent such as for instance the word "*dallo*" in LA and "*satel*" in SA which both refer to the object "*bucket*".[3] Hence, in order to enhance the putative differential effects in the processing of SA and LA words, we selected the words mainly from this last category, together with other words which share a minimal phonological overlapping between SA and LA. In addition, because Hebrew is a Semitic sister language of Arabic, a particular caution was paid to avoid Hebrew words which overlap phonologically either with SA and LA ones.

2 Material and Methods

2.1 Participant

Two different groups of participants were included in these studies. A total of 43 students (28 women and 15 men, mean age 22.8 ± 1.75, range from 18 to 28 years) underwent the auditory lexical decision task. Of these, 31 participants underwent the ERP experiment. Also, a total of 45 students (23 women and 22 men, mean age 22.7 ± 2.3, range from 19 to 29 years) participated in the visual lexical decision experiment. Of these, 30 participants underwent the ERP experiment. All participants were recruited from the University of Haifa. All were self-declared right-handers, native speakers of Arabic, whose SA is the colloquial Palestinian Arabic and who have acquired LA through their schooling in Arabic speaking schools since the age of 6. All had acquired Hebrew since the 2nd grade and were moderately to highly proficient in this language, to which they were highly exposed in their everyday life in the University. All participants had normal or corrected-to-normal vision, with no history of dyslexia, neurological or psychiatric diseases. They were all asked to provide an informed written consent before the participation to the experiment and were paid for their participation.

[3] There are also words shared by SA and LA, and there are others which are characterized by variable degrees of relatedness between the two forms that ranges from identical phonological representation in both varieties, to a phonological distance that alters both the phonemic and the syllabic structure of the words.

2.2 Stimuli and Procedure

The same stimulus set was used for the two experiments. This was composed of 180 words and 180 legal pseudowords in Arabic and Hebrew of which one third in SA (i.e. 60 words and 60 pseudowords), one third in LA and one third in Hebrew. Of note is the fact that SA and LA words were exclusive such that a word in one variety was never a word in the other variety (see examples in Appendix 1). All words were rated as highly familiar nouns in each language and pseudowords were created in each language condition by changing one or two letters in the word (consequently one or two sounds auditorily). It is worth noting here that the use of pseudowords was only intended to create a lexical decision task to assess the process of word recognition auditorily and visually. The possible effects of lexicality (i.e., difference between real words and pseudowords) were not in the focus of this study but all word and non-word conditions were analyzed at the behavioral level to test the validity of the used material in each language variety. For ERP analysis, only responses elicited by the real words were analyzed to test this work's predictions. In the selected word lists, the real word lists were equated on the average frequency/familiarity between languages. Thus, for the initial selection of the words, a first list that contained 321 randomized words was constituted (107 in each language condition), of which each word was rated for its frequency (familiarity in the respective language or language variety) by 46 adult volunteers using a 5 points scale (1 for non-frequent/non familiar and 5 for highly frequent/familiar). The average frequency for each item in each language variety list was computed and this allowed the selection of the 60 most frequent items in each language condition. These values were statistically compared using a one way ANOVA with three language conditions. This analysis showed that the stimuli did not differ in terms of word frequency (p = .88) with an average frequency of 4.3 (±0.32), 4.33 (±0.34) and 4.30 (±0.33) respectively in SA, LA and Heb.[4] Once selected, these items allowed the creation of the equivalent language lists of pseudowords. All the stimuli were then digitalized for the auditory lexical decision task using a male voice speaking the SA, LA and Hebrew. The digitalized words underwent computer processing, designed to equalize their volume, and their length as much as possible (with an average duration of ~1000 ms). In the average auditorily, SA words were of 0.89 s (± 0.14), LA words of 0.91 s (±0.18) and Hebrew words of 0.89 s (±0.19). Written words in all conditions varied between 3 and 6 letters in length. In the average, SA words were of 4.27 letters (±0.98), LA of 4.28 (±0.78) and Hebrew words of 4.13 (±1.04). In each experiment, the stimuli belonging to the different language and word conditions were then pseudo- randomized in a list that contained 360 stimuli. This list was then

[4] *Of note is the fact that we initially relied on Arabic speakers to rate also the Hebrew words, but because this is formally their second language, the average frequency for each of the words appeared a little low. Since it is a well-known fact the in the average second language words are of subjectively lower frequency than first language words, we passed the questionnaire to 10 Hebrew native students who rated them again and the frequency values reported here come from the Hebrew speakers and as seen indeed they compare to their equivalents in Arabic.*

divided into three equivalent sub-lists of 120 items each to form three experimental blocs, the order of which was balanced across subjects in each experiment. In addition, the order of the stimuli in each list/experimental block was randomized at each run for each participant.

In the auditory lexical decision experiment, the stimuli were presented to the subjects through earphones. Participants were instructed after the presentation of each stimulus (in the mixed list of SA, LA, and Hebrew spoken words and pseudowords) to respond using two button presses as quickly and accurately as possible whether each stimulus was a word or not (in Arabic or Hebrew). Each stimulation trial started by a fixation cross that appeared for 650 ms on the center of the screen in black over a white background, then the auditory stimulus was presented within an allowable response window of 2 s (with the fixation continuing to appear), and then a blank screen for about 1050 ms (varying between 950 and 1200 ms) as an inter-stimulus interval announcing the eminence of the next trial.

In the visual lexical decision task, participants in each trial saw a string of letters and were required to respond using two button presses as quickly and accurately as possible whether or not these letters constitute a word they know. Each trial started with a 500 ms fixation cross, followed by the stimulus during 150 ms. A blank screen appeared during 1850 to allow for the subject's response.

The participants were seated comfortably in front of a computer screen, approximately at 90 cm distance and were asked to perform a speeded lexical decision task (LDT) by pressing as quickly and accurately as possible using two keyboard keys. All participants responded with their dominant right hand. Half of the subjects in each experiment responded with their dominant major and index fingers for word vs non-word (pseudoword) and the other half responded using the inverse, major for non-words and index for words. All subjects in each experiment underwent the three experimental blocs (separated by a short break of ~3–5 min) the order of which was balanced across subjects. In addition, all underwent a short training session to familiarize with their task.

2.3 Electroencephalographic (EEG) Recordings and Analysis

The experiments were carried out in a quiet and sound attenuated room. EEG recordings were collected continuously using a 64 channel BioSemi Active Two system (www.biosemi.com) and the Active view recording software. 64 pin-type electrodes were mounted on a customized Biosemi head-cap (distributed all over the scalp according to the 10–20 international system) using an electrode gel. Additionally, two flat electrodes were placed on the sides of the eyes in order to monitor horizontal eye movements and a third electrode was placed below the left eye to monitor vertical movements and eye blinks. The EEG was collected reference free (i.e., the so called "Biosemi active electrodes") with a 0.25 high pass filter, amplified and digitized with a 24-bit AD converter, at 2048 HZ sampling rate.

The ERP epochs for trials with correct responses were averaged and analyzed off line for the two experiments using the Cartool software© (v.3.51; http://brainmapping.unige.ch). Briefly, the ERP epochs were filtered between 1 and 30 Hz and averaged separately for each word condition from −100 ms before the presentation of the auditory/visual stimulus to 700 ms post-stimulus. Before accepting the ERP epoch for each trial for which a correct answer was provided, the EEG data passed also a visual inspection to exclude trials with eye-movement artifacts and to exclude sweeps exceeding ±100 μV. After ERP averaging, the individual ERPs of each condition were down-sampled from 2048 Hz to 512 Hz, baseline corrected using the 100 ms pre-stimulus period, referenced to the average-reference (Lehmann & Skrandies, 1980) and averaged separately in each language to compute the grand-mean ERPs for SA, LA and Hebrew.

2.4 ERP Wave Shape Analysis

The individual ERPs were then subjected to a waveform analysis based either on exploratory statistical analysis or on the visual inspection of the superposition of the grand-mean waveforms. These analyses allowed determining the earliest time windows where reliable differences seemed to occur after stimulus onset. In order to assess statistically the data driven hypotheses based on the waveforms inspection, the signal for the period of interest and the electrodes of interest (see the Results section for details), both from subsets of left and right hemisphere recording sites, was extracted. This signal was then subjected to repeated measures analysis of variance (ANOVA) using language condition (SA, LA and Heb), hemisphere (left and right) and electrodes as within subjects' factors.

2.5 Behavioral Analysis

The median of the individual reaction times (RTs) for correct trials (>75% accuracy in all conditions in both experiments) was computed for each language condition separately for words and pseudowords conditions. This detailed analysis was done only for the purpose of verifying the validity of our tasks and the stimuli used here for the two experiments. In both experiments, we expected real words to be recognized faster than pseudowords as generally found in lexical decision tasks. For the RT measures, the response times below 250 ms were discarded from the individual computations. Individual values of the different RT measures were compared statistically between word conditions and language conditions using 2 × 3 ANOVA with word type (i.e., lexicality: word vs pseudoword) and language as within subjects' factors.

3 Results

In this section, behavioral and electrophysiological results will be presented first for the auditory lexical decision task and then for the visual lexical decision task.

3.1 Auditory Lexical Decision Task

Response Time Table 1 shows the mean RTs (±SD) over subjects for the different conditions in the three language conditions. The 2 × 3 repeated measures analysis of variance (ANOVA) performed on the subjects' individual median RTs showed a significant main effect of word type ($F(1, 42) = 282.39$, $p < .00001$) due to the fact that RTs were in the average faster for words (M = 1182 ms) than for pseudowords (M = 1392 ms). A significant main effect of language condition was also observed ($F(2, 84) = 69.85$, $p < .00001$) due to the fact that RTs increased gradually from SA through LA and Hebrew (in the average, M = 1238 ms, = 1298 ms and = 1326 ms respectively for SA, LA and Heb). A significant interaction between the factors was also found ($F(2, 84) = 7.37$, $p < .005$), due to the fact that the difference between word and pseudowords condition was not homogeneous across language conditions. Interestingly, the lexicality effect was larger here for SA (M = 229 ms) than for LA (M = 173 ms). More particularly for our purpose, the one-way ANOVA performed on RTs for the words only showed a highly significant language effect ($F(2, 84) = 45.68$, $p < .00001$). Post-hoc Fisher's LSD tests showed that RTs were shorter in SA than in LA ($p < .00001$) and in Hebrew ($p < .00001$), with the later two exhibiting no significant difference ($p = .89$, see Fig. 1).

Electrophysiological Results Due to a high number of eye movements and other artefacts in the auditory EEG data, 23 (16 women, 7 men) of the 31 participants were included in the following ERP analysis.[5] In order to identify the earliest ERP differences between language conditions, we first conducted an exploratory point-wise t-test analysis (see details of methods in Khateb et al., 2010; Taha & Khateb,

Table 1 Auditory lexical decision: Mean reaction times in ms. (±standard deviation, n = 43) for word and pseudoword conditions in the three languages: SA (Spoken Arabic), LA (Literary Arabic) and Hebrew (Hebrew)

	SA	*LA*	*Heb*
Words	1123 *(129)*	1211 *(138)*	1212 *(118)*
Pseudowords	1352 *(125)*	1384 *(133)*	1438 *(143)*

[5] *It is worth noting the re-analysis of the 23 subjects' behavioral data yielded very similar statistics on the RTs (not included here).*

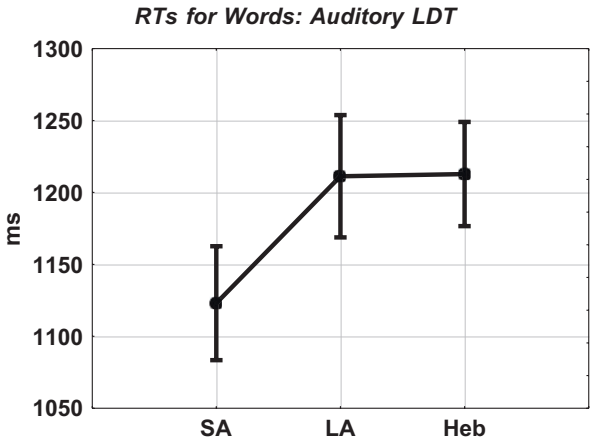

Fig. 1 Graph depicting the mean RTs (in ms.) in the auditory lexical decision task for the words conditions in the three language varieties: SA (Spoken Arabic), LA (Literary Arabic) and Hebrew (Hebrew). Vertical bars denote 0.95 confidence intervals

2013) on all electrodes and all time frames. This aimed at determining time points of reliable response differences between SA and LA, between SA and Hebrew and between LA and Hebrew after stimulus onset. This analysis (not illustrated here) showed that the earliest differences occurred at around 300 ms after word onset between SA vs LA and between SA vs Hebrew but not between LA vs Hebrew. Figure 2a illustrates the superposition of grand mean ERP traces from the different language conditions on a subset of left and right (anterior and posterior) electrodes which maximally depicted such differences. The traces on FC1 (upper left row) shows the P1-N1-P2 components' sequence as can be seen on the frontal electrodes. P1 occurred at around 130 ms, the N1 occurred at around 200 ms and the P2 occurred at around 300 ms. The posterior aspect of the P2 component showed the first reliable differences between SA and the other languages (see PO7 and PO8). The posterior aspect of the frontal P2 component was characterized by a negative response on the parieto-occipital electrodes (see blue shadow on Fig. 3a). In order to statistically assess these differences, we computed the mean signal in this time period between 280 and 330 ms from 3 left (P5 P7 PO7) and 3 right (P6 P8 PO8) posterior electrodes (see PO7 and PO8 in Fig. 3a, see inset in lower right panel). The 3 × 2 × 3 ANOVA performed on the P2 mean amplitude using language condition (SA, LA and Heb), hemisphere (left vs right) and electrode (3 sites) showed a significant language effect ($F(2, 44) = 7.7$, $p < .005$), and an electrode effect ($F(2, 44) = 14.0$, $p < .00005$), with no significant interaction between the analysis factors. The language effect was due to the fact that ERP amplitude to SA was on the average more negative (mean = −1.04 mV) than to LA (= −0.52 mV, $p < .005$) and Hebrew (= −0.48 mV, $p < .001$), with the later two not differing ($p = .83$). This finding is illustrated in Fig. 3b which shows a more negative response in SA than in the other language conditions on all tested electrodes.

A similar 3 × 2 × 3 ANOVA performed on the P2 mean amplitude on frontal electrodes (3 left, FC3, FC1, C1 and 3 right: FC4, FC2, C2, see examples of FC1 and FC2 in Fig. 2a) showed also a significant language effect ($F(2, 44) = 5.7$, $p < .01$),

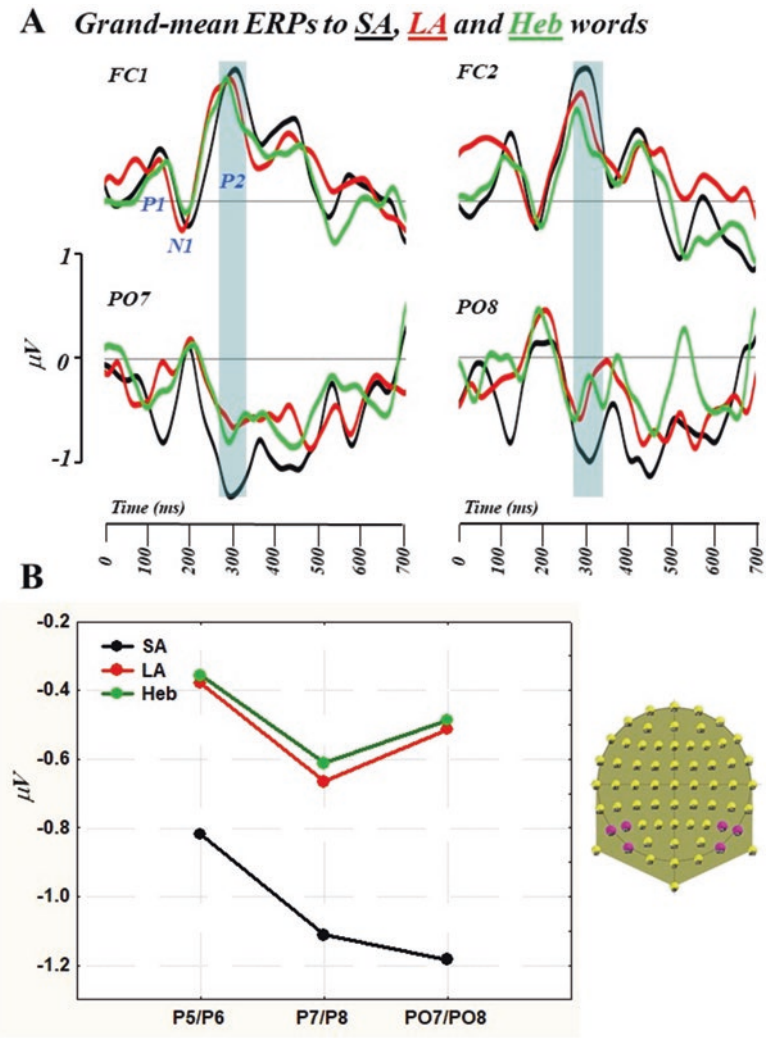

Fig. 2 (**a**) Superimposition of the grand mean ERP traces (from 0 to 700 ms post- stimulus) induced by SA words (black traces), LA words (red traces) and Hebrew words (green traces). The selected electrodes represent left (FC1) and right frontal (FC2) electrodes, left (PO7) and right (PO8) posterior electrodes where differences appeared maximally at the level of the P2 component. (**b**) Graph illustrating the mean signal for the P2 over left and right posterior electrodes as a function of language condition with SA (black) inducing responses being significantly different from LA (red) and Hebrew (Green, see text for statistics). Inset in the lower right shows the localization of the left and right posterior electrodes included in this analysis

and an electrode effect ($F(2, 44) = 22.6$, $p < .00001$), with no significant interaction between the analysis factors. Again here, the language effect was due to the fact that the frontal P2 response in SA was on the average more positive (mean = 1.03 mV)

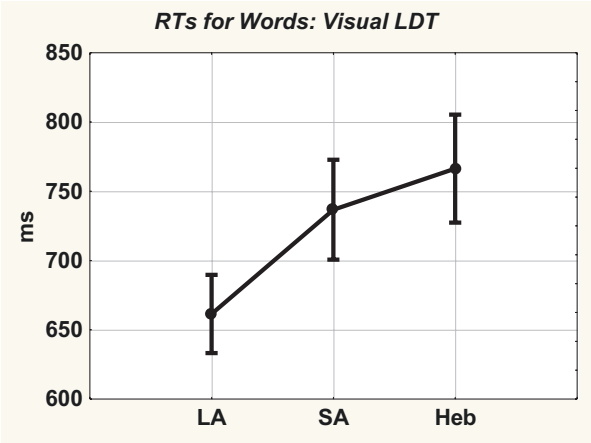

Fig. 3 Graph depicting the mean RTs (in ms.) in the visual lexical decision task for the for the words conditions in the three language varieties: LA (Literary Arabic), SA (Spoken Arabic) and Hebrew (Hebrew). Vertical bars denote 0.95 confidence intervals

than in LA (=0.82 mV, $p = .09$) and in Hebrew (=0.62 mV, $p < .005$), with the latter two not differing ($p = .11$).

To summarize, the results presented here showed that in terms of RTs, SA differed from both LA and Hebrew and behaved as the dominant language variety Electrophysiologically, the analysis of the participants' responses showed that the P2 component amplitude was larger in SA than in LA and Hebrew. Taken together, the results of this study in the auditory modality confirms that SA holds the status of the dominant language variety since SA and LA behaved differently during early the processing steps which seemingly strongly influenced word recognition speed and thus determined subjects' reaction times. During these early steps of information processing, LA which is acquired later in life and Hebrew which is the participants' formal second language behaved quite similarly.

3.2 Visual Lexical Decision Task

Response Times Table 2 summarizes the mean (±SD) of the subjects' median response time (RTs) for the different word types in the three language conditions. A 2 × 3 repeated measures analysis of variance (ANOVA) was conducted on the subjects' individual RTs with word type (2: word vs pseudoword, or lexicality) and language (3: LA, SA and Heb) as within subject factors. The analysis showed first a highly significant main effect of word type ($F(1, 44) = 65.48$, $p < .00001$) due to the fact that RTs were faster to words (M = 722 ms) than to pseudowords (M = 839 ms). This analysis showed also a highly significant main effect of language condition ($F(2, 88) = 25.22$, $p < .00001$) due to the fact that, in the average, RT augmented

Table 2 Visual lexical decision: Mean reaction times in ms. (±standard deviation, n = 45) for word and pseudoword conditions in the three language conditions: LA (Literary Arabic), SA (Spoken Arabic) and Hebrew (Hebrew)

	LA	*SA*	*Heb*
Words	661 *(94)*	737 *(120)*	766 *(130)*
Pseudowords	825 *(133)*	817 *(134)*	874 *(192)*

gradually from LA (M = 743 ms) to SA (M = 777 ms) to Hebrew (M = 820 ms). A significant interaction was also found between the two factors ($F(2, 88) = 12.21$, $p < .0001$) due to the fact that difference between words and pseudowords was again not homogenous. Interestingly, and contrary to the results in the auditory lexical decision, the lexicality effect was larger here for LA (M = 164 ms) than for SA (M = 80 ms). Of more interest for our purpose, the one-way ANOVA performed on median RTs for the words conditions only showed a highly significant language effect ($F(2, 88) = 45.49$, $p < .00001$). This was due to the fact that RTs were shorter in LA than in SA ($p < .00001$) and in Hebrew ($p < .00001$), and to the fact that RTs were also shorter in SA than in Hebrew ($p < .01$, see Table 2 and Fig. 3).

Electrophysiological Results Due to the presence of a high amount of artefacts in the EEG data of one subject, the following analysis was performed on 29 out of 30 recorded subjects. In order to determine time periods of possible reliable response differences between the three language conditions, we first conducted a visual inspection of the grand-mean ERP traces of the different conditions. As shown in Fig. 4a which illustrates a superposition of the traces from a subset of frontal and posterior recording sites from LA (Black), SA (Red) and Hebrew (Green), the earliest response differences occurred around the N1-P2 component complex (see labelling of P1-N1-P2-N2 on electrode PO8). In order to statistically assess these differences, we computed the mean signal in two regions of interests that included four left (P5, P7, PO3 and PO7) and four right (P6, P8, PO4 and PO8) posterior electrodes (see inset in lower right panel, Fig. 4b). From the individual averaged left and right traces of each participant in each condition, we determined the time points of the successive P1-N1-P2-N2 components.[6] The 3 × 2 ANOVA performed on the amplitude of each of these early components using language condition (LA, SA and Heb), hemisphere (left vs right) showed no significant language effects for the P1 and N1 components. In contrast, a significant language effect ($F(2, 56) = 4.74$, $p < .02$) and a hemisphere effect ($F(1, 28) = 74.76$, $p < .00001$) was found for the P2 component. As shown in Fig. 4b, the language effect was due to the fact that ERP amplitude to LA was on the average more positive (mean = 0.51 mV) than to SA (= 0.05 mV) and Hebrew (= −0.97 mV). A similar finding was also found for the N2

[6] These points determined from around 100 ms onwards refer to the first highest positive value around the P100 component (~100 ms) and its time latency, then successively the most negative for the N170 (~170 ms), then for the P2 and the N2.

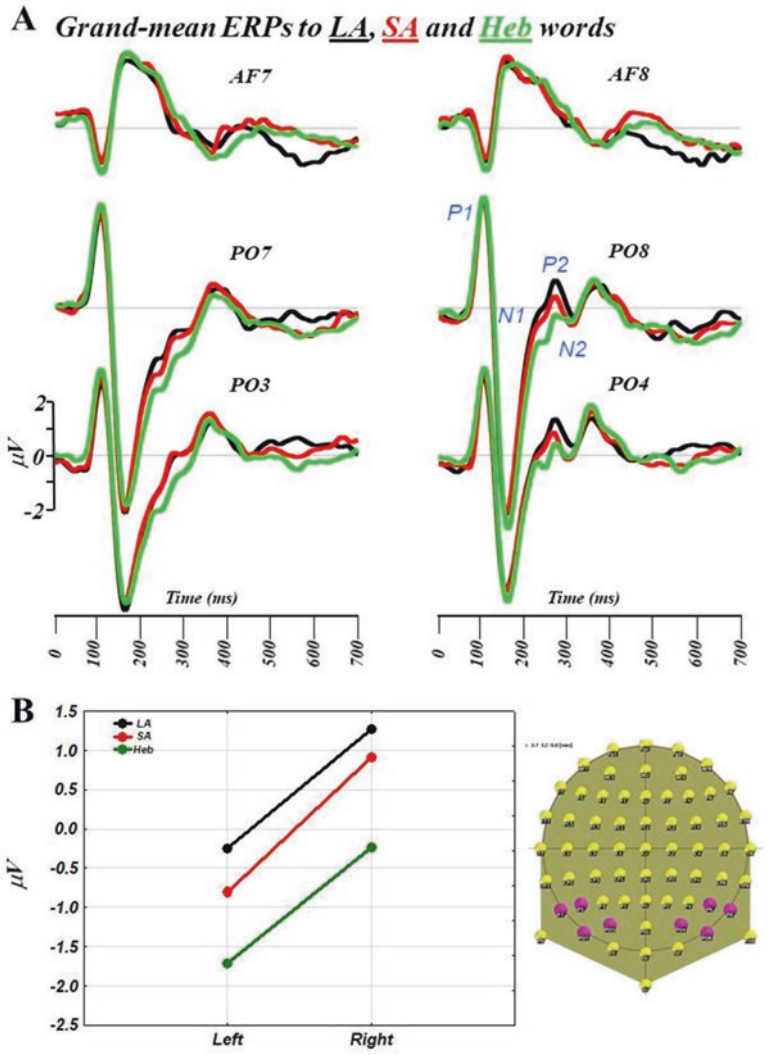

Fig. 4 (**a**) Superimposition of the grand mean ERP traces (from 0 to 700 ms post- stimulus) induced by LA words (black traces), SA words (red traces) and Hebrew words (green traces). The selected electrodes represent left (AF7) and right frontal (AF8) electrodes, left (PO7 and PO3) and right (PO8 and PO4) posterior electrodes where differences appeared maximally at the level of the P2/N2 components. (**b**) Graph illustrating the mean signal over the left and right regions of interest including 4 posterior electrodes showing a significant effect of language (and hemisphere) on the P2 component (black for LA, red for SA and Green for Hebrew, see text for statistics). Inset in the lower right shows the localization of the left and right posterior electrodes included in this region on interest analysis

component which demonstrated again significant language effect ($F(2, 56) = 3.78$, $p < .03$) and a hemisphere effect ($F(1, 28) = 11.86$, $p < .002$) due to a more positive signal in LA than in the other conditions. No effect of language was found for the time latency of either component. In the average in all conditions, the P1 occurred at ~105 ms, the N170 at ~173 ms, the P2 at ~250 ms and the N2 at ~300 ms.

To summarize, in terms of RTs, LA differed from both SA and Hebrew and behaved as the dominant language variety. The results of the P2-N2 complex showed a relation between the ease with which the words are recognized (as attested by RTs) and the amplitude of the response. Taken together, the results of this study in the visual modality indicated that LA holds the status of the dominant language variety both behaviorally and electrophysiologically during word recognition processes.

4 Discussion

Although some previous efforts have been devoted to investigate psycholinguistically the relationship between the two Arabic varieties, no previous research addressed the question of the brain basis of diglossia. In the diglossic Arabic-Hebrew bilinguals, previous investigations using behavioral measures only have suggested that the cognitive system treats LA differently than SA, which is the language variety acquired first by native Arabic speakers, and similarly to Hebrew, which is a formal L2 acquired later in life (Ibrahim, 2009). In particular, studies using auditory lexical decision assessing semantic priming suggested that SA behaved as the dominant language variety relative to LA and Hebrew as attested by the magnitude of the priming effects. Inversely, studies using visual presentation of LA, SA and Hebrew words (Bentin & Ibrahim, 1996) showed that LA behaved as the dominant language variety with SA ones behaving as LA low frequency words. Based on such previous evidence, we hypothesized that in the diglossic situation of Arabic, the status of SA and LA will be modality-dependent with SA functioning like an L1 and LA as L2 in the auditory modality and LA functioning as an L1 and SA as an L2 in the visual written modality. Because diglossia is a complex situation that must be tackled from the different angles of language production and comprehension, but still has not been investigated by means of functional brain measures, we first choose to rely on the these early findings related single word processing in the auditory and the visual modalities. Based on the hypothesis that the processing of the two varieties of Arabic in the brain of Arabic native literate speakers might mimic that of two different languages, the objective was to assess the neural responses differentiating SA and LA word processing by means of event-related potential (ERP) analysis in adult subjects. The reported studies aimed at providing for the first time both behavioral and electrophysiological evidence to test this prediction using the same type of task and the same linguistic material. In this lexical decision task, the participants' analysis of RT first showed a lexicality effect attested by the words' superiority effect in both varieties of Arabic and in Hebrew. This

expected effect is in line with previous data in the literature (Bentin et al., 1985; Coltheart et al., 2001; Forster & Chambers, 1973; Khateb et al., 2002) and confirmed the validity of the task and the used stimuli. The first prediction was that auditorily presented SA words would be processed faster than LA ones and that ERPs will show the correlates of this difference. The differences found here in RTs confirmed the first prediction. At the behavioral level, we found as expected that the response times were the shortest in SA and differed from both LA and Hebrew. These differences could be explained neither in terms of words' general familiarity in the Arabic language nor of word length since the words in all language conditions were equated in these respects. The fact that LA and Hebrew behaved similarly here in terms of RTs somewhat extends previous findings suggesting that, in certain instances, LA presents more similarities with Hebrew than with SA in the auditory modality (Ibrahim, 2009).

At the electrophysiological level, these first results were consistent with the behavioral findings presented above. The results showed that the earliest differences between language conditions appeared between words at around 300 ms after stimulus presentation, during a time period referred to here as to P2. The statistical comparisons of the ERP signals from SA, LA and Hebrew revealed reliable significant response differences between SA and both LA and Hebrew but not between LA and Hebew. In a previous lexical decision task involving first and second language words (Sinai & Pratt, 2002), ERP analysis in Hebrew-English bilingual speakers reported significantly longer latencies for N1 and P2 components to word pairs including L2, and suggested that different processing of L1 and L2 words occurred as early as during the stages associated with activation of the auditory cortex, but also showed difference during N400 between the two languages.

Although a more detailed analysis of the time course of the ERPs is still needed in order to better assess processing steps where SA and LA diverge and converge, the direct results which arise from the data in connection with the goals of this study are very conclusive. The fact that differences between the two forms of Arabic appeared both in terms of response speed and brain response amplitude is compatible with the history of acquisition of the phonological representations and words (Saiegh-Haddad & Haj, 2018; Saiegh-Haddad et al., 2020) in these different language varieties, and with the frequency of exposure to them in the auditory modality in everyday life. These findings confirm the dominance of SA in the auditory modality and support results from previous studies that suggested that SA words behave as L1 ones (Ibrahim, 2009; Ibrahim & Aharon-Peretz, 2005; Ibrahim & Eviatar, 2009).

As for the visual lexical decision task, the results presented here also confirmed the study prediction. In fact, RT analysis showed that using the same stimuli in the visual modality led to faster recognition of LA words. ERP analysis in parallel showed a modulation of the P2-N2 components which reflected the ease with which words were identified in the different language conditions. Previous observations in ERP literature show a modulation by word frequency of ERP response during the 150–300 ms time period (Hauk et al., 2006; Hauk & Pulvermuller, 2004; Proverbio et al., 2008). Differences during this time period were also reported between L2 vs

L1 in ERP analysis (Khateb et al., 2016). Hence, it appears plausible to suggest that these differences are mainly due to the visual familiarity/frequency of exposure to words in LA. This interpretation is also compatible with the history of acquisition and the patterns of use of LA words which are more frequently used (and the participants are more often exposed to) in the visual written modality. In fact, it is generally assumed that written transliteration of SA words has no accepted upon standard form in Arabic. Hence, one can predict that recognition of frequent LA words proceed from print to semantics using the lexical-semantic route based on word patterns while recognition of written SA words will be realized through the slower non-lexical phonological route, through a process of grapheme to phoneme conversion (Coltheart, 2005; Taouk & Coltheart, 2004). In functional brain imaging literature, one of the explanations raised to account for the differences observed between the processing of L2 vs L1 written words was the difference in proficiency in L2 compared to L1, the age of acquisition of L2, or the difference in subjective frequency of L2 words (Abutalebi, 2008; Abutalebi & Green, 2007; Perani & Abutalebi, 2005). This interpretation is certainly true here for words in Hebrew which showed the larger difference with LA both in terms of RTs and ERP response amplitude. However, for SA written words, and due to the currently widespread use of SA in non-formal written communication in social media, it is possible to predict that this change would lead to a minimization of the differences between LA and SA, a process which is certainly occurring in our participants. In line with this prediction, the results presented here suggest that despite the fact that the study participants were supposed to be quite highly proficient in Hebrew, their formal second language and to which they are highly exposed in their everyday life as students, they still recognized and processed more efficiently SA than Hebrew words. Future research should examine the long terms effects of the use of SA words in written electronic communication. Altogether and more importantly to our purpose, the results of the visual lexical decision task confirmed the prediction that in the visual modality, due to the history of acquisition and patterns of use of the written language, LA holds the status of the dominant language variety.

The pattern of RTs and electrophysiological response differences in the auditory and visual lexical decision tasks using SA, LA and Hebrew words confirmed the prediction and previous findings in the literature that the status of SA and LA in the cognitive system of native literate Arabic speakers is modality-dependent. In particular, in the visual written modality, LA words, the language variety acquired later in life and used for reading and writing and for formal communication, were processed faster and more efficiently than SA ones. In line with these conclusions, two different other studies using ERP analysis during single word and sentence processing during semantic tasks provided similar results. In the first study (Shehadi, 2013), behavioral and ERP measures were analyzed during the processing of semantically related and semantically unrelated written word pairs in SA and LA. While RTs were faster to LA than SA word pairs, ERP showed a more negative N400 component and a delayed response peak latency in SA compared to LA words, mimicking other L2 vs L1 effects reported in the literature. In the study using sentence semantic judgement task in SA and LA (Khazen, 2016), both semantically incongruent

word endings in SA and LA elicited again a more negative N400 response and a delay in its peak latency in SA compared to LA words. As for the N400, it was shown that this component amplitude was globally more negative in SA than in LA. This effect, which observed after both semantically congruent and incongruent sentence endings in SA, was interpreted as reflecting the ease/difficulty with which semantic integration processes take place in written SA sentences. This interpretation is strengthened by the observation of a delayed peak latency in SA, consistent with the claim of LA functioning as the dominant language variety in the visual modality. Taken together, all these results again confirm that the history of acquisition and the patterns of use are clearly the factors that determine how the brain processes the different types of information it receive from whatever modality. Along these lines, a recent fMRI study that analyzed the processing of LA, SA and Hebrew words using a semantic categorization task confirmed these observations (Nevat et al., 2014). In this first functional study on Arabic diglossia, it was found that RTs were faster to LA than to SA and Hebrew. The comparison of brain responses between SA and LA revealed differences that mimicked activation patterns found in comparisons of L2 vs L1 word conditions. In particular, an increase of activation was found in SA relative to LA (and not the inverse) in several language and left hemisphere areas.

Because diglossia is a complex linguistic phenomenon that must be addressed through the different modalities and contexts of language use including comprehension and production, a first study was also conducted by means of functional MRI to investigate picture naming in SA and LA in a mixed diglossic context and compared SA and Hebrew in a mixed bilingual context. In this completely different linguistic register (Abou-Ghazaleh et al., 2018), this study showed that naming in SA was slightly easier than LA, but was considerably easier than in Hebrew. fMRI analysis showed no difference when comparing brain activation between SA and LA. In contrast, Hebrew compared to SA revealed activation differences that could be interpreted both in terms of recruitment of language control modules and of second-to- first language effects. In a subsequent study, the aim was to assess the extent to which language control modules are engaged during language switching between SA and LA, in comparison to switching between SA and Hebrew (Abou-Ghazaleh et al., 2020). For this purpose, naming in SA in the bilingual SA-Hebrew mixed context, and in the diglossic SA-LA mixed context was compared to the simple naming context. The comparison of picture naming in SA in different contexts was predicted to reveal differences related to language control processes. The analysis of fMRI revealed significant effect of context that involved four main areas sensitive to the naming contexts (namely the left inferior frontal gyrus, the precentral gyrus, the supplementary motor area (SMA) and the left inferior parietal lobule). Analysis of these areas, together with two other areas (the left caudate nucleus and the anterior cingulate cortex) hypothesized to participate to language control (Abutalebi et al., 2008) revealed very striking findings. The comparison of SA naming in the diglossic context relative to the simple pure SA naming revealed a higher activation in all areas. These results appeared to support Abutalebi and Green's (2016) adaptive control hypothesis that predicts changes to the control demands of

language use as a function of the context requirements. Also, the findings suggested that in order for language control areas to be recruited, a high level of lexical competition should exist. This was actually the case when SA and LA were mixed, hence no difference in activation was found when comparing the activation of SA and LA in the same context (Abou-Ghazaleh et al., 2018). The findings regarding SA and LA in fMRI analysis during production in picture naming task contrast with those reported by Nevat et al. (2014) using visual word stimuli, where more activation was found for SA relative to LA. These previous findings suggested that, for the unique diglossic population of native Arabic speakers, the first acquired SA could in the written modality 'look' like an L2. This same result for SA in the written modality (confirmed here in several ERP experiments at the level of single word processing) contrasts with the conclusions proposing that SA words and LA words are processed as L1 and L2 ones (Ibrahim & Aharon-Peretz, 2005; Ibrahim, 2009) and confirmed in the auditory lexical decision experiment reported here.

5 Conclusion

These apparent contradictions in the results strengthen the primary assumption that guided this work, according to which the place that SA and LA hold (as "L1" and "L2" or inversely) might change as a function of the language modality in use. Based on all the results discussed (and some presented here), we again propose, as previously claimed (Nevat et al., 2014), that literate native speakers of Arabic who master the use of both SA and LA in everyday life function with two first languages: One in the auditory modality (SA) and one in the visual written modality (LA). During a language production tasks, the available data suggest that SA and LA might behave very similarly, although competitively (since sharing different linguistic features including particularly at the phonological/articulatory and lexical-semantic levels) as two first languages. Actually, despite their ability to manage the use of these "two first languages"/two language varieties, it appears that, when they are pushed to perform a lexical selection (at the single word level) in a "forced mixed diglossic mode", naming in each variety becomes a very competitive process that requires the engagement of language control mechanisms. Back to the question of whether Arabic diglossia is a form of bilingualism, the response is neither direct nor unequivocal. The observation here that SA and LA exchange places as L1 and L2 according to the modality used do not allow to conclude that they represent two separate linguistic systems. The cognitive status of each of the Arabic varieties seems to depend on several parameters that include (among other things) the nature of the task's demands, the linguistic register, the individuals proficiency in both varieties, the modality of presentation of the stimuli (auditory vs visual) and the type of processing (reception vs production, etc.). Given that we are only just starting out in this area of research, the conclusions raised here might not seem warranted. Hence, future research directions should not only investigate this issue in a wide range of modalities at the level of single word processing, but also at the

sentence level, during reading, listening, and discourse production and control for individual language proficiency in both varieties and each modality. A better understanding of the representation of, and interactions between, the two language varieties of Arabic is not crucial only for a greater understanding of Arabic diglossia itself but also of the human cognition and language experience in general.

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Appendix 1: Examples of Words Used for LA, SA and Hebrew and Their Phonetic Translation

LA	*SA*	*Hebrew*	*Referent*
/ʔanf/أنف	/xuʃum/ خُشُم	/ʔaf/אף	Nose
/dalw/دَلو	/saṭˤel/ سَطِل	/dli:/דלי	Bucket
/na:fiða/ نافذة	/ʃubba:k/ شبّاك	/ħalo:n/חלון	window
/miʕˤaf/ مِعطَف	/kabbu:t/ كبوت	/miʕi:l/מעיל	coat
/sari:r/ سرير	/taxet/ تَخت	/mita/ מיטה	bed
/θiya:b/ ثياب	/ʔawaʕi:/ أواعي	/bgadi:m/בגדים	clothes

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A Longitudinal Comparison of Spelling and Reading Comprehension of Bidialectal and Monolingual Dutch Speaking Children in Primary School

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1 Introduction: The Sociolinguistic Context of Dutch Limburg

The research question posed in this chapter is how bidialectal acquisition affects the acquisition of literacy, in particular, spelling and reading comprehension. Is it the case that bidialectal children, like bilingual children, may lag behind monolinguals in reading comprehension (Papastefanou et al., 2019: 2)? We will first approach this question by discussing research of monolingual, bilingual, and bidialectal literacy development trajectories. Second, we will present new research in which we compare two groups of children (within the same cohort) in the Netherlands with respect to their reading and writing skills in Dutch at two points in time, namely when they attended grade 2 of their primary school and four years later in grade 6. The two groups contain either monolingual Dutch speaking (n = 632) and/or dialect speaking children (n = 773). These dialect speaking children grew up in both dialect and Dutch simultaneously as two home or first languages from birth onwards (§1.1.) and are therefore labelled bidialectal. What makes this study unique is that bidialectal children in the Netherlands do not acquire basic literacy concepts in their dialect

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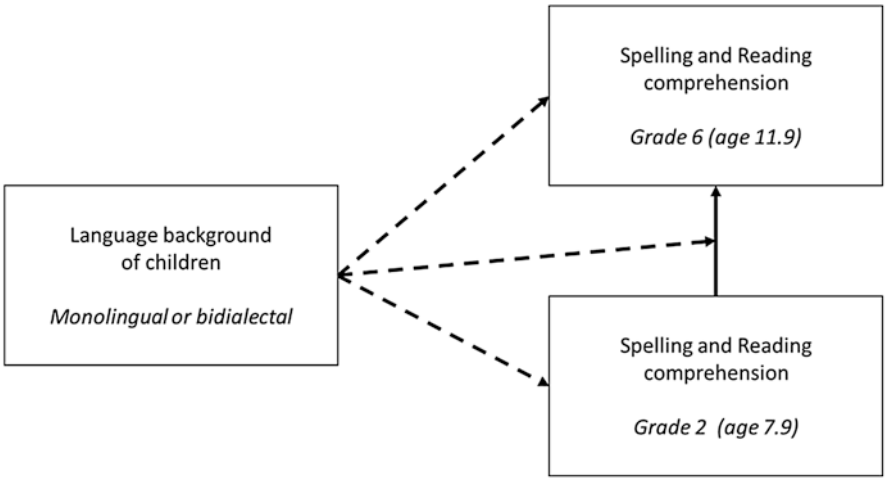

Fig. 1 Relations to be analyzed in this study

since dialect is transmitted only orally to the next generation in the home domain, and is neither a medium of instruction nor a subject in education in preschool and primary school. So the bidialectal children in our sample only acquire literacy skills in Dutch. Therefore, we take into account the number of (children's) books at home or borrowed from the library since we assume that the availability and function of print provides indirect insight into the introduction of "literary forms" at home that "help to promote children's path into literacy" (Bialystok, 2007: 58). Moreover, the number of books is taken as an indication of socio-economic background (cf. Hanushek & Woessmann, 2011) (Fig. 1).

The children were selected in the Dutch province of Limburg, bordering on Germany and Belgium (see Fig. 2). Limburg has about 1.1 million inhabitants in an area of 2200 square kilometers, and a population density of 520 inhabitants per square kilometer, which is slightly above the average population density in the Netherlands of 502 inhabitants per square kilometer (Statistics Netherlands, 2018).

A decade ago around 900,000 people or 75% of the population of Limburg (Driessen, 2016: 103) claimed to speak a *dialect* or *plat* (in lay terms). The Netherlands, a signatory of the 1992 European Charter for Regional Languages or Languages of Minorities (ECRML), extended minor recognition (under part II) to the dialects in Limburg in 1997 (Camps, 2018). Since this recognition, all dialect varieties spoken in Dutch Limburg belong to a regional language labelled *Limburgish.* Limburg constitutes a fluid multi-dialectal region (Cornips et al., 2016), i.e., the dialects spoken throughout Limburg are no clearly demarcated entities that can be neatly distinguished from another linguistically or can be counted. In this paper, in accordance with the European Charter, we will use the term *Limburgish*; the label *dialect* is used when writing from the perspective of its speakers.

In the Netherlands as a heavily standardized nation-state a monolingual standard language ideology is omnipresent: parents, teachers, politicians, journalists, and

Fig. 2 The location of the province of Limburg in the Netherlands. (Figure adapted from https://commons.wikimedia.org/wiki/Atlas_of_the_Netherlands#/media/File:Map)

Municipal Health Services (GGD) monitoring preschools believe that growing up as a bidialectal and/or bilingual child hinders ultimate attainment of Dutch, because Dutch is always considered to be or become the weakest language (Bialystok, 2007) when growing up bidialectally. Media in Limburg promptly report correlations between being bidialectal and/or bilingual acquisition and low literacy skills. The editor of the provincial newspaper *De Limburger* reported in his editorial comment in 2015: "De combinatie van dialect spreken, achterstandssituatie en gebrek aan stimulering thuis om te gaan lezen kan ervoor zorgen dat laaggeletterdheid in

Limburg een structureel karakter krijgt." (*The combination of speaking a dialect, low socio-economic family status and little parental encouragement to children to read, might cause low literacy to become a structural phenomenon in Limburg*).

The language situation in Limburg reveals both individual and societal bidialectism i.e. diglossia in the terms of Fishman (1967). Language ideology in the wider society of Limburg carries with it that the national and majority language, i.e. Dutch, should be spoken and written in educational and public contexts (Cornips, 2020). Dutch is taught in schools as a subject and is the language for factual teacher-student and in-classroom student-student communication, although in preschools Limburgish appears to be used to comfort children during free play in and outside the building (Cornips, 2020). Limburgish is thought to be suitable in the public domain to 'promote' culture and 'heritage' in associations, and 'behind the front door' in the private domain.

A standard orthography resembling Dutch orthography has developed; it was first practiced in the 1940s and became the basis for the normative orthography for all dialects and was published in 2003. The 2003 orthography, although standard, is not uniform for the different dialects, leaving space for orthographic variation, especially in the notation of the different vowels (See Camps, 2018 for an extensive discussion). The 2003 orthography also follows the same orthographic convention as for Dutch. However, writing in Limburgish according to the 2003 orthography is practiced by a few Limburgian authorities only (Camps 2018). Limburgish is an *oral* regional language: people do not write in Limburgish and if they do on social media, they use a lot of spelling variation and/or mix Limburgish with Dutch and English in their sentences (Jongbloed et al., 2017; Nguyen & Cornips, 2016).

The distinction between Limburgish and Dutch has psychological reality (Watson, 2013: 237), for people in Limburg although they are linguistically two very closely related language varieties. Nevertheless, they may differ to some extent at all grammatical levels: lexicon, phonology, morphology, and syntax (Cornips, 2013). Most dialects spoken in Limburg belong to the so-called *South Low Frankish* (Südniederfränkish) or *East Low Frankish* (Oostnederfrankisch in Dutch tradition) (cf. Hermans, 2013: 336–356). At the phonological level, Dutch and Limburgish are almost identical: they only differ in a few short vowels, diphthongs, and consonants (Bakkes et al., 2003). Some phonological correspondences between Dutch and Limburgish are for example that in the dialect of Kerkrade a verb like 'to make' is pronounced as /mɑxə/ and in Dutch /mɑkə/ i.e. Dutch /k/ corresponds to dialect /x/. Speakers from Kerkrade also pronounce /tsʌu/ 'closed' with /ts/ converging with Dutch /t/ as in *toe* /tu/ 'closed'. Further, the velar voiced fricative is realized as /j/ in onset position converging with Dutch /ɣ/. Generally, dialect speakers in Limburg pronounce the vowel in the word /tit/ 'time' as /i/, converging with Dutch /ɛi/, and they pronounce a palatal, postalveolar fricative /ʃ/ in onset in many dialects which corresponds to Dutch /s/.

Other than in Dutch, some Limburgian dialects have a contrast between two tonal accents: Accent1 and Accent2 (Hermans, 2013). As Ramachers (2018: 13) notes "a word prosodic contrast can signal lexical and morphological differences". In the Dutch dialect of Roermond, for example, *haas* [haːs] with falling pitch (accent

1, also called Stoßton, ‘pushtone’) means ‘hare’, whereas *haas* with falling-rising pitch (accent 2, also called Schleifton, ‘dragging tone’) means ‘glove’. In a small number of frequent nouns, pitch differences also serve a grammatical function with accent 1 systematically indicating plurality: *knien* [kniːn], with accent 2 meaning ‘rabbit’, but pronounced with accent 1 meaning ‘rabbits’.

Morphologically, Limburgish differs especially in diminutive and plural formation and in the use of congruent complementizers, and syntactically in the wider use of reflexives and the use of a three-way grammatical gender (M, F, N) system compared to the two-way one (C, N) in Dutch. Finally, Dutch and Limburgish share many cognates such as Dutch *konɛin* and Limburgish *kniːn* (‘rabbit’), Dutch *nøys* and Limburgish *naːs* (‘nose’), and Dutch *kɛrk* and Limburgish *kɪʁək* (‘kirk/church’). The high percentage of cognates (80%, see Blom et al., 2019) may enhance lexical-phonological awareness. On the other hand, Limburgish also differs from Dutch at the lexical level, such as Limburgish *haas* ‘glove’ versus Dutch *handschoen* ‘glove’. There has so far been no quantification yet of the different words in the lexicon used by children or adults in absolute numbers or in percentages. This is a consequence of the lack of structural financial support for conducting linguistic research on a regional minoritized language compared to the financial support for Dutch as the majoritized language.

1.1 Language Choice at Home in Limburg

In order to find out whether Dutch and/or Limburgish are acquired as a first language i.e. as a home language, a Limburgish version of the Questionnaire for Parents of Bilingual Children (PaBiQ, COST Action IS0804, Tuller, 2015) in the so-called CoDEmBi-project (Cognitive development in emerging bilingualism; see Blom et al., 2017; Francot et al., 2017) was administered by means of a telephone interview with *the parents* of 182 children in Limburg (68 girls, 114 boys) between the ages of 4 and 8.

Table 1 shows that all parents (n = 182) report that their child uses Dutch at home and 56 percent of the same parents report that their child also uses Limburgish at home; these children therefore speak both Dutch and Limburgish as first languages

Table 1 Reported home languages by parents (n = 182) in Limburg

Parents (N = 182) PaBiQ COST Action IS0804	Does your child speak *Dutch*?	Does your child speak *dialect*?	Does your child understand *dialect*?
Yes	100%	56,6%	98,4%
No		40,1%	1,1%
Sometimes		3,3%	
Other languages: English, Thai, Dari, Swahili, German, Lithuanian, Polish, Brabantic			

Table 2 Spare time reading by parents in Limburg

Parents (N = 182)	Never/Sometimes	Often/Daily
Mother	31.3%	68.7%
Father	40.6%	48.4%

Table 3 Reading behavior vs. storytelling of parents towards their children in Limburg

Parents (N = 182)		Never	1x per week	Every day
Reading aloud	*Dialect*	95.6%	3.8%	–
	Dutch	6.0%	25.8%	67.6%
Telling stories	*Dialect*	56.6%	13.2%	29.7%
	Dutch	34.6%	24.7%	39.6%

at home. Table 1 also shows that children in Limburg may grow up as monolinguals using Dutch, but never as monolinguals using Limburgish, as all Limburgish speaking children are also reported to acquire Dutch as a first language (bidialectism).

Moreover, we asked the parents about their reading behavior at home. Table 2 provides the parents' answer to the question 'Do you read in your spare time?' Mothers appear to read more on a daily basis than fathers. In Table 3, the question 'Which language practices do you engage in with your child and in which languages?' shows that parents never read aloud to their children in Limburgish although they do tell stories in Limburgish. Of course, the low percentage is not surprising since there are hardly any books for children available in Limburgish, thus, parents have to do an on-the-spot oral translations from Dutch into Limburgish when reading aloud.

2 Theoretical Background

Three different processes are involved in learning to read and write (Bossers et al., 2015). The first one concerns 'low-order processes' involved in recognizing and identifying incoming information. At first, readers and writers of an alphabetic language learn to recognize and identify grapheme for grapheme, then word for word and then sentence for sentence. When learning to read, readers identify words in an indirect manner via sounds, and those sounds are combined to reveal the words of the text. The second process concerns understanding and interpreting incoming information. In 'high-order processes' knowledge of the world is used and connected to the content of the reading and writing materials. The third and final reading process concerns the regulation of reading and writing strategies such as scanning, skimming, global reading, and intensive reading. Readers use and regulate these strategies to extract specific information which they are looking for (ibidem).

Children who learn to read identify words in an indirect manner via their sound: words are activated through children's explicit knowledge of phoneme-grapheme structures (Bialystok, 2007: 59). The process of phoneme-to-grapheme conversion is facilitated by phonological awareness which "refers to the ability to reflect on, and manipulate, the sounds of the spoken language" (Öney & Durgunoğly, 1997: 1) "in a systematic manner" (Verhoeven, 2007: 427; Papastefanou et al., 2019). Phonological awareness is, for instance, responsible for the discrimination between phonemes within syllables and words, the segmentation of words into syllables and phonemes, the deletion, addition, or replacement of phonemes within syllables and words and rhyming (Verhoeven, 2007). Since phonological awareness is related to one's awareness of the sound structures of a language (Anthony & Francis, 2005), it is not only necessary for reading comprehension and writing processes to develop, but is also one of the best predictors of reading acquisition (Öney & Durgunoğly, 1997).

The way in which phonological awareness develops can be divided into separate stages. First, a child's sensitivity towards sound structures becomes more fine-tuned. Then a child learns to distinguish between different phonemes, syllables, and rhymes. Finally, children learn to recognize and detect phonemes within intrasyllabic word units (Treiman & Zukowski, 1991). Another universal process, which readers of alphabetic orthographies experience, is a boost in phonological awareness skills when a child starts learning to read and to write. At this point, a child starts learning the alphabet and is now able to map the spelling of the individual alphabet and letters onto the phonemes of the phonological system of her/his language. This process also makes a child more aware of the phonological system of the language. According to the literature reviewed in Bialystok (2007), monolingual children develop literacy skills when they show (i) oral proficiency in the language of literacy, (ii) conceptual development establishing the concepts of sound, word, and the function of print before they can read, and (iii) metalinguistic insights, such that they have become aware of the phonological forms of the literacy language (Bialystok, 2007: 41).

The influence of being *bilingual* on phonological awareness has been studied by Chen et al. (2004), Campbell and Sais (1995), and Bialystok et al. (2003). A study by Chen et al. (2004) found that children speaking Cantonese-Mandarin have a phonological awareness advantage in onset, rhyme, and tone over monolingual Mandarin speaking children. According to Chen et al. (2004) bilingual children have to focus more on phonological differences between words, because both Mandarin and Cantonese are tone languages, whereas monolingual Mandarin speaking children only need to focus on the semantic differences within one and the same language. Because of this, bilingual children have more advanced phonological awareness skills. Similar results were found by Campbell and Sais (1995) who studied 5-year-old Italian-English speaking bilinguals and English-speaking monolinguals, who had to carry out several phoneme deletion tasks. The bilingual children were younger than the monolingual children, which makes the explanation of a phonological awareness effect even stronger. Bialystok et al. (2003) found that the similarity of sound structure and orthography between languages may influence the role of phonological awareness in bilingual children. They examined

Chinese-English bilingual, Spanish-English bilingual, and monolingual English speaking children. They conducted a longitudinal study and tested the children at three points in time: first before literary instruction (in kindergarten), second after the children started learning to read (grade 2), and third during the early stages of reading (grade 3). The most complex task was to replace the first sound in a target word with the first sound from another word to produce a new word. For example, the word "cat" could be converted to "mat" by substituting the first sound of "mop" into the target word. The results showed no differences for the monolingual and bilingual children. However, in the phoneme segmentation task, in which children were asked to decipher the number of phonemes in words, the three groups differed from each other. Spanish-English bilinguals scored highest and Chinese-English bilinguals scored lowest and the monolingual English children performed better than the Chinese-English bilinguals. So, similarity in sound structures between specific languages like English and Spanish and orthography affect phonological awareness rather than the phenomenon of bilingualism (Bialystok et al., 2003). Positive transfer can take place within languages that are more alike on the orthographical and phonological level such as Spanish and English. Finally, Loizou and Stuart (2003) argued that bilingualism is only related to phonological awareness when the second language is phonologically less complex than the first language.

To conclude, regarding bilingual effects on the development of literacy skills, Bialystok argues on the basis of a thorough literature review that looking for a so-called bilingual advantage in phonological awareness "has produced a variable set of effects and a list of conditions on when those effects might occur. There is some advantage to bilingual children in learning about the sound structure of spoken language, but the advantage is mitigated by the age of the children (which is likely confounded with literacy instruction), the nature of the task, and the language pairs in the bilingual mix. Bilingualism itself appears not to fundamentally alter the development of phonological awareness." (2007: 69).

The question arises whether bidialectalism may have a stronger effect on the development of literacy skills, since bidialectal children are exposed to language pairs which are typologically very similar, including the respective sound structures, and in the case of written languages, also a similar orthography. Vangsnes et al. (2015) investigated the literary development of bidialectal older children instructed in the two Norwegian written standards, namely the majority variety Bokmål and the minority variety Nynorsk. The written standards follow the same orthographic conventions. They examined the scores on a standardized national test in reading, arithmetic and English, obtained by The Norwegian Directorate for Education and Training, which tests a variety of cognitive skills from about 240,000 pupils in 5th, 8th, and 9th grade (age 10, 13, and 14, respectively) between 2009 and 2012 in 416 municipalities. The results revealed that pupils from municipalities with a high use of Nynorsk do better in national tests including reading than Bokmål municipalities, which led the authors to conclude that growing up with Nynorsk is a significant predictor of better school achievements. Comparable to Bokmål and Nynorsk, Dutch and dialects in the Netherlands, including Limburgish, are very close and as far as they are written they share the same orthographic convention.

Dutch by the way has a more consistent orthography than English (De Jong & Van der Leij, 1999). Probably because of the transparency of grapheme-phoneme correspondences (De Jong & Van der Leij, 1999), it is predominantly phonics that is used as a teaching method in the Netherlands. Driessen (2016) examined whether monolingual Dutch speaking children differed from bidialectal speaking pupils, considering the proficiency in Dutch and mathematics test performance of 3639 grade 2 children (about 5 years of age) from 437 Dutch primary schools. The bidialectal children included pupils speaking at home the minority language Frisian, the regional language Limburgish and Low-Saxon, and numerous dialects like the ones in the Brabantic area. Proficiency in Dutch and mathematics was examined on data collected in 2014 by the national standardized language and mathematics test developed by CITO (see also §4). No correlation was found between monolingual or bidialectal speaking children regarding proficiency in Dutch and mathematic test performance.

Regarding literacy acquisition in Dutch Limburg, Francot et al. (2017) investigated whether 128 monolingual Dutch and bidialectal Dutch-Limburgish speaking children between 5 and 9 years old differed in their knowledge of Dutch vocabulary, by using the standardized Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 2005, see Table 1). The results showed that bidialectal children and monolingual Dutch speaking children did not differ in receptive vocabulary in Dutch. An important result of this study was that a newly-developed expressive vocabulary task in Limburgish showed extensive variation between the bidialectal children, which did not support a dichotomous distinction between monolingual and bidialectal children.

Taken together, it seems that concerns in public and educational contexts about bilingual and bidialectal children lagging behind monolingual children in the acquisition of literacy skills in the dominant language are not entirely justified, also because a bilingual or bidialectal advantage includes a more variable set of effects and conditions. The next section will present data from a current study that will provide more insight into the question as to whether bidialectal and monolingual children in Limburg do indeed differ in the acquisition of literacy skills.

3 Comparing Test Scores in Spelling and Reading Comprehension Between Monolingual Dutch and Bidialectal Limburgish and Dutch Children

3.1 Research Question and Hypotheses

Against the background of prior research as discussed in the previous section, the research question of the present study is as follows: Do monolingual Dutch and bidialectal Limburgish-Dutch speaking children in the Netherlands differ in their test results of spelling and reading comprehension at two time points during primary school (grades 2 and 6), as well as in their growth rates between these time points?

Our study uses longitudinal data taken from a large-scale data collection embedded within a wider program (*Educatieve Agenda Limburg*). We will first describe the basic features of the tests used in the Dutch system and the way in which we define whether children are monolingual or bidialectal. Subsequently, we will discuss the specific features of the dataset and the selection of our sample, after which we describe our empirical approach and the variables used in more detail.

3.2 Test Scores Used and Language Definition

In the Netherlands, as of grade 1 (i.e. around the age of 6), after two years of kindergarten, children receive general formal education in reading and writing on a technical level (speedy and accurate word decoding). As of grade 2 they receive more specific formal training in the domains of reading comprehension and spelling. In grade 2 and grade 6, we can analyze whether bidialectal children, compared to children that are monolingual and only speak Dutch, perform differently on tests that make use of Dutch as a basis. In both grades, schools can use standardized tests for assessing children's language development. Several systems for such tests are available, but most schools use the tests from CITO (Dutch Central Institute for Test Development). We included test scores for spelling and reading comprehension in the present study since reading development across grades might be influenced by (in)consistency in spelling, i.e. by transparency of the orthography, and bilinguals may lag behind monolinguals in reading comprehension (Bialystok, 2007; Papastefanou et al., 2019: 2).

The CITO Spelling Test Grade 2 (2016) records the spelling abilities in Dutch of nouns, adjectives, verbs, and sentences (in dictation). In the test, 'active spelling' is measured without explicitly asking for the corresponding spelling rule (Tomesen et al., 2015; Van Boxtel et al., 2011; Jolink et al., 2015). The spelling test consists of two subtests, each containing 20 words, which are administered at two different moments in time. The teacher reads aloud each sentence and repeats the word that must be written down. In this way, doubt about the intended dictation word is almost non-existent and no illustrations are needed. In the complete spelling test battery from grade 1 to grade 6 the items increase in difficulty with respect to frequency, vowels, number of syllables, and word category (e.g. verbs are not tested in grade 2). Table 4 presents an overview of all categories (Tomesen et al., 2015).

Spelling might be taken as a measure of phonological awareness (Bialystok, 2007: 66). Phonological differences between Dutch and Limburgish concern, in fact, sound correspondences between Dutch and Limburgish and can be found in category 6 where Dutch *schr* might be pronounced in some dialects as /sj/, hence, with a palatal, postalveolar fricative /ʃ/; in category 17 where the diphthong /ou/ in Dutch is realized as [oə] before alveolar consonants in most dialects; and especially in category 14 where Limburgish speakers pronounce the vowel in the word *rijst* 'rice' as /i/, corresponding with Dutch /ɛi/; and in category 9 where the diminutive *-(t)je* in Dutch is most often realized as *-ke* in Limburgish. If the children

Table 4 CITO spelling test – grade 2: categories

Cat. nr.	Description	Example
5	words with more than two consonants in a row	*kunst* or *straat*
6	words with sch(r)-	*school, schrift*
7	words with -ng(-) or -nk(-)	*ring* or *bank*
8	words with f-, v-, s- or z-	*feest, veter, soep, zon*
9	diminutive with ending -je(s) or -tje(s)	*huisje* or *broertje*
10	words with -aai(-), -ooi(-) or -oei(-)	*haai, mooi* or *boei*
11	compound words	*wijnfles*
12	words with -eer(-), -oor(-) or -eur(-)	*beer, koor* or *deur*
13	words with ge-, be-, ver-, -te, -el, -er, -en	*gevaar, begin, verkeer, stilte, lepel, vlieger, boeken*
14	words with (-)ei(-) or (-)ij(-)	*trein* or *rijst*
15	words ending in -d(-)	*strand*
16	words on -a, -o or –u (sounds like /aa/, /oo/, /uu/)	*sla, stro* or *nu*
17	words with (-)au(w)- or (-)ou(w)-	*gauw* or *nou*
18	words with -ch(-) or -cht(-)	*pech* or *gracht*
19	words with -eeuw, -ieuw or -uw	*sneeuw, nieuw* or *duw*
20	words with open syllable	*boten*
21	words with closed syllable	*bruggen*

Table 5 CITO spelling test – grade 6: new categories compared to grade 2

Cat.nr.	Description
22	words with -f(-) to -v- and -s(-) to -z- change in plural e.g. *brief* > *brieven; muis* > *muizen*
29	words starting with ‘s, e.g. *‘s middags*
30	words ending in -tie, e.g. *infectie*
41	words ending in -isch, e.g. *tropisch*
45	material adjectives, e.g. *zilveren*

master basic concepts of phonological awareness in Limburgish, then reading in Dutch, the language in which initial literacy instruction takes place, will be facilitated (Bialystok, 2007: 66).

In the 20 items of the CITO Spelling Test Grade 6 (2012; part of the final CITO test) the spelling of both verbs and non-verbs is measured (Van Boxtel et al., 2011, Jolink et al., 2015). In Table 5 we present the categories that are new in the grade 6 spelling test compared to the grade 2 spelling test.

The spelling of verbs focuses on the correct application of the rules with respect to finite verb, infinitive, past participle, present participle, and adjectival participle.

The reading comprehension test reflects a child's understanding of a certain written text. The CITO Reading Comprehension Test Grade 6 (2012) focuses on the comprehension and interpretation of different text genres, such as articles, instructions, stories, and letters. Three types of tasks are presented: first, the pupils answer questions about (a part of) the text; second, they have to make a prediction about the content of the text on the basis of the title, a part of the text, or an illustration; and third, the text contains open spaces where words and/or sentences have been left out and the pupils have to choose the correct alternative. The CITO Reading Comprehension Test Grade 6 (2012; part of the final CITO test) consists of fiction and non-fiction texts with multiple choice questions at both a micro and a macro level (Van Boxtel et al., 2011; Jolink et al., 2015). Also so-called 'shuffle texts' are included, in which the sentences have been shuffled and the pupils have to put them in the correct order or to identify the first sentence of the text. Finally, 'text tests' form part of the spelling test: in these texts words or sentences have been omitted and the pupils have to choose from a selection of words/sentences which ones in terms of content and/or language use complete the text. In total, the reading comprehension test comprises 30 items.

Tests are taken yearly in the middle of the year and at the end, except in grade 6, where the end test is replaced by a different overall standardized test. Here we use the test scores of the middle of the year. The tests are administered and graded by the teachers who receive standardized coding schemes for this purpose. Teachers can choose between two versions of the test, depending on the child's basic level. Both versions first contain a module with a basic set of test questions. In addition, teachers can choose between one to two additional sets of questions, or modules, with a different level of difficulty of the two modules. Module 1 is a basic or easy follow-up module, to be worked out by the children who scored equal or lower than the average scores. Module 2 is an advanced follow-up module, to be made by children who scored higher than the average scores and need to be challenged. The data do not allow one to extract separately the basic module's score from the test scores. Overall so-called skill scores are provided by CITO, combining the basic module and the follow-up one. These are standardized scores for all tests, to facilitate the comparison of the different modules within one grade. We used these skill scores in the present study, and we used the overall score for either module 1 or module 2 per child.

We define children as monolingual or bidialectal based on the language(s) that they mostly speak with their parents, siblings, and friends. Children who are reported by their parents to only speak Dutch are labelled monolingual and children who are reported by their parents to speak both Dutch and Limburgish are labelled bidialectal. We do not include children who speak another language at home, albeit a different Dutch dialect, regional language, or another language (e.g. German, Polish).

3.3 Data Set and Sample Selection

For our study we used a subset of a unique dataset on the educational development of children in Limburg: the *Onderwijsmonitor Limburg* (OML). This dataset is part of an ongoing cooperative program between the regional government of the province of Limburg, regional school boards in primary, secondary, and vocational education, and institutes for higher education in Limburg: the *Educatieve Agenda Limburg* (EAL).[1] The aim of the program is to systematically collect information on the educational success of children in the region, and develop programs targeting learning difficulties (e.g. language or arithmetic difficulties) or regional challenges (e.g. early school dropout or inequality in education). The data collection was initiated in 2009 and supplements administrative data with test scores on language and calculation throughout primary school, and surveys among children, parents, and teachers at several moments during children's school career. Generally, these surveys take place at the end of kindergarten, the end of primary school or grade 6, and halfway during secondary education or grade 9, but in some years additional surveys were held in other grades of primary school. For this study we use a survey held in grade 4. Surveys are administered by the teachers in the schools, not by researchers, to be as close to regular school practice as possible. The surveys are also used for feedback to schools on school performance indicators (e.g. overall reading scores compared to other schools), so the schools acknowledge their importance. Parents can decide to withdraw from the survey by formally communicating this request. The data collection is approved by the Maastricht University inner city ethical committee (ERCIC_092_12_07_2018). A strong feature of the data is the participation of virtually all primary schools in the region in this project, implying almost complete coverage of children (about 95% of the regular primary schools participated in the program). Non-participating schools were in most cases either schools for special education (for students with special needs) or schools using alternative pedagogical approaches (e.g. Montessori, Jenaplan, Steiner). Some regular schools did not participate because they were unable to plan the survey activities.

We used data from one cohort of children, at two points in their primary school career. The children were in grade 2 of primary school in 2011–2012 and in grade 6 in 2015–2016, which was their final year of primary school. Children that failed to move up to the next grade were excluded. Failure rates in primary school were quite low and were not expected to bias our findings (Van Vuuren & Van der Wiel, 2015). We exploited the longitudinal character of the data to analyze differences between monolingual and bidialectal children in their test results at two points in time, as well as their growth rates in the domains of spelling and reading comprehension.

We took several steps in the selection of the sample for this study. First, we only selected children for whom we had information on the language that they mostly

[1] For more information, see http://www.educatieve-agenda.nl/onderwijsmonitor-p/english

Table 6 Number of children who took the spelling and reading comprehension tests in grade 2 and grade 6 and their mean scores, by module

	Spelling		Reading comprehension	
	Mid grade 2	Mid grade 6	Mid grade 2	Mid grade 6
Module 1 only Score mean (SD)	N = 97 115.94 (5.12)	N = 208 136.29 (4.12)	N = 392 3.69 (8.27)	N = 500 41.20 (9.62)
Module 2 only Score mean (SD)	N = 1473 124.46 (5.94)	N = 2010 148.62 (8.85)	N = 1171 21.74 (12.39)	N = 1668 69.38 (15.31)
Module 1 and 2 Score module 1 mean (SD) Score module 2 mean (SD)	N = 16 114.94 (5.63) 120.38 (4.51)	N = 3 137.33 (1.53) 139.00 (2.00)	N = 21 −2.57 (9.53) 16.14 (11.76)	N = 1 49 (.) 35 (.)
			Spelling	Reading
Module 1 in grade 2 and module 1 in grade 6			N = 27	N = 159
Module 1 in grade 2 and module 2 in grade 6			N = 67	N = 160
Module 2 in grade 2 and module 1 in grade 6			N = 106	N = 183
Module 2 in grade 2 and module 2 in grade 6			N = 1155	N = 815

Note: This table shows information on the observations per test type (by subject, by module, and by grade) plus mean scores of the groups with standard deviations of the mean provided in brackets

spoke with their parents, siblings, and friends. The total number of children of whom we had this information was 2853 observations. Second, we selected children of whom we had test scores on spelling and reading comprehension in both grades (as explained earlier). As mentioned before, next to the basic test module, teachers can choose to complement this by either an easy follow-up module (module 1) or an advanced follow-up module (module 2). For a small group of children (16 in grade 2 and 3 in grade 6) we had information on both modules within one year. We chose to focus on the results from module 1 in these cases, since we observed that module 2 turned out to be too difficult for these children, as their mean scores were below those of the others (see Table 6). The reason why teachers also administered the easier module was probably to get a better understanding of the child's language skills. Table 6 shows the number of children taking the different modules, within one grade, and the mean score of the different groups as well as the different combinations over time that we observed in the data. For 1405 children we have either spelling or reading test scores from grades 2 and 6.

3.4 Approach and Other Variables Used

The main aim of this study is to test the relations between being bidialectal and test scores in spelling and reading comprehension of the children in grades 2 and 6, as well as their growth rates between the two grades in these domains, as shown before in Fig. 1. We test these relations by using linear regressions, using various model specifications. Our main independent variable is a dummy variable of whether the child is bidialectal, taken from the parental questionnaire in grade 4. About 55

percent of the children is characterized as bidialectal (i.e. speaking both Dutch and Limburgish). We first estimate a baseline or raw model, only including this dummy variable:

$$\text{Model 1}: Y_j = \beta_{0j} + \beta_{1j} Bidialectal + \varepsilon_j \qquad (1)$$

The variable Y_j includes various outcomes for both spelling and reading comprehension: (a) the grade 2 test score; (b) the grade 6 test score; and (c) the growth rate in the test score between grade 2 and grade 6. β_{0j} refers to the constant of the model, and ε_j denotes the error term. This model shows a baseline relation between being bidialectal and these outcomes, or β_{1j}, and in model 2 we test whether controlling for some basic demographic background variables alters this baseline relation:

$$\text{Model 2}: Y_j = \beta_{0j} + \beta_{1j} B + \beta_{2j} Age + \beta_{3j} Sex + \beta_{4j} Books + \varepsilon_j \qquad (2)$$

The demographic variables in this model include age, gender and the number of books at home as a proxy for socio-economic background. Age is measured in years when the child is in grade 2 and derived from the birth date taken from the school's student administration (M = 7.9, SD = 0.43). Gender is taken from the school's student administration (46,8% is boy). Following other studies (cf. Hanushek & Woessman, 2011), we included the number of books at home as a proxy for socio-economic background, and as an indirect insight in "literary forms" at home that "help to promote children's path into literacy" (Bialystok, 2007: 58). Since there is no literacy tradition in Limburgish the number of (children's) books at home or borrowed from the library may be expected to provide indirect insight into whether the children are exposed to literary forms in Dutch in the home domain. Francot et al. (2017) and Blom et al. (2017) already showed by means of the standardized PPVT that bidialectal children in Limburg were as orally proficient in the language of literacy, i.e. Dutch, as monolingual Dutch speaking children. The questions concerning the number of books were asked in a questionnaire taken in grade 4. The information is available for 954 children, as not all parents completed the questionnaire. Three types of questions were asked: (a) the number of general books at home (measured on a 5-point Likert scale, with 1 = 0–10, 2 = 11–25, 3 = 26–100, 4 = 101–200, 5 = 201 or more; M = 2.9, SD = 1.20); (b) the number of children's books at home (measured on a 5-point Likert scale, with 1 = 0–10, 2 = 11–25, 3 = 26–50, 4 = 51–100, 5 = 101 or more; M = 3.1, SD = 1.06); and (c) the number of children's books monthly borrowed from the library (measured on a 4-point Likert scale, with 1 = none, 2 = 1–5, 3 = 6–10, 4 = 11 or more; M = 2.2, SD = 0.81). Table 7 presents the mean of the book variables and a t-test of the differences

Table 7 Number of books at home, by language groups (Mean and SD)

	Monolingual	Bidialectal	t-test
Number of books at home	3.14 (1.26)	2.77 (1.13)	4.85***
Number of children's books at home	3.26 (1.09)	3.05 (1.03)	3.05***
Number of books borrowed from the library per month	2.17 (0.86)	2.20 (.077)	−0.52

Note: Statistical significance is shown as follows: * for $p < 0.10$, ** for $p < 0.05$, and *** for $p < 0.01$

between the groups of monolingual and bidialectal children. Table 7 shows that the bidialectal children have significantly fewer (children's) books at home, but borrow an equal number of books from the library monthly. In the main analysis we will use the number of general books at home, but we will check for different results when using the other variables.

Finally, for all outcomes, we check for interactions between the main independent variable (being bidialectal) and the demographic variables (models 3–7). This might inform us on possible differences between demographic groups as to the relation between being bidialectal and test scores in spelling and reading comprehension. In the following section, we will first show the results for spelling, after which we show the results for reading comprehension.

4 Results

4.1 The Relation Between Language Background and Test Scores in Spelling

In our study we first examine the relation between the language background of the children and their performance on the spelling tests in grade 2 and 6. Table 8 shows the regression coefficients and standard errors of the relations between the independent variables and the test score in spelling in grade 2 (panel a) and the test score in spelling in grade 6 (panel b) for the various models as explained in section 3.4. To allow a comparison of the coefficients between models, we only present those models here that we have restricted to the sample of those respondents only for whom all relevant variables are non-missing. Table 8 shows that children who are bidialectal score higher on the spelling test in grade 2, also when we control for basic demographic background characteristics (models 1 and 2). On average, bidialectal children score 1.3 points higher on the spelling test in grade 2 compared to monolingual Dutch speaking children. These results are significant on a 99%-confidence interval. Panel b of Table 8 shows that the positive relation between being bidialectal and test scores in spelling is a bit weaker in grade 6, and only significant on a 90%-confidence interval.

Model 2 also shows the relation between background characteristics and the test scores in spelling, and in models 3–7 we test to what extent these relations differ between monolingual and bidialectal children. In both grades, children who are slightly older, perform less well on the spelling test. This could be because these older children have failed classes before grade 2 and were perceived as 'less ready for formal education' as of grade 2 in comparison to other children. According to the Kindergarten teachers this means that the older children had somewhat greater difficulties with focusing and were more eager to play. Interestingly, this negative relation between being older and test scores in spelling is weaker for children who are bidialectal. In addition, in grade 2 we observe that girls score on average 0.9

Table 8 Estimation results (regression coefficients and standard errors) for the relation between language background and test scores in spelling in grade 2 and grade 6

[a] Outcome: test score spelling in grade 2							
	General models		Models with interaction terms				
	Model 1 (N = 912)	Model 2 (N = 912)	Model 3 (N = 912)	Model 4 (N = 912)	Model 5 (N = 912)	Model 6 (N = 911)	Model 7 (N = 909)
Bidialectal	1.27*** (.406)	1.27*** (0.407)	−10.99 (7.261)	1.33** (0.593)	4.24*** (1.071)	2.04 (1.274)	2.34** (1.145)
Age in years		−2.03*** (0.465)	−2.84*** (0.670)	−2.03*** (.466)	−2.02*** (0.463)	−1.94*** (0.465)	−2.13*** (0.462)
bidialectal × age			1.56* (0.923)				
Girls		0.92** (0.399)	0.96** (0.399)	0.98 (0.603)	0.98** (0.398)	0.87** (0.399)	0.91** (0.399)
bidialectal ×girls				−0.11 (0.806)			
# books at home		0.21 (0.169)	0.21 (0.169)	0.21 (0.169)	0.72*** (0.239)		
bidialectal ×books					−1.00*** (0.334)		
# children's books						0.58** (0.278)	
bidialectal × children's books						−0.23 (0.380)	
# books from library							0.61* (0.345)
bidialectal × library books							−0.52 (0.491)
Constant	123.35*** (.304)	137.25*** (3.860)	143.62*** (5.390)	138.15*** (3.803)	135.45*** (3.890)	135.34*** (3.936)	137.40*** (3.809)
[b] Outcome: test score spelling in grade 6							
	General models		Models with interaction terms				
	Model 1 (N = 912)	Model 2 (N = 912)	Model 3 (N = 912)	Model 4 (N = 912)	Model 5 (N = 912)	Model 6 (N = 911)	Model 7 (N = 909)
Bidialectal	1.17* (0.620)	1.18* (0.616)	-25.99** (10.979)	1.37 (0.898)	4.17** (1.627)	4.34*** (1.934)	1.17 (1.738)
Age in years		−4.11*** (0.705)	−5.92*** (1.012)	−4.12*** (0.706)	−4.10*** (0.704)	−4.10*** (0.705)	−4.25*** (0.700)
Bidialectal × age			3.46** (1.396)				
Girls		0.98 (0.604)	1.06* (0.604)	1.17 (0.913)	1.04* (0.604)	0.96 (0.605)	0.95 (0.606)
Bidialectal × girls				−0.35 (1.220)			
# books at home		0.48* (0.256)	0.47* (0.255)	0.48* (0.256)	0.99*** (0.362)		

(continued)

Table 8 (continued)

bidialectal × books					−1.01* (0.507)		
# children's books at home						1.03** (0.421)	
bidialectal × children's books						−1.02* (0.577)	
# books from library							0.81 (0.524)
bidialectal × library books							−0.09 (0.745)
Constant	146.86*** (0.464)	176.19*** (5.848)	190.30*** (8.150)	177.12*** (5.760)	174.38*** (5.910)	174.32*** (5.973)	177.10*** (5.778)

Note: Each column represents a separate model. For model specifications see Sect. 4.4. Statistical significance is shown as follows: * for $p < 0.10$, ** for $p < 0.05$, and *** for $p < 0.01$

points higher on the spelling test compared to boys, which is significant at a 95%-confidence interval. The gender difference is no longer significant in grade 6, nor do we observe a difference between monolingual and bidialectal children. Finally, as for the relation between books at home and test scores in spelling, in the general model 2 we only observe a significant relation in grade 6. Children with more books at home (as an indication of higher socio-economic background) perform about 0.5 points higher on the spelling test in grade 6. Interestingly, the interaction models show that this relation is most strongly observed for children that are monolingual. When using the number of children's books, we do not observe any relation with spelling test scores in grade 2, but again a positive relation with test scores in grade 6 for monolingual children. Hardly any significant relations are observed when taking children's books borrowed from the library as a variable.

Next, we examined all these relations for the growth rate in spelling test scores between grades 2 and 6. Figure 3 shows this difference between the two tests scores both for monolingual and bidialectal children. As Fig. 3 shows, the growth patterns in spelling test scores between grade 2 and grade 6 are similar for the two groups of children.

Table 9 confirms the lack of a significant difference between the two groups of children in the growth rates in spelling between grade 2 and grade 6, using formal linear regression models. The models only show a significantly smaller growth for older children.

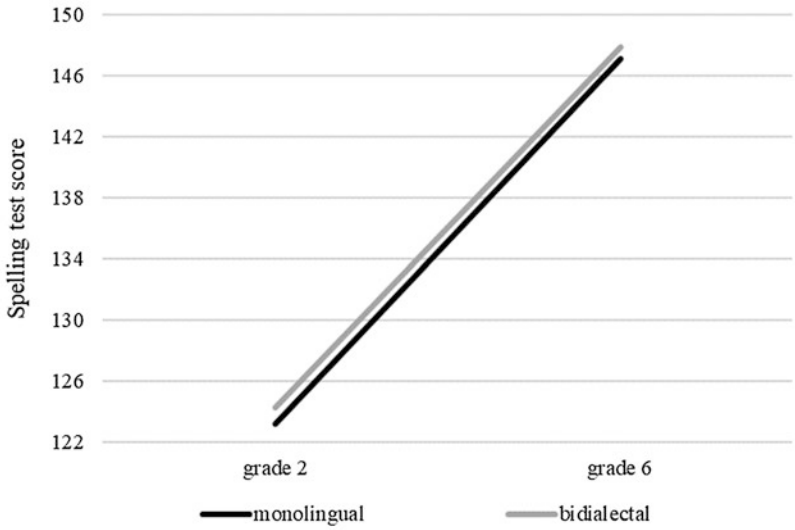

Fig. 3 Growth rates in spelling test scores between grade 2 and grade 6, by language background

4.2 The Relation Between Language Background and Test Scores in Reading Comprehension

To study the role of language background in reading comprehension, we took similar analytical steps as with spelling. Table 10 shows the regression coefficients and standard errors of the relations between the independent variables and the test score in reading comprehension in grade 2 (panel a) and the test score in reading comprehension in grade 6 (panel b) for the various models as explained in Sect. 3.4. Again, to allow a comparison of the coefficients between models, we only present those models here that we have restricted to the sample of those respondents only for whom all relevant variables are non-missing. Table 10 shows that children who are bidialectal score higher on the reading comprehension test in grade 2, also when we control for basic demographic background characteristics (models 1 and 2). On average, bidialectal children significantly score about 3 points higher on the reading comprehension test in grade 2 compared to monolingual children. When we look at the test scores in grade 6, this difference is no longer observed. Bidialectal and monolingual children perform in a similar way on this test.

Model 2 also shows the relation between background characteristics and the test scores in reading comprehension, and in models 3–7 we test to what extent these relations differ between monolingual and bidialectal children. The observed relations are generally similar to the results for spelling. Model 3 shows that in grade 2 a negative relation between being older and the test score in reading comprehension is discernible for children who are monolingual, but the interaction term shows that this relation is much weaker for children who are bidialectal. For bidialectal

Table 9 Estimation results (regression coefficients and standard errors) for the relation between language background and growth rate in spelling test scores between grade 2 and grade 6

	General models		Models with interaction terms				
	Model 1 (N = 912)	Model 2 (N = 912)	Model 3 (N = 912)	Model 4 (N = 912)	Model 5 (N = 912)	Model 6 (N = 911)	Model 7 (N = 909)
Bidialectal	−0.09 (.511)	−0.09 (0.516)	−14.99 (9.207)	0.04 (0.752)	−0.06 (1.365)	2.30 (1.620)	−1.17 (1.454)
Age in years		−2.08*** (0.590)	−3.07*** (0.849)	−2.09*** (.591)	−2.08*** (0.590)	−2.17*** (0.591)	−2.12*** (0.586)
bidialectal × age			1.90 (1.171)				
Girls		0.06 (0.506)	0.10 (0.506)	0.19 (0.764)	0.06 (0.507)	0.09 (0.507)	0.05 (0.507)
bidialectal × girls				−0.24 (1.021)			
# books at home		0.27 (0.214)	0.27 (0.214)	0.27 (0.214)	0.27 (0.304)		
bidialectal ×books					−0.01 (0.425)		
# children's books						0.45 (0.353)	
bidialectal × children's books						−0.79 (0.483)	
# books from library							0.20 (0.438)
bidialectal × library books							0.43 (0.623)
Constant	23.51*** (.382)	38.94*** (4.895)	46.68*** (6.834)	38.97*** (4.821)	38.93*** (4.957)	38.98*** (5.003)	39.70*** (4.834)

Note: Each column represents a separate model. For model specifications see Sect. 4.4. Statistical significance is shown as follows: * for $p < 0.10$, ** for $p < 0.05$, and *** for $p < 0.01$

children, there is no relation between age and test scores in reading comprehension in grade 2. In grade 6, we see that children who are slightly older perform less successfully on the reading comprehension test and that this is not significantly different between monolingual and bidialectal children. In grade 2 we observe that girls score significantly higher on the reading comprehension test compared to boys. This relation is stronger in comparison to that of spelling. For example, girls score about 3 points higher on the reading comprehension test in grade 2. These gender differences are not found in grade 6.

When we consider the relation between test scores in reading comprehension and the number of books at home, Table 10 shows that in both grades there is a positively significant relation, i.e. children who live in households with more books at home score higher on the reading comprehension test. The result is also observed when we look at the number of children's books at home, or the number of books borrowed monthly from the library. For the latter variable, we find that this positive

Table 10 Estimation results (regression coefficients and standard errors) for the relation between language background and test scores in reading comprehension in grade 2 and grade 6

[a] Outcome: test score reading comprehension in grade 2							
	General models		Models with interaction terms				
	Model 1 (N = 879)	Model 2 (N = 879)	Model 3 (N = 879)	Model 4 (N = 879)	Model 5 (N = 879)	Model 6 (N = 878)	Model 7 (N = 876)
Bidialectal	2.67*** (.934)	3.73*** (0.922)	−36.73** (16.504)	4.32*** (1.346)	6.40*** (2.456)	4.65 (2.912)	5.93** (2.635)
Age in years		−1.60 (1.056)	−4.38*** (1.546)	−1.62 (1.057)	−1.57 (1.056)	−1.81* (1.062)	−2.52*** (1.069)
bidialectal × age			5.15** (2.097)				
Girls		2.72*** (0.899)	2.82*** (0.897)	3.35** (1.379)	2.77*** (0.899)	2.40*** (0.399)	2.64*** (0.918)
bidialectal × girls				−1.10 (1.820)			
# books at home		2.52*** (0.382)	2.49*** (0.381)	2.53*** (0.382)	2.98*** (0.549)		
bidialectal × books					−0.89 (0.758)		
# children's books						2.79*** (0.645)	
bidialectal × children's books						−0.44 (0.867)	
# books from library							2.52*** (0.809)
bidialectal × library books							−1.53 (1.126)
Constant	16.04*** (.707)	16.37* (8.754)	38.20*** (12.459)	18.90** (8.631)	14.55 (8.890)	17.37* (8.974)	26.35*** (8.783)
[b] Outcome: test score reading comprehension in grade 6							
	General models		Models with interaction terms				
	Model 1 (N = 879)	Model 2 (N = 879)	Model 3 (N = 879)	Model 4 (N = 879)	Model 5 (N = 879)	Model 6 (N = 878)	Model 7 (N = 876)
Bidialectal	−1.20 (1.227)	0.31 (1.191)	−12.33 (21.397)	1.52 (1.739)	5.79* (3.169)	−0.51 (3.793)	4.30 (3.407)
Age in years		−5.22*** (1.365)	−6.09*** (2.004)	−5.27*** (1.366)	−5.15*** (1.363)	−5.65*** (1.383)	−6.74*** (1.382)
Bidialectal × age			1.61 (2.718)				
Girls		0.52 (1.161)	0.55 (1.163)	1.81 (1.782)	0.62 (1.161)	0.02 (1.180)	0.13 (1.187)
Bidialectal × girls				−2.24 (2.351)			
# books at home		4.01*** (0.493)	4.00*** (0.493)	4.03*** (0.493)	4.96*** (0.7.9)		

(continued)

Table 10 (continued)

bidialectal × books					−1.83* (0.978)		
# children's books at home						3.66** (0.840)	
bidialectal × children's books						−0.00 (1.129)	
# books from library							3.17*** (1.046)
bidialectal × library books							−2.54* (1.456)
Constant	62.69*** (0.929)	90.15*** (11.310)	96.97*** (16.148)	90.28*** (11.147)	86.39*** (11.472)	95.11*** (11.690)	108.47*** (11.358)

Note: Each column represents a separate model. For model specifications see Sect. 4.4. Statistical significance is shown as follows: * for $p < 0.10$, ** for $p < 0.05$, and *** for $p < 0.01$

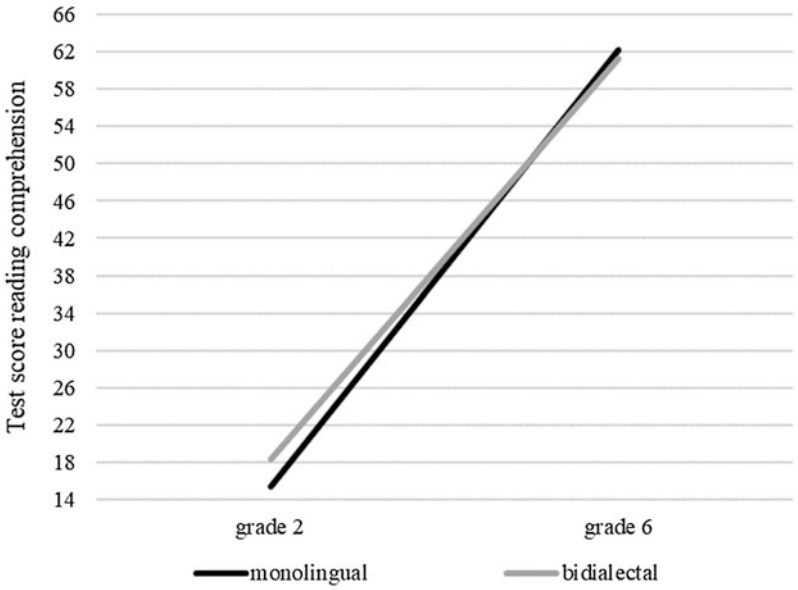

Fig. 4 Growth rates in reading comprehension test scores between grade 2 and grade 6, by language background

relation is smaller in grade 6 when children are bidialectal (model 7). For the relation between the other book-variables and test score in reading comprehension, no differences are observed between monolingual and bidialectal children.

Next, we examined all these relations for the growth rate in reading comprehension test scores between grades 2 and 6. Figure 4 shows the difference between the two tests scores both for monolingual and bidialectal children: the growth pattern in

reading comprehension between grade 2 and grade 6 is less steep for children who are bidialectal.

Table 11 confirms that bidialectal children have significantly lower growth rates in reading comprehension test scores between grades 2 and 6 in comparison to monolingual children. It also shows that children who are older and girls have significantly lower growth rates in reading comprehension between these two grades. Finally, Table 11 shows that children who have more (regular, i.e. non-children) books at home show significant higher growth rates in the reading comprehension test score between grades 2 and 6. This relation is not different between monolingual and bidialectal children, nor is it noticeable when we take the number of children's books at home or borrowed from the library into account.

5 Conclusion

The research question posed in this chapter is whether, and if so, how bidialectal acquisition affects the longitudinal acquisition of literacy in Dutch in the Netherlands, in particular with respect to spelling and reading comprehension. We have studied bidialectal children who speak both Dutch and the regional language Limburgish. Dutch and Limburgish are typologically very similar, including their respective sound structures. Limburgish is transmitted orally to the next generation in the home domain and is neither a medium of instruction nor a subject in preschool and primary school education. Consequently, the bidialectal children we looked at only acquire literacy skills in Dutch, which has a more transparent orthography than English.

We studied the data of the same children in grade 2 (mean age 7.9) and grade 6 (mean age 11.9) of primary school (n = 912 children for spelling and n = 879 children for reading). We also considered the number of (children's) books at home or borrowed from the library as an indicator of socio-economic background, which provides indirect insight in how children are supported at home in their development of literacy. To address the research question, we used a subset of a unique dataset on the educational development of children in Limburg, the *Onderwijsmonitor Limburg* (OML), which has existed since 2009 and supplements administrative data with test scores on language and math/calculation throughout primary school, and surveys of children, their parents and teachers at various periods during the educational years of the children.

The results of our study point to possibly two kinds of relations between speaking Limburgish and spelling and reading comprehension skills in Dutch by bidialectal children in primary school grades 2 and 6. Our findings show that regarding spelling skills, bidialectal children in grade 2 score significantly higher compared to monolingual Dutch speaking children. So, bidialectal children seem to profit from their oral proficiency in Limburgish in such a way that their acquisition of spelling skills in Dutch in initial literacy instruction is facilitated, which confirms the findings discussed in Bialystok (2007: 66). However, both groups score equally well in

Table 11 Estimation results (regression coefficients and standard errors) for the relation between language background and growth rate in reading comprehension test scores between grade 2 and grade 6

	General models		Models with interaction terms				
	Model 1 (N = 879)	Model 2 (N = 879)	Model 3 (N = 879)	Model 4 (N = 879)	Model 5 (N = 879)	Model 6 (N = 878)	Model 7 (N = 876)
Bidialectal	−3.86*** (1.062)	−3.43*** (1.067)	24.40 (19.139)	−2.81* (1.558)	−0.60 (2.842)	−5.16 (3.366)	−1.63 (2.952)
Age in years		−3.62*** (1.222)	−1.71 (1.793)	−3.64*** (1.224)	−3.58*** (1.223)	−3.85*** (1.227)	−4.22*** (1.198)
bidialectal × age			−3.54 (2.432)				
Girls		−2.20*** (1.040)	−2.27** (1.040)	−1.54 (1.596)	−2.15** (1.041)	−2.38** (1.047)	−2.52** (1.028)
bidialectal ×girls				−1.15 (2.107)			
# books at home		1.49*** (0.442)	1.51*** (0.441)	1.50*** (0.442)	1.98*** (0.636)		
bidialectal ×books					−0.94 (0.877)		
# children's books						0.88 (0.746)	
bidialectal × children's books						0.43 (1.002)	
# books from library							0.65 (0.907)
bidialectal × library books							−1.01 (1.261)
Constant	46.65*** (.804)	73.78*** (10.130)	58.76*** (14.448)	71.38*** (9.987)	71.84*** (10.288)	77.73*** (10.373)	82.12*** (9.840)

Note: Each column represents a separate model. For model specifications see Sect. 4.4. Statistical significance is shown as follows: * for $p < 0.10$, ** for $p < 0.05$, and *** for $p < 0.01$

grade 6, although there is no significant difference between the two groups in the developmental growth of spelling between grades 2 and 6. With respect to reading comprehension skills we observe similar patterns: bidialectal children score higher on the reading test compared to monolingual children in grade 2. But both groups score equally well in grade 6. In addition, bidialectal children progress less in reading between grades 2 and 6. We also note that bidialectal children benefit less in their reading comprehension from the number of books at home or the number of books borrowed from the library.

Table 12 provides a summary of observed relations in regression models: + (−) is positive (negative) significant relations, 0 is no significant relation)

The bidialectal advantage in grade 2 and its disappearance in grade 6 without any significant differences between them in the developmental growth of spelling

Table 12 Summary of observed relations in regression models

	Test score Spelling			Test score Reading comprehension		
	Grade 2	Grade 6	Growth	Grade 2	Grade 6	Growth
Bidialectal						
raw model	+	+	0	+	0	−
controlled for background	+	+	0	+	0	−
Age						
general	−	−	−	−	−	−
interaction with being bidialectal	+	+	0	+	0	0
Girls						
general	+	0	0	+	0	−
interaction with being bidialectal	0	0	0	0	0	0
# books at home						
general	0	+	0	+	+	+
interaction with being bidialectal	−	−	0	0	−	0
# children's books at home						
general	+	+	0	+	+	0
interaction with being bidialectal	0	0	0	0	0	0
# children's books from library						
general	+	0	0	+	+	0
interaction with being bidialectal	0	0	0	0	−	0

Note: + (−) is positive (negative) significant relations, 0 is no significant relation

between the two grades may be accounted for as follows. First, the structural correspondences in sound structure of Dutch and Limburgish may have influenced phonological awareness within the bidialectal youngest children only. Second, the high percentage of cognates between Limburgish and standard Dutch (80%, see Blom et al., 2019) very likely enhances lexical-phonological awareness. Finally, Dutch orthography is consistent and teachers in the Netherlands use phonics as teaching methods, in which they present concrete words to teach children the relevant grapheme-phoneme correspondences (De Jong & Van der Leij, 1999: 472). As Bialystok (2007: 67) argues, the advantage of phonological awareness interacts with the earliest phase of reading in primary school only and disappears later due to introductory formal teaching of reading which provides an "equalizing experience for all the children." Thus, the effects of phonological awareness on reading acquisition which provide a bidialectal advantage are limited to the early learning phases of reading and stabilize in later phases (De Jong & Van der Leij, 1999: 453).

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Between Varieties and Modalities in the Production of Narrative Texts in Arabic

Lior Laks and Elinor Saiegh-Haddad

1 Introduction

This chapter is a description of a research project that examines the distribution of language structures as reflected in actual language use in Arabic diglossia. Specifically, it examines grammatical differences between varieties and modalities in Arabic as reflected in narrative text production. With respect to variety distinction, the study compares Palestinian Arabic (hereafter PA), the spoken variety used for everyday speech, and Modern Standard Arabic (hereafter MSA); with respect to modality distinctions, we compare spoken texts produced in PA and in MSA, on the one hand, with those produced in written MSA. To illustrate, two variety-related differences are demonstrated in the sentences in (1) below. The two sentences were produced by the same 4th grade Arabic speaker depicting the same event, once in PA (a) and once in spoken as well as written MSA (b).

(1) a. ʔibin sˤaffi **waqqaʕni ʕa-l-** ʔ**ardˤ** (Spoken PA)
'mate class-my made-me-fall on-the-ground'
b. ʔibn sˤaffi **ʔawqaʕani ʔardˤ-an** (Spoken and Written MSA)
'mate class-my made-me-fall ground-accusative case'
"My classmate made me fall to the ground"
(Ahmad, 4th grade)

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(1a) was produced in PA, while (1b) was produced twice in MSA, once in the written and once in the spoken modality. Two differences stamp the variety-related differences of these utterances. These are the two different morphological forms of the verb 'made X fall' which share the consonantal root *w-q-ʕ* but surface in two different word patterns: *CaCCaC* in PA (*waqqaʕ*), and *ʔaCCaC* in MSA (*ʔawqaʕ*). The second is the two different morpho-syntactic forms of the phrase 'to the ground'. In PA the noun *ʔarḍ* 'ground' takes the definite article *l* and is part of a prepositional phrase headed by the preposition *ʕa* 'on', while in MSA it is indefinite and takes the adverbial case marker suffix *-an*. The current study examines such grammatical differences between varieties, as well as between modalities within the same MSA variety (spoken versus written) as manifested in actual text production by school graders and adults.

The development of writing and written language has over the past few decades become a topic of interest for theoretically motivated research going beyond primarily pedagogical or clinical concerns (See for example, Bereiter & Scardamalia, 1987; Halliday, 1989; Olson, 1994). A major impetus to such research in recent years has been the flourishing of the domain of "later language development" across the school years from middle childhood to adolescence (Berman, 2007; Nippold, 1998; Tolchinsky, 2004). Such studies underscore the lengthy developmental route to discourse-embedded command of linguistic forms and structures in general (Berman & Slobin, 1994) and the attainment of "linguistic literacy" in particular (Ravid & Tolchinsky, 2002). Importantly, recent research goes well beyond questions of writing as a notational system, the center of interest in the well-studied field of "emergent literacy", with the goal of investigating acquisition of the written language as a special style of discourse.

Studying language acquisition from the perspective of developing linguistic literacy is of crucial importance in contexts where there is a substantial linguistic distance between the spoken and written forms of language. Such a situation is particularly acute in the case of Arabic diglossia (Ferguson, 1959) where speech and writing typically involve use of two linguistic systems that differ markedly (Saiegh-Haddad, 2012, 2017, 2018) to a point where they have been shown to be cognitively represented as two distinct languages (Ibrahim & Aharon-Peretz, 2005; Khamis-Dakwar & Froud, 2007).

The goal of the project discussed in this chapter is to investigate the developing linguistic abilities of native speakers of urban dialects of PA from middle childhood to adolescence, as well as a group of adult students at universities/colleges, as reflected in the texts they construct in different genres (narrative and expository) in both Spoken Arabic, in our case PA, and in MSA in both speech and writing.

2 Language Development in Arabic Diglossia

2.1 Diglossia

In all literate societies, spoken and written languages are used in different sociocultural contexts, and the two forms of linguistic expression tend to be associated with different communicative conditions and distinct processing constraints,

involving such factors as clarity, speed, and effort in online versus offline output (Chafe, 1994; Olson, 1994; Slobin, 1977; Strömqvist et al., 2004). Yet, what appears unique to diglossia (although possibly applying to some extent in some other sociolinguistically analogous situations) is that the spoken and written language varieties are so remarkably distinct in lexicon, phonology, morphology, and syntax, that preliterate children find it very difficult, and in some cases impossible, to understand a story, or even an isolated utterance, when it is presented to them in the standard language.

Native Arabic speaking children are born into a linguistic context called "diglossia" which is "a relatively stable language situation in which, in addition to the primary dialects of the language there is a very divergent, highly codified (often grammatically more complex) superposed variety, which is largely learned by formal education and is used for most written and formal spoken purposes but is not used by any sector of the community for ordinary conversation" (Ferguson, 1959: 345). Though Ferguson proposes a dichotomy between a spoken and a written variety, the linguistic situation in Arabic diglossia has been described in terms of levels, or a continuum, with speakers shifting between as many as four (Meiseles, 1980) or five (Badawi, 1973) varieties, ranging between colloquial/vernacular and literary/standard forms, resulting in levels that are neither fully standard nor fully colloquial. As such, there are "gradual transitions" (Blanc, 1960) between the various varieties, and "theoretically an infinite number of levels" (Basiouny, 2009: 15).

In diglossic Arabic, children start out speaking a local variety of *Spoken Arabic* (hereafter SpA), the one used in their immediate environment: at home and in the neighborhood; once they enter school, at age 6 years, they are formally and extensively exposed to Modern Standard Arabic as the language of reading and writing while *Spoken Arabic* remains the language of informal speech. Academic school-related speech is conducted in a semi standard variety, Educated *Spoken Arabic* (Badawi, 1973), except in Arabic lessons, where MSA is more dominant, at least in aspiration (Amara, 1995). Outside the school milieu, there is a similarly stable coexistence of the two major varieties, each functioning for distinct spheres of social communication: Spoken Arabic is used by all native speakers: young and old, educated and uneducated, for informal and intimate verbal interaction in the home, at work, in the community, and so forth. On the other hand, MSA, alternating with Educated SpA, is expected to expected to be used for formal oral interactions, such as giving a speech or a lecture, and for writing (however, see, Abu Elhija, 2012; Al-Khatib & Sabbah, 2008; Haggan, 2007; Mostari, 2009; Palfreyman & Al-Khalil, 2007; Warschauer et al., 2002 for use of *Spoken Arabic* in electronic writing in Arabic). Thus, while *Spoken Arabic* is undoubtedly the primary language of spoken usage, native speakers of Arabic, including young children, are actively and constantly engaged with MSA as well. They pray, do their homework, and study for their exams in MSA, and they also watch certain TV programs and dubbed series in MSA. Thus, besides proficiency in using *Spoken Arabic*, linguistic proficiency in Arabic involves concurrent proficiency in using MSA, from an early age, both for reading and writing, and also for speech.

2.2 *Linguistic Differences in Arabic Diglossia*

Arabic diglossia was established, at the latest with the standardization of Arabic in the eighth and ninth centuries A.D. with the early grammarians producing a set of norms for the written form of the language that they called *fusha*. Over the course of many years, the continued use of this favored set of written linguistic norms led to substantial differences between the dynamic spoken varieties and the fixed written form, making the two linguistically distant, and engendered the notion that the written standard was the 'real language', while the other varieties were 'degenerate' and 'corrupt' versions (Maamouri, 1998). The linguistic distance between the spoken and the written varieties of Arabic is evident in all areas of structure and usage, including not only lexicon and phonology, but also syntax and morphology, as documented in a range of studies in the past several decades (see for example, Eid, 1990; Geva-Kleinberger, 2000; Hary, 1996; Henkin, 2010; Ibrahim, 1983; Kay, 1994; Levin, 1995; Meiseles, 1980; Rosenhouse, 2007, 2014; Myhill, 2014; Saiegh-Haddad & Henkin-Roitfarb, 2014; Saiegh-Haddad & Armon-Lotem, forthcoming; Versteegh, 1997, 2001; Wright, 1889).

Phonological differences between the two varieties are apparent in their phonemic and syllabic structure, phonotactic constraints, syllable weight and stress patterns (Aquil, 2011; Broselow, 1979; Jastrow, 2004; Watson, 1999, 2002). Morphologically, MSA and SpA differ markedly in inflectional categories, such as the absence in SpA of final short vowels indicating case and mood and of the preponderance of the genitive-accusative forms of duals and so-called "sound masculine plurals" (Holes, 1995, 2004). MSA has a rich morphological system of grammatical agreement contrasting with a far less varied and less complex system of agreement marking in SpA (Aoun et al., 1994; Aoun et al., 2010; Benmamoun, 2000; Brustad, 2000). Derivational morphology also reveals differences between the two varieties, primarily in the distribution and frequency of verbal patterns, with some patterns being less frequent and productive in MSA than in SpA (Benmamoun, 1991; Blanc, 1970; Bolozky & Saad, 1983; Fassi Fehri, 1994; Rosenhouse, 2002; Shawarbah, 2007; Younes, 2000). For example, the verb pattern *aCCaC* (Pattern IV) is hardly productive in PA, with a dictionary search revealing only 75 *aCCaC* verbs in PA, only 3.5% of all PA verbs (Laks, 2011, 2018). Syntactically, SpA and MSA vary in clausal word order; with VSO as the typical word order of MSA as against SVO in SpA (Bolotin, 1995; Fassi Fehri, 1993; Mohammad, 1989, 2000; Shlonsky, 1997). SpA, on the other hand, has a more complex system of lexical categories (parts of speech) than MSA, including an autonomous system of adverbs. The two varieties also differ in use of nominal constructions, with nominalizations being far more common in MSA than SpA (Laks & Berman, 2014; Rosenhouse, 1990, 2008). Moreover, at the intersection of morphology and syntax, the two varieties differ in processes of passivization with use of passive verbs being far more common in MSA than in SpA (Hallman, 2002; Holes, 1998; Laks, 2013). *Lexically*, SpA and MSA feature overlapping, yet different lexicons with approximately 80% of the spoken words in the spoken lexicon of young children (a dialect of PA) having

different lexical and lexco-phonological forms in MSA (Saiegh-Haddad & Spolsky, 2014).

Given the linguistic distance between SpA and MSA and the basic complementary distribution of how words and structures pattern in the two varieties, a given linguistic form can generally be identified as belonging to either SpA or MSA, with certain forms common to both varieties. For example, inflectional endings marking case and mood are used only in MSA, never in SpA, and negation relies on different sets of negation particles in SpA and MSA. On the other hand, processes of noun pluralization are similar in SpA and MSA, yet the same word may be pluralized differently in the two varieties (Saiegh-Haddad et al., 2011).

These linguistic differences have clear implications for language development in general and for acquisition of linguistic literacy in particular. Yet, the literature to date is almost totally lacking in psycholinguistic developmental research measuring (rather than only describing) linguistic differences between the two varieties of Arabic and investigating the consequences of such differences for language acquisition and usage. One exception is a recent study measuring the lexical distance between SpA and MSA in a dialect of Palestinian Arabic used in Central Israel: about 40% of the words in the spoken lexicon of kindergarten children had completely different lexical forms in MSA; another 40% consisted of partial cognates that had overlapping yet different forms in the two varieties (with differences ranging between one-to-seven phonological parameters, including phoneme substitution, addition, and deletion); and about only 20% had the same lexico-phonological form in both SpA and MSA (Saiegh-Haddad & Spolsky, 2014). The fact that only 20% of the words used by children aged 4–6 years maintain an identical surface lexical form in MSA is a compelling result – particularly in light of the finding that children found it difficult to recognize the lexical relatedness between SpA/MSA partial cognates even when the gap between the two forms consisted of a single phoneme. (Saiegh-Haddad, 2011; Saiegh-Haddad & Haj, 2018). These findings support the results of earlier studies demonstrating the difficulty encountered by preschool children as well as by adolescents speaking the same variety of Palestinian Arabic in operating on the phonological structure of MSA words – such as recognizing, isolating, or encoding a phoneme – when the same word had a different phonological form from that used in their SpA vernacular (Saiegh-Haddad, 2003, 2004, 2005, 2012; Saiegh-Haddad et al., 2011, 2020). These results have been shown to be argued to be related to quality of phonological representations in the lexicon (Saiegh-Haddad & Haj, 2018) and were shown to have cross-dialectal validity (Saiegh-Haddad, 2007). Further evidence from the scant research available in this domain demonstrating the difficulty schoolchildren have with linguistic structures that do not exist in their spoken vernacular is provided by the forced-choice grammaticality judgment study of Khamis-Dakwar et al. (2012) among schoolchildren, native speakers of Palestinian SpA, when presented with MSA linguistic structures. Recently, Laks and Berman (2014) measured morpho-syntactic differences between SpA and MSA as reflected in the speech and writing of adult native speakers of Jordanian Arabic; they found clear inter-modality linguistic differences

on a range of linguistic structures, including case marking, adverbials, dual forms, copula construction, nominalizations, aspect, and modalized prepositions.

3 Text Production as a Window on Language Development

Authentic, unedited text production has proven a valuable and methodologically valid tool for elicitation of a broad range of reliable data on language acquisition and development in different languages and contexts, both spoken (see Berman & Slobin, 1994; Labov, 1972) and written (Berman, 2005; Berman & Verhoeven, 2002; van Hell et al. 2008; Verhoeven & van Hell, 2008). Such studies yielded robust, age-sensitive data across a range of linguistic dimensions, including careful controlled comparisons of spoken and written usages in different languages (for Hebrew – Berman & Ravid, 2009; for French – Jisa, 2004; for Swedish – Strömqvist et al., 2004; Johansson, 2009). For example, in lexical usage, written texts differed from their spoken counterparts both in lexical density (the proportion of content words to total number of words) and lexical diversity (the ratio of different words to total number of words, so-called type-token ratio), with written texts more lexically dense and diverse. Such differences between the lexical properties of texts in speech and writing emerged as significant at all age-groups included in the large-scale crosslinguistic project in which the current study is anchored, including 9-to-10-year-old 4th-graders, 12–13-year-old middle school students, as well as high-school 11th-graders and university graduate level adults (Strömqvist et al., 2002). Other studies in this same framework that compared written and spoken texts in English and Hebrew demonstrated a range of differences in lexical usage (Berman & Nir, 2011a, b), in reliance on non-referential auxiliary material like repetitions, disfluencies and discourse markers (Ravid & Berman, 2006), as well as in level of usage or linguistic register (Ravid & Berman, 2009).

Beyond language variety, an important variable in examining text production abilities is that of genre. Narrative texts, arguably the most universal and earliest acquired type of extended discourse, were the first to be employed in this domain, providing important age-sensitive insights into children's grammatical and lexical knowledge from young pre-school age and into adolescence (Berman, 1997; Berman & Slobin, 1994; Hickmann, 2003; Labov, 1972). Subsequent research, including studies referred to above, went beyond narrative discourse to examine non-narrative, expository type discourse, largely, though not exclusively, in the written medium (e.g., Berman & Nir, 2009; Jisa & Viguié, 2005; Ravid, 2005). Such studies, without exception, demonstrate the early developing psychological reality of the distinction between narrative and expository genres of expression in the linguistic forms of expression selected for each of these contrasting types of discourse. The psychological reality of genre effects was manifest in linguistic expression across different languages and in a variety of linguistic constructions, including verbal structures (Ragnarsdottir et al., 2001), subject-NP patterning (Ravid et al., 2002), and lexical usage (Strömqvist et al., 2002). For example, narrative texts

triggered use of the past tense and of perfective aspect (where relevant) whereas expository texts were associated with reliance on timeless present tense and irrealis mood (Reilly et al., 2002). Clausal constructions also varied with genre with a higher proportion of copular and existential constructions in expository than in narrative texts, and use of personal pronouns in narratives as against impersonal pronouns and noun phrases with lexical heads in expository texts (Ravid et al., 2002). Inter-genre contrasts also reveal a certain "developmental paradox" (Berman & Nir-Sagiv, 2007). While schoolchildren find it harder to cope with the task of producing expository texts on an abstract topic, they invariably use high-register, more formal and less everyday means of linguistic expression in lexicon and syntax in producing such texts compared with narratives.

4 Arabic Diglossia in Text Production

The complex linguistic context in diglossia means that language development in Arabic can only be understood by a carefully controlled examination of acquisition of SpA oral skills, as well as MSA proficiency in both speech and writing, along with investigating the relationship between students' linguistic command of SpA and MSA. Such an investigation has not yet been undertaken in research on Arabic language or literacy acquisition. Moreover, despite the rich body of research comparing written and spoken text production, to the best of our knowledge, extended text production has not been exploited as a means of examining diglossia as a special factor along the lines envisaged in the proposed study. The major goal of this study is, consequently, to measure linguistic ability in three varieties of language use – in SpA speech, MSA speech and MSA writing across the school grades and among adult speakers.

A major aim of this study is to trace the development of linguistic skills in these different varieties of the language, from early stages of formal tuition in MSA to near-completion of high schooling by applying parallel procedures across large groups of native speakers across four different levels of age/schooling (4th, 7th, 9th, and 11th grades, and adults). The goal here is to trace the role of Arabic diglossia in children's linguistic skills at different stages of language, cognitive, and social development, on the one hand, and to examine the impact of formal schooling and increased exposure to MSA on their ability to differentiate between the two varieties and to adjust their language to different communicative situations and different contexts of use (in speaking or writing, in telling story or discussing an abstract topic).

A related goal is to test the extent to which speakers at different age are sensitive to the fact that the socio-functional complementarity between SpA and MSA has resulted in the alignment of text genre with language especially in the school context. Thus, for example, exposition, as a primarily academic genre, is typically formulated in MSA, or a semi-standard variety like Educated SpA, even when spoken. A further goal of the study is, consequently, to evaluate student's linguistic expression in both narrative and expository texts in both SpA and MSA, where MSA will

be elicited in both the spoken and written modalities. This innovative three-way comparison should yield important insights into how, across different phases of development, students differentiate between different varieties of their native language in keeping with communicative circumstances and genre-dependent level of formality. This novel direction of the proposed study is particularly important in the case of Arabic, where modality (speech/writing) is typically equated with language variety (SpA/MSA) and where all school-based language use, even in the early grades of elementary school is expected to be in MSA.

The study provides insights into a range of to date largely unexplored issues in various domains of linguistic and psycholinguistic research: Arabic diglossia in general, acquisition of Arabic as a first language, later language development in conditions of diglossia, and the interrelations between the variables of age/schooling level (grade-school, middle school, high school), variety of Arabic (SpA/MSA), modality (speech/writing), and the type of discourse genre (narrative/expository). Thus, it is expected to have significant theoretical and practical implications. Theoretically, it will identify and measure the linguistic differences between SpA and MSA in development and in interaction with modality and genre as they are used in actual text production. Practically, the findings are expected to have significant implications for instruction and assessment in Arabic as the first language as well as in Arabic as a foreign language. Moreover, although SpA dialects differ markedly from one place to another, linguistic commonalities obtain between them, especially in the domain of morpho-syntax, while importantly, all speakers of all dialects use a single highly uniform standard Arabic form. The findings of this study should thus have implications for language development and instruction among speakers of other SpA dialects beyond the Palestinian dialect dealt with here, and could constitute a point of departure for examining the same variables in other dialects.

4.1 Working Hypotheses

(a) Given the linguistic distance between SpA and MSA, it was predicted that participants would use different linguistic structures in (spoken) PA, on the one hand, and in MSA both spoken and written, on the other. Linguistic forms that are typically associated with PA are expected to be employed in speech in PA but not in MSA speech or writing. At the same time, we predicted to see some use of PA linguistic structures in linguistic expression in MSA speech and in MSA writing, but more in speech than in writing. This is due to the spoken modality and due to the cognitive constraints in producing online speech and the difficulty of attending concurrently to both form and content in the course of unmonitored spoken output, especially for the younger participants.

(b) Due to the strong alignment of genre with language variety in the case of Arabic, we expected to find a heavier reliance on MSA in expository than in narrative

texts in both speech and writing. Nonetheless, we expected writing, and regardless of genre, to be closer to the MSA end of the continuum than speaking.

(c) As an early acquired genre, we expected text construction abilities and modality-appropriate linguistic expression to emerge earlier and to be better consolidated in narrative than in expository texts in all three assignments: PA, MSA speech and MSA writing. Inter-genre differences were expected to diminish with age, as the modality factor becomes more dominant.

(d) Since acquisition of MSA and knowledge about the appropriate deployment of linguistic forms in this more formal variety is strongly impacted by increased age/schooling, we expected to see a developmental progression in linguistic expression over time in all assignments: PA, MSA speech, and MSA writing. We expected to find stronger three-way interrelations and distinctiveness over time, such that proficiency in linguistic expression would improve in tandem with increased adaptability to the demands of modality and genre across all three assignments as a function of age/schooling development.

4.2 Experimental Design and Method

The principles underlying the proposed study derive from a "form/function" approach to language acquisition, with a focus on how linguistic forms are deployed in the service of discourse functions such as reference to space, time, and person (Berman, 1990, 1996, 1997; Hickmann, 2003; Karmiloff-Smith, 1979; Slobin, 1990, 1991, 1996; Berman & Slobin, 1994). The current study is methodologically grounded in the framework of an international cross-linguistic research project on "Developing Literacy in Different Contexts and Different Languages" (funded by the Spencer Foundation, Chicago, Ruth Berman PI) that investigated the text construction abilities of schoolchildren and university graduate students in seven different countries (as described in Berman, 2008; Berman & Verhoeven, 2002). This study yielded rich research results that were reported in many publications, demonstrating the validity of its design. The current study largely replicated the design and procedures applied successfully in this large-scale project to enable directly comparable analyses of parallel texts – elicited on a shared topic (of interpersonal conflict) in both speech and writing, and in both narrative and expository genres across participants at four different levels of age and schooling. These procedures also provide a unique basis for applying analyses relating (linguistic) forms to (discourse) functions anchored in extended texts produced in different discourse genres. Our design differs from and goes beyond the "source" study to take into account the special sociolinguistic circumstances of the Arabic language, as follows. First, it evaluates linguistic usage not only in spoken PA and written MSA, but also in spoken MSA. Second, given the multi-faceted nature of linguistic distance between PA and MSA, the study addresses not only syntactic and lexical, but also phonological and morphological features of the linguistic expression in the two varieties, modalities and genres.

4.2.1 Participants, Materials and Procedure

Closely comparable written and spoken texts were produced by middle class children, adolescents and adults who are native PA speakers from Kufur Qareʕ in 5 age/grade level groups: 4th grade (9–10 years), 7th grade (12–13 years), 9th grade (14–15 years), 11th grade (16–17 years) and adults (25–35 years, university/college students). These age/grade level groups were targeted because studies have shown that during this period, between mid-childhood across adolescence, language usage changes significantly in comparison to what has been observed for younger children. A total of 150 participants produced narratives and expository texts in the two modalities and varieties of Arabic yielding 6 texts: three expository texts produced in PA, MSA-SP and MSA-W as well as three narratives produced in PA, MSA-SP and MSA-W. There were 30 students in each group and the pool of data consisted of a total of 900 texts (5 groups × 30 subjects × 6 texts).

Each participant was asked to produce both a narrative and an expository text in MSA in the two modalities: spoken and written, and the same texts in (spoken) PA, yielding a total of 6 texts per participant: PA Oral Narrative; PA Oral Expository; MSA Oral Narrative, MSA Oral Expository; MSA Written Narrative, MSA Written Expository. To elicit PA oral texts participants were instructed to use PA as they would do in speaking to a friend. To elicit MSA oral texts they were told to use MSA as if they were giving an oral presentation in class. To elicit MSA writing they were asked to write as they would normally do. Order of assignment was counterbalanced across the six tasks. To elicit the narrative and expository texts, the study employed the same three-minute speechless video clip as was employed in the cross-linguistic "source" project. The film depicts a variety of short scenes of interpersonal conflict in a school setting. Participants were shown the film at a quiet room in their school and were immediately asked to talk and write about "problems between people". To elicit narratives, participants were asked to tell a story about an incident or situation in which they had experienced problems with someone and to write it down, while to elicit expository texts, they were instructed to discuss the subject of 'problems between people' by giving a talk and writing a composition on the subject.

4.2.2 Transcription and Coding

All texts were transcribed and divided into clauses as specified in Berman and Slobin (1994, pp. 660–662) and measures of analysis in large part follow the principles adopted by the cross-linguistic "source" project. Data segmentation of both spoken and written texts takes into account three main linguistic units: words, clauses, and "clause-packages" – the latter as specified in analyses of English, Hebrew, and Spanish data in the crosslinguistic project (Berman & Nir, 2009). Elicited texts were transcribed in broad phonemic transcription using CHILDES program (MacWhinney, 2000). The main categories of analysis for comparison were coded in separate tiers. The categories selected for coding are as follows: verbs

were coded according to root, pattern, transitivity and semantic function (Berman, 1978, 2003; Ravid et al., 2016); auxiliary verbs were coded for root and pattern and their function (e.g. aspect); nouns were coded according to definiteness, gender, number and syntactic case marker (if any); nominalizations were coded according to their nominal patterns, their semantic function and their syntactic position; and adjectives were coded for gender, number, morphological type (e.g. affixation vs. patterns), semantic classification and their syntactic position (attributive vs. predicative).

5 Results

In the next section, we present results from two types of data elicited from narrative texts: the first involves the distribution of verbal patterns; the second involves voluntary usage of syntactic case markers. Both linguistic indicators have been found to distinguish between varieties and modalities among Arabic native speaking school graders and adults.

5.1 Distribution of Verbal Patterns

Semitic morphology highly relies on non-concatenative morphology, which involves forming words in configurations named 'patterns'. The pattern determines the phonological shape of the verb (Bolozky, 1978; Berman, 1978, 1987; Schwarzwald, 1981, 2002; Junger, 1987; Bat-El, 1989, 2011, 2017; Ravid, 1990, 2008; Aronoff, 1994, 2007; Holes, 1995; Ussishkin, 1999; Benmamoun, 2003; Izre'el, 2010; among many others). Verbal patterns differ from one another mainly in the type of semantic and syntactic properties of the verbs they host (Ariel, 1971; Berman, 1978; Bolozky & Saad, 1983; Wittig, 1990; Guerssel & Lowenstamm, 1996; Benmamoun, 2000, 2003; Doron, 2003; Goldenberg, 1998; Schwarzwald, 2002; Younes, 2000; Hallman, 2006; Henkin, 2009, 2010; Glanville, 2011; Tucker, 2011; Shawarbah, 2012; Ouhalla, 2014). For example, the root *k-s-r* 'to break' can be configured in two distinct patterns; *CaCaC* as a transitive verb, *kasar* 'break X' (transitive-causative), and *inCaCaC* as an intransitive verb, *inkasar* 'be/get broken' (intransitive-inchoative). The distribution of verbal patterns in Hebrew has been examined within different frameworks, including verb innovation (Bolozky, 1978, 1999; Ravid, 1990; Berman, 1987, 2003; Laks, 2018), language variation and change (Schwarzwald, 1981, 2002; Ravid, 1995, 2003, 2004; Bat-El, 2002, 2019; Laks, 2013; Ravid et al., 2016), acquisition (Berman, 1980, 1982, 1993; Armon-Lotem & Berman, 2003; Ravid, 2011; Ravid et al., 2016; Ravid & Vered, 2017) and different types of elicited texts (Berman & Slobin, 1994; Ravid, 2004; Berman et al. 2011; Ashkenazi et al., 2016; Levie et al., 2020). Fewer studies have examined psycholinguistic aspects of verbal patterns in Arabic as they are employed in actual text

production (DeMiller, 1988; Shawarbah, 2007; Ford, 2009; Henkin, 2009; Benmamoun, 2003; Dank, 2011).

While the literature provides a classification of the functions of Arabic verbal patterns (see Ryding, 2005), there has been little research on the psychological reality of these classifications and the scope of their usage in actual text production. In one such study, Laks et al. (2019) examined the distribution of verbal patterns in PA narrative texts produced by 30 adult speakers. We showed that while there are ten verbal patterns with the potential of using them all for verb formation, they differ in frequency of use in text production even when they convey similar semantic functions. However, Laks et al. (2019) examined PA only. The current study extends this question to MSA too. We present here some of the data reported in Laks et al. (2019) as well as new data based on spoken MSA and written MSA texts, in order to probe differences in the distribution of verbal patterns according to both variety: PA vs. MSA, and modality: spoken PA and spoken MSA, on the one hand, vs. written MSA. Both types of data are presented here as one pool. Texts were transcribed and verbs were coded according to root, verbal pattern, semantic type and transitivity. Tables 1 and 2 below summarize the distribution of patterns by type and token frequency and percentage out of the total number of patterns in the corpus.

As can be seen from Tables 1 and 2, *CaCaC* is the most productive pattern in text production in both modalities and varieties, and with respect to both type and token. In PA, it constitutes 41% of the total number of verb types and 59% of the total number of tokens. In spoken MSA, it constitutes 34% of the total number of verb types and 50% of the total number of tokens, and it written MSA it constitutes 38% of the total number of verb types and 51% of the total number of tokens. The *CaCaC* pattern is followed in frequency by *CaCCaC* and *tCaCCaC* which constitute between 12% and 19% of the verb types, respectively, and 7% and 12% of tokens, depending on modality and variety. The remaining patterns are less frequent, and each constitutes less than 10% of the verb types and tokens. Thus, *CaCaC* is the most frequent pattern and it hosts most basic verbs in both PA and MSA (Holes,

Table 1 Distribution of Arabic verbal patterns in types by variety-modality

Pattern	PA		MSA-SP		MSA-W	
	No	%	No	%	No	%
CaCaC	102	41%	84	34%	77	38%
CaCCaC	48	19%	34	14%	24	12%
Ca:CaC	13	5%	21	8%	17	8%
aCCaC	10	4%	12	5%	15	7%
tCaCCaC	29	12%	35	14%	25	12%
tCa:CaC	19	8%	21	8%	15	7%
inCaCaC	5	2%	2	1%	1	0%
iCtaCaC	19	8%	29	12%	28	14%
iCCaCC	0	0%	0	0%	0	0%
istaCCaC	6	2%	10	4%	3	1%
Total	251	100%	248	100%	205	100%

Table 2 Distribution of Arabic verbal patterns in tokens by variety-modality

Pattern	PA		MSA-SP		MSA-W	
	No	%	No	%	No	%
CaCaC	456	59%	327	50%	196	51%
CaCCaC	86	11%	59	9%	29	7%
Ca:CaC	42	5%	56	9%	33	9%
aCCaC	26	3%	24	4%	20	5%
tCaCCaC	71	9%	75	12%	42	11%
tCa:CaC	30	4%	37	6%	19	5%
inCaCaC	7	1%	3	0%	1	0%
iCtaCaC	45	6%	59	9%	42	11%
iCCaCC	0	0%	0	0%	0	0%
istaCCaC	7	1%	12	2%	5	1%
Total	758	100	652	100%	387	100%

1995). This stands in contrast to studies on verb innovation (Laks, 2018), which demonstrate that *CaCaC* is hardly used in the formation of new verbs, and that *CaCCaC* and *tCaCCaC* are used almost exclusively for this purpose. In addition, the data in Tables 1 and 2 also shows that *iCCaCC* is not used at all, and *inCaCaC* and *istaCCaC* are rarely used.

The results above reveal variety-related differences, where some patterns are more typical of one variety rather than the other. As shown in Table 1, *CaCaC* and *CaCCaC* are more dominanat in PA than in MSA both spoken and written. MSA texts, in contrast, demonsrate greater variation in the distribution of verbal patterns. The *iCtaCaC* pattern is more frequent in MSA. It constitutes 12% of verbs types in spoken MSA and 14% in written MSA, in comparison to only 8% is PA. Similarly, the *Ca:CaC* pattern constitutes 8% of the verb types in spoken and written MSA, and 5% in PA. Similar tendencies were also found with respect to verb tokens, as shown in Table 2.

Differences between varieties and modalities are also reflected in some of the semantic functions of verbal patterns. We demonstrate this below with respect to the expression of causativity. As shown in (2) below, the same participant used the same consonantal root *f-h-m* 'understand' in two different patterns to denote the causative verb 'make understand': *CaCCaC* in PA, and *aCCaC* in MSA.

(2) a. **PA**: u-**fahhamtoh** inno: ha:ðˤa il-iʃi ɣalatˤ
'I made him understand that thing is wrong'
b. **MSA-S**: fa-ʔ**afhamtuhu** wijhat naðˤari:
'I made him understand my point of view'
c. **MSA-W**: wa-ʔ**afhamtuhu** wijhat naðˤari:
'I made him understand my point of view'
(Aref, Adult)

Table 3 Distribution of causative verbal patterns in types by variety-modality

Pattern	PA		MSA-SP		MSA-W	
	No	%	No	%	No	%
CaCaC	5	17%	8	30%	5	24%
CaCCaC	19	63%	13	48%	6	29%
Ca:CaC	1	3%	1	4%	1	5%
ʔaCCaC	5	17%	5	19%	8	38%
tCaCCaC	0	0%	0	0%	1	5%
Total	30	100%	27	100%	21	100%

Table 4 Distribution of causative verbal patterns in tokens by variety-modality

Pattern	PA		MSA-SP		MSA-W	
	No	%	No	%	No	%
CaCaC	13	23.5%	12	29%	6	21%
CaCCaC	32	58%	16	38%	8	29%
Ca:CaC	3	5.5%	4	10%	3	11%
ʔaCCaC	7	13%	10	24%	10	36%
tCaCCaC	0	0%	0	0%	1	4%
Total	55	100%	42	100%	28	100%

Tables 3 and 4 summarize the distribution of causative verbs across patterns in type and token counts. In PA, the most typical pattern of causative verbs was *CaCCaC*, whose verbs made up 63% of the total types and 58% of the total tokens. Causative verbs were also common in *CaCaC* making up 17% and 23.5% of types and tokens, respectively. 17% of the causative verb types were also found in *ʔaCCaC*, but they made up only 13% of the tokens. In contrast, MSA texts, and especially written MSA, demonstrated greater variation with respect to the distribution of causative verbs in other patterns. *CaCCaC* hosted 48% of the causative verbs types in spoken MSA and only 29% in written MSA. In spoken MSA, 30% of the causative verbs types were in *CaCaC*, while in written MSA there was even greater variation between *ʔaCCaC* (38%) and *CaCaC* (24%). Similar tendencies were also found with respect to tokens, as shown in Table 4.

Taken together, these results explicated above shed light on the distribution of verbal patterns in text production in PA and MSA. Their distribution can be used as a linguistic tool to measure the differences between Arabic modalities and varieties. The most noticeable morphological differences are between varieties, where spoken MSA and written MSA pattern more closely together and different from PA. At the same time the morphological differences that surface more prominently are between PA on the one hand and written MSA on the other, with spoken MSA occupying an intermediary position.

5.2 Case Markers

Overt case markers are commonly regarded a key feature of the difference between MSA and spoken, or colloquial Arabic. This is because these markers have disappeared from all spoken varieties (Maamouri, 1998) remaining in a few lexicalized forms such as *shukran* 'thank you' or *ahlan* 'welcome' Only MSA marks case on nouns and adjectives by suffixation (Holes, 1995; Saiegh-Haddad & Henkin-Roitfarb, 2014, among others). Thus, knowledge of case marking in not acquired naturally but is learned mainly at school. Moreover, case markers are only obligatory in writing/spelling in Arabic when they involve letters rather than short vowel or nunation, both of which are represented as optional diacritics. This means that case markers are often not encoded in written MSA because the default orthography of Arabic is the unvowelized orthography which uses only letters and disposes of diacritics. Case markers are not encoded in spoken MSA either because speakers prefer to use the pausal forms and to disperse with word final inflections. This is mainly because: (a) they do not master the complex system of case marking, and (b) case marking does not alter the meaning of the word (Saiegh-Haddad & Henkin-Roitfarb, 2014).

In a previous study, Laks & Berman (2014) examined narrative text production among adult speakers in colloquial Jordanian Arabic and written MSA. The texts analyzed in that study did not display evidence for actual use of case marking in neither variety. Instances in which case was explicitly used were restricted to accusative case in adverbials, e.g. *qari:b-an* 'soon' (cf. *qari:b* 'close'), and to "sound" masculine plurals and dual forms, where case-assignment is marked by the addition of one or more (consonant) letters as bound suffixes in direct objects , adverbials , duals and copular constructions.

Examination of our data produced by school graders reveals similar tendencies to those produced by adults as reported in Laks & Berman's (2014) study. Overts case markers were rarely used in both spoken and written MSA texts. At the same time, interestingly, younger participants stood out in degree of usage of case markers with 4th graders using case markers to the greatest extent. This could be explained by the fact that 4th graders have been reading the fully vowelized orthography since the 1st grade and conceive the system of case marking as an indispensable part of MSA. Exposure to the unvowelized orthography in the Arab school system in Israel happens mainly after the fourth grade and hence these children are still immersed in the vowelized orthography and are used to reading and writing in this orthography. The usage of case markers decreased with age and was almost completely absent in the texts produced by adults.

Examination of the data reveals some degree of variation with respect to the usage of case markers. The following example (3) demonstrates a case where the same noun *bayt* 'house' is used in the same syntactic position once without and once with a case marker (in this case *-i*).

(3) rajaʕtu **ʔila l-bayt**…wa-ʕindama rajaʕtu ʔila **l-bayt-i** ….
'I returned to the house…and when I returned to the house …..'
(Majd, 4th grade)

Differences in degree of usage of case markers were also found according to modality. Case markers were more common in spoken texts (PA and spoken MSA) than in written texts (written MSA). MSA is typically more written than spoken, and case markers are typically learned in the context of written language. We believe that case markers were used more in spoken texts because participants wanted to over distinguish between spoken MSA and spoken PA and to mark MSA as the more formal variety. Another explanation pertains to the fact that usage of case marking is obscured by the fact that written MSA does not encode diacritics.

Morpho-syntactic factors appear to also be associated with the use of case markers and lack thereof. We focus here is on the distribution of case markers in 4th graders texts, where the usage of case markers was the highest. An analysis of the data shows that the distribution can be partially predicted based on systematic structural guidelines.

(i) **Lexical category.** Case markers are more common on nouns than adjectives. This might suggest that case is perceived as more typical of nouns. As shown in (4), the noun *walad* 'boy' is used twice: once with the nominative case marker *-un* and once without it. In contrast, neither adjective in the same sentence marks case.

(4) qa:la li: [eh] ʔannaka **walad-un** (N) **sayyiʔ** (Adj) wa-ʔanta [eh] **walad** (N) **ʔana:ni:** (Adj)
'(he) said to me you are a bad boy and you are a selfish boy'
(Mahmud, 4th grade)

(ii) **Definiteness.** Indefinite nouns demonstrate a higher ratio of case marking. As shown in (5), the speaker used the indefinite noun *film* with a case marker, but the definite noun without one. This may also be related to an orthographic characteristic, namely the use of the letter *alif* in the orthographic representation of accusative case.

(5) ʔara:dat ʔan nuša:hid **film-an**…. kunna nuša:hid **al-film**…
'(she) wanted/liked that we watch a film....we were watching the film...'
(Aseel, 4th grade)

(iii) **Syntactic position.** Subjects of sentences tended to be more marked for case. As shown in (6) below, the noun ʔawla:d 'children' is the subject of the sentence and receives the nominative case marker *u*, while the noun *malʕab* 'courtyard' is a direct object and does not receive the accusative case marker *a*.

(6) wa-ʕindama ʔaxaðа **al-ʔawla:d-u al-malʕab**
'and when the children took over the court yard'
(Laian, 4th grade)

(iv) **Bound morphemes.** Most nouns with possessive clitics received case markers. This is probably because when clitics are appended case markers become an internal part of the word and not pronouncing the case marker would result in a consonant cluster that is not licensed, or not typical of MSA phonology (*bay-**tu**na/bayt**a**na/bayt**i**na* vs. *baytna* 'our house'). As shown in (7) below, the noun ʔ*uxt* 'sister' receives the possessive clitic *-ha* 'her' and the case marker *u* surfaces between the two morphemes.

(7) baʕda ðа:lik ʔatat **ʔuxt-u-ha**
'then her sister came'
(Lana, 4th grade)

Theses tendencies accord with previous studies that examined spoken MSA in formal speeches and interviews of adults (Meiseles, 1977; Parkinson, 1994; Magidow, 2012; Hallberg, 2016).

To sum up, as expected, texts produced in PA were not found to include case markers. This suggest that the usage of case markers (and lack thereof) case may be used as a distinctive feature differentiating the two varieties (PA vs. MSA) and modalities (spoken MSA vs. written MSA) as they are actually used by speakers. However, this feature is mostly dominant at the early grades because the use of case markers is encoded in school textbooks and is explicitly taught, yet its use decreases with development and gradually ceases to serve as a tool for distinguishing between modalities and varieties. The results also showed that usage of case marking may be predicted by structural properties such as lexical category, definiteness, syntactic position and the usage of bound possessive morphemes.

6 Conclusion and Future Directions

This chapter is a description of a research project that examines the distribution of language structures as reflected in actual language use in Arabic diglossia according to variety and modality distinctions. We presented results from two domains: verbal

patterns and case markers. The distribution of verbal patterns reveals both variety and modality related differences. While there are three patterns that are the most frequently used in both varieties and modalities, some interesting differences emerged. In both varieties and modalities, *CaCaC* was the most productive pattern, followed by *CaCCaC* and *tCaCCaC*. The other patterns were less frequently used overall. At the same time, some of the less frequently used patterns, like *Ca:CaC* and *iCtaCaC* were clearly sensitive to variety and were more frequent in spoken and written MSA than in PA.

The voluntary usage of syntactic case markers is another manifestation of the language users' sensitivity to variety and modality distinctions in Arabic. Voluntary use of case markers distinguished between PA and MSA among young children in particular. Case markers, which are typically only expected to be used in MSA, were used more in spoken MSA than in written MSA. We think this might be related to the participants' intent to over distinguish between spoken MSA and (spoken) PA and to mark MSA as the more formal variety. Alternatively, case markers are represented in Arabic mostly using diacritical marks, and because the default orthography of Arabic is the unvowelized, writers tend to omit these markers from their written texts more often than they did in speaking MSA. Moreover, because the use of case markers, or lack thereof, determines the phonological structure of the word, especially when they appear word-internally (like before clitics), their use may be phonologically driven. More research is needed to test this hypothesis directly.

This chapter shed light on morphological differences in Arabic text production according to differences in varieties and modalities . The data reported in the current study is a first step in showing that such differences may be to a large degree predictable and suggest that certain linguistic constructions are more typical of one variety/modality condition than another. It remains to be seen whether other linguistic structures tend to also pattern systematically with differences in modality and variety such as nominal and adjectival patterns, syntactic agreement, word order, text length and syntactic complexity.

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Acquiring Literacy in the Diglossic Contexts of Malay and Tamil in Singapore: Problems and Prospects in Early Childhood Classrooms

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1 Introduction

1.1 The Relation Between Oral and Written Language – Cases of Divergence

Language as a basic human skill involves the interpretation of aural speech. The soundwaves generated from a speaker are shaped by many things – the speaker's gender, age and emotion, a range of articulatory constraints, the age when language was acquired if it is one's second language, and so forth. In essence, the aural speech stream conveys all of this information which may be considered 'noise' to the 'signal' of the actual linguistic meaning that is conveyed to the listener. Separating the signal from noise in the message requires the listener to categorize uttered speech sounds into meaningful units, or phonemes (Ladefoged, 2006). The listener must learn to ignore some variation in phones, where for instance a similar phoneme sounds different within the context of different words because of co-articulation with adjacent phonemes in each word, and thus consider what is meaningful, versus allophonic, variation. Babies master this skill with impressive ease, learning implicitly these phonemic building blocks of language. Conscious awareness of such phonemic structure is a bigger challenge – but is required for learning to read in alphabetic languages. Adams et al. (1998) wisely referred to the "elusive phoneme", because beginning readers need to learn all over again what categorizes phonetic sounds that are represented by printed graphemes.

Spoken languages are known to show diachronic changes in speech sounds over time (for example, the Great Vowel Shift in English), and languages which do not

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have a written form tend to shift more rapidly (Lass, 1992). Thus, it is believed that written language cements, to some extent, phonemic categories within a language – and within an individual, literacy cements, to some extent, phonemic awareness: "grapheme knowledge in turn promotes the development and refinement of phonemic awareness" (Ziegler & Goswami, 2005, p. 19). But cementing is perhaps too strong a term – because even within an epoch of time, established languages with written forms can show variation in pronunciations, as for example the case of African American Vernacular English or the Arabic or Hebrew languages. In the study of nonmainstream American English (NMAE) dialects (e.g., Oetting & Garrity, 2006), Appalachian English (Garn-Nunn & Perkins, 1999), and Latino English (Gutiérrez-Clellen & Simon-Cereijido, 2007), research showed that the mismatch between the spoken language and the print resulted in poor reading achievement (Terry et al., 2016). What all of this variation means for literacy acquisition is that it certainly introduces more challenges for the learner – and likewise has implications for the teacher in terms of pedagogy.

1.2 Reading and Spelling Development

Spelling, the focus of interest in this chapter, is harder to acquire than reading (Bosman and Orden, 1997) especially for young children. Studies have shown that when children were given a reading task and then asked to spell the same words afterwards, they usually fared better in reading performance (Snowling et al., 1993). That is, there was some discrepancy in their reading and spelling performance although the words given were the same. While children found spelling in English to be a more demanding task than reading, studies show that some children use letter–sound and letter-name knowledge strategically to approach difficult words (Ehri, 2015; Snowling et al., 1993), for example, spelling *liked* as "LIKT," or *jeep* as "GP" (Bear et al., 2012, p. 155). This suggests young children are able to use phonemic awareness to make such attempts at encoding even before they learn the orthographic units for each word. As such they must to some extent be relying on speech-based representations.

As observed from past studies that have examined reading and spelling performance in children, it is evident from the literature that spelling is harder than reading. There are many reasons for this difference. Learning to spell requires the ability to translate sounds into written words –firstly with phonemic awareness of all the constituent sounds in the word, and secondly the alphabetic knowledge of which letters represent which speech sounds. In order to represent sounds into written letters, children must learn the mappings between the phonemes in spoken words and the letters that represent them in print. This correspondence may not always be an exact match due to the speech variations noted above, and may be especially true in languages that have deep orthographies with inconsistencies in the letter mappings (e.g., English) or with greater orthographic breadth (e.g., Tamil) (Nag, 2017).

Another reason is that good readers have the ability to identify a printed word even when the memory for spelling is incomplete (Share, 1995). For example, a child may be able to guess or estimate the meaning for the word 'chocolate' after decoding the sounds of the word. It would be easier for the child to read the word if the picture of a bar of chocolate is on the same page above or below the word. The child may also persist to phonologically decode and recode until he/she generates a spoken word that makes sense; that is, via self-teaching, the child provides corrective feedback to learning to read a word (Share, 1995). However, when it comes to spelling the word 'chocolate', the child does not have any form of corrective feedback to rely on and hence may make misspellings such as 'chokolate' or 'chocolte' or 'chokolet'. In this case, spelling is harder than reading as the child would need to check with the teacher, or a parent or perhaps the dictionary to gain knowledge of the correct spelling.

As proposed by Saiegh-Haddad (2005), speech perception – the interpretation of sounds – is an important skill required to read efficiently. Extending this idea to spelling, scholars propose that changes in sound may also affect the way spelling skills are acquired (Abu-Rabia & Taha, 2004). If early spellings are speech based, another reason why the process of encoding letters may be more challenging than reading for young children is the change in pronunciation of words (e.g. "sound shift" as noted above) across generations. The change in pronunciations may serve to attain adequate levels of communication more efficiently and with minimum effort (Saiegh-Haddad, 2005). Such changes may include omitting phonemes, modifying sentence sequences and contracting morphemes. However, over time, the change in speech versus written forms may create two or more representations of the same language, resulting in what is known as a diglossic variant.

1.3 Diglossia and Literacy Acquisition

According to Ferguson (1959), diglossia is a relatively stable language situation in which, in addition to the primary dialects of the language (which may include a 'standard' or regional standards), there is a very divergent, highly codified (often grammatically more complex), superposed variety. Typically, the written form is used in formal settings while the spoken form is usually used at home. Diglossia typically works in subsystems in that one variety is used for a casual everyday interaction and a different variety is used for more official, formal purposes. The variety that is used for daily communication is typically a 'low variety', meaning that it is not formally learned and the speakers do not formally learn its grammar or how to write in that language. It is merely learned as a spoken language. The language used for more formal situations is the 'high variety'. It is the language that is learned at school, formally. And speakers learn how to write in that language and learn the formal grammar rules of that language. The high variety would be highly codified; i.e., it would have its own standard grammars, dictionaries and reference books. It would also have a long tradition of being widely acknowledged that Ferguson says

is 'written', suggesting that it must have a writing system and a literary tradition. In many cases, the community considers this 'high variety' to be the 'pure' or 'correct' form of the language and they want to keep it the same without allowing for change. The 'low variety', on the other hand, is more flexible and it is more likely to change over time because it is not restricted by the rules of the 'high variety'. The high variety would have to be learned formally and it serves as a reference point. High varieties are largely associated with formal and guarded functions; the low varieties with home environment and informal settings like at churches or mosques. Thus, the high and low varieties typically include forms of written and colloquial use, respectively (Harris & Hodges, 1981), and the formal, school-based versus informal-home contexts in which the forms are learned involve different modes of learning. While school contexts rely more heavily on direct instruction, home contexts would involve more naturalistic language learning. Hence, children may face problems of receiving their oral language training in one form and reading and writing in the other.

One of the most intriguing associations that has emerged from the field is the relationship between diglossic speech variation and literacy. Diglossia usage is expected to contribute to reading and spelling outcomes. This follows from aggregated research evidence that learning to read and spell is dependent on phonological awareness (the ability to pay attention to smaller speech units in spoken language; Goswami & Bryant, 2016), which is in turn dependent upon speech perception (the ability to categorize speech sounds into meaningful units), and that together these form the underlying foundation for decoding written words to speech when reading, and encoding speech into written form during spelling (Goswami & Bryant, 2016). Exposure to nonstandard phonology and other nonstandard language features should, therefore, influence the kinds of spelling errors children make. Most preschoolers from diglossic families are routinely exposed to the colloquial nonstandard form during conversations at home because the social setting determines the form that their parents use. In addition, children's language use may reflect their family's diglossic speech. The extent to which they use such features has been referred to as 'dialect density', and increased use of diglossic variation is reported to negatively affect reading performance (Brown et al., 2015). Saiegh-Haddad and colleagues also found such effects on word decoding, where phonological differences between Modern Standard Arabic (MSA) and Spoken Arabic (SA) were shown to affect reading acquisition (Saiegh-Haddad, 2003), accuracy and fluency (Saiegh-Haddad & Schiff, 2016), as well as phonological awareness across kindergarten to early adolescence (Saiegh-Haddad et al., 2020). Given that spelling is harder to acquire than reading, diglossia exposure and use is also expected to affect spelling performance.

Research has shown that when children learn to spell words in English, they represent the words in the manner that they are heard rather than by graphically representing each sound with a letter, as illustrated above (Snowling et al., 1993). Developmentally, when spelling, children tend to phoneticize the spellings and invent words that sound similar to what they hear. This can be especially problematic with scripts such as English, where the orthography does not have a one-to-one

correspondence with the pronunciation (Snowling et al., 1993). Supporting this view, researchers inspected the misspellings produced by children who speak different dialects of English, namely African American English (AAE) as compared to Mainstream American English (MAE), also termed as Standard American English (SAE; Craig & Washington, 2004). AAE includes a variety of morphosyntactic, phonological, and pragmatic features (Craig et al., 2003). Another study by Treiman et al. (1997) examined British and American children's spelling performance and found that children's dialectical variation had an influence on their spelling, resulting in more spelling errors. This difference was also noted in older British and American college students. Similarly, Terry (2006) showed that African American children's spelling mistakes were influenced by their use of AAE. Further, focusing on reading, Brown et al. (2015) found that the linguistic differences between AAE and MAE contributed to learning difficulties resulting in delays in academic achievements. Collectively, these studies highlight that dialectical variation can be a basis for spelling errors along with reading difficulties.

These findings indicate that at least some of the spelling errors committed by children may be ascribed to the speech they hear and use. The two languages under investigation in this chapter, Tamil and Malay, may be considered relatively 'shallow' or transparent orthographies, with print mapping fairly consistently to speech sounds (as explained in the sections below). Yet the conditions of diglossia in both languages within Singapore would be expected to affect the acquisition of reading and spelling despite this transparency. In the case of Tamil, this orthography is more transparent in its grapheme-phoneme correspondences and is also a more alphabetic-like system compared to the other Indian Brahmi-derived languages (e.g., Kannada or Telugu), as almost all the aksharas[1] appear in-line, meaning in a linear sequence from left to right following the temporal ordering of sounds in words from first to last. These unique features of Tamil make it a useful choice in comparing spelling outcomes as it provides a good link of comparison with alphabetic systems like the Malay language.

Written sentences or written words of children coming from diglossic backgrounds may contain errors due to misalignment between spoken words and written words. It is also possible that there may be differences in the nature of spelling errors committed. While most of the research on diglossia has focused on phoneme level processing and how this relates to reading and spelling, we may expect effects at the larger units of syllables, morphosyntactic units or whole words as well (see Tables 2 and 3). In the study reported in this chapter, we aimed to examine the extent to which diglossia influences the ability to spell Malay or Tamil words, specifically.

[1] Aksharas can represent consonants with inherent vowels, short vowels and dipthongs (for a more comprehensive description, see O'Brien et al., 2020b).

1.4 Diglossia in Singapore

Diglossia is very common around the world. The most commonly discussed example in the literature is probably the Arabic language. In every Arabic country, there are different dialects that differ in grammar, vocabulary, and pronunciation from other dialects and also from Standard Arabic (Abu-Rabia, 2005). Standard Arabic is a heavily codified language which is basically fixed in its rules that do not readily change even while the dialects are constantly evolving. In casual speech with other locals, Arabs exclusively use their local dialect. But in writing, in formal speeches and in news broadcasts, Standard Arabic is used. Also Standard Arabic is used as a "bridge language" when communicating with speakers of different dialects.

Subsequently, Snow (2013) distinguished the case of 'modern diglossia' existent in speech communities, whereby the spoken dialect supports a distinct local identity while a written standard adopted from ancestral or neighboring countries maintains a cultural identity (p. 73). This appears to be the closest case for two speech communities within Singapore: Malay and Tamil.

Singapore's current population consists of 74.3% Chinese, 13.3% Malay and 9.1% of Indian descent, with Eurasians and other minority ethnicities making up the remaining 3.3% (Singapore Department of Statistics 2014). According to the 2015 Singapore population census, the language most frequently spoken at home by all three major ethnics groups is the English language (Singapore Department of Statistics, 2015). The prevalent use of English among all ethnic groups and the use of Chinese by the majority (in numbers) of the ethnically Chinese residents have effectively raised English and Chinese to the ranks of majority languages, and consigned Malay and Tamil to the status of minority languages. While Chinese- and Malay-speaking families used English as the main language at home, most of them continued to speak in their mother tongues at home (Chinese = 46.1%, Malay = 78.4%). Conversely, for the Indians, English was the most commonly used language at home, with 44.3% of Indians conversing in English most frequently at home, while 37.7% used mainly Tamil at home and the rest using a mix of both.

Ferguson (1959) developed nine criteria for a diglossic language, which are summarized in Table 1. These include: function, prestige, literacy heritage, acquisition, standardization, grammar, lexicon, phonology and stability criteria. It should be noted that whilst Ferguson used these criteria to describe any diglossic situation, the focus in Table 1 is on Tamil and Malay. The characteristic differences in the nine criteria between the diglossic variety for each language are predicated on grammatical, lexical differences and phonological distance between the two varieties. The claim of diglossia for Tamil and Malay significantly depends on the linguistic distance existing between the two varieties (Annamalai & Steever, 1998).

According to Taouk and Coltheart (2004), reading and spelling acquisition are highly likely to be dependent upon the nature of the script and of the writing system which the child seeks to master. Hence, the unique features of Tamil and Malay orthographies should be considered carefully when discussing diglossia and how children learn to read and spell in these scripts. Considering that the current study

Table 1 Criteria for diglossic language

	Tamil		Malay	
	Literary	Standard spoken	Standard spoken/ written	Non-standard spoken/written
Function	Associated with formal contexts, such as in news broadcasts, or in political speeches	Spoken form is associated with informal contexts such as in daily conversations, schools or radio	Associated with formal contexts, such as in news broadcasts, political speeches, schools or radio	Associated with informal contexts, such as daily conversations with friends, family members and society at large
Prestige	In general, it is held in high regard and a sacred form	It is accepted as a form to bridge the gap between the home and school environment	In general, it is held in high regard and a sacred form	It is accepted as a common form of speech and written language
Literary Heritage	Has a well-establish literary heritage dating over two millennia	No heritage	Established since 1956	Established and evolved as an interethnic language to facilitate trade in the Malacca Straits
Acquisition	Typically learned in writing in schools	Learned at home and in schools	Learned in schools	Learned at home and in schools
Standardization	Has well-established rules	Established rules	Has well-established rules	No established rules
Grammar	Complex and allows for manipulation of the vocabulary to obtain multiple forms of a word	Less complex and allows for contraction of words and sentences. At times, leaves out suffixes and affixes in words	Complex with adherence to a morphological system	Less complex and allows for contraction of words and sentences. At times, leaves out prefixes and affixes in words
Lexicon	Lexical variables well defined	Contracted morphemes	Similar lexical variables in both written and SSM	Has a different set of vocabulary for words of the same meaning
Phonology	More complex than spoken form with an underlying alpha-syllabary system	Drop in final word nasal, laterals Analogical changes in phonological structure	Consistent orthography-phonology mappings	Different vowel sounds /i/ to /e/, /u/ to /o/ and /a/ to / /
Stability	Highly stable	Fluid	Highly stable	Fluid

investigates the association between aural/oral language and the impact on reading and spelling skills of Tamil- and Malay-speaking students in Primary 1,[2] a brief linguistic description of the Tamil and Malay language phonology and orthography is presented next (for a more complete description of the linguistic features for Tamil, see Annamalai & Steever, 1998; Nag & Narayanan, 2019, and for a more complete description of linguistic features in Malay, see Omar, 2008).

1.5 The Nature of Tamil

Tamil Orthography Tamil, a Dravidian language, which is predominantly spoken by Tamil people of India, Sri Lanka and Singapore, is a language written in an alpha-syllabary[3] system of 18 consonants, 12 vowels and 1 special character. Each akshara symbol, the smallest graphemic unit in the orthography, can be a combination of consonant and vowels (Nag & Narayanan, 2019). Additionally, there are added diacritical marks that contribute to the phonemic value of each akshara symbol unit (Nag & Narayanan, 2019). These diacritical marks are curvilinear marks attached to either the consonant or the vowel of the akshara which changes the letter-sound pronunciation. As a syllable-rich language, words can be formed using simple V, CV, CVC, CVCC, VC, VCC patterns, where V denotes a vowel, C denotes a consonant, CV denotes a consonant vowel (Annamalai & Steever, 1998). Tamil is an agglutinative language and has a complex and rich inflectional morphology. A Tamil word can be made up of a single letter standing alone or multiple letters combined. Additionally, Tamil words usually consist of multiple morphemes strung together, with a high morpheme-to-word ratio. There is no limit on the length and extent of agglutination, resulting in long words with many suffixes, which would require several words when translated in English. As an example, the word pogamuḍiyadavargaḷukkaga (போகமுடியாதவர்களுக்காக) means "for the sake of those who cannot go" consists of the following morphemes; poga-mudi-ya-da-var-kal-ukka-ga. When this written word is converted to speech, 1 syllable cluster is contracted (poga and pova) and 1 final nasal sound is omitted (ga is dropped) as in this example, pova-mudi-ya-da-var-kal-ukku (போவமுடியாதவங்களுக்கு). Additionally, Tamil has short and long vowels, and it has very limited consonant clusters, unlike English, and the relationship between the aksharas and the sounds they represent are highly consistent (Nag & Narayanan, 2019). This transparency between the letter-sound correspondences makes it easier for beginning readers to make the connection between sounds and aksharas and akshara combinations, thus allowing for effective reading acquisition (Ziegler & Goswami, 2005; Padakannaya & Mohanty,

[2] Primary education lasts 6 years and is compulsory for all Singapore citizens. Primary education starts after Kindergarten at ages 6 to 7.

[3] Script which shares features of both alphabet and syllabary writing systems. It includes symbols for consonants and vowels where each consonant has an inherent vowel and phonetic sound that can be changed or muted by means of diacritics or other modifications.

2004). However, exposure to diglossia through the home or classroom environment can result in children developing phonological representations based on the standard spoken Tamil. If early attempts at writing are based on speech, as explained before, exposure to standard spoken Tamil could influence the kind of spelling errors made by Primary 1 learners. Thus, it is predicted that children's oral production of Tamil words when speaking would be consistent with the spelling errors of Tamil words, even when dictated with standard phonology.

Diglossia in Tamil

The Tamil language in Singapore also has two varieties: a literary 'high' and colloquial 'low' form (Saravanan et al., 2007). The former is traditionally used in classrooms, while the latter is learned in naturalistic contexts of the home and community. Before the introduction of the TL Curriculum Framework in 2005, (Ministry of Education, 2005), there was a declining use of Tamil in Singapore. This was in part due to the insistence of Tamil purists that teaching should be of Literary Tamil (LT), a high variety that sharply contrasts with the varieties spoken in homes. Following, the recommendations put forth by the Tamil Language Curriculum and Pedagogy Review Committee (TLCPRC), the revised syllabus was designed to make Tamil a living language beyond the classrooms (Ministry of Education, 2010). An important shift in the focus of the syllabus was a new emphasis on productive skills such as oracy and listening skills. A newly re-packaged Standard Spoken Tamil (SST) was found to be prevalently used by Tamil teacher in classrooms, to motivate and encourage students to converse without difficulty with their friends and the community at large (Saravanan et al., 2007).

In Singapore, Tamil diglossia is almost entirely a distinction between spoken communication on the one hand and writing on the other. People in Singapore do not really accept the idea of their spoken Tamil being a 'low variety'. Thus, they are encouraged to use their dialect of spoken Tamil in all situations even in formal situations (Saravanan & Lakshmi, 2005) to create a more immersive environment for the use of Tamil language. Literary Tamil (LT), on the other hand is used only for reading and writing. Standard spoken Tamil may differ from Literary Tamil in a few ways. In standard spoken Tamil, word-final nasal sounds may be omitted [Avan vanthan (LT) to Avan vantha (SST)], reduction in cluster sounds may occur [NiinkaL unkal viittai viRRuvittiirkaLaa? (LT) to Niinka unka vittai vittuttingaLaa? (SST)] or palatalization conversion of /tt/ into /ch/ sounds [Naan chiritten (LT) to Naan chirichen (SST)]. More examples of standard spoken Tamil and literary Tamil words are presented in Table 2. This contrasts with the literary form of Tamil taught in schools, for which children must quickly learn to read and write long words that consist of several suffixes. Hence, the differences between literary Tamil and spoken Tamil can be quite striking and are potential sources of reading and spelling problems for children learning Tamil. Examples of standard spoken Tamil and literary Tamil words are presented in Table 2.

Table 2 Examples of differences in literary Tamil versus standard spoken Tamil (Aaron & Joshi, 2005; Lakshmi & Saravanan, 2011)

	Differences	Literary	Standard spoken	English
1.	Word-final nasal sounds omitted in speech	Avan **vanthan**.	Avan **vantha**	He came.
2.	Consonant omission/ addition	Enakku panam **veentum.**	Enakku panam **veenum.**	I want money.
3.	More than one standard spoken term exists for the same literary term.	Avar **mikavum** nallavar.	Avar **romba** nallavar.	He is very good.
4.	Cluster reduction	**NiinkaL unkal** viittai **viRRuvittiirkaLaa?**	**Niinka unka** vittai **vittuttingaLaa?**	Did you sell your house?
5.	Palatalization converts /tt/ into /ch/	Naan **chiritten.**	Naan **chirichen.**	I laughed.
6.	Palatalization of diphthong /ai/	Ainthu.	**Anchu**	Five.
7.	Sandi changes – deletions of sonorants at morphemic junctions	Pizheiyindri	**Pizheiyillamal**	Without mistakes.

Note. Differences between literary and standard spoken Tamil are in bold

1.6 The Nature of Malay

Malay Orthography Malay belongs to the Austronesian language family and is the national language and traditional lingua franca of Singapore. The standard form of Malay, Sebutan Baku, is used for literacy and instruction. Similar to English, Malay is characterized by 26 letters of the Latin alphabetic script. It does not contain any diacritics and the letter 'x' is only featured in loan words. This feature allows children to see the language patterns sooner compared to learning a language with many rules (e.g., English) and diacritics (e.g., Chinese). Therefore, they are able to learn to read in Malay more efficiently. As Malay is not a tonal language either, the pitch and tone do not affect the meaning of a word. Non-Malay children may be able to read Malay words even though they are not able to comprehend the words. Malay children should also be able to write shortly after learning the language as it is a transparent, shallow orthography characterized by highly regular letter-to-phoneme mappings. Phonetically, it has 6 vowel phonemes (a, e, /ə/, i, o, u), 3 diphthongs (<ai>, <au> (eds.) and <oi>) and 21 consonant phonemes. Only the letter 'e' carries two phonemic forms (/e/ or /ə/). In terms of syllable structure, it is usually short but variable (V = vowel, C = consonant: VCC, CCV, CV, CVC, CVCC, CCVC) with CV and CVC being the most common structure (Lee et al., 2012). Morphologically, affixation, reduplication and compounding are the three main processes (Karim et al., 2008), with derivational affixation being the most common (Prentice, 1987).

Table 3 Examples of standard Malay versus non-standard Malay (Jalil & Rickard Liow, 2008)

Differences	Standard Malay (Spoken/ Written)	Non-standard Malay (Spoken/ Written)	English
Grammar	Ayah **tidak tahu.**	Ayah **tak tau**.	Dad doesn't know.
Vocabulary	Ayah **terlihat** seekor katak.	Ayah **tengok** seekor katak.	Dad saw a frog.
Phonology	**Die** melihat dengan **matenye.**	**Dia** melihat dengan **matanya.**	He saw with eyes.

Note. Differences between standard Malay and non-standard Malay are in bold

Diglossia in Malay As the traditional lingua franca of Singapore prior to its national independence (1965), a spoken variety for Malay was established that is still in use today. However, a standard spoken form of Malay, Sebutan Baku, was introduced by the Ministry of Education in 1993 to stabilize the linguistic structure with a system of one letter to one phonemic sound, and to increase proficiency in the language (Dahaman, 1992). This standard form of Malay (SM) is used in formal settings such as schools, while in the private sphere Non-Standard Malay (NSM) remains the norm. The upshot from the current co-existence of standard Malay and non-standard Malay is that differences in grammar and phonology lend to developmental challenges of learning the written standard Malay when a child has prior exposure to non-standard Malay from their home and community (Jalil & Rickard Liow, 2008). Examples of non-standard Malay and standard Malay words are presented in Table 3. Thus, while the transparency of the alphabetic written form of SM should be more easily acquired according to the Orthographic Depth Hypothesis (Katz & Feldman, 1983), the different spoken varieties complicate the speech-to-print matching process. Saiegh-Haddad (2017, 2018) argues that this linguistic distance between the form of the word in the spoken variety and in the standard variety makes the orthography psycholinguistically deep because it maps a phonological form of the word which may be regularly recovered from the orthography but is different from the one stored in the children's memories. Daniels and Share (2018) refer to this as a new aspect of orthographic depth.

1.7 The Home Environment – Language and Literacy Exposure

Children's speech perception and lexical and phonological representations and literacy skills are influenced by factors in the home, which include parent language input, books available at home, and shared book reading, amongst others. In particular, the language the parent speaks to the child is especially important since children spend most of their time at home (Dixon et al., 2012). In a study examining home literacy environment in Singapore, O'Brien et al. (2020) found that a shared reading factor, which included number of books at home, frequency of reading to the child and child asking to be read to, had the strongest relations to both English

language and literacy of all the home factors, and significantly predicted vocabulary and reading outcomes. Home language input (HLI) and literacy environment (HLE) are known to contribute to children's oral language and literacy skills, but less is known about the degree to which these components of the home contribute to children's developing skills in a language other than the societal language. While HLE and HLI were found to contribute to children's developing literacy skills in their Asian language (Tamil or Malay), the relations were weak to moderate (Arshad et al., 2018). It was concluded that in the case of HLE, the impact on child literacy may be indirect and small, implying that it may operate through children's oral language (Arshad et al., 2018).

Given that standard spoken Tamil and non-standard Malay are acquired at home and are also used in preschool classrooms, these can be considered as acquired naturally as a mother tongue (MT) for everyone, while the literary forms are not spoken as a mother tongue but are taught in schools. Before children enter preschool, they are mostly exposed to standard spoken Tamil and non-standard Malay, hence the influence of the early home language and literacy environment on reading and spelling outcomes is of pedagogical and theoretical interest.

1.8 The School Environment – Implications for Instruction

At preschool, education in Singapore consists of 4 years: nursery for three and 4-year old children, and kindergarten for 5 and 6-year olds. However, these 4 years are not compulsory and are not a pre-requisite for enrolment in primary school (Source: TODAYonline, 2019). According to the Ministry of Education's kindergarten framework "Nurturing early learners (NEL)" (MOE, 2013), one of the learning goals of the MT curriculum in preschool education in Singapore is to develop foundational language and literacy skills. Although there is a greater emphasis on oracy (through songs, shared book readings, etc.), children are still expected to recognize words and to read with assistance and make marks, draw symbols and write letters/characters to represent ideas by the start of primary school. Primary education in Singapore comprises of a total of 6 years. At the primary level, the "Mother Tongue" curriculum focuses on teaching standard Tamil and Malay in relation to the four linguistic skills (i.e., listening, speaking, reading and writing) for the languages that are the focus of the current study.

As outlined above, the reformation of Malay and Tamil curriculum was necessary to maintain use of the language. The effects of these changes were seen in children's learning of the Malay language as detailed in Jalil and Rickard-Liow's (2008) paper with children making more vowel dilution errors as compared to vowel mediation as they learn the CVCV structure of words earlier as compared to CV + CVC structures. Additionally, children were more likely to make these errors on high familiarity words instead of nonwords. In similar terms, although the diglossic variations between literary forms and spoken forms of Tamil are very salient and are potential sources of spelling problems for children (Dixon et al., 2010),

quantitative research on children's learning of the Tamil language remains inconclusive and limited, hence more work is needed for this language.

Both cases, Tamil and Malay in Singapore, present educational challenges not currently addressed: That is, how best to teach literacy for diglossic languages in which the spoken forms differ from that which is coded in the script. Given that many children first acquire the spoken form (either at home or through oracy exposure in preschool), they begin literacy instruction with a background in a language that does not map directly onto the written forms they will acquire. Often, standard Tamil or Malay is used in schools and by teachers in classrooms, but the written forms are taught when it comes to learning to read and write. As previous international research has shown, diglossia can contribute to difficulty in learning to read and spell.

In sum, diglossia exists within the Asian languages practiced in Singapore, especially in Tamil and Malay, and as noted such diglossic variation is expected to have effects on literacy acquisition, in particular, spelling. In the next section a study is described examining young bilingual children's Tamil and Malay spelling performance and the influence of diglossia per language. From the literature review above, this study focuses on children's diglossic language input (from the home) and language use, and the relation of these to their early spelling performance.

2 A Study of Young Children's Spelling Errors in Tamil and Malay

In a study with simultaneously bilingual Tamil-English (n = 117) and Malay-English (n = 113) speaking children at Primary 1, we examined the proportions of diglossic-related spelling errors, and whether these were predicted by home language variables. The following research questions were addressed:

I. Is the incidence of diglossia in children's expressive speech related to their home language environment?
II. Do children with higher proportions in diglossic speech show poorer spelling performance?
III. Do the types of spelling errors that children make include diglossic errors? And how do these relate to their speech output, or home backgrounds?

In this chapter, we examine diglossic-related behavior in two areas – speech and spelling errors. For Malay, the characteristics of these errors include contractions of words (e.g. 'tidak to tak'), non-standard Malay words ('tengok' instead of 'lihat') and non-standard pronunciations and/or spellings of Malay words (e.g. 'mate' instead of 'mata'). The coding for non-standard pronunciation and/or spelling is based on their deviation from Sebutan Baku or Standard Spoken Malay established by the Ministry of Education in 1993. For Tamil, the Standard Spoken Tamil words

were selected, and the coding was based on Schiffman's (1983) phonological rules of standard spoken Tamil.

2.1 Methods

Expressive Vocabulary This task involved narrative elicitation using wordless picture books based on the frog story series by M. Meyer (1969, 1973, 1975). Original illustrations were redrawn by the Ministry of Education to make them appropriate for the cultural and environmental context of Singapore. "Frog on his own" (Meyer, 1973) was the story children were introduced to. The tasks were administered as part of a larger study which was conducted at the schools of participating children. Instructions for this task were given in standard spoken Tamil and non-standard Malay and children were encouraged to speak in their mother tongues as much as possible. They were not told to use either standard or non-standard varieties specifically, but if they responded in English, they were prompted to use Tamil/Malay. Children were asked to view all the pages of the book one by one, in order to familiarize themselves with the sequence of pictures and to be able to start forming their own storyline. After the child viewed the pictures in the book at his/her own pace, the experimenter asked the child to go through the book a second time and make up a story in Malay or Tamil using the picture sequence. If the child happened to skip any page while flipping through the pages or when narrating the story, the experimenter pointed it out by going back to that page. If the child was hesitant to start speaking, the experimenter prompted him/her with specific prompts. The entire storytelling interaction was audiotaped for later scoring and coding purposes. Recorded responses were transcribed, where total words spoken and spoken words with diglossic-related features were tabulated. A proportion score was calculated with diglossic-related speech errors divided over total number of words spoken. Prior to analysis, a transformation was applied to the proportions (arcsine of the square root of the proportion). Diglossic-related speech errors included contracted words, non-standard words and non-standard pronunciation of words. Examples of errors involved in this task for Tamil and Malay are specified in Tables 4a and 5a respectively.

Sentence Writing Children's diglossic spelling was evaluated through a sentence writing task. A picture (of a family of four in the living room) was shown to the child and they were given 3 min to describe the picture in Malay or Tamil. Their response was audio recorded. Following that, they were given 5 min to write out their picture descriptions in Malay or Tamil. Children were allowed to look at the picture as they wrote. The total number of words written was tabulated. Additionally, children's written responses were coded for diglossic-related writing errors based on the coding scheme explained below. Examples of errors involved in this task for Tamil and Malay are specified in Tables 4b and 5b respectively. Prior to analysis, a transformation was applied to the proportions (arcsine of the square root of the proportion).

Table 4a Examples of errors on the expressive vocabulary task in Tamil

	Differences	Standard-spoken/Errors made in Tamil	Transliteration	In literary Tamil	Transliteration	In English
1.	More than one standard spoken term exists for the same literary term. and Word-final nasal sounds omitted in speech	பையன்	**Paiyan**	சிறுவன்	**Siruvan**	Boy is taking.
		எடுக்குறா	yedu**kuran.**	எடுக்கிறான்.	yedu**kiran.**	
2.	Consonant omission and More than one standard spoken term exists for the same literary term.	நாளு	Naa**lu**	நான்கு	Naan**gu**	Four boys.
		பையன்	**paiyan.**	சிறுவர்கள்	**siruvargal.**	
3.	More than one standard spoken term exists for the same literary term and Palatalization converts /tt/ into /ch/	பையன்	**Paiyan**	சிறுவன்	**Siruvan**	Boy is keeping.
		வெச்சிருக்கான்	ve**churukan.**	வைத்திருக்கிறான்	v**eithurikiran.**	

Note. Differences between literary and standard spoken Tamil are in bold

Table 4b Examples of errors on the Tamil sentence writing task

	Differences	Standard-spoken/Errors made	Transliteration	Literary	Transliteration	English
1.	More than one standard spoken term exists for the same literary term and Consonant substitution	பய்யன	**Paiyan**	சிறுவன்	**Siruvan**	Boy is playing.
		விளையாடிகிரான்.	vi**la**yaa**di**kiran.	விளையாடுகிறான்.	vi**lai**yaa**du**kiran.	
2.	Consonant substitution	அப்பா செடிதாள்	Appa se**di**taal	அப்பா செய்தித்தாள்	Appa se**ithit**taal	Father is reading newspaper.
		படிகிரார்.	padikiraar.	படிக்கிறார்	padi**k**kiraar	
3.	More than one standard spoken term exists for the same literary term and Word-final nasal sounds omitted in speech	பய்யன	**Paiyan**	சிறுவன்	**Siruvan**	Boy is running.
		ஓடுரா.	Odura.	ஓடுகிறான்.	oduragiran.	

Note. Differences between literary and standard spoken Tamil are in bold

Spelling Children's spelling was also evaluated with a dictated spelling list in Tamil, or Malay. Words were derived from the primary school curriculum for the first year (P1). The list of words included 5 low level words of 2–3 letters, 3 medium level words of 3–4 letters and some phonemic/graphic confusability, and 2 difficult words with 4 or more letters and/or multi-letter graphemes. The children were encouraged to write to the best of their abilities even if they were unsure of the spelling. Each word was given in isolation and then in a sentence, then repeated, by the experimenter, as many times as the child required. If the child was unable to write or was unsure of the spelling, the child was told to leave the response area with attempts or blanks. All 10 words were administered to all children. A total correct score was tabulated for the whole list. In this study, we also selected 3 Malay and 5 Tamil words that had potential diglossic-related spelling errors and these words were scored for the proportion of diglossic spelling errors. Examples of errors involved in this task for Tamil and Malay are specified in Tables 4c and 5c respectively.

Reading A reading task was given at the same time point. For Tamil children, it consisted of 3 parts: letter discrimination, letter naming and word reading. The letter discrimination task in part one was developed in house and was based on the format of the Preschool and Primary Chinese Literacy Scale (Li, 1999). The word reading list for Tamil language was based on word lists from K to P3 curriculum materials from library at the National Institute of Education (NTU). In the first part, a total of 18 letters was tested. For each item, the experimenter said a letter name, and the child selected which of the 4 glyphs correctly matched the letter name by to pointing to it. In the second part, a total of 12 letters was tested, where the child named aloud the printed letter. The third part constituted 5 blocks of 20 words each. If the child was unable to read any of the words in a particular block, testing was terminated. A sum of all 3 parts was calculated to form a total reading score.

For Malay children, the reading task had two parts: letter naming and word reading. The word reading list for Malay language is based on word frequencies from a word corpus by Lee and Low (2011). In the first part, a total of 11 letters was tested, where the child named aloud the printed letter. The second part constituted 4 blocks of 25 words each. If the child was unable to read any of the words in a particular block, testing was terminated. A sum of both parts was calculated to form a total reading score.

Bilingual Receptive Vocabulary Skills For this purpose, the Bilingual Language Assessment Battery (BLAB – Sze & Rickard-Liow, 2008) was administered. It is a locally-developed measure widely used in Singapore (e.g., Yeong & Rickard-Liow, 2012), and consists of a spoken word-picture matching with a total of 80 items and three practice trials. The task was rendered on iPads. In each trial the child listened to an audio-recorded word and selected one of four pictures on screen that matched the word. Children completed the English version, as well as the Malay or Tamil version of the task. Based on children's scores on the English and Mother Tongue language task, an index was computed of the relative bilingual receptive vocabulary

Table 4c Examples of errors on the Tamil spelling task

	Differences	Dictated words	Transliteration	Errors made	Transliteration	English
1.	Consonant substitution	கணினி	Ka**Nini**	கனாணி	Ka**naNi**	Computer
2.	Consonant substitution	இன்பம்	**In**bam	இம்பம்	**Im**bam	Joy
3.	Word-final nasal sounds omitted in speech	விமானம்	Vimaana**m**	விமாண	Vimaana	Airplane
4.	Consonant substitution	நாற்காலி	Na**a****R**kaali	நாட்காலி	Na**at**kaali	Chair
5.	Consonant omission	உடற்பயிற்சி	Uda**R**payirchi	உட பயிற்சி	Udapayirchi	Exercise

Note. Differences between literary and standard spoken Tamil are in bold

skills by subtracting the Malay or Tamil score from the English score and dividing this number by the sum of the Mother Tongue and English language scores. In this way, positive indices reflected stronger receptive vocabulary skills in English, as compared to Malay or Tamil, while negative indices represented the opposite pattern.

Home Language Input (HLI) and Home Literacy Environment (HLE) Parent-report questionnaires were given to parents which included items about the relative usage of languages in the home (Malay or Tamil vs. English), and the types of literacy activities carried out in the home. For home language input, the proportion of time that each language was used for interacting with the child (spoken and heard) was indicated per family member in the home. Along with this the percentage of time the child spent with each family member was collected, and this was used in a family-wide weighted sum of the overall proportion of time for English use and Malay/Tamil use. The difference between this proportion of Malay/Tamil use and English use was then calculated as a home language input index (e.g., 50% – 50% would indicate an index of 0 meaning balanced input, and 80% – 20% would indicate a positive index score where Malay/Tamil use predominated).

For HLE, a subset of items was adapted from Farver et al. (2006). Two items were included and were rated on a 7-point scale. First, parents estimated how many Malay/Tamil children's books they have in at home (0, 1–10, 10–30, 30–60, 60–90, 90–120, more). Second, parents rated the number of days per week that someone read to the child in Malay/Tamil (0–7) on average.

For mother's education, parents chose a number between one and 11 corresponding to one of the following levels of the Singaporean educational level, ranging from completion of: primary school (1), O-level or grade 10 (4), A-level or grade 12 (6), a technical certificate or polytechnic diploma (7, 8), to a bachelor, master, or doctoral degree (9, 10, 11). This information was used as a proxy for children's socioeconomic status (SES).

Coding Scheme Following consultation with language and curriculum experts from the Ministry of Education and National Institute of Education, the first authors introduced the coding steps and outlined the coding sequence to 2 coders for each MT, who then each coded the diglossic-related speech errors and diglossic-related writing errors separately and noted potential issues. This feedback facilitated subsequent minor changes to the coding procedure. Any disagreements on the coding were resolved with consensus discussions, and further consultations with an expert panel.

Children's diglossic-related speech errors from their expressive vocabulary task were tabulated by counting the frequencies of total words spoken and diglossic-related speech errors separately. A proportion score was calculated with diglossic-related speech errors divided over total number of words spoken. Children's diglossic-related writing errors were tabulated by counting the frequencies of errors made. Diglossic-related writing errors included contracted words and non-standard spelling and/or form of words. Diglossic-related speech features and diglossic-related writing errors were identified based on the rules in Aaron and Joshi's (2005) and Lakshmi and Saravanan's (2011) studies for Tamil and errors for Malay included non-standard words and non-standard pronunciation of words. Examples of errors committed in the expressive vocabulary, sentence-writing, and spelling tasks are detailed in Tables 4a, 4b and 4c for Tamil and Tables 5a, 5b, and 5c. for Malay, respectively.

Procedure Children participated in a larger battery of tasks within a larger longitudinal study (Ng et al., 2014). The tasks were administered one-to-one by trained research assistants at the primary schools they were attending. The administration was conducted in a quiet classroom. Total administration time per child ranged from 1 to 2 sessions for the whole battery, depending on the arrangements with each primary school. Each session lasted approximately 30–60 min. The tasks were administered in a similar order to all children.

Table 5a Examples of errors on the expressive vocabulary task in Malay

	Differences	Non-standard Malay (Spoken/Written)	Standard Malay (Spoken/Written)	English
1.	Phonology	D**ie**	D**ia**	He/She
2.	Vocabulary	**Nak**	**Mahu**	Want
3.	Vocabulary	**Ambek/ambik/Amek**	**Ambil**	Take

Note. Differences between standard Malay and non-standard Malay are in bold

Table 5b Examples of errors on the Malay sentence writing task

	Differences	Non-standard Malay (Spoken/Written)	Standard Malay (Spoken/Written)	English
1.	Vocabulary	Ibu **tengah tengok** tv.	Ibu **sedang menonton** televisyen.	Mother is watching the television.
2.	Grammar	Abang sedang duduk di **dalam** kerusi.	Abang sedang duduk di **atas** kerusi.	Brother is sitting on a chair.
3.	Phonology	Budak tu ma**e**n kerete.	Budak itu ma**i**n kereta.	That kid is playing with a car.

Note. Differences between standard Malay and non-standard Malay are in bold

Table 5c Examples of errors on the Malay spelling task

	Differences	Dictated words	Errors made	English
1.	Single Word Substitution (Phonology)	D**a**n	D**e**n, d**e**na, d**i**	And, With
2.	Single Vowel Addition (Phonology)	D**a**n	Den**a,** dan**a**, dan**i**	And, With
3.	Single Consonant Addition (Phonology)	Mata	Mata**h**	Eye

Note. Differences between standard Malay and non-standard Malay are in bold

3 Results

The children in this study were taking lessons in Malay (n = 113) and Tamil (n = 117) as their mother tongue while attending Primary 1 in Singapore. Mothers of children in the Tamil group had relatively higher levels of education ($M = 8.56$, $SD = 1.76$) than the mothers of children in the Malay group ($M = 5.53$, $SD = 2.27$). In addition, Tamil children had a relatively higher bilingual receptive vocabulary score ($M = 0.16$, $SD = 0.16$) than the Malay children ($M = 0.09$, $SD = 0.13$), meaning more of the Tamil group were relatively stronger in English (see Methods section for details on the sources of this information). In terms of home language environment indicators, there were no significant effects between the two language groups for both books read at home, $t(211) = -1.55$, $p = .13$, and for shared book reading, $t(203) = -1.51$, $p = .13$. Notably, all the children in the study took part in the larger longitudinal study for which they were followed through 2 years of preschool (kindergarten) before entering Primary 1. This is in line with the majority of children in Singapore who attend preschool (99%, Source: LIEN foundation, 2019).

First, examining the degree to which the children's speech is "diglossic", the instances defined as non-standard Malay and standard spoken Tamil diglossia in children's expressive speech is summarized in Table 6. The bottom of the table presents the descriptives, where the average proportions (non-transformed) show that about 20% and 29% of children's expressive speech (i.e words used) contained non-standard Malay or standard spoken Tamil, respectively, on average. Children's use of diglossia in their narrative speech was correlated negatively with the amount of time their parents read with them in the case of Malay children, and positively with the amount of Tamil spoken at home on the other hand (upper part of Table 6).

Given the wide range of diglossic speech patterns across individual children, we next examined whether a greater use of non-standard Malay or standard spoken Tamil would be related to poorer spelling performance in Malay and Tamil, respectively. Correlations are reported in Table 7. As shown, each language group reveals the same pattern, whereby children's diglossic speech is unrelated to their spelling performance or to their reading and is also unrelated to the rates of diglossia within their sentence writing. On the other hand, all the literacy measures were related (spelling and reading), including significant moderate positive correlations between diglossic writing with overall accuracy on the word spelling and reading tests.

Table 6 Spearman's Rho correlations between diglossia in children's expressive language and home environment variables

	Malay (N = 113)			Tamil (N = 117)		
Home environment	Total words	NSM words	Proportion	Total words	SST words	Proportion
Language Input	0.051	0.101	0.073	0.134	0.247*	0.317**
Books at Home	0.026	0.042	−0.025	0.047	0.105	−0.023
Shared Reading	0.181	0.234*	0.118	0.087	0.096	−0.031
Mean	75.16	20.18	0.199	136.21	45.05	0.286
SD	60.91	23.44	0.052	72.91	31.28	0.056
Range	0–317	0–109	0–0.64	0–348	0–143	0–0.66

Note: Language input (HLI) = the difference between Asian language minus English input across the family (positive values indicate greater Asian language input). Books at Home and Shared Reading = rated on a 7-point scale; NSM = Nonstandard Malay, SST = Standard Spoken Tamil, proportion = NSM/Total words and SST/Total words. **p < .01, *p < .05

Table 7 Spearman's Rho correlations between diglossia in children's expressive oral language and written language, and their general literacy skills

	Malay (N = 113)					Tamil (N = 117)				
	Measure	1	2	3	4	Measure	1	2	3	4
1	NSM prop Speech	–				SST prop Speech	–			
2	Spelling Accuracy	−.052	–			Spelling Accuracy	−.020	–		
3	Reading Accuracy	−.038	.872**	–		Reading Accuracy	−.048	.844**	–	
4	NSM prop Writing	−.042	.395**	.399**	–	SST prop Writing	−.048	.358**	.355**	–
	Mean	0.199	5.13	57.18	0.003	*Mean*	0.286	3.18	61.08	0.021
	SD	0.052	3.05	33.44	0.021	*SD*	0.056	1.93	31.62	0.054
	Range	0–0.64	0–10	0–108	0–0.38	*Range*	0–0.66	0–8	1–122	0–0.51
	n	113	128	123	129	*n*	117	115	115	114

Note: NSM prop Speech = proportion of NSM words in expressive language task, SST prop Speech = proportion of SST words in expressive language task. Spelling accuracy = total correctly spelled words from 10-word dictated list, Reading accuracy = total correctly read words from 100 word list. NSM prop Writing = proportion of NSM spellings in sentences writing task, SST prop Writing = proportion of SST spellings in sentences writing task. **p < .01, *p < .05

Finally, to see what may contribute to the number of non-standard Malay and standard-spoken Tamil spelling errors in children's expressive sentence writing, Poisson regression analyses (Gonzalez-Blanks et al., 2020) of these error counts were performed for each of the language groups separately. Predictors in the models included the home environment variables (relative home language input, number of books, and frequency of shared book reading), the proportion of non-standard Malay or standard spoken Tamil in the child's expressive speech, and their literacy proficiency (reading accuracy scores) (see Table 8). As shown in the table, only

Table 8 Poisson regressions predicting children's diglossic spelling errors for Malay and Tamil

	Malay (N = 85)					Tamil (N = 80)				
	χ^2	(df)	*p*	B		χ^2	(df)	*p*	B	
Model fit	1.884	(5)	0.865			36.185*	(5)	<0.001		
Intercept	7.403	(1)	0.007	−2.136	**	13.161	(1)	<0.001	−4.091	**
Language Input	0.036	(1)	0.850	−0.097	ns	0.052	(1)	0.820	−0.087	ns
Books in Home	1.395	(1)	0.238	0.259	ns	0.001	(1)	0.973	0.007	ns
Shared Reading	0.215	(1)	0.643	−0.079	ns	2.519	(1)	0.112	0.146	ns
Proportion Speech (NSM/SST)	0.674	(1)	0.412	0.779	ns	0.077	(1)	0.781	0.289	ns
Reading	0.107	(1)	0.744	−0.002	ns	23.051	(1)	<0.001	0.034	**

Note: χ^2 for *Model* = *Likelihood Ratio* χ^2 (omnibus test of full model vs. intercept-only model), for covariates = Wald χ^2; Language input = the difference between Asian minus English language input across the family (positive values indicate greater Asian language input). Books at Home and Shared Reading = rated on a 7-point scale. Proportion Speech (NSM/SST) = proportion of NSM/SST words in expressive language task. Reading = total score on reading task. B = unstandardized regression coefficient (expected change in log counts)

reading showed a small contribution to diglossic spelling errors in the Tamil full model ($\chi^2(5) = 36.185$, $p < 0.001$). The model for the Malay group did not show any significant predictors of diglossic spelling errors, as the full model did not yield a better fit than the intercepts-only null model ($\chi^2(5) = 1.884$, $p = 0.865$).

4 Discussion

This chapter focused on diglossia within two speech communities in Singapore: Malay and Tamil. The expectation that diglossia in these speech communities may present a challenge for children learning to read in written forms that diverge from the spoken form they are more familiar with was examined in the study described. The central aim of this study was to examine Primary 1 Malay and Tamil children's diglossic speech patterns and to investigate the role of the home environment in affecting their literacy skills.

A number of findings stand out in relation to the literature. First, when examining children's expressive language as related to variables in their home language environment, Malay children's speech seemed to be correlated only with their shared book reading sessions at home. An interesting possibility for this finding is that although the words in the book are printed in the literary form, parents may have used the non-standard Malay form to reiterate the words. Hence, when children listen to the stories being read in a diglossic manner, this may draw attention to the segmental features of the non-standard Malay usage, thereby promoting acquisition and output of the lower variety. Such was also the case in an observational study conducted by Mukhlis and Pang (2015), where Malay parents were found to use a number of strategies when they engaged in shared book reading with their children,

such as code-switching using English and colloquial Malay. While we hypothesized that more shared book reading with the parents would contribute to increased standard Malay output, unexpectedly this relationship was in the opposite direction. More shared book reading at home was related to more non-standard output by the child. This might be explained by findings of Mukhlis and Pang's (2015) case study where parents interacted with their children during shared book reading time using dialogic reading and conversations instead of reading directly from the print. Hence, this might have also exposed the children to more non-standard Malay and needs to be taken into consideration in future studies. In the case of the Tamil children's expressive language, only their home language input was associated with their instances of diglossic language output. This is in line with the emphasis upon using standard spoken Tamil in everyday situations and that it is strongly encouraged even in formal situations (Saravanan & Lakshmi, 2005).

Second, the variable of primary interest in this study was diglossic speech patterns and how this in turn relates to diglossic spelling errors. While one might expect that children's diglossic speech patterns would have a close association to their spelling performance, especially in an alphabetic script like Malay, the results obtained in the present study show that this was not the case. This could be attributed to the lack of opportunity to commit diglossic mistakes where this study only included 3–5 diglossic targeted words and free sentence writing instead of it being dictated. Under the Singapore educational system, Malay standard or literal Tamil is taught in Primary schools usually for about 30–60 min per day. During classroom instruction, teachers often engage in conversations with their students in standard spoken Malay or Tamil. There is, however, an initiative by teachers to compartmentalize and maintain the literary form within the classrooms by pointing out the differences in spoken Tamil and written Tamil (Lakshmi, 2001). For example, if a child were to write the word naarkali (chair) in its standard spoken form (naakali), teachers make an effort to point out the difference in the two varieties. This type of feedback not only serves as a constant reminder to keep the two varieties separate but also increases the child's knowledge of the literary form of the word, hence enabling the child to code-switch between the two varieties. Our findings are also in line with the survey findings by Lakshmi (2001) where the variety used by students at school in classroom activities differed from the variety that they used at home. While future studies could consider alternative interpretations to ours, regarding code-switching, the current result still raises an important question. What and how explicit should instruction be in teaching the differences between the two varieties? This certainly has strong educational implications.

In our current study, one might think that the task demands for sentence writing may affect our results. Specifically, the task included having the children orally describe the picture first in Malay/Tamil and then writing out their description. This could have resulted in more diglossic errors in writing because it was based in their spoken responses. However, when children were given the dictated spelling task (10 words) in standard phonology, some children (though not all) also tended to write the word in the diglossic form (refer to Fig. 1). During the dictation test, children may be constructing an untaught rule for themselves regarding the words that they

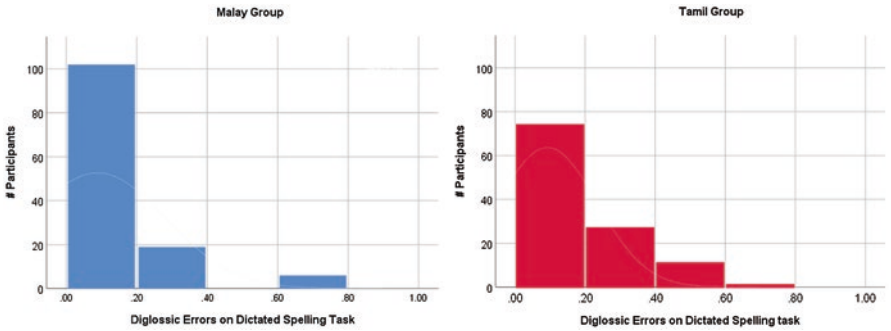

Fig. 1 Number of children making errors on the spelling dictation task for the proportion of NSM errors (Left panel) and SST errors (Right panel)

are unable to remember by accessing the lexical phonology of the word. The words may be familiar because they read them during sight-word reading sessions with their teacher, but they also may have a lexical memory of the word from their spoken vocabulary that includes the non-standard spoken form. In the second case, children may use an addressed whole word phonology based on standard spoken Tamil or nonstandard Malay, so that when they attempt to phonetically spell out the words, they rely on the spoken form of the word, which may be more easily retrieved.

We began this chapter by considering the different ways spelling may be challenging for children and how literacy skills might be influenced by the properties of spoken language. Children's home environments influenced their own diglossic speech – for Tamil, the more Tamil spoken in the home, the more diglossic instances in children's speech, while for Malay, the more shared reading in Malay at home, the more diglossic instances in children's speech. With regard to their literacy, for Tamil language, although surprising, our findings are in line with previous work by Nag (2013) and Aaron and Joshi (2005) – that is, the effect of diglossic speech to spelling accuracy was negligible. For Malay, in our sample, children's diglossic speech was also unrelated to their spelling. Also, although the home literacy environment related to children's speech, this did not translate to diglossic spelling in Malay. These results are in contrast to Jalil and Rickard Liow (2008) who found that Singaporean preschoolers made diglossic spelling errors whereas children from non-diglossic families in Indonesia did not make the same spelling errors in Malay. Two things may account for the divergent findings. First, over the past 10 years there has been a shift in home language use to be predominantly English across all ethnic language groups, so children may experience less Malay input overall at home. Second, there was also a difference in the measures administered in the two studies. In our study, we allowed for free writing of words for sentence writing, and in our dictated spelling test there were only 3–5 items that involved diglossic-related words. Jalil and Rickard Liow's (2008) study involved a dictated spelling list with more items and most items were focused on diglossic vowel confusions (/e/ for /i/,

/o/ for /u/ and /e/ for /a/). Thus, there may have been more opportunities for children's diglossic knowledge to affect their spelling performance. Indeed, further investigation of this phenomenon is warranted.

In general, we found that expressive language and literacy were unrelated in terms of diglossic instances of language production. This is keeping with the above argument that the children are effectively switching between the varieties when speaking and writing. While this is our interpretation of the findings, further examination would be required to confirm it. For example, this could be done by using a task other than spelling from dictation, where instead children might be asked to name a picture and then spell the word. By tapping into both their own spoken and written response to the same stimulus, one could observe whether these modes are kept independent in terms of language variety. This way, it may distinguish whether children name the picture using diglossic speech and a variant they adopt when asked to spell the word. Following our findings, we would expect the children to switch between the variants successfully and we would see differences in the naming versus the spelling of the same word. Additionally, within their literacy skills, there appeared to be a positive relationship between children's Tamil/Malay reading and the production of diglossic writing errors, and for Tamil diglossic spelling, errors were predicted by reading skills. On the other hand, neither language input from the home nor diglossia in their own speech were predictive of children's diglossic spelling errors.

The purpose of the present study was to add to the small but expanding body of literature on the role that diglossic speech patterns may play in reading and spelling acquisition. While a good deal of literature is known about the home language environment (Dixon et al., 2012) and spelling development, there has been less research on how a specific aspect of speech patterns such as having to code-switch between two variants at home and at school impacts literacy skills. This study was also the first of its kind to investigate diglossia in a minority language such as Tamil, with most of the published literature on the influence of diglossia in spelling coming from either the English language (Terry et al., 2016) or from Arabic (for a review, see Saiegh-Haddad, 2017, and in this collection).

In conclusion, as pointed out in the introduction, the study of diglossic speech errors in Tamil and Malay languages is still in its infancy. In comparison to past studies, the current study looked at different patterns of diglossic influence on reading and spelling. Previous spelling research in Tamil by Aaron and Joshi (2005) demonstrated that children made spelling errors mostly at the retroflex vowels or consonants level or secondary vowel diacritic marks. Similarly, in Jalil and Rickard Liow's (2008) study, children were committing mistakes in spelling Malay words at the phonology level, specifically at vowel substitution. We also note that the errors we observed (as exemplified in Tables 4b, 4c and 5b, 5c) occurred on all levels for Malay students (e.g. grammar, vocabulary and phonology) while the errors committed by Tamil students on the three tasks involved mostly phonology with some instances of whole word substitutions.

The current study is the first step towards understanding the relationship between diglossic speech patterns and writing. The findings of our study provide preliminary

insights into this relationship where there appeared to be no crossover from diglossia in speech to spelling, with children using the standard forms when speaking at home and using the literary written forms in their writing in schools. The examination of language use in a diglossic community suggests (a) that standard and literary varieties not only can but do co-exist in educational settings and (b) children have in ways learned to tune in and out of the varieties successfully. Successful use of non-standard Malay or SST in informal situations and standard Malay or literary Tamil in the classroom and when writing demonstrates sophisticated linguistic behaviour. Henceforth, a great deal of work needs to be done in terms of developing comparable hypotheses between the varieties and devising similar methods and test batteries across investigations in the two languages. Further, it will be important to also examine how teachers' approach in classrooms may be effective in helping children learn the standard language form of each language. An implication for Tamil scholars and educators would be to work on developing books similar to the ones in Malay to educate children on both forms of the language, since research that builds understanding on how Tamil children respond to bi-variant children's books is scarce and under-developed. At a curriculum level, more guidance can be provided regarding how such books can be used instructionally both in the classroom as well as at homes to promote a deeper awareness of the differences between the two forms and a greater development of standard Malay and literary Tamil. Additionally, given that the children learn two languages simultaneously at schools, it is essential to gain a cross-linguistic perspective, making comparisons with children's literacy skills in English. In due course, it will be the combination of detailed within-language and cross-linguistic analyses that will produce a better understanding of the relationship between the diglossic varieties.

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Reading and Writing in a Diglossic Context: A Multifaceted Perspective

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1 Reading and Writing in a Diglossic Context

Modern communications technologies devices, such as online chats, Short Message Service (SMS), and mobile phones have influenced and rapidly transformed patterns of communication in the whole world, without considering the local linguistic realities and the variety of orthographies and writing systems. This has caused an increase in linguistic diversity in Computer-Mediated Communication (CMC) contexts and environments (Palfreyman & Khalil, 2003). CMC has been defined as "the practice of using networked computers and alphabetic text to transmit messages between people or groups of people across space and time" (Jacobs, 2014:470).

The most common form of CMC script-switching has been Latinization[1] of a non-Latin-scripted language (Palfreyman, 2001). Crystal (2001) relates this phenomenon

[1] Ivković (2015) defines Latinization as: "… the substitution of native, non-Latin-based graphemes with graphemes from the Latin alphabet in languages where standard usage prescribes a different writing system". (p. 2)

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to the fact that earlier computer encoding systems and digital platforms were not capable of representing non-Latin script, and the only means to communicate effectively was through the use of the English language and/or Latin-script based. Therefore, the first users of CMC were forced to use Latin characters even though it was not their native script. This situation resulted in the emergence of several Latin-script-based orthographies such as Latin-scripted Greek (e.g., Koutsogiannis & Mitsikopoulou, 2003), Japanese (e.g., Nishimura, 2003), Chinese (e.g., Wei, 2016) and Arabic (e.g., Palfreyman & Khalil, 2003; Warschauer et al., 2002).

Arabic is an especially interesting case because native Arabic speakers are born into a diglossic context with a *High,* primarily written variety and a *Low,* spoken variety (Ferguson, 1959). The acquisition of literacy is centered on the teaching of Modern Standard Arabic (MSA), a standardized written form that displays a high degree of uniformity; and children are taught to read and write it at school (Saiegh-Haddad & Henkin-Roitfarb, 2014). This language of literacy functions as the official standard language in all Arab countries (Al-Toma, 1969; Holes, 2004). A vast body of work has described this standard language from the seventh century A.D. onwards, and to this day it remains the exemplary model for the contemporary written language. In contrast, another – remarkably different yet related – linguistic code constitutes the vehicle for daily life communication, *Spoken Arabic* (SA). SA varies widely along geographical locations and demographic variables such as region, social class, age, sex and ethnicity (Holes, 1995; Moore, 2012). SA is naturally and spontaneously acquired by Arabic children as their mother tongue. Traditionally, writing in SA is viewed as dis-preferred "because it breaks with what is in effect a "cultural taboo" whose ideological validity is sanctioned by tradition and historical practice" (Suleiman, 2004:72). However, in the last two decades there has been a substantial increase in written SA in the public sphere, in contexts such as advertisements, popular magazines, and short stories (Doss, 2006; Elinson, 2013; Mejdell, 2006a, b; Walters, 2003).

The use of Latin letters to write SA in the context of CMC has been termed *Arabizi* (the fusion of *Arabic* and *Inglizi*, 'English' in Arabic pronunciation; Bashraheel, 2008). Recently, the advent of Arabic-supporting software has allowed the writing of SA in Arabic orthography. However, this has not completely eradicated Arabizi, and its use – as well as its academic study – continues. In fact, SA written in Arabic as well as in Arabizi coexist today in the CMC context, as shown in Fig. 1.

Although the use of Arabizi is much less ubiquitous than it was half a decade ago, as this chapter shows, its effects on the cognitive processes involved in literacy are scientifically interesting. The current chapter thus takes a novel perspective on the issue of reading and writing processes, skills, and practices in Arabic, one which is typically addressed to a lesser degree in current literature – literacy in SA.

To date, the use of Arabizi has been addressed from a sociolinguistic perspective, in terms of its use in various sociolinguistic circumstances (e.g., Bashraheel, 2008; Masmoudi et al., 2015; Warschauer, 2001). Because English is commonly used also in the online Arab sphere (Bjørnsson, 2010), the use of Latin script is highly accessible to Arabic-speaking CMC users (Shoufan & Alameri, 2015). As a result, the Latinization of Arabic became widely spread among Arab youth (rather than older

Fig. 1 Spoken Arabic written in both Arabizi and Arab letters (Instagram, July 2020)

people) across many Arab countries (Kindt & Kebede, 2017), and has been a bona fide linguistic resource for its users (Lee, 2007; Pavlenko & Blackledge, 2004). As mentioned above, the apparent necessity for Latinization in CMC has diminished in recent years due to multilingual and script support for most CMC applications (Androutsopoulos, 2007; Palfreyman & Khalil, 2003). Despite this, Latinization of non-Latin-scripted languages continues (Al-Shaer, 2016; Palfreyman & Khalil, 2003), posing interesting questions about code choice and code use. Indeed, in our case, Arabizi is a prime example of such a linguistic resource. When this study was conducted in 2014–2015, Arabizi was still the major way to communicate in CMC.

2 Characterization of Arabizi

The Latinization of SA in the context of Arabizi can be considered as both transcription (writing based on attempts to match pronunciation) and transliteration (writing based on replacing one character for another). In Arabizi, each Latin letter represents an Arabic phoneme that matches it in pronunciation (according to English pronunciation), whereas transliteration is used for Arabic phonemes that are nonexistent in the English language. This process relies on Arabic numerals that resemble Arabic letters in their shapes (e.g., 2 = = ء/ ʔ/, 3==ع / ʕ /, 7 = ح=/ ħ/) (Garra, 2007; Palfreyman & Khalil, 2003; Sperrazza, 2011). In some cases, accent marks can also be used to refer to an Arabic phoneme along with the Arabic numerals (e.g., **3′ = =** غ /ɣ/). Bianchi (2012) describe these forms as "arithmographemes", while Al-Tamimi and Gorgis (2007) suggest that Latinized Arabic might be described as a hybrid lingua franca or even a pidgin. Beesley (1998) assumed that the transliteration process of a word occurs letter by letter or "one phoneme, one grapheme" by following the phonological principle (Ivković, 2015:5). In Arabizi, this process is concerned with representing the pronunciation of a spoken word by finding the equivalent, or closest equivalent, sound in a Romance language and recording its orthographic value

(e.g., Palfreyman & Khalil, 2003; Pasha et al., 2014). However, in Arabizi, we see an orthographic characteristic of MSA, where in the unvoweled form; short vowels are mostly omitted as they are in the written orthography representing MSA (Fig. 2).

As with all writing systems, the efficiency of using Arabizi depends on its users and their experience with typing it (Muhammed et al., 2011). However, the variation of writing in Arabizi is also related to the significant phonological variation between SA dialects. Thus, the way people transcribe the same phonemes differs between Arabic speaking countries and even among different regions in the same country, depending on the specific spoken dialects in each area. For example, the word *liberation* has the following popular Arabizi spellings: *ta7rir, t7rir, tahrir, ta7reer, tahreer* (Darwish, 2013). The orthographic representation of SA investigated to date reflects this variation (Adamson, 2009) and its lack of standardization (e.g., Palfreyman & Khalil, 2003; Bahrainwala, 2011; Muhammed et al., 2011). And yet, the stability of Arabizi as a writing system has received very little attention in research. The only study that examined the use of Arabizi among Palestinians was Zoabi's (2012) study of writing in Facebook, which did not analyze the orthographic variation of the different users. This can be expected to be high, given the phonological variation between the dialects.

Consider, for example, some of the most relevant features of these dialects. The colloquial Arabic dialects vary in their articulation between the urban /dˤ- ðˤ-d/ (ض,ظ, د) for /ðˤ/ (ظ) for /z/ (ز) and /s, t/ (س, ت) for /tˤ/ (ط), and the respective 'traditional' literary Arabic articulation /ð/ (ذ) and /ðˤ/ (ظ) which is characteristic of rural and Bedouin dialects. The four basic emphatics /sˤ- dˤ- tˤ- ðˤ/ (ص, ض, ط, ظ)

- good evening beauty. How are you?

- I feel good. Thank god

- what about our plans? You still want to go out together one of these nights, or what?

- sure…where will we go? Do you think about a specific place or you prefer to go to Teishreen?

-Teishreen is excellent..we have a deal

- Ok..see you tomorrow...goodnight my love

Sweet dreams

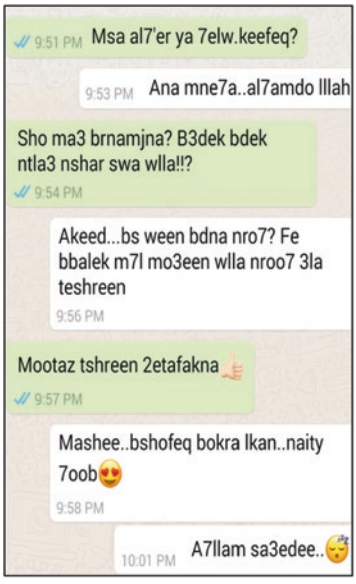

Fig. 2 An example of a WhatsApp conversation between two young women that was sampled in 2015

(especially at word-final position) are often pronounced as non-emphatic phonemes in some colloquial Palestinian dialects, mainly urban ones, as in /s/ (س) for /sˤ/ (ص) in colloquial Arabic, e.g. */sandūq/* for literary Arabic */sˤ undūq/* 'box' (Rosenhouse, 2002). In all markedly urban dialects, the older interdental spirants /θ, ð/ (ث, ذ) have been replaced with their postdental stop equivalents /t, d/ (ت, د) (e.g., maab:uθ / maab:ut 'was sent'). Moreover, the pronunciation of qa:f can be regarded as the most prominent distinctive feature for the classification of Arabic dialects spoken in Palestine. In urban dialects this phoneme is generally articulated as the glottal stop [ʔ] (ئ, ء, أ, ؤ) (Geva-Kleinberger, 2004; Horesh, 2014; Levin, 1994; Palva, 1984; Rosenhouse, 2007). The postvelar /q/ (ق) is used by a great majority of Muslim and Christian villagers in the Galilee, and the shift from /q/ to strong guttural /k/ is documented for many central Palestinian villages (e.g., *kult* 'I said', *kalb* 'heart') (Blanc, 1965). In the Bedouin dialects, /g/ alternates with /ʤ/, as in *qahwe* (rural) / *ghawa* (Bedouin) / *ʔahwe* (urban) 'coffee' (Behnstedt & Woidich, 2005; Levin, 1994; Rosenhouse, 1998). Another distinctive feature is related to vowels. Abd-El-Fatth (1990) notes that /u,i/ may be heard as /o,e/ respectively under certain circumstances, mainly near gutturals /h, x, ʔ, r/ (ر, ء, خ, ه) and emphatics (sˤ- dˤ- tˤ- ðˤ) (ص, ض, ط, ظ). Rosenhouse (2008) gave some examples of this process in short vowels: *bethum* / *bethom* 'their house', *ʔurs* / *ʔors* 'wedding', *zirr* / *zerr* 'button', *ʔinti* / *ʔinte* 'you', *bitħibbi* / *bitħibbe* 'you like/love'. Generally, this feature is widely used in Nazareth and other towns, and at least in several rural dialects of the Galilee and the "Triangle".[2] In addition, vowel insertion is also common to break up consonant clusters—for example, the pronunciation of the name *ʔısım* versus *ʔısm* in spoken dialect versus MSA, respectively.

2.1 Studies of Arabizi

Several studies have investigated the use of Arabizi as the online language in the Arab world from different perspectives, focusing particularly on sociolinguistic issues as well as psycholinguistic and computational aspects of language use (e.g., Alghamdi & Petraki, 2018; Allehaiby, 2013; Al-Shaer, 2013; Alsulami, 2019; Palfreyman, 2006; Palfreyman & Khalil, 2003; Pasha et al., 2014; Sperrazza, 2014; Warschauer et al., 2002).

Generally, in the Arab world MSA was found to carry more prestige than SA and to be valued more positively (Hussein & El-Ali, 1989). Furthermore, Belnap and Bishop (2003) found that MSA, be it written or oral, is generally seen as too formal to use in interpersonal communication especially with peers. Arabic speakers prefer using SA for these purposes. Similarly, Bataineh et al. (2014) and Al-Naggär

[2] The **Triangle** (Hebrew: המשולש, *HaMeshulash*; Arabic: المثلث, *al-Muthallath*), formerly referred to as the **Little Triangle**, is a concentration of Israeli Arab towns and villages adjacent to the Green Line, located in the eastern Sharon plain among the Samarian foothills; this area is located within the easternmost boundaries of both the Central District and Haifa District

(2012) reported that Emirati female students prefer using Arabizi when communicating with their peers. Kindt et al. (2016) examined the attitudes and usage of written language on CMC, based on a large sample from a literate population of greater Cairo (N = 2529), and Kindt and Kebede (2017) conducted a similar survey in Rabat (N = 959). The two studies indicated the same patterns: SA is used more frequently as a written language in CMC than both MSA and English, and those language users have positive attitudes to the concept of SA as a written language, especially in CMC context.

To the extent that reading and writing have been considered with respect to the use of Arabizi, the common view is that literacy practices related to the written dialect(s) remain a marginal phenomenon in comparison to reading and writing in MSA and the influence of diglossia on reading ability, text comprehension skills, and writing among skilled readers (e.g., Abu-Leil et al., 2014; Saiegh-Haddad, 2003, 2017; Saiegh-Haddad & Schiff, 2016; Eviatar et al., 2019). As the research project reported on below shows, the study of a writing system such as Arabizi can provide us with unique affordances also for the better understanding of literacy in diglossic situations.

3 The Current Study

The current study reports the results of an exploration of the use of Arabizi in 77 Arabic speaking eighth graders from northern Israel. We address three issues: the first is a socio-linguistic survey that explored the youths' attitudes towards MSA and Arabizi and the contexts in which each is used. The growing practice of writing SA among young people has worried their seniors, because it may threaten the status of MSA (e.g., Muhammed et al., 2011; Palfreyman & Khalil, 2003). The first question we asked was whether this is true – does the use of Arabizi overshadow the importance of MSA for the adolescents who use it. In addition, we examined the prevalence of the use of Arabizi by these participants. The second issue examined literacy skills and abilities in MSA and Arabizi, using measures of oral reading efficiency and silent reading comprehension in Narrative and Expository texts. The manipulation of genre tests the hypothesis that the use of Arabizi in daily communication would be more characteristic of the Narrative genre than the Expository genre. This hypothesis is based on the findings of research indicating that information in stories or narrative has a comparatively high affinity to specific experiences of everyday life (e.g., Bruner, 1986; Graesser et al., 1994) while expository texts typically focus around general or abstract topics (e.g., Berman & Katzenberger, 2004; Berman & Nir-Sagiv, 2007, 2009; Graesser et al., 1991), as well as on research indicating a relationship between oral language skills and text comprehension (e.g., Cutting & Scarborough, 2006). The third issue focused on the orthographic features and characteristics of Arabizi. This was done by examining texts generated in Arabizi written on the computer. We evaluated the stability of the Arabizi orthography, analyzing common orthographic variants in Latinized Palestinian Arabic, and

examined letter-sound relations and word spellings used in the Arabizi texts. In addition, we examined the manner in which the unique phonological dialectical characteristics of the Spoken Palestinian dialects were manifested in the subject's written Arabizi texts.

3.1 Method

3.1.1 Participants

We tested 77 eighth graders (age range 13–15, Mean = 14.26, *SD* = 0.488) who are native Arabic speakers (37 females and 40 males). All were students at a public junior-high school in an urban center in the north of Israel. Exclusion criteria were neurological, emotional, or learning disorders. We received parental consent and all of the children verbally expressed willingness to participate.

3.1.2 Materials and Stimuli

Questionnaires

Demographic Information A questionnaire was used to obtain demographic information such as age, sex, and parents' education, and an estimate (by the children) of how much time during the day they spend on CMC, and in which context they use it.

Transcription of MSA consonants, short and long vowels Participants were asked to report the Latin characters that they use to represent the different sounds of SA. This was done by giving each student a list of the MSA letters, the short vowel diacritics and the long vowel letters, and asking them to write the Latin equivalent letter that they use for these sounds.

Attitudes towards MSA and Arabizi This questionnaire consisted of 18 questions. The responses are measured on a Likert scale, where degree of agreement or disagreement with a statement was indicated by circling the number of a category, which ranged from strongly agree (5) to strongly disagree (1). The questionnaire was written in MSA and is included in Appendix A.

Reading Tasks

We used three reading tasks: oral reading of single words (50 words in each of three lists), oral reading of short texts (average 150 words each), and silent reading of longer texts (average 400 words each). Each of these categories of materials appeared in three formats: Vowelized MSA, Unvowelized MSA, and Arabizi. In order to control the variation in the Arabizi orthography, we used the most common transcription phoneme. The texts were divided into two types, Narrative and Expository. Thus, the children read three lists of single words, six short texts, and six longer texts.

Isolated words for Oral Reading Efficiency Test materials consisted of three lists of Arabic single words: vowelized words, unvowelized words and Arabizi words, with each list containing 50 words. The internal consistency of the tests was high, Alpha Cronbach = .84. The lists are presented in Appendix B.

List 1 consisted of vowelized words. 50 words were chosen from an 8th grade textbook selected from the Arabic literature curriculum of the Israeli Ministry of Education. The words included 36 nouns, 10 verbs, three adjectives, and one adverb. All words chosen were from four to eight letters in length (three-to-six syllables) and were judged to be moderately frequent by five Arabic teachers. These words appeared as unvowelized in the book, but we presented them in vowelized form. Words in the form of *fa'ala*. Which can be understood as either nouns or verbs (such as the words 'wish', or 'run' in English) were counted as the more frequent form.

List 2 consisted of 50 unvowelized words. The words included 34 nouns, seven verbs, seven adjectives, and two adverbs. These were chosen from the same book and rated in the same manner as the vowelized words. No homographic words were included.

List 3 consisted of Arabizi words. A list of 50 words in Spoken Arabic was compiled from a total of 923 words collected from 150 Facebook messages and comments. The list included 39 nouns, seven verbs, and four adjectives. The relative frequency of words in these messages was computed and words with frequencies in the range 3–37 in this sample were chosen for inclusion. These were also four to eight letters in length (three-to-six syllables). When there were variations in form (inclusion or omission of short vowels), we used the more frequent form that appeared in the overall sample of 923 words (computed with the tools of CLAN, a software dedicated to the analysis of spoken and written language samples; MacWhinney, 2000).

Texts All of the texts used were taken from the materials of the National Authority for Measurement and Evaluation in Education, and are of equal difficulty, as the average correlation between responses to the texts in previous years was 0.93. These statistics are taken from the publications of the National Authority for Measurement and Evaluation in Education. The Arabizi texts were translated by five Arabic teachers into spoken Arabic. In the translation process, the teachers discussed the translations of individual sentences, and reached a consensus on the form closest to SA. The participants read different texts in each of the conditions (vowelized, unvowelized, Arabizi). Three shorter texts (approximately 150 words) were read aloud and three longer texts (approximately 400 words) were read silently for the comprehension tests. The longer texts were followed by nine-12 multiple-choice questions. The multiple-choice questions were constructed specifically for the present research and they examined various aspects of comprehension including explicit local information, lexical comprehension, main idea and inferential comprehension. The texts are presented in Appendix C.

3.1.3 Procedure for Reading Tasks

Oral Reading Efficiency In all of the Oral Reading Efficiency measures (isolated words and texts) participants were tested individually in a quiet room at school. Each word list or text was presented separately. Order of isolated words lists and texts presentation was counterbalanced between participants. The students were verbally instructed to read the printed stimuli aloud as quickly and as accurately as possible. Testing sessions for isolated words were of approximately 10 min duration, varying according to level of proficiency. The single words lists were read in the same day, while the texts were read on a different day. Importantly, because our readers use the Arabizi script in CMC or cellular telephone – and in order to control for the influence of context (paper/computer) – we created two different sets of each reading task. Each set of single words or texts was printed separately on a blank sheet of paper, or appeared in a full computer screen. This manipulation was performed between groups of participants.

Silent reading comprehension Reading comprehension was tested in groups of 15 participants at a time, on three different days with a week between each meeting. Every time, each participant was exposed to two different texts in different genres and types. They were required to answer the multiple-choice questions that followed. The texts remained in sight and participants were permitted to refer back to the text if they wished. There were no time limitations.

3.1.4 Scoring of Reading Tasks

Oral Reading Efficiency Scores for reading speed are based on the total reading time in seconds correctly each isolated word list or text. Accuracy was computed in the following manner: correct reading of letter sequence and vowels gets three points. Correct reading of the consonants in sequence, while replacing a vowel or ignoring one vowel or more, gets two points (for example, a reading of an MSA word in which the final morpho-syntactic affix was omitted); correct letters not in sequence with the right vowel gets one point, and all other errors get no points. This graded scoring system allowed us to give partial credit for different levels of word identification.

Silent reading comprehension Scores for reading comprehension are based on the percent of total score of answering correctly each question.

3.1.5 Procedure for Arabizi Transcription and Writing Tasks

Transcription of MSA consonants, short and long vowels Subjects were asked to identify the Latin characters that they use for the sounds of SA. Letter identification was measured by giving each student a list of Arabic letters, short and long vowels, and asking them to write the Arabizi equivalent that they use for these sounds.

Composition of two essays In order to characterize the Arabizi orthography and examine heterographic spelling in Arabizi, our subjects were asked to write two

essays in Arabizi, a Narrative-type text on one of two possible topics, "The Class Trip" or "What will I be like in 10 years", and an Expository-type text on one of two other topics, either "Positive and Negative aspects of Facebook" or "The Importance of Keeping the Environment Clean". The topics within each genre were counterbalanced across participants. These texts were all written on the computer.

Our method of data collection is unique, since in all previous sociolinguistic and psycholinguist studies who investigate the orthographic properties of Arabizi data are retrieved from blogs and other digital platforms that abound with abbreviations and other forms of informality. The writing tasks administered in the current study are considered as a more complex level of asynchronous communication (Sullivan, 2017). Moreover, the texts were produced by the same participants (see Berman & Verhoeven, 2002) who were tested for their attitudes towards the language and for their reading abilities. This makes the corpus unparalleled in terms of what it reflects regarding literacy practices and skills.

4 Results

4.1 The Questionnaires

Computer Habits and Use of Arabizi

There was a sex difference in the measure of time spend during the day using CMC, $t_{(75)} = -4.38$, $p < .0001$, with girls (M = 3.24 h) spending more time than boys (M = 2.25 h). These data were used as covariates in the analyses of the reading tasks.[3]

The questionnaire also included three questions that examined the degree and distribution of the use of Arabizi. These and the responses are shown in Table 1.

Table 1 Language use on the computer

Question 1. Which languages do you use in order to communicate in CMC?				
Language of CMC	Arabic	Arabizi	Hebrew	English
% of sample	21%	100%	9%	32%
Question 2. How did you learn to write and read this language?				
Source of Arabizi knowledge	Friends taught me	Siblings taught me	Spontaneously, from the environment	Relatives taught me
% of sample	36.4%	11.7%	46.8%	5.2%
Question 3 with whom do you communicate in Arabizi?				
	Parents	Other family members	Close friends	Acquaintances
% of sample	35.1	48.1	92.2	35.1

[3] This sex differences in using CMC was also reported among American (Jantz's, 2011), German (Höflich & Rössler, 2002) and Norwegian (Ling, 2001) teens.

Attitudes towards the Varieties of Arabic

The questionnaire included 18 questions. Responses were analyzed with factor analysis and resulted in the identification of five factors, which, with varimax rotation, explained 59.53% of the variance. Although our sample is marginal in terms of size (N = 77) for this analysis, the correlation matrix revealed the presence of high coefficient values of .3 and above, the Kaiser-Meyer-Oklin values exceeded the recommended value of .60, and Bartlett's test revealed a significant chi square ($X^2_{(153)} = 418.1$, $p < .0001$).

Responses were on a Likert scale that ranged from 1 (do not agree), to 5 (completely agree). We grouped the responses into three categories, where 1–2 indicate disagreement, 3 indicates neutral response, and 4–5 indicate agreement with the statement. We analyzed the frequency of these responses with chi square, checking for the effects of sex, and separately, for religion. None of the questions revealed effects of either variable, such that the data are pooled over sex and religion.

Factor 1: Arabizi is a modern language This factor included 4 statements and accounted for 23.04% of the variance, with an eigenvalue of 4.15. The four statements and the descriptive data are shown in Table 2.

The majority of respondents do not accept the statement that writing in Arabizi using Latin script makes them a modern person. However, 60% do admit that expressing themselves in Arabizi is easier than in MSA.

Factor 2: Accessibility of Arabizi vs. MSA This factor included the replies to four statements, and accounted for 11.48% of the variance, with an eigenvalue of 2.06 (Table 3).

The majority of respondents do not think that Arabizi should replace MSA, even though they are split on the relative difficulty of MSA and Arabizi. They do admit that errors in MSA are regarded more seriously than errors in Arabizi.

Factor 3: The uses of Arabizi Four statements are included in this factor, which explains 9.6% of the variance, and has an eigenvalue of 1.73 (Table 4).

Although the majority of the adolescents think that the internet is the main reason for the use of Arabizi, they do not think it is essential in order to communicate in CMC. However, they do feel most comfortable using it, especially with their peers, as it is a form of script in which they can write in their native spoken language.

Table 2 Arabizi is a modern language

Statement	Correlation coefficient	% Disagree	% Neutral	% Agree
Arabizi is a modern language and using it means I am a modern person	0.73	65	10	25
Writing in Arabizi reflects how good I am in English	0.66	70	20	10
I choose to write in Arabizi because writing in MSA is too hard	0.63	70	0	30
Sometimes I have trouble finding the right words in MSA and so I choose to express myself in Arabizi	0.74	40	0	60

Table 3 Accessibility of Arabizi vs. MSA

Statement	Correlation coefficient	% Disagree	% Neutral	% Agree
I believe that Arabizi should replace MSA and become the formal language of the Arab world	0.68	85	10	5
I wish that school books could be written in Arabizi	0.66	75	5	20
Writing and reading in Arabizi is easier for me than writing and reading in MSA	0.72	55	0	45
No one corrects my errors in Arabizi, but I am always corrected in MSA	0.57	20	20	60

Table 4 The uses of Arabizi

Statement	Correlation coefficient	% Disagree	% Neutral	% Agree
Knowing Arabizi is necessary in order to use the internet	0.74	50	30	20
I use Arabizi because it's my mother tongue	0.7	35	10	55
I think the internet helps to spread Arabizi	0.53	0	20	80
Using Arabizi brings me closer to my peers	0.46	40	15	45

Table 5 Language Status

Question	Correlation coefficient	% Disagree	% Neutral	% Agree
Writing in MSA is rare on social media	0.70	35	0	65
My ability to express myself about daily events is best in Arabizi	0.52	35	5	60
I think that Arabizi is a real language and has its own standards	0.53	20	5	75
Using MSA consistently develops my proficiency in it	0.56	5	10	85

Factor 4: Language Status Four statements are included in this factor, which explains 8.61% of the variance, with an eigenvalue of 1.55 (Table 5).

This factor seems to reflect the adolescents' metalinguistic perspective on Arabizi and MSA, with both receiving the status of a real and useful language. The association between the responses to these four questions reflects the status of MSA and Arabizi (SA) as separate, legitimate, languages. Thus, it is not the case that preferring to write in Arabizi results in a delegitimization of MSA, or vice versa, rather both languages are legitimate.

Factor 5: Identity and Culture Two statements were included in this factor, which explains 6.79% of the variance, and has an eigenvalue of 1.22 (Table 6).

Table 6 Identity and culture

Statement	Correlation coefficient	% Disagree	% Neutral	% Agree
Using MSA develops my connection to my Arab identity and culture	0.81	19	20	70
We live in a country in which MSA is not an official language, so it is important to keep it in daily use	0.66	35	5	60

This factor reflects the relation seen by the respondents between MSA and their ethnic and national identity. It seems that, like their elders, the students acknowledge the importance of MSA, and feel a responsibility to maintain it as a cultural value.

4.2 Reading in Arabizi and MSA

Reading Single Words

The correlations between RT and accuracy revealed negative and significant effects for all of the conditions, indicating that there were no speed-accuracy tradeoffs in the performance of our sample. We therefore computed the inverse efficiency index (IES), as (RT/proportion correct). This measure combines RT and accuracy and is a measure of speed normalized by accuracy, such that a lower score indicates better performance (Townsend and Ashby (1978, 1983). The data were analyzed with a 2-way ANOVA, using sex as a between group factor and word type (Vowelized words, Unvowelized words, Arabizi) as a within subjects' factor. The analysis used the number of sending and receiving SMS to the cellular telephone and overall time on CMC as covariate variables.

The analysis revealed a two way interaction between type of word list and sex, $F(2,144) = 5.99, p < .005, \eta^2_p = .08$; a significant effect of list type, $F(2,144) = 51.61$, $p < .0001, \eta^2_p = .42$, and a marginal effect of sex, $F(1,70) = 3.85, p = .054, \eta^2_p = .05$. These effects are illustrated in Fig. 3. The interaction is due to the fact that the simple main effect of sex is significant only for vowelized MSA words, $F(1,70) = 6.41$, $p = .013$, $\eta^2_p = .08$. It can be seen that unvowelized MSA words were read most efficiently, and that overall, girls were slightly more efficient than boys.

Text Reading Aloud

All correlations between speed and accuracy were significantly negative, indicating that there were no speed-accuracy tradeoffs. We therefore computed the inverse efficiency index (IES), as (RT/% correct). These data were analyzed using sex and as a between-groups factor and type of script (Vowelized, Unvowelized, Arabizi) and genre (Narrative vs. Expository) as within groups factors. Again, estimated SMS use and time on CMC were used as covariates.

The analysis showed a significant 3-way interaction between sex, type of script and genre, $F(2,144) = 4.77, p < .01, \eta^2_p = .07$, and two significant 2-way interactions:

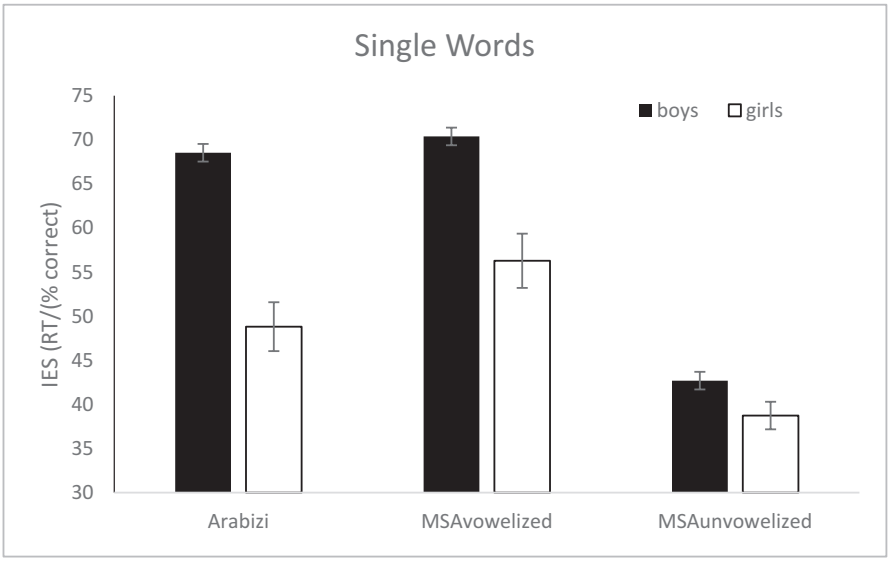

Fig. 3 Inverse efficiency scores for boys and girls on the three types of word lists

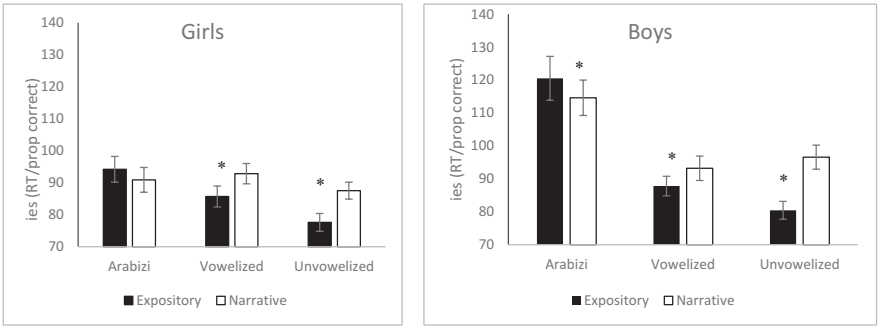

Fig. 4 Efficiency of reading out loud expository and narrative texts in the three types of orthography

sex by genre, $F(1,72) = 4.47$, $p < .05$, $\eta^2_p = .06$; and sex by type, $F(2,144) = 3.6$, $p < .05$, $\eta^2_p = .05$. There were also significant main effects of genre, $F(1,72) = 18.86$, $p < .0001$, $\eta^2_p = .21$; and of type of script, $F(2,44) = 19.82$, $p < .0001$, $\eta^2_p = .22$. These patterns can be seen in Fig. 4. Planned comparisons revealed the significant simple effects shown in the Figure. It can be seen that for both boys and girls, Narrative texts were read more efficiently than Expository texts in Arabizi, (this was significant for boys: $F(1,39) = 7.63$, p=,008, $\eta^2_p = .16$, and in the same direction, but not significant for girls, $p > .5$), while in MSA, Expository texts were read more efficiently than Narrative texts in both the vowelled (boys: $F(1,39) = 3.99$, $p = .05$,

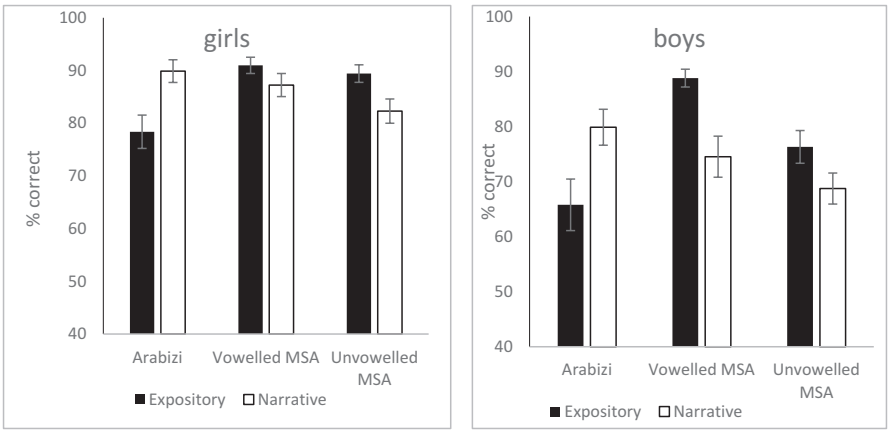

Fig. 5 Accuracy of responses to comprehension questions after silent reading

η^2_p = .09; girls: F(1,36) = 6.42, p = .01, η^2_p = .15) and the unvowelled form (boys: F(1.39) = 51.27, p = 0001 η^2_p = .56; girls: F(1,36) = 13.41, p = 00001, η^2_p = .27).

Reading Silently for Comprehension

Recall that the children answered comprehension questions after silently reading both Narrative and Expository texts in the three different orthographies. The % correct on these questions were analyzed with the same 3-way ANOVA. These scores are illustrated in Fig. 5. The analysis revealed a significant 3-way interaction between sex, type of script, and genre, F(2,144) = 6.21, p < .005, η^2_p = .08; and three 2-way interactions: type of script by genre, F(2,144) = 19.31, p < .0001, η^2_p = .21; sex by genre, F(1,72) = 11.95, p < .0001, η^2_p = .14; and sex by type of script, F(2,144) = 9.62, p < .0001, η^2_p = .06. There was a main effect of type of script, F(2,144) = 43.54, p < .0001, η^2_p = .38. It can be seen that again, comprehension scores in Arabizi showed the opposite pattern as those in both vowelized and unvowelized MSA, with Narrative texts being comprehended better in Arabizi and Expository texts being comprehended better in MSA.

4.3 Writing in Arabizi

Transcription of MSA Letters in Arabizi

The bulk of the phonemes transcriptions are Latin letters; 27 letters or combinations of letters were used. Out of the 22 phonemes that are transcribed as Latin letters, 15 phonemes have direct correspondences with English and have the best phonetic approximations of the sounds of Arabic. These, together with their Arabizi transcription, are shown in Table 7. There was no variability in these transcriptions, with 100% agreement among the participants.

Table 7 MSA letters which are represented by Latin letters with analogous phonemic characteristics, and showed 100% agreement among the responders

ه	ن	م	ل	ك	ف	ش	س	ز	ر	د	ث	ت	ب	ا
h	N	m	L	k	F	Sh	s	z	r	D	th	T	b	a

Table 8 Latin representation of short and long vowels

	IPA symbol	Alternatives (percent selection)
Short vowels		
ـَ	A	a (100%)
ـُ	U	u (100%)
ـِ	I	e (100%)
Long vowels		
ا	a:	a (92.2%); aa (7.8%)
و	u:, o:	o (84.4%); w or o (13%); oo (2.6%)
ي	i:, e:	e or y (40.13%)y (29.9%), ee (18.2%), e (11.7%)

Table 9 Arabic phonemes which have no analogues in Latin letters and are represented by numbers

Arabic letter	ئ, ء, أ, ؤ	ح	خ	ط	ع	غ
IPA symbol	ʔ	ħ	X	$t^ʕ$	ʕ	ɣ
Arabizi grapheme	2	7	5	6	3	3’

Table 10 MSA Letters that revealed variability in their representation in Arabizi

Arabic letter	IPA symbol	Alternatives (% selection)
ج	ʤ	j (54.5%); g (32.5%), g or j (13%)
ذ	Ð	d (80.5%) th (16.9%), z (2.6%)
ض	$d^ʕ$	d (92.2%), x (3.9%), t (3.9%)
ظ	$ð^ʕ$,$z^ʕ$	d (59/7%), th (22.1%), z (14.3%), x (3.9%)
ق	Q	q (70.1%), k (24.7%), q or k (5.2%)
و	W	w (58.4%), o or w (26%), o (15.6%)
ي	J	e (55.8%), y or e (22/1%); e, i (18.2%); y, e or i (3.9%);

This full consensus was true for short vowels, but not for long vowels, as shown in Table 8.

Some phonemes in Arabic do not have analogues in English. Of these, six were represented by numbers, again, with 100% agreement among the responders. These are show in Table 9.

Arabic has four emphatic phonemes which have unique graphemes. It can be seen that other than ط /$t^ʕ$/, which is written as the number 6, all are written as Latin letters, with ص /$s^ʕ$/ =s, showing 100% consensus, and the other two letters showing variability.

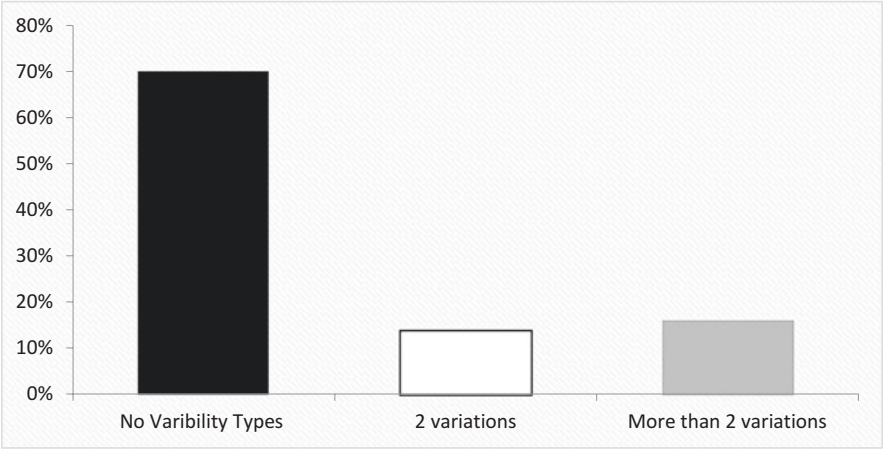

Fig. 6 Distribution of orthographic variability by tokens in the Arabizi essays (N tokens = 16,142)

The remaining letters had three or more alternatives in the representation of the respondents. These are shown in Table 10. This variability may be explained by dialect variations among the students. The school from which our sample was recruited is a regional school, and the majority of the students are from Nazareth and have an urban dialect, while other students are from the nearby villages and have a rural dialect.

Essay Writing in Arabizi

Recall that the children were asked to write in Arabizi two essays about particular subjects. Thus, we had 154 Arabizi texts to analyze in order to examine the degree of variability in the orthography of this North Palestinian dialect, specifically Nazareth and surrounding villages. The total number of word token in all essays produced was 16,142. Figure 6 shows the distribution of the variability. It can be seen that the vast majority of the words were spelled identically by the children.

5 Discussion

In this chapter, we provide an integrative summary of a unique study of the reading and writing practices of young Arabic speakers in northern Israel as it emerges from the investigation of the use of Arabizi, an orthography that is considered in academic and educational (as well as other formal) circles to be a dispreffered, nonstandard, and transient phenomenon (Kindt & Kebede, 2017). Studying the attitude, reading abilities, and writing practices of the same participants allows us to provide novel conclusions with respect to the issue of sociolinguistic, orthographic, and linguistic factors in literacy in a complex diglossic situation.

Our findings based on data collected in 2014 match previous studies in showing that in the first two decades of the twenty-first century, Arabizi was the dominant written variety in CMC (Belnap & Bishop 2003; Doss, 2006; Mejdell, 2006a, b). Today, writing SA in Arabizi coexists with writing SA in Arabic letters in the context of CMC. This fact, almost two decades after these initial investigations of Arabizi, can serve as evidence for an overall increasing tendency to write SA in contexts characterized by informal interpersonal communication (e.g., Daoudi, 2011; Elinson, 2013), in sharp contrast with MSA as a language that is generally seen as too formal (Belnap & Bishop, 2003). All of the participants in our study reported using Arabizi more frequently than MSA, English or Hebrew to communicate in CMC, and Arabizi was used mostly to communicate with friends and peers. Even though our participants did not consider Arabizi as necessary for CMC, they still used it consistently, as it allowed them to write freely and easily in the language they use naturally for everyday speech and which is their true mother tongue. In other words, a substantial portion of the sample accepts the colloquial as a written language. Furthermore, these young people showed a clear awareness of the impact of world-wide globalization and of the rapidly-spreading communication technology as a reason for the emergence of Arabizi and its proliferation, in which an informal style of writing is not only allowed, but expected (Belnap & Bishop, 2003; Kindt & Kebede, 2017). Our participants indicated that while MSA has its own stringent and standard rules, Arabizi is considered more flexible given its informal nature and its spontaneous emergence (Maamouri et al., 2014). Although not studied here, anecdotal evidence points to the existence of this freedom in writing SA in Arabic letters in the context of CMC as well, as shown in the circled entries in Fig. 7.

This informality is considered by Walters (2003) as a key to understanding why people write in the colloquial rather than in the standard language. In fact, our participants had no difficulty in extending the use of Arabizi from the context of

Fig. 7 Flexibility of writing in SA in Arabic letters (Instagram, July 20, 2020)

writing in CMC contexts to writing extended narrative and expository discourse. We return to this point below.

Overall, with no differences found between sex and religion, the students' attitudes towards Arabizi are positive, and they acknowledge its usefulness. Similar responses, emphasizing that Arabizi is easier to understand than MSA, were found in studies by Al-Khatib and Sabbah (2008) and Bani-Khaled (2014). At the same time, our participants reported a sense of pride in MSA, feelings of obligation to it, and even responsibility to preserve it. In a diglossic duality, speakers' attitudes to their language and dialect are particularly important (Saiegh-Haddad & Henkin-Roitfarb, 2014). In the last decades, sociologists have described a phenomenon of "undermining of the power of authority", a trend that manifests itself as *destandardization*: "a development whereby the established standard language loses its position as the one and only "best language"" (Coupland & Kristiansen, 2011:27). Against such descriptions, all of our participants disagreed with the idea that Arabizi should replace MSA and be the formal language of the Arab world. Similarly, they also refused the suggestion that schoolbooks be written in Arabizi instead of MSA. Although we did not examine this, we tend to think that this attitude would generalize also to the writing of SA in Arabic letters. In general, the similarities and differences between the two ways of writing SA, in Latin or Arabic letters, is an interesting topic for further research.

Suleiman (2003) writes that "[f]ormulations of Arab nationalism… are invariably built around the potential and capacity of Arabic in its standard form to act as the linchpin of the identity of all those who share it as their common language" (p. 224). Therefore, it is clear why Arabizi is often frowned upon by the older generation, working seniors, and people of higher class (e.g., Muhammed et al., 2011; Palfreyman & Khalil, 2003). For instance, Egyptian intellectuals and ordinary people alike share the opinion that *āmmiyya* (Spoken Arabic) is not serious enough to become a written language (Haeri, 2003), and even perceive it as posing a threat to MSA especially among young people (e.g., Duwairi et al., 2014). However, as our results show, at least for our population of young Palestinian adolescents, MSA remains a highly valued variety, existing alongside the high acceptance of Arabizi as a written language. There are no indications that the spread of the written SA (in Arabizi) is a threat to the significance of MSA, which keeps its position as a prestigious language, alongside the colloquial varieties (Kindt & Kebede, 2017). In fact, the majority of our students showed an ideological faithfulness to MSA, and acknowledged that MSA is related to their "authenticity" as Arabs regardless of the fact that it is more complex and less accessible for use than Arabizi. It should be mentioned that both Christian and Muslim students in our study reported that MSA symbolizes their Arabic nation. Sebba (2013) establishes a link between language ideologies and identity, stressing the importance of scripts in particular, as markers of identity and belonging.

The students' responses to the attitude questionnaires also received empirical confirmation from our reading and writing tasks. In the reading tasks, the results

revealed a significant effect of word type (vowelized MSA words, unvowelized MSA words, Arabizi) in both single words and texts. Oral reading efficiency in vowelized words was the lowest, reading unvowelized words resulted in the highest efficiency, and reading Arabizi was in-between. These 8th graders have had no contact with vowelized Arabic script for approximately 4 years, given that diacritical marks are gradually phased out by 4th grade, making unvowelized words more familiar. In previous studies, skilled adolescent Arabic readers had similarly explicitly stated that the vowel signs constituted a hindrance to them (Abu-Leil et al., 2014; Abu-Rabia & Siegel, 2003; Roman & Pavard, 1987). It was further empirically found that when the vowels were not present, participants read words more fluently (Saiegh-Haddad & Schiff, 2016) arguably thanks to the role of morphology (Saiegh-Haddad, 2018). Also, participants accessed the lexicon through a visual-orthographic code which is faster than phonological coding (e.g., Coltheart et al., 1993; Fender, 2008; Frith, 1985; Jackson & Coltheart, 2001; Taouk & Coltheart, 2004; Weiss et al., 2015). Even though Arabizi represents SA words, which are supposed to be easier to identify, it is read more slowly than unvowelized script probably because it requires a full phonological representation of the word. In contrast with unvowelized Arabic, Arabizi, was read more quickly than vowelized script, probably because the vowels are an integral part of the word, making the visual representation of the words less complex. Additionally, while reading MSA, skilled readers usually identify roots of words, which is sufficient for initial lexical access (Abu-Rabia, 2001; Ibrahim et al., 2013a). While reading Arabizi, there may be differences in the salience of the root. This is an empirical question and should be examined in the future.

In our reading comprehension tasks, there was also an effect of word type: vowels were found to have a positive effect, improving silent reading comprehension. In fully vowelized Arabic, vowels supply a regular and consistent representation that renders any additional linguistic information redundant, and readers identify the meaning of the word directly (Saiegh-Haddad & Geva, 2008), disambiguating the identity and meaning of heterophonic homographic words, which are very common in unvowelized Arabic (e.g., Abu-Leil et al., 2014; Hayadre et al., 2015; Taouk & Coltheart, 2004).

Another significant factor that was found to impact performance in reading efficiency and silent reading comprehension, was genre. In Arabizi, students read and understand Narrative texts better than Expository texts. The information in stories has a comparatively high similarity to experiences in everyday life (Bruner, 1986; Graesser et al., 1994). Graesser et al. (1991) assume that another advantage of narrative is that it is close to the heart of oral literacy, the language of the mother tongue. To the best of our knowledge, this is the first empirical study to support this assumption, decoding of an orthography that is imbued and imbedded with personal and interpersonal practices and attitudes, facilitates the reading of a highly personal, informal type of text. At the same time, expository texts convey and communicate factual information, and it also contains

more advanced vocabulary and abstract concepts (e.g., Berman & Katzenberger, 2004; Berman & Nir-Sagiv, 2007, 2009). In MSA, Expository texts were read relatively more efficiently than in Arabizi. We related this result to the association of this genre to literary contexts. In the school system which these students attend, only literature lessons present them with reading tasks that include both Narrative and Expository texts, while other lessons (e.g., social studies and science) focus on reading and writing various types of Expository texts. Furthermore, the language used in Narrative texts written in MSA is usually poetic and contains rare lexical items of a highly elevated literary register and employs language that some of the students may not be familiar with (Abdul-Mageed et al., 2011).

The evaluation of oral reading efficiency and of silent reading comprehension, and the comparison of these variables with their parallel tasks in MSA orthography, allowed us to manipulate both the impact of diglossia and of orthographic complexity. Our results highlight reading as a multi-faceted process that relies both on cognitive as well as socio-cognitive and socio-cultural factors. Such interactions can only be revealed when examining literacy practices in contexts that allow for the differentiation between these factors, as in the case of reading and writing in Arabizi.

A similarly integrative contribution is provided from the study of writing in Arabizi. Our participants reported that they acquired not only reading but also writing Arabizi naturally, informally, and spontaneously. We assume that this informality of acquisition is typical, and mainly specifies the acquisition of reading and writing in grass-root orthographies that emerge in a bottom-up process (Blommaert, 2008), and that this ability cannot be acquired other than in the context of literacy in a standard orthography (that is, our participants can read and write in Arabizi because they can read and write in Arabic and in English). Additional studies are needed here in order to investigate the manner in which literacy is acquired in non-standard orthographies.

Furthermore, as noted above, these language users had no issue with writing both narrative and expository texts in Arabizi. In our investigation of the Arabizi orthography we also found high compatibility and harmony between our students' attitudes, their reports on their usage of Arabizi script with respect to the phoneme-symbol correspondences in Latinized Palestinian colloquial Arabic, and their actual usage of the orthography in written texts. Thus, while some phonological differences that exist between the spoken dialects were mirrored in the participants' reports and in their writing practices, this variation is far from being a defining factor of the orthography. Thus, across the large sample of words that the students produced in their texts, we found high stability in the use of orthographical conventions, and only marginal variability. Despite the fact that some of our students speak different dialects, they use largely the same standards and rules while writing in Arabizi. This may be an indication of a how quickly a grass-roots orthography can become stable, or alternatively, a reflection of the fact that the majority of the students speak the same form of

SA. These two options cannot be discriminated in our study and are also a good topic for further research.

6 Conclusions

This chapter is the first to establish a quantitative estimate of oral reading efficiency, silent reading comprehension and writing ability in Arabizi. In addition, it differs from other studies that attempted to describe the characteristics of Arabizi orthography, being the first to evaluate the stability of this orthography. We can assume that the intensive practice of communicating in Arabizi contributes to the efficiency in using it.

There are still many aspects of reading in Arabizi which remain unknown. As mentioned above, it will be especially interesting to examine the similarities and complementarity of writing SA in Latin letters or in Arabic letters. Further research is necessary to establish whether our findings are replicable and generalizable to writing SA in Arabic letters. Additionally, it is worth examining if reading disabled students behave similarly to skilled readers while dealing with Arabizi, or they would benefit more than typical readers because of the similarities between Arabizi and spoken language (Ibrahim et al., 2013b).

The use of Arabizi and of SA written in Arabic letters, in daily communication in CMC indicates that reading and writing in digital media is a process which fundamentally upsets the diglossic model of Arabic (Panović, 2017). Diglossia is typically and consistently considered as an obstacle in the context of literacy in Arabic. Our study rather indicates that diglossia can also be a unique resource for the language users.

Appendices

Appendix A

The Questionnaire written in MSA, including three parts. Part1- Demographic information; part 2- CMC habits and use; part 3- Perceptions, and attitudes for the two writing systems, Arabizi and MSA.

استبانة للطالب[4]

هذه الاستبانة هي جزء من بحث وهي إحدى المتطلّبات لاستحقاق لقب الدكتوراة في مجال العسر التعلمي – في جامعة حيفا.
سؤالا، وتستغرق تعبئتها مدّة لا تتجاوز العشر دقائق تقريبًا. 30تحوي الاستبانة ما يقارب ال-
ستستخدم هذه المعلومات، فقط، لخدمة البحث ولن يتمّ نشرها لأيّة أهداف أخرى.

القسم الأول- تفاصيل شخصيّة

1. رقم الطالب:_____
2. العمر:_____
3. الجنس : ذكر / أنثى.
4. الديانة : (1) مسلم (2) مسيحي (3) آخر :_____
5. ثقافة لأهل:

	الأب	الأم
ابتدائي (6 سنوات)		
إعدادي (9 سنوات)		
ثانوي (12 سنوات)		
فوق ثانوي		
أكاديمي: - لقب أوّل- بكالوريا - لقب ثانٍ- ماجستير - لقب ثالث- دكتوراة		

6. دخل الأهل:

	الأب	الأم
لا يعمل (يتلقّى مخصّصات بطالة)		

[4] وردت الكتابة في صيغة المذكّر من باب التسهيل فقط، وهي تشمل الجنسين.

حتى 4000 ش.ج		
4000 -7000		
7000 -10000		
10000 -15000		
15000 وما يزيد		

القسم الثاني:

يفحص هذا القسم مدى استعمال العربيزي أثناء استخدام الإنترنت وشبكات التواصل الاجتماعيّ المختلفة .

1. هل لديك حساب فيسبوك/ بريد إلكتروني/ هاتف خليوي/ تويتر (أحط بدائرة ما يناسبك)؟
2. إذا كانت الأجابة نعم؛ أيّ لغة تستعمل أثناء التواصل (أحط الإجابة المناسبة): اللغة العربيّة الفصحى/ اللغة العبريّة / اللغة الإنجليزيّة / العربيزي[5]/ لغة اخرى.
3. هل تستطيع قراءة العربيزي؟ (أحط الإجابة المناسبة): بسهولة / إلى حدّ ما / بصعوبة
4. هل تستطيع طباعة العربيزي؟(أحط الإجابة المناسبة): بسهولة / إلى حدّ ما / بصعوبة
5. كيف اكتسبت هذه اللغة؟_____.
6. ما هي اللغة المُعَرَفة في جهازك: عربيّة / عبريّة / إنجليزيّة.
7. ما هو الوقت الذي تقضيه أمام الحاسوب أو في استخدام شبكات التواصل الاجتماعي: ((أحط الإجابة المناسبة):

   حتى ساعة واحدة يوميًا / حتّى ساعتين يوميًا /من ساعتين إلى أربع ساعات / أكثر من أربع ساعات.
8. مع من تتواصل في غالبيّة الأوقات: الأهل / الأصدقاء /الأقارب/ المعارف/ آخر:_____.
9. عدد الرسائل النصيّة التي تكتبها وتتلقّاها يوميًّا: _____

القسم الثالث:

أمامك مقولات تتعلّق باستخدامك العربيزي في الشبكة العنكبوتيّة. اختر مدى تأييدك لها:

التدريج هو من 1 – 5، المفتاح : 1= غير موافق بتاتًا, 2= موافق بنسبه قليله, 3= موافق جزئيا, 4= موافق بنسبه كبيره و 5 = موافق جدًا.

الرقم	المقولات	1 غير موافق بتاتًا	2 موافق بنسبه قليله	3 موافق جزئيا	4 موافق بنسبه كبيره	5 موافق جدًّا
1.	مدى معرفتي لطباعة العربيزي تؤثّر في قدرتي على التواصل مع الشبكات الاجتماعيّة المختلفة.					

[5] العربيزي يقصد بها استعمال اللغة المحكية كتابيا بواسطة احرف انجليزية في المواقع الالكترونية المختلفة والهواتف الخليوية

.2	أعتقد أنّ إتقان هذه اللغة هو أمر ضروريّ على كلّ مستخدم في الشبكه العنكبوتيه.					
.3	لغة العربيزي هي لغة عصرية، واستعمالي لها يعني أنني منفتح وعصريّ.					
.4	قدرتي على التعبير عن مشاعري وأحداثي اليوميّة بالعربيزي، تفوق تعبيري في لغات أخرى.					
.5	الكتابة باللغة المعياريّة (الفصحى) تعدّ أمرًا نادرًا في شبكات التواصل الاجتماعي.					
.6	كتابتي بالعربيزي تدلّ على أنّني مُلمّ ومتمكّن باللغة الإنجليزيّة.					
.7	اخترت الكتابة بالعربيزي لأن الكتابة باللغة المعياريّة (الفصحى) هي مهمّة صعبة بالنسبة لي.					
.8	أحيانًا أجد صعوبة في إيجاد الكلمات المناسبة باللغة الفصحى لذلك أختار التعبير عن نفسي بالعربيزي.					
.9	أختار التعبير بالعربيزي لأنني أستخدم أثناءها لغة الأمّ وهي العربيّة المحكيّة.					
.10	أعتقد أنّ شبكة الإنترنت ساهمَت في انتشار هذه اللغة.					
.11	أعتقد أنّ العربيزي أصبحت لغة عالميّة ولها معايير متعارف عليها.					
.12	أعتقد أنّ العربيزي تستطيع استبدال اللغة الفصيحة لتصبح اللغة العربيّة الرسميّة في العالم العربي.					
.13	أفضّل أن تتحوّل اللغة في الكتب الدراسيّة من اللغة الفصيحة إلى لغة العربيزي.					
.14	قراءة وكتابة العربيزي أسهل بالنسبة لي من القراءة والكتابة باللغة الفصيحة.					
.15	استخدامي للعربيزيّة يقرّبني من أبناء جيلي .					
.16	لا أجد من يحاسبني إن أخطأت في اللغة العربيزيّة، بينما أحاسب كثيرا إن أخطأت باللغة العربية المعيارية.					
.17	استعمالي اللغة العربية المعيارية يطوّر من معرفتي بها.					

.18	استعمالي اللغة العربية المعيارية ينمّي انتمائي لهويتي وثقافتي					
.19	نحن نعيش في دولة لا تعترف بلغتي العربيّة، لذا عليّ الحفاظ عليها واستخدامها.					

شكرًا جزيلا
على حسن تعاونك

Appendix B: Word Lists

List 1*: *Isolated words for Oral Reading Efficiency - Vowelized MSA

امامك قائمه الكلمات التاليه عليك قرائتها بالشكل الصحيح. اقراءها بالسرعه والدقه الممكنه.

	الكلمه		الكلمه		الكلمه
1	بِساطُ	18	تُناسِبُ	35	كُرومَ
2	جُدرانَ	19	شَرعِيَّةٍ	36	اِشْراقَةُ
3	تَبْتَعِدينَ	20	مَواعِيدَ	37	جَليدٌ
4	الْغُرَباءِ	21	أَضْواءَها	38	عائِمْ
5	الأَزْمَةَ	22	انْكَسَرَ	39	صَيّادينَ
6	سَيارَةٍ	23	أَقْبَلْتُ	40	صَمَّمَ
7	مُتَوَجِهينَ	24	فَجاؤوا	41	الإيمانِ
8	يُسْعِفَني	25	أَحْوالِكَ	42	يَتَشَقَّقُ
9	الْكَلامِ	26	الْقائِمَةُ	43	أَنْشَأَتْ
10	الْخادِمُ	27	يَنْهَزِمُ	44	شِفاهُ
11	أُسْبوعَينِ	28	أَلْواناً	45	أَبْهَجَ
12	أَفْسَدَ	29	أَضْواءَها	46	دَراهِمَ
13	الْكَرى	30	جَوفِ	47	الأَعاصيرَ
14	شَهيقٌ	31	اِنْسِكاباً	48	نُفوسٌ
15	مَوطِنٍ	32	مُتَعاقِبَةٌ	49	تَتَهَدَّلُ
16	اِلحاحُها	33	اِشْتَدَّتْ	50	اِكْليلاً
17	أَنْشَأَتُ	34	جاذِبِيَّتُها		

List 2*: *Isolated words for Oral Reading Efficiency - Unvowelized MSA

	الكلمه		الكلمه		الكلمه
1	مكان	18	أوقاتهم	35	النّفسيّان
2	الأرض	19	معظم	36	الفارغة
3	طريق	20	القدمَيْن	37	ستوصلني
4	حركات	21	الظهيرة	38	معلّقتين
5	عمرها	22	أبناؤه	39	ممارسات
6	مشاركة	23	القمامة	40	نصيب
7	حاجة	24	مريضة	41	السّاخرة
8	نصائح	25	الحافلة	42	ملامحه
9	تتطلّب	26	الموظّفين	43	جواري
10	استخدام	27	قدماي	44	حالمتين
11	صحيح	28	فأتبادل	45	تنطق
12	الموسيقى	29	متواصلة	46	إيابهم
13	يصغون	30	المنزليّة	47	مستهتر
14	العضلات	31	الإرشاد	48	محتواها
15	مواصلة	32	الأطراف	49	التّحذير
16	الظلام	33	يسبّبها	50	ناقوس
17	منازلهم	34	الضّرران		

List 3*: *Isolated words for Oral Reading Efficiency – Arabizi

امامك قائمه الكلمات التاليه عليك قرائتها بالشكل الصحيح. اقراءها بالسرعه والدقه الممكنه.

	الكلمه		الكلمه		الكلمه
1	shoo	18	elawlad	35	merta7
2	bkon	19	alyoom	36	brkod
33	Sar	220	el2akeel	37	3mro
4	l2no	21	elsobe7	38	yenzal
5	m3roof	22	25adto	39	fa7as
6	shwi	23	sa7ee7	40	3balhen
7	kant	24	eljaw	41	honak
8	eldohor	25	bet7eb	42	syara
9	Se3eb	26	katabet	43	7elwe
10	b2dar	27	mosa3ade	44	kbeer
11	b3mlha	28	al7ayah	45	2ademe
12	ro7na	29	bt2alel	46	w7de
13	lesh	30	mostrayat	47	2st3malha
14	youm	31	tnzelat	48	btzakar
15	ensan	32	kman	49	elfadye
16	7akeena	33	3balhen	50	elmasa
117	momken	334	mrawe7		

Appendix C: Texts

***Text1**- Oral Reading Efficiency of Arabizi text*

Jame3 el3ilab elfare3'a

7at 2edo 3la saba7 bento wla2a enno el7rara mrtef3a kteer, 7melha bsor3a wra7 3lm7ta yestna elbas . elbas et2a5ar kteer. Blash yetms5ar 3la el3elab w3la ele b3mlha w3la eltojar ele beshtroha wbeb3oha. " lw sar eshi llbenti? Meen ra7 yenqezha? ". rje3 lalbet tani youm abel elfajer bsi3at. fa2 bkeer, a5ad elkees wra7 3lzbale ydawer 3la el3elab elfadye." Lazem 2alem el3elab bsor3a abel ma yo5doha elwlad elz3'ar, ra7 asbo2hen." Rakad bsor3et elbar2 yetna2al mn m7al lm7al. elt3ab kan mbayen 3leh, l2no mnamesh kteer leyelt mbare7.
Kan eljaw a7ma bkteer mn elyoum ele abel . 3ldohor kant elshams t7re2 m2dresh yet7amal hai el7rara, kan ylahet mn elt3ab , whwi 7afi, mad 2edo ymsek hadek el3lbe bs 7as to2ol b2edo, wka2eno 3'azat ebar btitla3 mn 2ejro lkol jesmo . kan bdo ymed 2edo bs m2dresh, balash yetmayal , b3den w2e3 3la elzbale. Kant mrto wewlado 3m yestano , bs hwi mrj3esh 3la beto.

***Text2**- Oral Reading Efficiency of vowelized MSA*

في حانوتِ الحلوى

نَحنُ في مَحَلِّ بَيعِ الْحلوى الذي نُديرُهُ، نَتَّبِعُ أُسلوبًا ما زِلنا نَتَّبِعُهُ مُنْذُ أن دَفَعَ بِنا والدُنا إلى الْعَمَلِ، وَوَزَّعَ علينا مَهامَّ الْحانوتِ؛ بَعْضُنا لِلْبَيعِ وبَعْضُنا لِلْحِساباتِ.

أمّا الْوالدُ فلا يَبْقى في مَوضِعٍ؛ فَهوَ كُلُّ شيءَ ولا شيء في آنٍ واحدٍ. وَيَقولُ لَنا إذا لاحَظَ نُفورًا في خدمةِ أحدٍ: "خُذوا الناسَ باللُّطفِ، وقدِّموا لهم ممّا هو أمامَهم، حبّةً زائِدَةً أو حَبّةً ناقِصَةً لنْ تَفْعَلَ شيئًا".

كُنّا نَأْخُذُ بِنَصيحَتِهِ دائمًا، لكنّنا نقولُ إنّ هؤلاءِ اللذينَ يَقْبلونَ أن يَتَذَوّقوا هُم الْقِلَّةَ، خاصّةً إذا كانوا

رجالاً، فَهُم عادةً لا يُدَقِّقونَ، بَلْ يَطْلُبونَ الصِّنْفَ بالاسْمِ.
أمّا النسوةُ فالواحِدَةُ منْهُنَّ تُطيلُ التأَمُّلَ والْمُقارَنَةَ، وتَقْبَلُ بابْتِسامَةٍ كُلَّ ما نَعْرِضُهُ عليها على سبيلِ التذوُّقِ ثُمَّ تَقِفُ "فَوقَ رُؤوسِنا"، كَما يَقولونَ، وَنَحْنُ نُنَسِّقُ الحَبّاتِ
في صَناديقِها الكرتونيّةِ، لِتَطْمَئِنَّ إلى أنَّ كُلَّ شَيءٍ يَجْري عَلى ما يُرام. على كلِّ حالٍ، كانتْ للقاعِدَةِ شَواذٌّ بينَ الرِّجالِ. والشاذُّ عَنِ الْقاعِدَةِ هُنا هُو رَجُلٌ يَزورنا بِمُعَدَّلِ مَرَّتَيْنِ في الأسبوعِ.

***Text3**- Oral Reading Efficiency of unvowelized MSA*

القلب والموسيقى

يُعتبر الإيقاعُ الموسيقيّ لقلب الأمّ أوّلَ لحن بشريّ عرفه الإنسان، منذ تمام الشّهر الرّابع لتكوينه البنيويّ والعضويّ من دورة حياته الجَنينيّة، لأنّ حاسّة السّمع تعمل وتكتمل في ذلك الوقت من نشأته الأولى، ولهذا نعرف كيف يستطيع الطّفلُ أن يظلّ هادئًا في رَحْم أمّه خلال فترة الحمل المتبقّية، حيث يُصغي إلى أجمل موسيقى إلهيّة مؤلّفُها وملحّنُها وعازفها الأوّل هو القلب، وكذلك يُعتبر القلب العضوَ الوظيفيّ الأوّل في حياة الإنسان، حيث يعمل منذ اليوم الواحد والعشرين في تكوينه الأوّليّ. وفي هذا الوقت يتناغم قلبُ الجنين مع قلب أمّه ليعزفا معًا أوّل لحن بشريّ مشترك عرفه التّأريخ، ألا وهو لحن الحبّ، ويبكي الطّفل بصورة حادّة بعد الولادة مباشرة، تعبيرًا عن سَخَطه ولابتعاده القَسْريّ عن سماع موسيقى قلب أمّه!

ومن جمال الحياة أنّ المولود الجديد عندما يوضَع على صدر أمّه الأيسر من جديد، يعود للهدوء والنّوم، بل والإصغاء لصوت قلبها المفعَم بالمودّة والرّحمة والحبّ. ولهذا نعرف لماذا يسجّلون صوت قلب أمّ الطّفل قبل ولادته.

***Text1**- Silent Reading Comprehension of Expository vowelized text*

عالم النّمل

(1) عالَمُ النّمْلِ مَليءٌ بالأسْرارِ واللّقَطاتِ ٱلفَريدَةِ، حَيثُ تَجِدُ أنّ هُناكَ عَلاقاتٍ مُشْتَرَكَةً بَيْنَ الْنَّمْلِ وَغيرِهِ مِنَ الْكائِناتِ يَسْتَفيدُ كُلٌّ مِنْهُما مِنَ الآخَرِ، مِثلُ عَلاقَةِ المُعايَشَةِ بينَ الْنَّمْلِ وَحَشَراتِ الْمَنِّ وَأبْناءِ عُمومَتِها مِنَ الْحَشَراتِ.

(5) إنَّ مثلَ هَذِهِ الْعَلاقَةِ مَوجودٌ أيْضًا بَيْنَ الْنَّمْلِ وَالْنَباتاتِ الّتي تُقَدِّمُ إفْرازاتٍ رَحْيقِيَّةً مَوجودَةً عَلى الأَوْراقِ، حيثُ يَنْجَذِبُ الْنَّمْلُ إلى هذِهِ الإفرازاتِ وَفي المُقابِلِ يَتَوَلّى الدّفاعَ عَنْ هذِهِ الْنَباتاتِ وَحِمايتَها مِنَ الْحَشَراتِ الّتي تُهاجِمُها.

للنَّملِ حواسٌّ حادّةٌ للَّمسِ وَالشَّمِّ وَالتَّذَوُّقِ، وَمَراكِزُ هذه الحواسِّ مُنْتَشِرَةٌ عَلى جَميْعِ أجْزاءِ الْجِسْمِ وَلكِنَّها تَكونُ مُرَكَّزَةً عَلى قُرونِ الاسْتِشْعارِ لِفَحْصِ الأشْياءِ وَأيضًا لِنَقْلِ الْمَعلوماتِ بَينَ أفْرادِ مَجْموعَةِ النّملِ، ويُعتَقَدُ أنَّ لِضَرَباتِ قُرونِ الاسْتِشْعارِ الّتي تَكونُ قَويَّةً أو لَطيفَةً، سريعةً أو بطيئةً، مدلولاً في نقلِ الأفْكارِ بينَ الأفْرادِ، فَالتقاءُ الأصدقاء يُعطي النّملَ رضًا واضحًا، أمّا التقاءُ الأعداءِ فيصحَبُهُ تناحرٌ وعِراكٌ. وفي هذا المقالِ نُلقي الضّوءَ على بعضِ أسرارِ النّملِ.

كَشَفَ بَحْثٌ عِلْمِيٌّ عنْ اِحْتِواءِ أرْجُلِ النّمْلِ عَلى عَدّادٍ لِلْمَسافاتِ يُساعِدُهُ على العُثورِ على مَسكنِهِ مهما بَعُدَ عنهُ دونَ أنْ يَضَلَّ طَريقَهُ.

وَقالتِ الدّراسةُ الْمَنْشورَةُ فيْ الْعَدَدِ الصّادِرِ من مَجَلّةِ "سايَنْس" العلميّةِ إنَّ نملَ الصّحراءِ الّذي يغدو في رحلاتِهِ الطّويلةِ بحثًا عن الطّعامِ، يَسْتَخْدِمُ عَلاماتٍ في السّماءِ لِتَحْديدِ مسارِ الْعَودَةِ إلى مَسْكَنِهِ. لكنَّ الْعُلَماءَ تَعَجَّبوا كَيْفَ تُأْخَذُ هذهِ الحشرةُ دائمًا أقصرَ طريقٍ وأكثرَها مباشرةً إلى مَساكِنِها، وَتَعْرِفُ الْمَسافَةَ الّتي ابتَعَدَتْها بالضّبط.

وَوَجَدَتِ الدِّراسَةُ أَنَّ قِيامَ الْنَّمْلِ بِعَدِّ خُطُواتِهِ هُوَ السِّرُّ وَراءَ هذِهِ الدِّقَّةِ المِلاحيَّةِ. وَقَد تَعَدَّدتِ النّظريّاتُ على مَدارِ السّنينَ حَوْلَ كَيفيّةِ عُثورِ الْنَّمْلِ على مَنازِلِهِ حَيْثُ افترضَتْ إحداها أنّ النّملَ – مثلُ النّحلِ – يَتَذَكَّرُ علاماتٍ مرئيّةً.

لكنَّ التّجاربَ وجدتْ أنّ النّملَ يُمْكِنُ أن يسيرَ في الظّلامِ بل ومعصوبَ العينَيْن، وأشارَ افتراضٌ آخرُ لم يتمَّ إثباتُه إلى أنَّ النّملَ يسيرُ بِسُرْعَةٍ ثابِتَةٍ وَلذا يَسْتَطيعُ حَسَابَ زَمَنِ الْمَسافَةِ الّتي اِسْتَغْرَقَها ذهابًا وإيابًا. (25)

وَقالَتْ نَظَرِيَّةٌ ثالِثَةٌ إنَّ النَّمْلَ عِنْدَما يَعْثُرُ على مَصْدَرٍ جَيِّدٍ للطَّعامِ يُعلِمُ النَّمْلَ الآخرَ كَيفَ يَصِلُ إِليهِ.

وَعَرَفَ الْعُلَماءُ عام 1904 أنّ النّملَ يَمْتَلِكُ عدّادًا للخُطواتِ لَكِنَّ هذِهِ النّظريّةَ لم تُختَبَر حتّى الآن.

وَقَدْ قامَ الْعُلَماءُ بِتَدْريبِ سِربٍ من نملِ الصّحراءِ على أنْ يَسيرَ في طريقٍ مُسْتَقيمٍ إلى مصدرٍ غذائيّ وَضَعوهُ على بُعْدِ 30 قدمًا مِنْ عُشّهِ، ثُمّ قاموا بِنَقْلِ الْمَصْدَرِ الْغِذائِيّ فَوجدوا أنَّ النَّمْلَ بَدأَ يَتَفَرَّقُ عَبْرَ مَساراتٍ أُخرى بَعْدَ وُصولِهِ إلى الْمَوقِعِ السّابِقِ لِمَصْدَرِ الْغِذاءِ وَبَدَأَ يَبْحَثُ عَنْ هَدَفِهِ.

ثُمَّ قاموا بعمليّةِ تَغْييرٍ بَسيطَةٍ للنَّمْلِ تَمَّ مِنْ خِلالِها تَرْكِيبُ دَعاماتٍ طَويلَةٍ لِمَجْموعَةٍ مِنْ السِّربِ أدَّتْ إلى إطالةِ أَرْجُلِها مِنْ أَجْلِ تَوسيعِ خُطواتِها. ثُمَّ قامَ الْعُلَماءُ بِتَقْصيرِ أَرْجُلِ بعضِ أفْرادِ السّربِ لِتَضْييقِ خُطواتِها.

وَبالتَّلاعُبِ بِطولِ وَقِصَرِ خُطواتِ الْنَّمْلِ اسْتَطاعَ الْعُلَماءُ أَنْ يُقَرِّروا ما إذا كانتش هذه الحشرةُ تَسْتَخْدِمُ آليّةً شَبيهَةً بِعَدّادِ السّرعةِ أمْ آليّةً داخليّةً تَعْتَمِدُ على عَدِّ خُطواتِ السّيرِ في قياسِ الْمَسافَةِ.

وَتَبَيَّنَ أَنَّ أَفْرادَ الْنَّمْلِ الّتي تَحَرَّكَتْ على دَعائِمَ قَطَعَتْ نَفْسَ عَدَدِ الْخُطَواتِ الّتي اعتادتْ سَيْرَها بَينَ الْعُشِّ وَمَصْدَرِ الْغِذاءِ، وَلِذا فَقَدْ تَجاوَزَتْ الْهَدَفَ بَعْدَ زِيادَةِ اتّساعِ خُطواتِها.

أمّا الْنَّمْلُ الّذي تَمَّ تَقْصيرُ أَرْجُلِهِ فَقَدْ سارَ نَفْسَ الْعَدَدِ مِنَ الْخَطواتِ المُعتادَةِ لَكِنَّهُ لمْ يَصِلْ إلى هَدَفِهَ بِسَبَبِ قِصَرِ خُطواتِهِ.

لكنْ بَعْدَ أنْ اعْتادَ كِلا الْفَرِيْقَيْنِ عَلى أَرْجُلِهِ الْجَديدَةِ تَمَكَّنَ الْنَّمْلُ مِنْ ضَبْطِ خُطواتِهِ والوصولِ إلى هَدَفِهِ بِشَكْلٍ أَدَقٍّ ممّا يُثْبتُ أَنَّ مَدى اِتِّساعِ الْخُطْوَةِ الّتي تَخْطوها الْنَّمْلَةُ يُشَكِّلُ عَدّادًا تلقائيًّا لِلْمَسافَةِ الّتي تَقْطَعُها.

السّؤال 1

لماذا تُعتبر العلاقة بين النّمل والنّباتات علاقة مشتركة متبادلة؟

_____

السّؤال 2_____

اكتب **نظريتَيْن** من النّصّ حول كيفيّة عثور النّمل على منازله.

1- _____

2-_____

السّؤال 3

وُضِعَت كلمةُ "**سايَنْس**" (السّطر 15) بين مزدوجَيْن لأنّها:

(1) عامّيّة (2) مألوفة (3) أجنبيّة (4) عربيّة

السّؤال 4

التّعبير "هذه الدّقّة المِلاحيّة" (السّطر 20) يشير إلى قدرة النّمل على:

1☐ تحديد نسبةِ الملح.

2☐ معرفة مكان النّجوم في السّماء.

3☐ معرفة مكان رسوّ السّفينة.

4☐ تحديد مسار عودته.

السّؤال 5

اكتب **دليلَيْن (برهانَيْن)** بحسب النّصّ يثبتانِ أنّ النّصّ "عالم النّمل" هو نصّ معلوماتيّ.

1- _____

2- _____

السّؤال 6

كيف تفسّر وجود عدد كبير من النّمل حول قطعة حلوى ملقاة على الأرض؟ أجب بحسب **المعلومات الّتي وردت في النّصّ.**

_____

***Text2**- Silent Reading Comprehension of Expository unvowelized MSA*

الاستخدام الطّويل للحاسوب

(1) تتحدّث إليهم مرارا وتكرارا ولكنّهم لا يصغون... تحاول أن تشغل عقولهم أو تبعد
نظرهم المتعلّق بشاشة الحاسوب ولو قليلا دون جدوى، ينهمكون في صنع انتصارات وهميّة
ومحاولة قهر شخصيّات مُقَزَّمة تظهر وتختفي بكبسة زرٍّ أو بلغة التّكنولوجيا بِـ"كبسة فأرة".
هذه حال الكثير من أطفالنا هذه الأيّام، وهم يحاولون
(10) قتل وقت الفراغ عن طريق ممارسة الألعاب الإلكترونيّة والجلوس أمام شاشات الحاسوب
والتّلفزيون لساعات طويلة بمباركة منّا وبدون أن نتذكّر معا المخاطر النّاجمةَ عن ذلك.

ومن ضمن الأخطار النّفسيّة كما يقول أخصّائيّو الإرشاد النّفسيّ جرّاء ذلك
هو التّخوّف من الوصول إلى مرحلة يصعب فيها التّفاهم بين الأهل والطّفل بسبب انقطاع
(20) الحوار بينهم لساعات طويلة وخاصّة إذا كان هذا الطّفل على أبواب مرحلة المُراهقة الّتي
تتطلّب تواصل وحوارات مستمرّة لمعرفة مشاعر الطّفل وميوله وتوجّهاته وتقييم سلوكيّاته.
وفي أغلب الأحيان يقلّد الأطفال ما يشاهدونه،
وتلتصق طريقةُ أشكال وحركات الشّخصيّات الّتي يرونها عبر الألعاب الإلكترونيّة
في عقولهم، ممّا يؤثّر في بناء شخصيّاتهم في المستقبل.

(15) إحدى الأمّهات الّتي لديها طفلة عمرها تسع سنوات قالت: أنا أخالف رأي الأخصّائيّين
النّفسيّين في تَضْخيمهم لمخاطر استخدام الحاسوب لفترات طويلة.
فأنا أرى العكس تماما لأنّ ابنتي تتميّز بشخصيّة قويّة وحضور متميِّز أمام
زميلاتها، وهي تحبّ المشاركة في الحديث وإبداء الرّأي بعد التّركيز ومعرفة ما
يجبُ أن تقول. وأضافت: إنّ لغةَ التّفاهُم والتّواصل بين الأهل والطّفل لا يُعيقها استخدامُ
(30) جهاز الحاسوب، وبالإمكان مشاركةُ الأطفالِ هوايتَهم هذه وطرحُ
موضوعات مختلفة بين الوقت والآخر لجذب اهتمامهم عن الحاسوب ومناقشة
أمور تتعلّقُ بهم شخصيّا. وقالت: إنّ فكرة التزام الطّفل بمكان محدّد ولفترات
طويلة يساعد الأمّ على القيام بالمهامّ المنزليّة العديدة وبنفس الوقت تكون مرتاحة
(25)

ذهنيّا بأنّ طفلها بأمان وغير معرّض لحوادث السّير إذا كان خارج المنزل.

ويرى أخصّائيّو أمراض العيون أنّه وعلى الرّغم من المخاطر الّتي تتعرّض لها العين نتيجة الاستخدام المتواصل للحاسوب فإنّه لا حاجة للقلق إذا تمّ اتّباع نصائح معيّنة، ومنها إراحة العين كلّ نصف ساعة على الأقلّ ولمدّة دقيقة بالنّظر بعيدا عن جهاز الحاسوب، واستعمال قطرات العين المرطّبة إذا أحسّ مُستخدم الجهاز بأيّ نوع من احمرار العين أو وجودِ جَفاف فيها وخاصّة للّذين يضعون العدسات اللاصقة إضافة إلى الابتعاد عن الشّاشة إلى مسافة لا تقلّ عن 40 سنتمترا، واستخدام الشّاشات الواقية أو النّظارات الخاصّة، ولذلك فإنّ الأبحاث العالميّة صارت تركّز على مكان وجود الجهاز ونوعيّة الأدوات والأثاث الموجود حوله وطبيعة الموادّ الّتي تدخل في تصنيعها.

يرى أخصّائيّو أمراض العظام أنّه لا بدّ من دقّ ناقوس الخطر الآن حول صحّة أطفالنا ممّن يستخدمون جهازَ الحاسوب لساعات طويلة. فقد ازدادت في السّنوات الأخيرة بشكل ملحوظ الحالات الّتي باتت تُعرف باسم "أمراض الكمبيوتر"، ومنها حالات ضعف وإرهاق شديدَيْن لعضلات الأطراف العليا وتقوّس الظّهر نتيجة للجلوس الخاطئ المنحني أمام الشّاشة، ويضرّ كثيرا عظام أصابع اليد وشدّ العضلات باستخدام مفاتيح جهاز الحاسوب الّتي تتطلّب السّرعة والمتابعة والضّغط على عضلة معيّنة دون سواها. وينصح أطبّاءُ العظام بالجلوس بشكل صحيح عند استخدام جهاز الحاسوب مع رفعه قليلًا بما يوازي النّظرَ بحيثُ لا يحني مستخدمه رأسه، والتّركيز على اللّياقة البدنيّة وممارسةِ الألعاب الرّياضيّة وخاصّة السّباحة، والتّعويض عن شدّ العضلات الّتي يتعرّض لها مستعمل الجهاز بتحريكها بشكل صحيح وإراحتها، والتّركيز على أهمّيّة عدم استخدام جهاز الحاسوب لأكثر من ساعة متواصلة ثمّ الاستراحة لفترة وجيزة قبل العودة إليه.

السّؤال 1

كيف يقضي معظم الأطفال أوقاتهم بحسب الفقرة الأولى (الأسطر 1–7)؟

السّؤال 2

كلمة "**ذلك**" (الأسطر 4–7) تشير إلى:

السّؤال 3

اكتب **نصيحتَيْن** بحسب النّصّ لشخص يستعمل الحاسوب لفترة طويلة كي يحافظ على عيونه.

1– _____

2 _____

السّؤال 4

التّعبير "دقّ ناقوسِ الخطر" (السّطر 34) يعني:

1☐ ضرورة إعلان نهاية التّهديد.

2☐ ضرورة تحديد موعد الدّخول.

3☐ ضرورة حسن التّصرّف.

4☐ ضرورة التّنبيه والتّحذير.

السّؤال 5

الضّمير "**ها**" في كلمة "**إراحتها**" (السّطر 44) يعود إلى:

السّؤال 6

أُذكر **ضررَيْن جسديَّيْن، وضررَيْن نفسيَّيْن** على الأطفال يسبّبها استخدامُ الحاسوب لفترة طويلة، بحسب النّصّ.

أ. الضّررانِ الجسديّانِ	ب. الضّررانِ النّفسيّانِ
1– _____	1– _____
2– _____	2– _____

السّؤال 7

الهدف الرّئيسيّ من النّصّ هو:

***Text3**- Silent Reading Comprehension of Narrative vowelized text*

في حانوتِ الحلوى

(1) حنُ في مَحَلِّ بَيعِ الْحلوى الذي نُديرُهُ، نَتَّبِعُ أُسلوبًا ما زِلنا نَتَّبِعُهُ مُنْذُ أن دَفَعَ
الدُنا إلى الْعَمَلِ، وَوَزَّعَ علينا مَهامَّ الْحانوتِ؛ بَعْضُنا للْبَيعِ وبَعْضُنا لِلْحِساباتِ.
لْوالدُ فلا يَبْقى في مَوضِعٍ؛ فَهوَ كُلُّ شيءَ ولا شيء في آنٍ واحدٍ. وَيَقولُ
ذا لاحَظَ نُفورًا في خدمةِ أحدٍ: "خُذوا الناسَ باللُّطفِ، وقدِّموا لهم ممّا هو
(5) هم، حبّةً زائِدَةً أو حَبّةً ناقِصَةً لنْ تَفْعَلَ شيئًا".

نّا نَأْخُذُ بِنَصيحَتِهِ دائمًا، لكنّنا نقولُ إنّ هؤلاءِ اللذينَ يَقْبلونَ أن يَتَذَوّقوا هُم
، خاصّةً إذا كانوا رجالاً، فَهُم عادةً لا يُدَقِّقونَ، بَلْ يَطْلُبونَ الصِّنْفَ بالاسْمِ.

(10)

أمّا النسوةُ فالواحِدَةُ منْهُنَّ تُطيلُ التأَمُّلَ والْمُقارَنَةَ، وتَقْبَلُ بابْتِسامَةٍ كُلَّ ما نَعْرِضُهُ عليها على سبيلِ التذوُّقِ ثُمَّ تَقِفُ "فَوقَ رُؤوسِنا"، كَما يَقولونَ، وَنَحْنُ نُنَسِّقُ الحَبّاتِ في صَناديقِها الكرتونيِّةِ، لِتَطْمَئِنَّ إلى أنَّ كُلَّ شَيءٍ يَجْري عَلى ما يُرام.

على كلِّ حالٍ، كانتْ للقاعِدَةِ شَواذٌّ بينَ الرِّجالِ. والشاذُّ عَنِ الْقاعِدَةِ هُنا هُو رَجُلٌ يَزورنا بِمُعَدَّلِ مَرّتَيْنِ في الأسبوعِ؛ يَقِفُ أوّلاً بِبابِ الدُّكّانِ وَقَدْ عَقَدَ كفّيْهِ وَراءَ ظَهْرِهِ، ثُمَّ يَبْتَسِمُ ابْتِسامَتَهُ الْمُنْكَسِرَةَ، وَيَدْخُلَ المحلَّ وَقَدْ زاغَتْ عَيْناهُ بَيْنَ تِلالِ الْحَلوى مِنَ "الطوفي والملبّس"، فأتبادلُ مَعَ أخي اِبْتِسامَةً ذاتَ معنىً ما أَظُنُّهُ أدْرَكَها مَرَّةً. ثُمَّ يَسأَلُنا عَنْ أَصْنافِنا الجَديدَةِ، فَنَصْطَنِعُ الجِدَّ وَنَحْنُ نُعَدِّدُ مَزاياها، وَهُوَ يَسْتَمِعُ إلينا جادًّا، قائلاً بَينَ اللحْظَةِ والأُخْرى: "هكذا، هكذا...". هُنا كانَتْ تُدْرِكُنا الشَفَقَةَ عَليهِ، فَنُناوِلَهُ حَبَّةً يَضَعُها بَينَ أَسْنانِهِ؛ يَمُصُّها ثُمَّ يُديرُها شِمالاً أو يَمينًا إلى حَيثُ تُسْعِفُهُ أسنانٌ لا يَمْلُكُها في واجِهَةِ فَمِهِ، وإذْ يَنْتَهي مِنْها يَقولُ وَهُوَ يَمْسَحُ فَمَهُ: "حُلْوة، شَديدَةُ الْحَلاوَةِ... لَيتَ السُّكَّرَ كانَ فيْها أَخَفُّ..."، أو "رائِحَةُ الْبَيْضِ فيها ظاهرةٌ". فَنَضْحَكُ وَنَحْنُ نَقُولُ لَهُ بِدَورِنا: "هَكَذا!"...

كُنّا نَعْلَمُ أنَّهُ لا يَشْتَري، وَأَنَّهُ لا يَمْلُكُ في جَيْبِهِ ما يَشْتَري بِهِ. لكنَّ حُبَّه الطفوليّ للحلوى كان لا يُقاوَمُ، فَكانَ دُخولُهُ المَحلَّ وَسيلةً يَذوقُ بِها حَبّةً مِنْ هذهِ الآلافِ المُكَدَّسَةِ. وَعِنْدَما كُنّا نَتأَفَّفُ كانَ الوالدُ يَنْتَهرُنا بِقولِهِ: "لا تَحْرِموهُ هَذه الْمُتْعَةَ. لعلّها الوحيدةُ في حَياتِهِ".

(25) ٠تَ صَباحٍ دَخَلَ الْرَجُلُ، وكانَ المحلُّ غاصًّا بالزَبائِنِ، يَشْتَرونَ حَلْوى الْعيدِ
ءٍ لا تَعْرِفُهُ أيّامُهُم العاديّةُ. رفعْتُ يديّ متأفِّفَةً، فَرَمَقَني والدِي بِنَظْرَةِ تأنيبٍ،
أَنْ يَفْتَحَ الرجُلُ فاهُ، امتدّتْ يَدُ أَبي إلى عُلْبَةٍ مَلْفوفَةٍ، كُنّا قَدْ جهّزناها لِنَبْعَثَ
دِيَّةً مِنَ الْمَحَلِّ إلى زَبائِنِنا، فَقَدَّمَها لهُ قائلاً: "هذِهِ لَكَ بِمُناسَبَةِ الْعيدِ". تَرَدَّدَ
ُ في مَدِّ يَدِهِ، فَأَخَذَ أبي يقولُ: "هَدِيَّةٌ، هَدِيَّةٌ. أَلَسْتَ زبونًا قديمًا؟ اقْبَلْها".
(30) واضحًا أَنَّ الرَجُلَ قَدْ أُحْرِجَ، فَقَد انْتَفَخَت رقَبَتُهُ قليلاً، وزَحَفَ شيءٌ مِنَ
بِرارِ إلى وَجْهِهِ، لكنّه لم يحملِ الْعُلبَةَ وَلَمْ يَنْصَرِفْ، بَل وَضَعَها جانبًا، وقالَ:
أَشْياءَ أُخرى... أَشْياءَ كثيرةً؛ علبةُ الشوكولا هَذه الكبيرةِ، وَ... ودزّينتَيْن

كعكِ جوزِ الهِنْدِ، وكيلو... هل تُسَجّلينَ ذلك؟ سَجّليهِ لئلاّ تَنْسَي، أو اثنينِ مِنْ
"الطوفي"، إنّنا نُحِبُّهُ في البيتِ... هيّئيها في رَبْطَةٍ واحِدَةٍ مَعَ عُلبَةِ الهديّةِ... وحضّري
مةَ. سأمُرّ خِلالَ عَوْدَتي إلى البيتِ وَأحْمِلُها... وَأدفعُ لكم... أجلْ
(35) فعُ لكم...".

نالَ ذلك واِستَدارَ، وَقَدْ كادَ يَصطَدِمُ لهرولَتِه بِعجوزٍ وَطفلٍ، وَتَرَكَ المحلَّ دونَ
يودِّعَ الواجهةَ بنظرةٍ أخرى... هَلْ أقولُ إنّنا لم نُكَلِّفْ أنفسَنا عَناءَ تَحْضيرِ الأغراضِ
طِها، ولم نكنْ نصدِّقُ حتّى لو هيّأناها لهُ بأنّهُ سيمرّ ليحمِلَها؟ لكنْ
(40) أثار أَلَمَنا حقًّا هو أنّه تركَ عُلْبَةَ الهديّةِ، وأنّنا لم نَعُد مُنذ ذلك الصباحِ نرى لهُ
ها.

الاسئله

1. من الذي وزّع المهامّ في محلّ بيع الحلوى، بحسب الفقرة الأولى؟

_____

2. ما هي النصيحة التي كان يأخذ بها الأَخَوان دائمًا، بحسب الأسطر 1-7؟

_____

3. ما هي "**القاعدة**" التي قصدها الراوي (السطر 11)؟
   - ☐1 الرجال يُحِبّون تناوُل الطوفي والملبّس.
   - ☐2 النساء لا يَشْتَرين الحلوى إلاّ بصناديق كرتونيّة.
   - ☐3 الرجال لا يدقّقون في أنواع الحلوى عند شرائها.
   - ☐4 النساء يُطِلْنَ في تَرْتيب الحلوى قبل شرائها.
4. "**الابتسامة**" التي كان يتبادلها الأَخوان (السطر 14) تدلّ على:
   - ☐1 الإعجاب.
   - ☐2 السخرية.
   - ☐3 الخجل.
   - ☐4 الفرح.

5. ماذا كان يدّعي الرجل لكي يُبَرِّر عدم شراء الحلوى، بحسب الأسطر 11–20؟

☐1 أنّ الحلوى تؤذي أسنانه.

☐2 أنّ مَذاق الحلوى لا يُعْجِبُه.

☐3 أنّ تصرُّف بائعي الحلوى سيّئ.

☐4 أنّ أسعار الحلوى لا تُناسِبُه.

6. لماذا كان الرجل يتردَّد على محلّ الحلوى، رغم أنّه لا يملك نقودًا للشراء، بحسب الأسطر 21-24؟

_____

_____

7. اكتبْ دليلاً على أنّ الرجل كان مُحْرَجًا بعد أن قدّم له الأب الهديّة، بحسب الأسطر 25-31.

_____

8. أيّ كلمة ممّا يلي يمكن أن تحلّ محلّ "**ما**" في الجملة "فأتبادل مع أخي ابتسامة ذات معنى **ما** أظنّه أدْرَكها مرّة"، مع المحافظة على المعنى؟

☐1 حتّى.

☐2 لا.

☐3 الذي.

☐4 قد.

***Text4**- Silent Reading Comprehension of Narrative unvowelized text*

اقرأ النّصّ التّالي بتمعّن ثمّ أجبْ عنِ الأسئلةِ الّتي تليه:

صدى الحياة

(1) حكى أنّ أحد الحكماء خرج مع ابنه خارج المدينة ليعرّفه على تضاريس الحياة
بوّ نقيّ، بعيدًا عن صخب المدينة وهمومها. سلك الاثنان واديًا عميقًا تحيط به
(5) جبال شاهقة، وأثناء سيرهما تعثّر الطّفل في مشيته فسقط على ركبتَيْهِ، وصرخ
لطّفل تعبيرًا عن ألمَه: آ آ آه. فإذا به يسمع من أقصى الوادي من يشاطره الألم
(10) صوت مماثل آ آ آه. نسيَ الطّفل الألم وسارَع في دهشة سائلاً مصدر الصّوت:
مَنْ أنتَ؟ فإذا الجواب يردّ عليه سؤاله: مَنْ أنتَ؟
(15) ندهش من هذا التّحدّي فبادر بالسّؤال، فردّ عليه مؤكّدًا، بل أنا أسألك مَنْ أنتَ؟
مرّة أخرى لا يكون الرّدُّ إلاّ بنفس الجفاء وحِدّة الخطاب، بل أنا أسألك مَنْ
(20) نتَ؟
طّفل صوابَه بعد أن استثارته المجابهة في الخطاب، فصاح غاضبًا:
- أنتَ جبان. وبنفس القوّة يجيء الرّدُّ:
(25) - أنتَ جبان.

درك الصّغير عندها أنّه بحاجة لأنْ يتعلّم فصلاً جديدًا في الحياة من أبيه الحكيم الّذي وقف بجانبه دون أن يتدخّل في المشهد الّذي كان من إخراج ابنه. قبل أن يتمادى في تقاذُف الشّتائم، تملّك أعصابَه، وترك المجال لأبيه لإدارة لموقف حتّى يتفرّغ هو لفهم الدّرس.

عامل الأب – كعادته – بحكمة مع الحدث، وطلب من ولده أن ينتبه للجواب

المرّة، وصاح في الوادي:

- إنّني أحترمُكَ.

فكان الجواب من جنس العمل أيضًا، فجاء بنفس نغمة الوقار:

- إنّني أحترمُكَ.

تعجّب الطّفل من تغيُّر لهجة المُجيب، وقبل أن يسأل والدَه صاح الأب مكمّلاً

بصوت عالٍ:

- كم أنتَ رائع.

فلم يكن الرّدُّ على تلك العبارة الرّاقية إلاّ:

- كم أنتَ رائع.

ذُهل الطّفل ممّا سمع، ولم يفهم سرّ التّحوُّل في الجواب، لذا صمت بعمقٍ لينتظر تفسيرًا من أبيه لهذه التّجربة العجيبة.

علّق الحكيم على الواقعة بهذه الحكمة:

- أيْ بنيّ، نحن نسمّي هذه الظّاهرةَ الطّبيعيّة في عالم الفيزياء "صدى الصّوت"، ها في الواقع هي الحياة بعينها، واستطرد الأب في حديثه الحكيم قائلاً:

(30)

إنّ الحياة لا تعطيك إلاّ بقدر ما تُعطيها.

ولا تحرمك إلاّ بمقدار ما تحرم نفسك منها.

(35)

الحياة مرآة أعمالك وصدى أقوالك.

إذا أردت أن يحبَّك النّاس، فأحبب النّاس.

وإذا أردت أن يوَقّرك النّاس، فوَقّر النّاس.

(40)

وإذا أردت أن يرحمَكَ النّاس، فارحم النّاس.

وإذا أردت أن يسترَك النّاس، فاستر النّاس.

وإذا أردت أن يساعدك النّاس، فساعد النّاس.

وإذا أردت أن يستمع النّاسُ إليك ليفهموك، فاستمع إليهم لتفهمَهم أوّلاً.

لا تتوقّع من النّاس أن يصبروا عليك إلاّ إذا صبرت عليهم ابتداءً.

أيْ بنيّ، هذه سُنّة الله الّتي تنطبق على شتّى مجالات الحياة. وهذا ناموس ون الّذي تجدُه في كافّة تضاريس الحياة.

صدى الحياة، تجد ما قدّمتَ، وتحصد ما زرعتَ!

السّؤال 1

المكان الّذي جرت فيه أحداث النّصّ هو:

_____

السّؤال 2

اكتب صفة بارزة للابن مع التّعليل.

صفة الابن: _____

التّعليل: _____

السّؤال 3

لماذا غضب الولد حين سمع صدى صوته؟

_____

_____

السّؤال 4

ما هي التّجربة المقصودة بالتّعبير "لهذه التّجربة العجيبة" (السّطر 27)؟

_____

السّؤال 5

الضّمير "**ها**" في كلمة "**لكنّها**" في جملة "لكنّها في الواقع هي الحياة بعينها"

(السّطر 30) يعود إلى:

1 ☐ العين المجرّدة.

2 ☐ الفيزياء العلميّة.

3 ☐ التّجربة العجيبة.

4 ☐ الظّاهرة الطّبيعيّة.

السّؤال 6

ما المقصود بـ"تلك العبارة الرّاقية" (السّطر 24)؟

1 ☐ إنّني أحترمك.

2 ☐ كم أنت رائع.

3 ☐ من أنت؟

4 ☐ أنت جبان!

السّؤال 7

لو بقي الابن في المدينة، هل كان سيتعلّم عن ظاهرة الصّدى؟ علّل إجابتك.

السّؤال 8

العنوان البديل الأكثر ملاءمةً للنّصّ هو:

1 ☐ الوادي العميق.

2 ☐ رهبة الجبال.

3☐ حكمة الحياة.

4☐ الابن الجبان.

السّؤال 9

في النّصّ "صدى الحياة" عناصر تبيّن أنّه نصّ قصصيّ/سرديّ.
اكتب **عنصرَيْن** منها، واذكر مثالاً على كلّ عنصر منهما.

1- العنصر الأوّل: _____

المثال: _____

2- العنصر الثّاني: _____

المثال: _____

***Text5**- Silent Reading Comprehension of Narrative text in Arabizi*

Jame3 el3ilab elfare3'a

Elsi3a w7de eldohor. zlme msh labes fe ejreh , awa3eh 2ademe, el3lamat ele 3la wejho btdel enno 3mro sten. M3 hek hwi 5fef el7rke, brkod bsor3a wbilaheth mn elt3b. brkod mn satel zbale lltani 3shan yjame3 3elab fadye , masek fe 2edo kees kteer kbeer 3shan y7ot feh el3elab.

hajam bsor3a mtl el asad ele hajem 3la faresto shwi wra7 ma y5bot fe elmosalen ele tal3en mn elmasjed b3d salat eljom3a, msalamesh 3la wla 7da mnhn kant 3yono tra2eb hadek el2anene elfadye ele 7da sharebha wrameha 3lzbale, rakad wmsekha a7sn ma 7da 3'ero yo5dh . Kan y3ref enno msh bs hwi ele bjme3 2nane fady. mr2at mn 7do syara f5me rma elswa2 2anene fadye mn b3d ma shrebha. kant el2anene ra7 t5bot bwejho' msekha bsor3a mtl el3sfora lma tla2et el7b. dal safen fe elsyara l7d ma e5tfat b3den 2al beno wben 7alo: "aaah lw knt aso2 mtl hai elsiara elf5me".

Sar el7m kteer wsar yenzal mno el3ra2 whwi yejma3 el3elab. shaf shajra mn b3eed ra7 bsor3a 2a3ad t7t delha wala3 elsegara w3'amad 3yene shwi, sara7 fe afkaaro wbalash yetzakar ayam elmadi lma kan yesht3'el fe elmena, keef kan shab wjesmo 2awe, wfe elbalad kan m3roof b2ewto, wb3dd el lo3'at ele b3refha, hai el lo3'at ektsbha lma kan yesht3'el fe elso2. Mkanesh y3ref ykteb esmo , bs kan y3ref y7ki hai el lo3'at. Tzakar el3marat el3alye wlmlahe el layleye ele kant mlyane blnas, wlmoseqa el3alye ele kant t3zefha elfer2a.

"aaaa5 lw kont asht3'el honak, kan b2dar asro2 kl hai el3elab elfadye mtl ma 3'ere bsro2ha wbbe3ha fe elso2.mtl ma sm3et Se3r elm3dan ertfa3 hlayam, wsar 7a2 elkelo de3f else3r el2adem".

Fa2 mn 3'afewto mn b3d ma mr2at mn 7do seyara msir3a, wtal3at sot bna2ez wb5awef. Fa7as elkes wla2a b2edo. Lazem ykamel sho3'ol lal masa.

Kamal ydawer fe elzbale 3la el2nane elfadye whwi ynt2el mn m7al lm7al. fe elmasa rje3 3la beto , est2balto mrto ele kant 2a3de 7d bentha elmreda. Twaja3 lma shaf had elmnzar wfkr w2al knt a3ref enha mreda bs sho bde a3mal ?

7at 2edo 3la saba7 bento wla2a enno el7rara mrtef3a kteer, 7melha bsor3a wra7 3lm7ta yestna elbas . elbas et2a5ar kteer. Blash yetms5ar 3la el3elab w3la ele b3mlha w3la eltojar ele beshtroha wbeb3oha. " lw sar eshi llbenti? Meen ra7 yenqezha? ". rje3 lalbet tani youm abel elfajer bsi3at. fa2 bkeer, a5ad elkees wra7 3lzbale ydawer 3la el3elab elfadye." Lazem 2alem el3elab bsor3a abel ma yo5doha elwlad elz3'ar, ra7 asbo2hen." Rakad bsor3et elbar2 yetna2al mn m7al lm7al. elt3ab kan mbayen 3leh, l2no mnamesh kteer leyelt mbare7.

Kan eljaw a7ma bkteer mn elyoum ele abel . 3ldohor kant elshams t7re2 m2dresh yet7amal hai el7rara, kan ylahet mn elt3ab , whwi 7afi, mad 2edo ymsek hadek el3lbe bs 7as to2ol b2edo, wka2eno 3'azat ebar btitla3 mn 2ejro lkol jesmo . kan bdo ymed 2edo bs m2dresh, balash yetmayal , b3den w2e3 3la elzbale. Kant mrto wewlado 3m yestano , bs hwi mrj3esh 3la beto.

Elas2ele

1. Ekteb t3ber bdelo 3la enno elzalame fa2eer (ster 1-4)

_____

2. Br2yak enno baya3 el3elab elfadye hwi ensan met3alem? Ensa5 elklemat ele sa3dtak 3la eljwab.

_____

_____

3. jame3 el3elab kan m3roof bshbabh fe sh3'lten. Aktebhen:

1)_____

2)_____

7. wenta 5elsat a7dath el2osa?

   1) youm eljom3a elmasa
   2) youm eljom3a eldohor
   3) youm elsbet elmasa
   4) youm elsbet eldohor

Text6*- Silent Reading Comprehension of Expository text in Arabizi*

El3adat el3'etha2ye

ba3d mn el3olma2 3araf el3adat el3'etha2ye b2enha toro2 feha ben5tar kef nowkel aw nesti3ml ela3'theye elmawjode fe elbe2a. wfe mn hai el3adat elsa7 wfe el3'alat ele ra7 tdor belsi7a. wra7 ne7ki 3n jozo2 mn hai el3adat bltafsel.

Awlan : **ehmal wajbet elftor**, kteer mn elnas bhemlo wajbet elftor momken 3shan fsh 3ndhn w2et aw momken 3shan bkonesh jay 3balhen yoklo elsobe7. Eza 3refna enno elm3de btkon fadye mn b3d 8 si3at mn elnom wmn aham el ashya2 ele b3mlha elwa7d btkon ben ftret elsobe7 wldohor w enno wajbet elftor bta3te eljsem tolt e7tejyato mn el3'etha2. 3refna ahamyet hai elwajbe wlt3awod 3la akelha elsobe7.

Taneyan : **shorb elmshrobat el3'azye aw shorb kamye kbere mn almay w2et wajbet el akel**. l2no shorb hai elmshrobat bt5ali elwa7d y7es b2eno shbe3 3shan hek mnla2eh enno wla a5ad e7teyajato el3'etha2ye elkamle wl lazme lhadem el akel, whad elsha5s bkon y3ani mn el emsak m3 enno bkon merta7 nfsanyean l2no hai elmshrobat Bet7'li yetdara3 bs heye fe3leyan btsabeb 3osr elhadem.

elmai , wmadet elnasha elmawjode feh btet7lalesh bshakel 3shan 3osaret elm3de bt2daresh t7alelo wlhad elsbab bkon elhadem s3eb.

Sabe3an : **fkret b2eno el5obez elm7amas feh a2al so3rat 7rarye mn el5obez el3adi**. boklo elnas ele 7aben yenzalo fe elwazen, wl7a2e2a enno 3dad elso3ratle ele b3tena eyaha kamye mo3ayne mn el5obez elm7amas heye nafs elkamye ele bt3tena aiah nafs elkamye mn el5obez el3ad. bs elfre2 enno hadem el5obez elm7amas ahwan mn el5obez el3adi l2eno 3malyet elta7mes bt2alel mn nsbet elmai wbt7wel elnasha la sokar ya3ni bt2alel mn mra7el 3malyet elhadem bs wla bt2ater 3la kamyet elso3rat el7rarye.

Tamenan: shorb 3seer elfwake eltaza bye7twe 3la nfs elqeme el3'etha2ye ele fe elfwake elkamle. Wl7a2e2a enno 3seer elfwake few nesb a3la mn elsokriat elbaseta, wnsbe a2al mn el alyaf ele bt3tena aiaha elfwake elkamle. Wheye darorye ll7maye mn elkteer mn el amrad w5astan enha bti3mal 3la tanzem elsokar fe eldam , wbt2alel mn mostwa el kolestrol fe eldam , wbt2alel forest el esabe b anwa3 mo3ayne mn elsrtanat, 5astan srtan el" qolon" wl "etna 3ashar".

1) sho heye ahamyet wajbet elftor lal ensan 7sb elnas (al astor 4-9)?

_____
_____
_____

2) lesh bet3rad el sha5s lal somne b7sb elnas (al astor 18-23)?

_____
_____
_____

3) lesh yo3tbar el 5obez elbared ashal lal hadem mn el5obes elso5on (al astor 27-32)?

_____
_____

_____
_____

4) ekteb sbab lesh beseer 3osr elhadem 7sb elnas?

_____
_____
_____

5) sho a7san akel elfwake elkamle wla shorb 3seer elfwake? E3tmed bjwabk 3la elnas

_____
_____
_____

6) elhadaf elra2ese mn elnas,hwi enno y5alee el ensan :

1- 3adet elmo7afza 3la jesmo
2- 3ader e5tiar elmshrobat el3'azye
3- 3adat reyadye montazme
4- 3adat 3'etha2ye saleme

7) ekteb 3ade 3'etha2ye 7abeb t3malha .e3tmed 3la elnas.

_____
_____
_____

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Part III
Dialect and Literacy in Special Contexts and Populations: Acquisition, Assessment and Instruction

Arabic Diglossia and Heritage Arabic Speakers

Abdulkafi Albirini and Elabbas Benmamoun

1 Introduction

Heritage speakers of Arabic are children of immigrants whose parents' language is Arabic. Arabic is considered their first language (L1) because they are typically exposed to it from birth in the home. However, they live in societies where Arabic is a minority language in the sense that it co-exists with a dominant language that is used in most social domains.

Although they are exposed to the colloquial varieties of their parents from birth, at some point in their childhood—typically at school age—, they start learning the second and dominant language (L2) in their societies. In the United States, for example, most heritage Arabic speakers start hearing English on regular basis by around the age of 4–6 years (Albirini, 2018). Over time, they become more reliant on their L2 to perform everyday linguistic and sociolinguistic functions, such as conversation, reading, and writing. Due to the limited opportunities for L1 input and use in their societies, heritage speakers eventually become unbalanced bilinguals as their L2 becomes stronger than their L1.

In the past two decades or so, a growing body of research has examined various aspects of heritage Arabic speakers' knowledge and use of both CA and SA. Some studies have focused on their knowledge of particular areas in their L1, such as syntax, morphology, and phonology (e.g., Albirini et al., 2011; Albirini & Benmaoun, 2014a, b; Benmamoun et al., 2014b; Albirini & Benmamoun, 2015; Bos, 1997;

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Boumans, 2006; El Aissati, 1996). Other studies have examined the pedagogical aspect of heritage language learning in instructional settings. This applies particularly to heritage speakers in college-level Arabic language classrooms (e.g., Albirini, 2015; Benmamoun & Albirini, 2018; Albirini et al., 2020; Husseinali, 2006). Yet a third group of studies has looked at the sociolinguistic aspects of their L1, such as language attitudes, identity, and codeswitching (e.g., Albirini & Chakrani, 2017; Albirini, 2014a, b; Almubayei, 2007; Martin, 2009; Nortier, 1990; Oriyama, 2010; Othman, 2006; Rieschild & Tent, 2008; Rouchdy, 2013).

In this chapter we focus on the relationship between the acquisition and use of Arabic by heritage speakers and the topic of diglossia. In particular, the chapter focuses on the implications of the situation of heritage Arabic speakers as a minority group in a context where diglossia is non- existent on their acquisition and use of the two broad varieties of Arabic, namely, Colloquial Arabic and Standard Arabic.

2 Diglossia and Arabic Dialects

The Arabic sociolinguistic situation is characterized by the co-existence of two language varieties that are used in various societal domains and for various functions. These two varieties are often labeled Colloquial Arabic (CA) and Standard Arabic (SA). CA is a broad term that covers a wide variety of regional and local, mainly spoken, dialects across the Arabic-speaking region. CA is used in everyday communication and in casual interactions at home, work, market and other informal domains. It is acquired naturally by Arabic children from parents and the larger community. CA is neither codified nor standardized, and that is why is rarely used in written discourse, though this pattern is changing due to the spread of modern technologies.

Unlike CA, SA is both codified and standardized. Hence, it is relatively uniform across the Arab region, with the exception of some lexical items and phonological features where the influence of the local dialects is found (Holes, 1995; Mitchell & El-Hassan, 1994; Parkinson, 1991, 1993). This uniformity makes SA relatively easily understood by educated speakers across the Arabic-speaking region. SA is also one of the main markers of a shared history and heritage that Arabic-speaking people have across a vast geographical space. SA is commonly used in written discourse, news, religious speeches, written communication, and other formal contexts. Although they do not typically acquire it from parents, Arab children may hear SA from various sources, such as television, children's stories and religious speeches, and they start learning it formally at school age.[1]

Though the two main varieties of Arabic, SA and CA, share many linguistic features at all levels, lexical, phonetic and phonological, morphological, and syntactic, there are

[1] With the increasing prevalence of preschool in the Arab world, children are exposed to SA at an even earlier age.

also differences between them.[2] For example, unlike SA, many Arabic dialects do not have the interdental fricatives /θ/ and /ð/ as part of their phonetic inventory. Other differences at the phonetic and phonological levels include the distribution of glides (contexts where CA may have long vowels), the presence of the glottal stop /ʔ/ or one of the velars /g/ or /k/ instead of the uvular phoneme /q/, and syllabification and particularly the use of initial consonant clusters. At the morphological levels, it is well known that SA has richer agreement paradigms that include dual forms and feminine plurals in the second and third persons. On the other hand, CA tend to have richer aspectual and temporal systems with independent morphological markers and proclitics. Another major difference includes the presence of a robust morphological case system in SA that marks nouns as nominative, accusative, and genitive, while this system is totally absent in CA.[3]

At the syntactic levels, the differences are as notable. For example, negative markers in SA and CA may display differences as shown in Table 1 from Benmamoun et al. 2014a, b.

Unlike CA, SA has different markers of negation in the past and future tenses (Benmamoun, 2000; Aoun et al., 2010). Questions in SA and CA display similar contrasts as shown in (1).

(1).

a.	**maa(ðaa)**	turiid	(SA)
	what	2ms-imp.want	
	‘What do you want?’		
b.	**šu**	bədə-n	(Jordanian)
	what	want-3p	
	‘What do they want?’		
c.	**šnu**	bɣiti	(Moroccan)
	what	perf.3ms	
	‘What do you want?’		
d.	ʕaayiz	**eeh**	**(Egyptian)**
	wanting	what	
	‘What do you want?’		

Table 1 The distribution of the sentential negation in Arabic varieties

Tense	Standard	Egyptian	Moroccan	Jordanian/Levantine	Gulf
future	*lan*	*miš/muš*	*ma-š*	*maa or ma-š*	*maa*
present	*laa*	*ma-š*	*ma-š*	*maa or ma-š / muš*	*maa*
past	*lam*	*ma-š*	*ma-š*	*maa or ma-š*	*maa*
imperative	*laa*	*ma-š*	*ma-š*	*maa or ma-š*	*laa*

[2] We are putting aside here the issue of the historical relationship between SA and CA and the historical status of SA relative to CA.

[3] In CA, only pronouns and clitics vary relative to grammatical function.

SA questions are realized through the displacement of the question marker to the sentence initial position, which is not necessarily the case in Egyptian Arabic, where the question marker can occupy the original position. However, despite these differences there is no mistaking the relationship between SA and CA at all the levels discussed above. They share a significant number of cognates, show remarkable overlap in their phonetic inventories, use broadly similar strategies to form plurals (broken, sound feminine, and sound plural), overlap in their agreement paradigms, display two major verbal forms, perfective and imperfective, with similar affixal properties, and have similar strategies for syntactic word order, questions, relative clauses, and other sentential patterns (Benmamoun, 2000; Aoun et al., 2010).

In his classic article in *Word*, Ferguson (1959) presented the Arabic sociolinguistic situation as a prototype of diglossia. According to Ferguson's model of diglossia, SA and CA have distinct statuses and complementary distribution with respect to contexts of use. SA serves as the High and prestigious code that is used in formal contexts and high functions, whereas CA is the Low code that is used in informal contexts and low functions. SA is used, for example, in university lectures, mosques/churches and religious sermons, whereas CA is used to in casual conversations and informal interactions. Ferguson's model has been critiqued and revised over the years, and new propositions have been advanced to explain the intricate and constantly- changing interplay between SA and CA (see Albirini, 2016 for a review).

More recent research suggests that SA and CA overlap and mix in various contexts. For example, CA is often used along with SA in university lectures, political speeches, religious sermons, and literary works (Albirini, 2011, 2020; Bassiouney, 2006, 2013; Holes, 1993, 1995; Mazraani, 1997; Mejdell, 1999, 2006; Rabie, 1991; Saeed, 1997; among others). Similarly, SA elements may appear in informal domains and functions, such as work, sports, and everyday communication (e.g., Abu-Melhim, 1991, 1992; Albirini, 2014a, b; Sabir & Safi, 2008; Shiri, 2002). This means that neither SA nor CA are confined to specific domains and functions.[4] CA, in particular, seems to be increasingly used for functions and in domains that have traditionally been associated with SA. For example, recent research findings suggest that CA is used on regular basis even in political speeches and college-level Arabic-language lectures (Albirini, 2020).

Another facet of diglossia that has changed over the years is prestige, which may not be a factor defining the contexts, functions and uses of SA and CA (Ibrahim, 1986; Abdel-Jawad, 1987; Albirini, 2014a, b, 2020; Abu-Melhim, 1992; Shiri, 2002). The idea that SA is the prestigious variety is more conceptual than tangible in everyday language use. By contrast, certain varieties of CA are gaining increasing prestige due to different economic and political factors. For example, Albirini (2020) reports that, for Jordanian college students, both SA and CA are valued in

[4] Both varieties are also increasingly being used in plays and novels (see Albirini, 2016).

their own right. The Jordanian CA dialect is gaining more prestige as it is associated with surging Jordanian-nationalist sentiments in the post-Arab Spring era. One may argue that the prestige of SA has been diminishing along with the decline of pan-Arab nationalist discourse, which used SA as a main symbol of Arab unity and shared history.[5]

A related aspect of change in diglossia is attitudinal. Historically, Arabic speakers have generally had positive attitudes toward SA. SA is deep rooted in Arab consciousness because it is associated with the Arabs' history and heritage, their classic literature, their linguistic homogeneity, and their collective identity. For many Muslim Arabs, SA is significant because it is the the language of the Quran and Islamic workship and prayers. The symbolic value of SA has afforded it a special status across the Arab region. However, the various regional, sectarian, and political challenges in the Arab region as well as the rise of state-based nationalisms have given rise to CA as a powerful means of state-based representation (see Albirini, 2020). Thus, the stigma that is often associated with CA in particular domains seems to be fading. This change in attitudes toward SA and CA is remarkable and reflects the changing political, social, and cultural landscape in the area since the time Ferguson wrote his pioneering work on diglossia.

A last aspect of change in the early models of diglossia has to do with the acquisition of CA and CA. In Ferguson's early model of diglossia, CA was presented as the language variety acquired naturally from parents, family and community, whereas SA is acquired formally at school. However, with the spread of satellite television, internet technologies and social media, Arab children have greater opportunities to be exposed to both varieties from an early age. Little research has been done on this topic, but the existing studies suggest that Arab children may develop comprehension and production skills not only in CA, but also to varying degrees in SA (Sabir & Safi, 2008; Leikin et al., 2014; Albirini, 2015). However, given the limited exposure to SA—in comparison to CA—the existing studies suggest that Arab children's knowledge and skills in SA significantly lag behind their knowledge and skills in CA, which is not surprising given how the two varieties are acquired.

Overall, diglossia as a linguistic reality that characterizes the Arab region has undergone noticeable developments, particularly with the growing overlap in functions and domains between SA and CA with the increase in literacy and the spaces occupied by both SA and CA. Other aspects of diglossia such as the acquisition of SA and CA and their relative prestige in the Arab communities have rendered the concept much more fluid and nuanced than it has ever been before.

[5] There are also debates in some countries about the role of CA in education, particular at the preschool and elementary school levels. For example, recently there was intense discussion about this issues in Morocco.

3 Diglossia-Less Context of Heritage Arabic Acquisition

Social context provides the framework for language acquisition and use for any speech community (Edward, 1992). Context involves broad social dynamics such as social norms, power relations, ideologies, and discursive practices as well as more specific aspects of time, space, event, occasion, and interlocutors (Albirini, 2016). In language acquisition, it also involves opportunities for language input and use within different domains and with different social actors. Understanding the dimensions of context is important for pinpointing the various factors that may influence language acquisition and use in heritage speakers. Because the dimensions of context often change from one community to another, many issues related to language acquisition and use may change as well.

One important aspect of context that has direct impact on heritage Arabic speakers' language acquisition and use is the *diglossia-less* situation in which they live. Unlike monolingual speakers of Arabic, who live and experience how SA and CA co-exist and function in the Arabic linguistic landscape, heritage speakers live in a context where SA and CA have no place in the public sphere. In the US, Arabic is not used in virtually any public venue, unlike English which is used in daily interactions, education, government, media, and other communication channels. The fact that Arabic is invisible in the public arena means that heritage speakers have little or no chance to hear SA and CA in context or be familiar with the patterns of their use in everyday life. This, of course, impacts not only their acquisition of the grammars of these two varieties, but also to their awareness of how diglossia transpires in everyday interactions and communication.

For heritage speakers, the main sources of input in CA are the parents and family. Outside their homes, they may rarely be able to hear or use CA. Thus, they do not have access to the whole spectrum of functions in which CA as an L1 is used in various social domains, such as the marketplace, work, and other informal settings. This contextual constraint reduces their exposure to and knowledge of this variety as well as their ability to use it in contextually appropriate manner (Albirini, 2016; Albirini & Chakrani, 2017). Eventually, heritage speakers resort to English to carry out different communicative functions, even in their interactions with parents and family members (Albirini, 2014a, b; Martin, 2009; Shiri, 2010; Suleiman, 1999). It is, therefore, not surprising that the acquisition and development of heritage CA has often been characterized by incompleteness, attrition, and loss of various linguistic features and forms (see Montrul, 2008; Polinsky, 2011).

Unlike CA, SA represents an L3 for most heritage Arabic speakers (Albirini & Benmamoun, 2014a, b; Albirini, 2015). While monolingual speakers of Arabic in the Arab region are usually exposed to SA from school, television, literature, formal written communication, religious sermons, and other formal channels, all of these SA input sources are not readily available to most heritage speakers. Therefore, their exposure to this variety is either minimal or non-existent in early childhood (Albirini, 2018). Some may learn SA in Sunday School, but this type of learning is often intended for specific purposes (mostly Qur'an recitation). This is why many heritage speakers in the US take college SA courses, mostly to obtain literacy skills

in SA (Husseinali, 2006). Heritage speakers also differ from their monolingual counterparts in the lack of affective attachment to SA. For many monolingual speakers of Arabic, SA represents an important anchor of their Arab identity, history and heritage (Suleiman, 2003). These affective links are not pertinent to most heritage speakers who often identify themselves more as American and less as Arab (see Albirini, 2016).

In general, for most heritage speakers of Arabic, diglossia is an abstract notion that does not reflect their daily linguistic and sociolinguistic experiences. Heritage speakers are characteristically different from monolingual speakers of Arabic in the Arab region who see diglossia in action in their lives through their exposure to SA and CA on regular basis. This diglossia-less context has direct impact on their knowledge and use of various aspects of CA and SA, as the next section shows.

4 Knowledge of CA and SA

As noted above, heritage speakers are typically exposed to CA at an early age from their parents and family. However, once they acquire English and gradually become dominant in it, they become less and less reliant on CA in their daily communication. Despite this common pattern in their language development, however, heritage speakers vary considerably in their ultimate attainment in L1, with some being close to monolingual speakers of Arabic while others having rudimentary skills in their L1. Generally speaking, however, heritage speakers rarely attain native-like proficiency in L1. Heritage speakers' unique situation and L1 development have oriented research to investigating two broad topics: (1) aspects of heritage speakers' linguistic system that are maintained or lost; (2) factors determining language maintenance and loss in heritage Arabic speakers.

With respect to the first topic, existing studies suggest that heritage Arabic speakers differ from their monolingual counterparts in various linguistic aspects, including phonology, morphology, syntax, and lexicon. In phonetics/phonology, heritage speaker may *sound* like monolingual speakers due to their early exposure to CA. However, they differ from their monolingual counterparts in various phonological features. Saadah (2011) found that, when compared to L2 learners and monolingual speakers, heritage speakers of Arabic have developed a somewhat hybrid phonological system that is similar in some respects to monolingual speakers and in other respects to L2 learners. For instance, in terms of vowel height, their front and back vowels (i.e., /i, i:/ and /u, u:/, respectively) were similar to monolingual speakers, whereas their low vowels (i.e., /a, a:/) were similar to L2 learners. With respect to vowel backness, they were similar to L2 learners in back vowels and similar to monolingual speakers in low vowels.

Heritage speakers have different gaps in their morphological system. Studies show that heritage speakers have difficulties with plural formation (e.g., Benmamoun et al., 2014b; Albirini & Benmamoun, 2014a, b). Broken plurals, particularly those with geminated and defective roots, seem to be challenging (e.g., *baab* ➔ *bwaab*

'doors' and *kaff* ➔ *kfuuf* 'palms'). Broken plurals are often replaced by default sound feminine plurals, as shown in example (2). Similarly, heritage speakers struggle with dual nouns (Albirini, 2014a, b; Albirini & Benmamoun, 2014a, b). Agreement morphology is another challenging area for heritage speakers (Albirini et al., 2011, 2013). Albirini et al. (2013) report that agreement between plurals nouns and verbs/adjectives is the most difficult form of agreement for heritage speakers. With plural nouns, they often deploy the default singular masculine form instead of the target plural forms. In (3), for example, the speaker incorrectly uses a verb marked as singular masculine *raaḥ* 'went.3sm' with the conjoined plural subject *Elwalad wi-lkalb* 'the boy and the dog.'

(2) *kərse* ➔ *kursiyyaat** 'chairs' (correct form: *karaase*) (Benmamoun et al., 2014a, b, p 109

(3) elwalad wi-lkalb raaḥ* barra
the boy and the dog went outside
"The boy and the dog went outside." (Albirini et al., 2011, p 285)

Heritage speakers seem to have a strong grasp of the core aspects of their L1 syntax (Albirini et al., 2011; Albirini & Benmamoun, 2014a, b; Benmamoun & Albirini, 2018; Bos, 1997). However, their knowledge of complex syntactic relations, such as dependency and merger, and interface relations between syntax and other domains is less robust. Albirini et al. (2011) examined sentence structure of heritage L1 in elicited narratives. They found that the basic structure of the Arabic sentence is kept intact. However, the participants displayed a strong preference for the SVO word order, even in contexts where VSO is more appropriate. Also using narratives, Albirini and Benmamoun (2014a, b) report that heritage speakers lacked accuracy in realizing long-distance dependencies between antecedents and their position in restrictive relative clauses. For example, sentence (4) is lacking a resumptive pronoun after *ʕaawiz* 'wanting' which is required to mark the position of the antecedent *ḥaaga* 'thing' in the relativized clause. Albirini and Benmamoun (2015) examined Egyptian heritage speakers' knowledge of the syntax of negation. They found that heritage speakers had a solid knowledge of the syntactic location of negation, but were less successful in other aspects, such as realizing merger with lexical heads and dependency relations. In (5), for example, the speaker incorrectly uses the particle *miš* instead of discontinuous form *ma-š*, which requires merger of negation with the verbal head in this past-tense sentence.

(4)

l-jinn	ʔall-u	ʔaddi-ha-lak	ʔay ḥaaga lli	ʔinta ʕaawiz*
The-genie	told-him	give.1s-it-you	any thing that	you wanting

'The genie told him that I give you anything that you want' (Albirini & Benmamoun, 2014a, b, p 266)

(5)

huwwa	*miʃ	raaḥ	l-kaftiria
He	Neg	went	the-cafeteria

'He did not go to the cafeteria.' (Albirini & Benmamoun, 2015, p 483)

A few studies have examined heritage speakers' knowledge of SA (Albirini, 2014a, b; Albirini & Benmamoun, 2014a, b; Benmamoun & Albirini, 2018). Benmamoun & Albirini (2018) examined heritage speakers' knowledge of sentential negation in SA. The participants were students in college-level SA courses. Benmamoun and Albirini found that heritage speakers enter elementary college-level courses in SA with very limited knowledge of the SA negation system. Forms that do not have equivalents in CA, such as those involving *laysa*, *lam*, and *lan*, were particularly challenging to them. Similarly, Albirini and Benmamoun (2014a, b) report that heritage speakers have various gaps in their knowledge of plural morphology in SA, particularly with respect to broken plurals and sound masculine plurals. Broken and sound masculine plurals were often replaced with the default sound feminine form, as in (6) where the singular stem was incorrectly pluralized with the sound feminine morpheme *-aat* instead of the sound masculine morpheme *-iin*.

(6) *ṭabbax* ➔ *ṭabbaxaat** (correct form: *ṭabbaxiin*) (Albirini & Benmamoun, 2014a, b, p 864)

Studies focusing on the factors responsible for language loss or maintenance in heritage speakers suggest that multiple factors may influence their L1 systems. Albirini (2018) examined the impact of *age of exposure to L2/English* and *amount of input in Arabic* on pre-school heritage children's knowledge of three areas: agreement morphology, plural morphology and relative clauses. He found that both age of exposure to L2 and amount of L1 input correlate positivity with the participants' accuracy scores on these three areas. However, age of exposure to L2 was the only significant predictor of their accuracy scores. Albirini (2014a, b) investigated the factors that may predict variability in adult heritage speakers' proficiency levels. He found that *L1 usage* was the only significant predictor of variability in proficiency; heritage speakers who use their L1 on regular basis are more likely to have higher proficiency in L1 than those who do not.

Studies investigating the role of social factors in heritage speakers' L1 development and ultimate attainment report that a variety of factors may affect heritage speakers' L1 acquisition, including social networking, community relations, language attitudes, ethnic identity, family involvement, and demographics such as gender and parents' L1 (Albirini, 2014b; Almubayei, 2007; Martin, 2009; Oriyama, 2010; Rieschild & Tent, 2008; Rouchdy, 2013). This means that L1 attainment for heritage Arabic speakers is influenced not only by acquisition or linguistic factors, but social ones as well.

In general, the existing literature suggests that the context in which heritage speakers live limits their access to input and use opportunities in SA and CA, which in turn has a negative impact on their knowledge of these varieties. Another impact of the context of heritage language acquisition is transfer effects from the dominant L2, English, and also between these two varieties, which is covered next.

5 Language Transfer

For heritage speakers, the L2 (e.g., English) is the dominant language that is used in their daily communication and interactions. The fact that L2 is their dominant language means that not only do heritage speakers have more accessibility to and more proficiency in L2 than in L1/CA, but it also influences the structure and use of their heritage L1.

The influence of the dominant L2 on heritage L1 may take different forms, such as simplification, overregularization, borrowing, avoidance, omission, restructuring, convergence, and misinterpretation (e.g., Albirini, 2014a, b, 2015; Albirini et al., 2011; Albirini & Benmamoun, 2014a, b; Benmamoun et al., 2014a, b). For example, a number of studies indicate that heritage speakers use the suffixation strategy to form regular and irregular plurals, as in (1) where the default sound feminine morpheme *-aat* is incorrectly attached to the singular stem (El Aissati, 1996; Benmamoun et al., 2014a, b; Albirini & Benmamoun, 2015). This could be a case of overregularization that may be triggered by the influence of L2, though the same pattern is found with L1 learners of Arabic in the Arabic speaking world (see Albirini, 2015; Saiegh-Haddad et al., 2012). In their investigation of heritage speakers' knowledge of dual nouns, Albirini and Benmamoun (2014a, b) identify the frequent use of "modifier + noun" structures as a form of transfer from English. In (7), for instance, an Egyptian heritage speaker used *tintein banaat* 'two sisters' to express duality. In this respect, they differ from monolingual speakers, who mark duality morphologically with the morpheme *-ein*.

(7) ʕind-ha *tintein banaat
at-her two.f. girls
'She has two girls.' (Albirini & Benmamoun, 2014a, b, p 258)

Transfer effects have been observed in complex syntactic relations as well as syntax interfaces with other domains. As noted earlier, heritage Arabic speakers display a strong preference for SVO word order, even in contexts where VSO order is more appropriate (Albirini et al., 2011). Bos (1997) tested Moroccan heritage children's comprehension of complex clauses. Heritage children's

comprehension was found to be significantly lower than that of their monolingual counterparts in VSO sentences, but not SVO sentences. In addition, heritage speakers were found to overuse overt pronominals in sentences that favor the pro-drop strategy (Albirini et al., 2011). The *avoidance* of both VSO and pronoun omission may be ascribed to L2 effects since English is an SVO and overt-pro language.

Using an oral narrative procedure, Boumans (2006) compared Moroccan immigrants in the Netherlands and their monolingual counterparts in Morocco with respect to the use of synthetic and analytic constructions for expressing possession (*raas l-kelb* 'dog head' vs *r-raas dyal l-kelb* 'the head of the dog'). The immigrant speakers displayed a strong preference for the analytic construction in comparison to those in Morocco. Boumans suggests this trend in Moroccan heritage Arabic may be due to the influence of Dutch as the dominant language.

Similarly, Albirini and Benmamoun (2014a, b) examined the structure of relative clauses in heritage speakers' narratives. They found that heritage speakers produce relative clauses that are built on the structure of their L2. In (8), for example, the speaker uses the wh-word *wein* 'where?' as a relativizer, which is possible in English but not in Arabic.

(8)

ktiir min ʔaṣḥaab-i	ʕaayʃiin bi-l-ʕamaara	*wein ʔana	ʕaayeʃ halla ʔ
many of friends-my	living in-the-building	where I	living now

'Many of my friends live in the building in which I live now.'
(Albirini & Benmamoun, 2014a, b, p 264)

In addition to these aspects of transfer, heritage speakers may borrow forms directly from their L2, such as lexical items (e.g., Albirini & Chakrani, 2018; Othman, 2006). Some of these forms may be caused by accessibility and processing issues. Because they use their L2 on regular and frequent basis, heritage speakers may find it easier to access and process elements from their L2 than these same elements in L1. Accessibility and processing factors may also explain transfer effects between SA and CA, which is widely observed in the literature (e.g., Albirini, 2014a, b; Albirini & Benmamoun, 2014a, b; Albirini & Chakrani, 2017; Albirini et al., 2020). For example, in (9), the speaker attached the SA dual morpheme *-aan* to the CA singular stem *ṣeif* 'summer.' The speaker's resort to the SA morpheme is possibly due to the fact that marking the dual morphologically is less common in CA than in SA in the sense that, for instance, dual adjectives in CA are marked as plural.[6]

[6] A dual noun and its adjective should be both dual (baabain kabiirain 'door.dual big.dual') whereas in CA a dual noun is typically followed by a plural adjective ((e.g., *baabein kbaar* 'door.dual big.pl').

(9)

nsaafir	ʔila misr	kul	ṣeif	or ṣeif*aan*
travel.1pl	to Egypt	every	summer	or summers.dual

'We travel to Egypt every summer or every two summers'
(Albirini & Benmamoun, 2014a, b, p. 259)

However, transfer is more likely to occur from CA to SA. Although not as commonly used as L2 in everyday communication, CA is still relatively more familiar to heritage speakers than SA. Therefore, when heritage speakers have to use SA (e.g., in Arabic language classrooms), the influence of their CA is often visible in their output. For example, Benmamoun and Albirini (2018) used pictures and matching/unmatching statements to elicit sentential negation from heritage speakers in SA courses. The participants made various types of errors, including the use of forms that are exclusive to CA. In (10), for example, the speaker deploys the CA negation form *miʃ raaḥ* 'didn't go' instead of its SA counterparts *lam yaðhab* or *maa ðahaba*.

(10)

Prompt: Khaled ðahaba ʔila l-kaftiria
Response: huwwa ∗miʃ raaḥ l-kaftiria
he NEG went the-cafeteria
'He did not go to the cafeteria.' (Benmamoun & Albirini, 2018, p. 482)

Overall, the patterns of language transfer suggest that the context in which heritage speakers live requires them to rely on their dominant L2 and simultaneously reduces the role of their L1 in their speech. Naturally, the continuous use of L2 contributes indirectly to the loss of different features in L1 and their replacement with similar forms derived from the L2. Transfer effects between SA and CA are also noticeable, and they often serve as a compensation strategy. The effects of context on heritage speakers also appears in their codeswitching, which is covered in the next section.

6 Codeswitching

Codeswitching is an important indicator of the extent to which heritage speakers command their L1 because it can reflect lexical and retrieval gaps in their knowledge. It may also demonstrate whether they have knowledge of the rules for juxtaposing elements from different languages/dialects and the constraints that regulate this process (Albirini et al., 2011). This is critical if we take into account hypotheses indicating that codeswitching is governed by a unitary morphosyntactic system (e.g., Myers- Scotton, 1993).

One of the most noticeable aspects in CA usage by heritage speakers is the regularity of their codeswitching to English and, to a very limited extent, to SA (Albirini, 2014b; Albirini et al., 2011; Nortier, 1990; Othman, 2006; Rouchdy, 2013). Codeswitching is not exclusive to heritage speakers; monolinguals speakers of Arabic do often switch between CA, CA and English (Albirini, 2011, 2014a, b; Bassiouney, 2006, 2013; Holes, 1993, 1995; Mazraani, 1997; Mejdell, 1999, 2006; Rabie, 1991; Saeed, 1997; Soliman, 2008; among many others). Research suggests that Arabic speakers may switch between SA, CA, and English to achieve different discursive, social and pragmatic goals.

From a grammatical perspective, heritage speakers are often successful in juxtaposing elements from CA and English without violating the basic structure of their sentences (Albirini et al., 2011; Albirini, 2014a, b; Benmamoun et al., 2013). In (11), for example, the speaker places the definite article before the English noun *suburbs*, which is required here. The definite article is correctly assimilated to match the following coronal consonant /s/, following the rules of Arabic allomorphy. Moreover, the determiner phrase *s-suburbs* 'the suburbs' is felicitously embedded under the preposition *fi* 'in.' In (12), the non-assimilated form of the definite article – 'the' is attached to the English noun *major*. The determiner phrase *l-major* 'the major' is introduced by the demonstrative *haada* 'this', which modifies singular masculine nouns. Further, a singular- masculine object pronoun, namely *–u*, is attached to the verb *ḥəbb* 'like' to refer to the noun *major*. The accuracy in which heritage speakers combine all of these elements indicates their knowledge of the basic structure of their L1.

(11) humme ʕaayšiin fi-s-suburbs fi Chicago
they living in-the-suburbs in Chicago
'They live in the suburbs of Chicago.' (Albirini, 2014a, b, p 744)

(12) ʔahamm ʔiši fi haada l-major ʔin-i baḥəbb-u
The most important thing in this major that-I like-it'
'The most important thing in this major is that I like it.' (Albirini, 2014a, b, p 744)

Heritage speakers are also successful in integrating elements from CA into SA, which again may reflect their knowledge of the underlying structure of their L1 system (Albirini, 2014a, b; Albirini & Benmamoun, 2014a, b; Albirini & Chakrani, 2017). When they switch between these two varieties, they do that accurately and without violating the structural soundness of their sentences. In (13), for example, the speaker incorporates the SA noun *ʔaxawaat* 'sisters,' instead of *ʔixwaat*/*xawaat*, into the CA sentence. This noun is used in its plural, indefinite form, as is required in this context. Likewise, in (14), the SA verb *ḥadθət* "occurred.3SF," opens the

CA sentence. This SA verb agrees with the sentential subject *l-ʔəṣṣa* "the story" in gender and number. Th verb is correctly used in the so-called perfective form, which is used with past tense sentences. The placement of the verb before the subject creates a VSO sentence, which is commonly used in Arabic narratives (Albirini et al., 2011).

(13) ʔana ʕind-i talaata ʔaxawaat.[6]
I at-me three *sisters*
'I have three sisters' (Albirini & Benmamoun, 2014a, b, p 256)

(14) ḥadθət l-ʔəṣṣa ʔabl sini taʕriiban
Occurred.3SF the-story before year almost
"The story occurred almost a year ago." (Albirini & Chakrani, 2017, p 324)

The use of SA elements may be driven by the need to find alternatives to CA forms that may not be readily accessible or retrieved by heritage speakers.

Although heritage speakers are generally successful in their use of CS at the morphosyntactic level, they differ from monolingual speakers of Arabic in certain respects. For one, heritage speakers seem to switch between CA, SA, and English to fill in gaps in their lexical knowledge or to overcome retrieval delays (Albirini, 2014a, b; Albirini et al., 2011; Othman, 2006).

Moreover, their codeswitching between SA and CA is not always situationally or contextually appropriate. In (15), for example, the speaker narrates a personal story about a handyman regarding removing animals from the attic. The speaker narrates the story in CA, but switches to SA by using the phrase *hal* taqbal "do you accept?" The word *hal* is used to introduce yes/no questions in SA, but it can sometimes be used in CA discourse to highlight the importance of the question (Saeed, 1997). The situation in this sentence makes the switch contextually inappropriate. It is also marked because its position relative to the preceding and following elements do not show any need to highlight the importance of this point.

(15) baʕdein saʔalt-u *hal taqbal* miyye… innak tetxallaṣ min-hum w-ta ʕṭii-na
then asked.1S-him Interg. accept.2S hundred… that get-rid of-them and-give-us
kamaan šahr ḍamaan innu ma yirjaʕ-u also month warranty that Neg. return.3P
"Then I asked him. Do you accept one hundred [dollars]… that you get rid of them and give us warranty that they do not return." (Albirini & Chakrani, 2017, p 329)

Heritage speakers also differ from monolingual speakers of Arabic in the goals of codeswitching: their codeswitching does not always serve social or pragmatic

purposes. Based on his study on code alternation in heritage speakers in the United States, Elsaadany (2003) argues that codeswitching does not have well-defined "communicative functions." similarly, Othman (2006) report that the participants in his study used codeswitching for only a few conversational functions. Othman found that, even when codeswitching concurs with a change in domain or topic, the direction of the switching is not always predictable. For example, the participants may speak about school in CA and then shift to English to discuss a religious issue. This stands in contrast to monolingual speakers who often use SA or CA when discussing religion (Al-Enazi, 2002). This suggests that, for heritage speakers, there is no clear relationship between a particular language/dialect and a matching domain, relative to their non-heritage counterparts.

Overall, studies examining heritage speakers' codeswitching suggests that they may have general grammatical competence to combine elements from different languages or language varieties, which suggests that they have internalized the core aspects of their L1 syntax and the constraints on integrating elements from different languages. However, they lack the communicative competence to use codeswitching in a contextually appropriate manner to serve communicative and social functions. This may be due to the fact that they did not grow up in the Arabic diglossic context where they experience how SA and CA are used in everyday life for various purposes. In addition, their limited knowledge of the phonology, morphology, and syntax of SA may explain why their diglossia is probably more an instance of borrowing lexical items from SA for use in their heritage Arabic discourse.

7 Conclusion

In this paper, we provided an overview of Arabic diglossia as it relates to heritage speakers in the diaspora, particularly in Western countries such as the United States. We compared the situation of heritage Arabic with their counterparts in the native context of Arabic diglossia (the Arabic speaking region in Africa, Middle East, and Gulf). The two contexts differ greatly. In its native contexts, CA is usually the dominant variety throughout the speakers' lives. It is acquired natively as a first language and it is the language that is used on daily basis in the home and in the wider society. In that context, SA also occupies a prominent linguistic space and has a commanding presence in people's daily lives. Though SA in the Arabic speaking countries is not acquired natively through natural and spontaneous input in the home and in the community, it is very much present early in childhood. For example, many TV programs, including cartoons, targeted to young children are in SA. There are also books and magazines in SA for young readers.

Within the Arab diglossic context, a question is often raised as to how to characterize SA. The neat distinctions that most language acquisition researchers rely on to differentiate first/native language acquisition and second/non-native language acquisition do not easily extend to SA. To take a concrete example, English is clearly an L2 in the Arab region. It is acquired mainly in school settings and is typically not introduced in early childhood and does not have the same contextual

presence and history as SA. In many respects, SA does not completely pattern with languages that are acquired as L2s later in childhood or adulthood, but it is not an L1 either, at least according to our understanding of what it means to be a native speaker of a language.[7]

While we don't have a good characterization of SA relative to the debate about native vs. non- native language dichotomies and while the notion of native speakers is itself not sharp enough, we are tempted to put SA in a place between native languages such as CA and non-native languages, such as English.[8] In heritage contexts, by contrast, CA is acquired natively under restricted input, but later English becomes the dominant language. SA, on the other hand, is a third language that is acquired through learning in formal settings, mainly schools. In that respect, SA sits in a different position in the native vs. non-native continuum, with English and CA close to each other and SA at another end. This differential status of SA in the two contexts may perhaps account for the diglossic output that we get in the two contexts. In their native contexts, we get significant SA presence in CA discourse, at almost all levels, phonetic, phonological, morphological, and syntactic. In their non-native contexts, any diglossic discourse is severely limited with the SA component mostly restricted to lexical borrowings.

There are many questions that arise in the context of Arabic-based diglossia. Above we discussed issues of form, distribution, and social perceptions and attitudes. These questions have received a great deal of attention in various areas of linguistics, especially formal linguistics, sociolinguistics, and language acquisition. What has not received the same degree of attention is the issue of how accurately to characterize the acquisition of SA in its native contexts and how that differs from its acquisition in non-native contexts. Research on SA acquisition and use by heritage Arabic speakers can help engage those issues. In both situations, we have two varieties that are close to each other (by any quantitative measure of linguistic distance) but the contexts where they are acquired are different. One question is how factors such as linguistic distance and linguistic contexts and the key language players in it facilitate or hinder the acquisition of SA and ultimately the diglossic output of the learners. That key question remains open for now.

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[7] The notion of native speaker is itself a subject of a long running debate. See Benmamoun et al. (2013) for a discussion of this issue in light of results from heritage language research.

[8] This is perhaps the intuition behind Parkinson's notion of "native users" of SA as opposed to native SA speakers (See Parkinson, 1991).

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Assessment of Developmental Language Disorders in Bilinguals: Immigrant Turkish as a Bilectal Challenge in Germany

Solveig Chilla

1 The Immigrant Turkish Dialect as a Heritage Language in Germany

Germany has always been a country with several bilectal and diglossic contexts (Rash, 2002; Földes, 2005; Koneva & Gural, 2015). In the last decades, dialect use is continuously decreasing, whereas the empowerment and the legal and societal acceptance of minority languages and their speakers, such as "Low German (Plattdeutsch)", "Lower Sorbian", or Danish, increases.

Despite Germany's long history of immigration and experience with heritage speaking and refugee children in the educational system, the languages of migrant communities, such as Turkish, Russian, Kurdish, Syrian Arabic or Bosnian, however, are not addressed with the status of minority languages legally, even though most citizens in Germany acquire one or more of these languages additionally to German. In 2018, 64% of families with children under 18 years of age had a migrant background (Autorengruppe Bildungsberichterstattung, 2018). The number of children speaking more than only German oral language at home increases constantly (Autorengruppe Bildungsberichterstattung, 2018), leading to an increase of heritage language speakers (i.e. Fishman, 2001; Gagarina, 2014).

Turkish is spoken in Europe and other countries, and since the 1960s, many states in Western Europe host large Turkish immigrant communities (e.g. Backus et al., 2010). Importantly, language loss is remarkably rare in the Turkish communities, since immigration is a continuous process. Today, Germany has the biggest Turkish-origin population in Western Europe. An estimated population of 4 million

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people, of full or partial Turkish origin live in the country (Feltes et al., 2013: 93); that is approximately 5% of Germany's total population of 82 million inhabitants.

Note, however, that, even after four generations Turkish-origin minority populations, people with a Turkish background tend to occupy the lower end of the socioeconomic spectrum, as it is not untypical of immigrant communities with roots in labour migration (cf. Backus, 2010; Riphahn et al., 2010). In 2010, Immigrants of Turkish origin were least successful in the German labour market, 30% of adolescents did not finish school, many were jobless, and only one third of Turkish women in Germany were employed. The Turkish communities often live in city centres, and, in cities like Berlin, Hamburg or Mannheim, where seem to be city quarters almost exclusively populated by people of Turkish origin.

The German school system and the educational policies in the Federal Countries of Germany, however, hold specific obstacles for students with a heritage language background. The segregated system of schooling leading to the early tracking of children into higher and lower types of secondary education is particularly disadvantageous for children who grow up speaking non-standard varieties of the majority language, and local dialects, ethnolects, some youth style, or a mixture of these (i.e. Backus, 2010). Moreover, national education reports continuously state the additional disadvantage of children from families with a low socioeconomic status and a history of migration ("migrant background") (i.e. Autorengruppe Bildungsberichterstattung, 2016, 2018). Such children need more time for acquiring the standard academic variety of the language ("Bildungssprache"). This is – alongside the stereotypes of teachers against the performance of children with a migrant background (Berliner Institut für empirische Integrations- und Migrationsforschung, 2017) – the most relevant drawback on school attainment (i.e. Gogolin, 1994). In spite of the efforts of many scholars in educational science to establish translanguaging as method of teaching and language education already in the 1990s (i.e. Gogolin, 1994), knowledge of the German language is considered a necessary condition for academic and later professional success.

Turkish as a heritage language in Germany, however, is a peculiar case of language acquisition in a bilectal situation. The term *heritage language* defines the first/family language of minority language children in Germany, being "languages spoken by the children of immigrants or by those who immigrated to a country when young" (Cho et al., 2004: 23). Children acquire the heritage language particularly at home and among the extended family. Exposure to the societally dominant (majority) language may start in the family, but it is more dominant outside home, and especially at school (Polinsky, 2018). The heritage (language) speakers can be successive or simultaneous bilinguals (Bennamoun et al., 2013). A heritage language is acquired incompletely, since the individual uses another (i.e. the majority) language. Secondly, heritage language implies a continuity of proficiencies, reflecting the heterogeneity in heritage language proficiencies observed by several researchers (see Polinsky & Kagan, 2007). Considering linguistic characteristics in

detail, there is systematic change in the heritage language of young adults, e.g., of third/fourth generation immigrants. If compared to the standard variety of the L1, the heritage varieties of the L1 show, for example, reduced morphological and syntactic structures (Valdés, 2000; Fishman, 2001; Cummins, 2005; Polinsky & Kagan, 2007; Montrul et al., 2010). At the same time, heritage language speakers seem to have advantages in pronunciation, phonology and spontaneous speech production in comparison to the learners of the second language (Au et al., 2002; Montrul et al., 2008). The reduced input and effects of the second on the first language (Cook, 2003) can result in incomplete acquisition or language attrition (Montrul, 2009; Rothmann, 2009).

Monolingual Turkish speakers immigrated to Germany with the first generation of migrant workers from the 1960s. Importantly, the German labour market recruited people with little education and supported the intention to return to Turkey after a few years, hardly offering opportunities for learning the majority language. Recent generations, as children under the age of 3–4, might be monolingual speakers of Turkish, as immigration continues and the community members actively chose Turkish as family language at home. However, self- reported survey data in France and Germany show that many families use the national languages increasingly alongside Turkish (Akıncı, 2008; Akıncı et al., 2013). Intra-community variation in language use and family language practice is a relevant factor for sociolinguistic research and language assessment in children with Turkish heritage language in Germany. Even though the ethnolinguistic vitality of Turkish is documented (Yagmur & Akinci, 2003; Extra & Yağmur, 2004), it has to be stated that heritage language acquisition often reduces to the spoken language variety of Turkish. The family language use is mostly restricted to the oral varieties, and literacy or academic use of Turkish is limited to some children participating in secondary education (i.e. Turkish as a subject in secondary schools in Hamburg) or (private) afternoon classes, but the general development in the last decade has been toward the abolition of forms of bilingual education. Though contexts for writing in Turkish exist, the degree to which Turks in Western Europe are used to writing in Turkish varies enormously. Consequently, studies of the written Turkish of the immigrant communities has increased only recently (but see Schroeder, 2007; Akıncı, 2008; Dirim, 2009; Akıncı et al., 2013). Moreover, Schroeder (2009) illustrates that Turkish language education in German schools aims at teaching the written language in a very norm-orientated way, emphasising a dichotomy between the standard variety of “anadil” (mother tongue) on the one and “Türkçemiz” (our Turkish) on the other hand.

The notion of the cultural and linguistic differentiation between the standard (written) and the spoken language is of grave importance for heritage language acquisition in Germany, since the Turkish used in Germany is subject to language change, resulting in a new dialect. Large- scale research projects in France, the Netherlands and Germany compared samples of immigrant speech or texts and

samples of speech collected in the regions in Turkey from which the original immigrants came (i.e. Doğruöz & Backus, 2007, 2009; Pfaff, 1991; Rehbein, 2001; Herkenrath et al., 2003; Rehbein & Karakoç, 2004; Baumgarten et al., 2007; Herkenrath, 2007; Karakoç, 2007; Banaz, 2002; Johanson, 2002; Uzuntaş, 2008; Şimşek & Schroeder, 2011; Schellhardt & Schroeder, 2013; Schroeder & Dollnick, 2013). They focused on the changes of spoken varietes of Turkish grammar and written language competencies of bilingual children with Turkish as their heritage language.

The changes to Turkish are systematic, and were defined by Johanson as a New Variety of Turkish. The "Immigrant Turkish" dialect (Backus, 2004) differs from Standard Turkish in several aspects (cf. examples below). Importantly, these changes are not entirely based on language contact phenomena, such as cross-linguistic influence in the lexical domain that leads to almost literal translation of multiword units in the majority language. Importantly, "Immigrant Turkish" as a branching term conceals the specific language-induced contact phenomena in different countries as well as the influence of migrant waves, leading to unique ways of dialect levelling. Syntactic variation, for example, between the Turkey-Turkish norms and the Immigrant Turkish dialect were very few in the Netherlands. Neither were entire subsystems, nor were constructions especially sensitive to Dutch influence, that is <1% of "unconventional" structures (Doğruöz & Backus, 2009).

In Germany, however, the Hamburg project focused on structures above clause level, such as subordination, discourse connectivity, and discourse marking in retelling the Snow White fairy tale. Several differences between Immigrant Turkish dialect (IT) and the data from Turkey were different use of finite verb inflection, the use of a smaller range of forms, limitations to one tense marking in narratives (substitution of the evidential form of *–mIş*, Pfaff, 1994), and the overuse of deictic temporal adverbs in retelling. While monolingual Turkish children acquire both complement and relative clauses at the age of approximately 5 years or older (Aksu-Koç, 1994), Turkish-German bilingual children between the ages of 4 and 9 prefer finite clauses over subordination. Deviations between the standard variety of Turkish in Turkey and the Immigrant Turkish dialect are especially found in the avoidance of using "complex structures" simple juxtaposition instead of complex structures (Sarı, 2006; Treffers-Daller et al., 2006; Dollnick, 2013; Herkenrath, 2014; Bayram, 2013; Onar Valk, 2015; Schroeder, 2016) (cf. example 1). It has also been reported for Immigrant Turkish dialect speakers that they interchange dative and accusative, and use unconventional forms of plural markings ("iki adamlar" instead of "iki adam" in the standard variety).

(1) Finite instead of non-finite clauses

Immigrant Turkish dialect:

Çocuk	sineği	vurmak	istiyor.	
Child	fly-ACC	hit-INF	want-PROG-3SG	
Babası		diyor		
Father- POSS-3SG		say-PROG-3SG		
"Hayır, yapma!"				(Treffers-Daller et al., 2006)
no	do-IMP-NEG-2SG			

Standard Turkish:

Çocuk sineği		vurmak	istiyor.
Child	fly-ACC	hit-INF	want-PROG-3SG
Babası	da	yapmamasını	söylüyor.
Father-POSS-3SG	so	do-NEG-NOM-POSS-3SG-ACC	tell-PROG-3SG

'The child then wants to catch it with a cloth. And his father tells him not to do (that).'

Further characteristics of the IT dialect refer to the omission/substitution of genitive markings in modal constructions (Menz, 1991), compounds (Aytemiz, 1990), and with subjects in nominalised subordinated sentences (Sarı, 1995). IT speakers also tend to overuse pronominal subjects and objects (Aytemiz, 1990; Menz, 1991; Pfaff, 1991; Rehbein, 2001). Besides, bilingual speakers and bilingual children acquiring the Immigrant Turkish dialect as heritage language use the general all-purpose verb *yapmak* extensively by adding it to the German verb stem or the Turkish infinitive form and to avoid the standard progressive form (Boeschoten, 1994) (cf. example 2).

(2) General All-Purpose Verb *yapmak*:

Immigrant Turkish dialect:			
Ondan sonra ödevim		bitmediyse,	
Later	homework-POSS-1SG	finish-NEG-PAST-COND	
onu	devam	yapıyorum	(Boeschoten, 1994)
it-ACC	**continuance**	**make-PROG-1SG**	
Standard Turkish:			
Ondan sonra	ödevim	bitmediyse,	
Later	homework-POSS-1SG	finish-NEG-PAST-COND	
ona	devam ediyorum.		
It-DAT	continue-PROG-1SG		

'Then if my homework hasn't been finished, I go on with it.'

Moreover, it is not only the German/Turkish contact situation, but also the origin of the first- and second-generation immigrants that features IT as a distinct spoken dialect. Dialect levelling, i.e. levelling of Anatolian dialects spoken especially by the first generation of immigrants (Boeschoten & Broeder, 1999; Schroeder & Stölting, 2005), is a typical feature of IT in Germany. It arises in, for example, an overuse of ablative forms in locative contexts (cf. example 3), or an omission of interrogative particles in yes-no questions (cf. example 4).

(3) Overextension of the ablative case

Immigrant Turkish dialect:			
Savaştan	rüya	gördüm.	(Backus & Boeschoten, 1998)
War-**ABL**	dream	see-PAST-1SG	
Standard Turkish:			
Rüyamda	savaş gördüm.		
my dream-LOC	war	see-PAST-1SG	

'I dreamed about the war.'

(4) Omission of interrogative particle in yes-no questions

Immigrant Turkish dialect:			
Bugün okulda		oynadın?	(Hess & Gabriel, 1979)
Today	school-LOC	play-PAST-2SG-**Ø**	
Standard Turkish:			
Bugün okulda	oynadın	mı?	
Today school-LOC	play-PAST-2SG	INT	

'Did you play at school today?'

Since the previous examples are documented for the variety of IT over 20 years ago, the current study used the data from the MULTILIT study (Schellhardt and Schroeder 2015) to test the actuality of these IT features for contemporary learners of IT in Germany. The MULTILIT corpus contains oral and written data from bilingual children with Turkish heritage language in Germany and France. The analyses of the MULTILIT data confirm the status of IT as a dialect that shapes the heritage language (L1) input of bilingual Turkish-German children. The characteristics of the Immigrant Turkish dialect consist of dialect-levelling features from East-Anatolia. Boeschoten (2000), and Şimşek and Schroeder (2011) illustrate such features with the the instrumental case suffix: While the standard form is *(y)la* / *(y)le*, a different form, *len* / *lan*, is typically for the spoken Turkish in Western Europe. Further, dialectal variations on the lexical level, like the use of *değmek* (touch) instead of *çarpmak* (hit) (cf. example 5). The omission of genitive markers and other indications of morphological changes and loss (cf. example 6), (Boeshoten, 2000) are revealed. Other phenomena, such as the use of reflexive pronoun *kendi-* as a focus marker (Schroeder, 2014) or unconventional plural marking (i.e. an increased use of plural markers as language-contact phenomenon between German and Turkish, Johanson, 1993: 214) are documented (cf. example 7).

(5) Dialect levelling and code-switching

Immigrant Turkish dialect:		
Kafanlan	Stuhle	değiyon. (OGU; 5th grade; 11–12 years old)
Head-POSS-2SG-**INS**	chair-GER-DAT	DIALECT- touch-2SG
Standard Turkish:		
Kafanı	sandalyeye çarpıyorsun.	
Head-2SG-ACC	chair-DAT	hit-PROG-2SG

'You hit your head on a chair.'

(6) Omission of genitive-possessive markers, *kendi-* as focus marker and use of locative postposition

Immigrant Turkish dialect:

Burada	bir	kız	kendi	sınıfın	içinde
Here	INDEF	girl-**Ø**	self	class-ACC-**Ø**	inside-POSS-3SG-LOC
dışlanmasıdır.					(YON, 12th grade, 17 years old)
exclude-PASS-VN-2SG-GM					

Standard Turkish:

Burada (olan)	bir	kızın	sınıfta	dışlanmasıdır.
Here (AUX-PART)	INDEF	girl-GEN	class-LOC	exclude-PASS-VN-2SG-GM

'What happens here is the exclusion of a girl in her own class.'

(7) Unconventional plural marking

Immigrant Turkish dialect:

Üç	kızlar	gine	gittiler.	(ILH; 5th grade, 11–12 years old)
Three	girl-PL	again	go-PAST-3PL	

Standard Turkish:

Üç kız yine gitti.

Three girl again go-PAST-3SG

'Three girls went again.'

To summarise the results on the Immigrant Turkish dialect in Germany so far, show that IT is a "catalyst" dialect (Rehbein et al., 2009), which may cause bilingual Turkish speakers either to develop new forms or to use existing ones in ways that differ from the Turkish used in Turkey. Thus, the heritage language input of bilingual Turkish-German children is a dialectal one. The bilectal problem is evident with respect to the heterogeneity of the Turkish speaking community (Johanson, 1991; Chilla et al., 2013). In contrast to other bilectal contexts, such as Cypriot Greek, IT dialect children in Germany have only limited access to a "high" variety (Rowe & Grohmann, 2013; Kambanaros et al., 2013) of Turkish. The "discrete bilectalism" of "low variety" IT in Germany is unique, since Turkish children lack a formal register as well as a general access to formal education (i.e. in preschool) and literacy education for standard Turkish in Germany (Küppers et al., 2015).

2 The Assessment of Developmental Language Disorder in Bilingual Contexts

It is alleged that Developmental Language Disorder (DLD) appears with a prevalence rate of approximately 8% (Norbury et al., 2016). Hence, it is very common in children, especially if compared to genetic syndromes, for example. Research further indicates that DLD is a life-long condition characterised by difficulties with understanding and/or using spoken language and is likely a result of a number of biological, genetic and environmental risk factors (Bishop et al., 2016, 2017). Following the CATALISE recommendations, the term "DLD" is used for children whose language disorder does not occur with another biomedical condition, such as a genetic syndrome, a sensorineural hearing loss, neurological disease, Autism Spectrum Disorder or Intellectual Disability (cf. Stothard et al., 1998; Johnson et al., 1999; Tomblin, 2010). For epigenetic studies, Tomblin et al. (2008) proposed the EpiSLI criterion, based on five composite scores representing performance in three domains of language (vocabulary, grammar, and narration) and two modalities (comprehension and production). Children scoring in the lowest 10% on two or more composite scores are identified as having language disorder. Furthermore, Lancaster and Camerata (2019) point out that DLD should be seen as a spectrum condition.

2.1 DLD in Bilinguales and Bilectals

Given the heterogeneity of DLD, language assessment is generally difficult even to the point that clinically interpretable subtypes are unlikely (Lancaster & Caramerata, 2019). With respect to bilingual acquisition, evidence is clear that children acquiring a second language (L2) in childhood differ from monolingual age-matched peers in several aspects. In the area of morphosyntax, for example, certain linguistic patterns deviating from those of typically developing monolingual children are reported for children acquiring their second language, i.e. German or French (Hamann et al., 2013; Marinis & Armon-Lotem, 2015; Tuller et al., 2018). These distinctive patterns often overlap with those known for monolingual children with Developmental Language Disorders (Paradis, 2010). DLD is common among monolinguals and bilinguals (Leonard, 2010; Engel de Abreu et al., 2013). Therefore, DLD and bilingualism are challenging for research and practice to disentangle DLD specific patterns from L2 interlanguage phenomena. Thus, typically developing bilingual children (BiTD) may be misdiagnosed as having DLD. Several studies focusing on different languages have nonetheless shown that the quality and the quantity of errors differ in BiTD and monolingual children with DLD (MoDLD) (e.g. Paradis et al., 2008; Armon-Lotem, 2014; Meir et al., 2016; Tuller et al., 2018). Since DLD should affect all languages of an individual, it was proposed that the assessment of language disorder must respect both the child´s languages to avoid misdiagnosis.

The typical first language acquisition of Turkish has been in the focus of research for several years now (e.g. Aksu-Koç & Slobin, 1985). Moreover, knowledge on the delayed or disordered acquisition of Turkish, such as different forms of language impairment, phonological disorders, among others, increases constantly (Topbaş, 1997, 1999, 2005, 2007; Babur et al., 2007; Uzuntaş, 2008; Topbaş & Güven, 2008; De Jong et al., 2010; Rothweiler et al., 2010; Topbaş & Yavaş, 2010; Acarlar & Johnston, 2011, among others). These findings lead to the conceptualization and establishment of standard tests for DLD in Turkish (i.e. TELD-3: T, Topbaş & Güven, 2011; see Chapter 3.2 for more details; TİFALDİ, Kazak-Berument & Güven, 2010; T-SALT; Acarlar et al., 2006). Within the COST IS0804 action, Thordardottir (2015), for example, argues for the applicability of standardized assessment tools with a bilingual benefit to Z-scores for simultaneous bilinguals. In the same wake of the COST Action, cross-linguistically valid tools known as the LITMUS tasks (Language Impairment Testing in Multilingual Settings, Armon-Lotem et al., 2015), were developed, also for children with Turkish as heritage language, such as the Multilingual Assessment Tool for Narratives such as MAIN (Gagarina et al., 2012). Those LITMUS tasks aim at identifying Developmental Language Disorder (DLD) in bilingual populations.

2.2 The Assessment of Developmental Language Disorder with Sentence Repetition Tasks

Sentence repetition tasks (SRTs) are widely recognized as tools for the identification of specific language impairment in monolingual and bilingual children (Conti-Ramsden et al., 2001; Vinther, 2002; Klem et al., 2015). SRTs contain of fixed sentences that the participant repeats and thus generate a restricted set of obligatory contexts. They are subtests of most language testing materials and standardized tests for decades, since they are easy to use in clinical settings and have been shown to assess underlying grammatical representations (Polišenská & Kalpaková, 2014) as well as language processing (Archibald & Gathercole, 2006). In addition, evidence shows their applicability in bilingual contexts for distinguishing bilingual children with and without DLD (Meir et al., 2016; de Almeida et al., 2017; Hamann & Abed Ibrahim, 2017). SRTs have been argued to be more reliable than other language-dependent expressive and receptive language tasks, such as (for English) third person singular or past tense tasks for the assessment of DLD (Stothard et al., 1998; Conti-Ramsden et al., 2001). Note, however, that SRTs differ in their conceptualization. The German and the French versions of the LITMUS SRT, for example, focus on morpho-syntactic knowledge, and knowledge of computationally complex structures in particular (Hamann et al., 2013; Marinis & Armon-Lotem, 2015; Fleckstein et al., 2018).

For speech and language practice, SRTs combine several advantages over other testing materials: They aim at grammatical knowledge, are simple and fast to administer and easy to score (identical repetition yes/no). Moreover, they proved to have

reasonable to good diagnostic accuracy for children with or without DLD in several language pairs, such as, for example, Turkish-German, Arabic-French, or Portuguese-German children (Hamann & Abed Ibrahim, 2017; Abed Ibrahim & Fekete, 2019; Chilla et al., in press; Hamann et al., in press). As Marinis et al. (2017) point out, LITMUS SR tasks can tease apart BiTD from MoDLD and from BiDLD in several countries and for several language combinations.

Thus, the use of SRTs qualifies as a promising pathway for the assessment of DLD in bilingual populations. Consequently, the use of L1 assessment tools in heritage language contexts, and especially monolingual SRT tasks as a measure for grammatical development is nowadays common practice in research and speech and language assessment. Ertanir et al. (2018), for example, use the SRT subtask of the TELD-3: T (Topbaş & Güven, 2011; see Chapter 3.2 for more details) for the assessment of Turkish kindergarten children in Germany. Their results strengthen the impression that mean performance level in Turkish grammar was below the norming sample mean. The authors argue that bilingual heritage language children show lower L1 grammar skills, if their performance was evaluated with a sentence repetition task. Ertanir et al. (2018) conclude that their results are in line with earlier research observing lower language levels in L1 and L2 (e.g., Caspar & Leyendecker, 2011; Akoğlu & Yağmur, 2016), although the sample in their study consisted of children with well-developed vocabulary skills in their L1, even when compared with monolingual norms.

It is at this point that this study hopes to contribute. Current trends in the assessment of language difficulties and disorders in bilingual children are often unaware of differences between the standard variety and the (emergence of) a dialect in heritage languages. This study aims at filling this gap by focusing on one of the most frequent first languages in Germany, Turkish, showing that the Immigrant Turkish dialect is the major heritage language (L1) input for Turkish-German children. We hypothesize that the bilectal situation of the Immigrant Turkish dialect has an impact on the individual performance of bilingual heritage language children with Turkish as L1 even for sentence repetition tasks. We will show that the appreciation of the Immigrant Turkish spoken dialect has indeed an impact on the construction, scoring, and outcome of standardized language tests. Thus, the study sheds light on the (non-)applicability of SRTs for bilingual children acquiring this specific dialect variety of the standard language Turkish as a minority language in western European countries.

3 The Immigrant Turkish Dialect as a Test Case for Standardized Assessment Tools in Bilectal Contexts

3.1 Participants, Materials and Methods

In our BiliSAT and BiLaD projects (see below), data of 61 Turkish-German and Turkish-French children, 52 bilingual typically developing (BiTD), and 9 children with DLD (BiDLD), was gathered. Both projects established the clinical status of

the bilingual participants by applying standardized tests in both languages of a child and regarding a "child with DLD" if she scored below adjusted norms in two language domains in each of the languages (cf. Tuller et al., 2018). All participants were tested with a broad assessment procedure (cf. Hamann et al., sub.), including standardized tests in the L1 and L2 (Hamann & Abed Ibrahim, 2017; Tuller et al., 2018; Chilla et al., in press), respecting dominance effects on test performance. Adjustment of monolingual norms was performed following Thordardottir's (2015) recommendations and by carefully establishing language dominance. Relevant background information was collected with the Questionnaire for Parents of Bilingual Children (PaBiQ; Tuller, 2015).

The analysis here is based on the data subset of 52 typically developing Turkish-German children (age range 5;0-12;4, with 32 boys and 20 girls). 52 SRT subtests from TELD-3: T (Topbaş & Güven, 2011) are taken into account. The TELD-3: T is a norm-referenced test for the Turkish competence of children and an adaptation of the English language assessment tool TELD-3 (Hresko et al., 1991). It includes receptive and expressive language performance in children (2;0- 7;11), using two forms (Form A and Form B). The test aims at identifying a child's strengths and weaknesses in different language areas as morphology, syntax and semantics and is suitable for the assessment of language delays. Scoring covers expressive, receptive, and global language performance, the latter being a composite value.

Further SRT data was taken from 21 data sets of the TÖDIL (Topbaş & Güven, 2017) sentence repetition subtask. The TÖDIL is an adaptation of the English language assessment tool "Test of Language Development-Primary: Fourth Edition" (TOLD-P:4; Hammill & Newcomer 2008), being a norm-referenced and standardized test for the Turkish competence of children between 4;0-8;11. It intends to provide professionals with a measure for examining receptive, expressive, and organizational language skills and comprises of nine sub-tests such as picture vocabulary, syntactic understanding, sentence repetition, morphological completion, grammar and phonology skills. They include three measures each for listening and speaking abilities.. The combination of all nine sub-tests claims to cover general spoken language abilities. Only children without a risk for DLD and who scored above percentile rank 9 (IQ score $\geq$ 80 according to Wechsler's IQ scale) were included in the current study.

3.2 Analysis

Both standardized tests were administered as per description. The children's responses on the TELD 3: T and the TÖDIL were recorded using special dictaphones. Data transcription, verification and coding for errors were done offline by two independent linguistically trained raters (percentage of agreement was at least

90%). For each repetition measure, the percentage of correct responses was used as basis for data analysis (cf. also Abed Ibrahim & Fekete, 2019). The scoring procedure followed the test handbook, with 1/0 for correct/incorrect repetition of a sentence. Further qualitative analysis classified the incorrect repeated sentences into error types in terms of Immigrant Turkish dialect features (ITfeat), error types that pattern monolingual Turkish DLD (DLDfeat), children or neither of both or unclear (UN). Null reactions were counted as errors, unless they were due to technical problems or errors by the investigators (missing data, less than 1% of the overall data).

3.3 Results

A total of 547 sentences from the SRT subtests was analysed (n TELD 3:T (SRT) = 349; n TÖDIL (SRT) = 198), with a correctness rate of 36% (TELD 3: T: 112/349 – 32%; TÖDIL: 40/198 – 20%). 87 sentences were errors of unclear origin. 152 (36%) incorrectly repeated sentences showed features that pattern errors known from monolingual Turkish speaking children with DLD.

The analysis here focuses on the remaining 156 incorrect sentences (TELD 3: T = 100/349 – 29%; TÖDIL: 56/198 – 28%). The children in our study repeated the sentences from the SRT using patterns typical for the Immigrant Turkish dialect.

These features are, for example, omission of possessive markers in genitive-possessive constructions, that appeared in 8% of all incorrect sentences (13/156 – 8%) (cf. example 8).

(8) Omission of the possessive marker in genitive-possessive constructions

Standard Turkish (TÖDIL SRT item number 34):

Dün	öfkeli bir	kaplanın	pençesinden	zor	kurtarıldık.
Yesterday	angry INDEF	tiger-GEN	paw-POSS-3SG-ABL difficult rescue-PASS-PAST-1PL		

'Yesterday we hardly survived the paws of an angry tiger.' Immigrant Turkish dialect:

Dün	kaplanın	pençeden	zor	kurtarıldık. (041432; 12;0)
Yesterday	tiger-GEN	paw-**Ø**-ABL	difficult	rescue-PASS-PAST-1PL

More, substitutions of case markings (22/156 = 14%; DAT for ACC: 8; ACC for DAT: 2; LOC for ACC: 2; DAT for ABL: 3; ABL for DAT: 7)) or the omission of obligatory case markings (20/156= 13%; DAT: 6; ACC: 13), and, especially with genitive (20/156 = 13%), were observable (cf. example 9–11).

(9) Substitution of dative with accusative; omission of dative

Standard Turkish (TEDIL SRT Item Number 27d)

Zeynep arkadaşlarına	ve	öğretmenine	hediye	verdi.
Zeynep	friend-PL-POSS-3SG-DAT	and	teacher-POSS-3SG-DAT present	give-PAST-3SG

'Zeynep gave present to her friends and teacher.'

Immigrant Turkish dialect:

Zeynep	ve	arkadaşlarını	birşey	alıyordu. (024332; 9;2)
Zeynep	and friend-PL-POSS-3SG-**ACC**		something	buy-PROG-PAST-3SG
Zeynep arkadasi	ve	ögretmenine	hediye	verdi. (BAY; 5;1)
Zeynep	friend-3SG-POSS-**Ø** and teacher-POSS-3SG-DAT		present	give-PAST-3SG

(10) Substitution of ablative with dative

Standard Turkish (TODIL SRT Item number 9)

Fabrikadan	çıkınca	çocuklar	arabayı	tamir ettiler.
Factory_ABL	come out-SUB	children	car-ACC	repair-PAST-3PL

'When the children went out of factory, they repaired the car." Immigrant Turkish dialect:

Fabrikaya (04432; 9;3)	çıkarken	çocuklar	arabayı	unuttu.
Fabrika-**DAT**	go-out-SUB	child-PL	car-ACC	forget-PAST-3SG

(11) Omission of genitive case, omission of accusative case; substitution of dative with accusative

Standard Turkish (TÖDIL SRT Item Number 14)

Kadın	adamın	kendisini	sevdiğine	inanmadı
Woman	man-GEN	self-ACC	love-CV-POSS-3SG-DAT	believe-NEG-PAST-3SG

'The woman did not believe that the man loves her".

Immigrant Turkish dialect:

Kadın	ama adamı	kendisi	sevdiğini	
Woman but	man-ACC-**Ø**	self-**Ø**	love-CV-POSS-3G-**ACC**	
inanmadı.				(040432; 9;3)
believe-NEG-PAST-3SG				

Further, lexical dialect levelling (10/156 = 6%) was found, as well as blending of omission and substitution in the same sentences (cf. example 11). Note, however, that the avoidance of complexity by using finite clauses (40/156 = 26%) was most prominent among all errors (cf. example 12), and that several errors would appear in the same repeated sentence.

(12) Finite clause instead of adverbial subordination

Standard Turkish (TÖDIL SRT Item number 9):

Fabrikadan	çıkınca	çocuklar	arabayı	tamir ettiler.
Factory_ABL	come out-SUB	children	car-ACC	repair-PAST-3PL

'When the children went out of factory, they repaired the car.'

Immigrant Turkish dialect:

Fabrikadan .	çıkmışlar	Çocuklar	arabayı tamir etmişler. (019332; 11;3)
Factory-ABL	go out-EVD-3PL	child-PL	car-ACC repair-PAST-EVD-3PL
Fabrikadan	çıktı.	Çocuklar	arabayı tamir ettiler. (036432; 11;2)
Factory-ABL	go-out-PAST-3SG	child-PL	car-ACC repair- PAST-3PL

Importantly, these sentences are correct by Immigrant Turkish dialect standards. Turkish- German bilingual children make use of the dialectal variety in the sentence repetition task, processing and understanding the sentences in the standard variety of Turkish correctly, and repeating them in their spoken Immigrant Turkish dialect.

4 Discussion: The Immigrant Turkish Dialect as a Heritage Variety and Its Implications for Language Assessment and Education

Immigrant Turkish as heritage language for bilingual children in Germany reflects the necessity of an acknowledgement of dialect input for language assessment. From a sociolinguistic point of view, it is remarkable, how differences between the Immigrant Turkish and standard Turkish have long been unattended as a factor most relevant for the validity of assessment tools in bilingual contexts. This might be due, however, to a lack of systematic investigations with broader populations of bilingual children with and without DLD in several countries.

The studies carried out within the IS0804 and the bi-sli networks, however, allow for new insights to the relevance of dialects for language input and assessment, since they provide research with a broad database and a fair number of participants for linguistic study. Further, earlier studies struggled with the (im)possibility of disentangling bilingual children with DLD from typically developing children (i.e. Paradis, 2008; Armon-Lotem et al., 2015; Tuller et al., 2018), so that reliable data

for the evaluation of assessment tools in bilingual and bilectal populations is only emerging (i.e. Marinis et al., 2017; Theodorou et al., 2016; Abed Ibrahim & Fekete, 2019; Leivada et al., 2019; Chilla et al., in press).

Our results confirm former studies, underlying systematic differences between the standard variety or dialects in the country of origin, and the Immigrant Turkish dialect. The omission and/or substitution of case markings (i.e. Cindark & Aslan, 2004), as well as changes in genitive-possessive constructions (Dirim & Auer, 2004), and, most relevant, the use of finite and/or co-ordinated sentences instead of more complex structures continue to be prominent features of Immigrant Turkish dialect. If compared to monolingual speakers of the standard variety of Turkish, bilingual speakers of IT avoid complexity. Non-finite sentences are more prominent among bilingual IT speakers than finite clause coordination, and juxtaposition is more common than complex embedding (Treffers-Daller et al., 2006; Bayram, 2013; Herkenrath, 2014; Schroeder, 2016). However, some features, such as an overuse of ablative forms in locative contexts, or an omission of interrogative particles in yes-no questions, are characteristics of dialect levelling or, as for genitive-possessive without possessive marker, common in informal spoken Turkish and some dialects (i.e. Csató & Johanson, 1998).

The robustness of the Immigrant Turkish dialect as a heritage language for bilingual Turkish- German children is evident. Even if language proficiency was measured by an easy-to- administer and age- and language-appropriate task, IT children tend to repeat the sentences in the dialectal variety. However, sentence repetition tasks should be robust of language change phenomena, if the (in)correctness of answers was based on working memory capacities, only. The sentence repetitions of the IT dialect-speaking children here, though, refer to structural changes and to systematic deviations from the standard variety, and to the necessity and meaningfulness of grammatically motivated SRTs (i.e. Hamann & Abed Ibrahim, 2017). Since the data provided here contains of a homogeneous group of Turkish-German bilingual children without DLD, who took part in a comprehensive assessment procedure (i.e. Abed Ibrahim & Hamann, 2019) the high error rate in a SRT should not result from language disorder, children being under age or on limited cognitive development. The corpus is furthermore representative for the Turkish-German population of heritage children in Germany, since participants from different German Federal Countries (i.e. Baden-Württemberg, Berlin, Hamburg, Hessen) and from different living environments (cities/rural areas) attended. It is also true that the majority of test items (64%) was processed and repeated in the standard Turkish model, as expected.

If the scoring procedure considered IT sentences as correct, the overall correctness rate would increase considerably. Note, however, that the data also provide further evidence for an overlap between Immigrant Turkish and DLD features in bilinguals (i.e. Babur et al., 2007; Rothweiler et al., 2013; Topbaş et al., 2016; Chilla & Şan, 2017), since there are nearly the same number of sentences in the corpus (101 in the TEDIL and 51 in the TÖDIL), which are likewise characteristic for DLD in Turkish monolinguals. These features are, for example, the substitution of case markings (i.e. accusative for dative), or the omission of obligatory elements or

suffixes. It is also true that the reduction of syntactic complexity is a distinctive feature of DLD in Turkish.

Thus, to avoid misdiagnosis, scoring of language proficiency in the bilectal context of Immigrant Turkish should not just rely on a transformation of raw scores based on knowledge of the dialectal input of the child, in the sense of adding a "bilectal error bonus", as it has been proposed for bilinguals. Rather, further systematic study on the qualitative and quantitative differences between the language performances of IT speaking children with and without DLD with sensitive error type analysis could lead to a better understanding of clear patterns of DLD vs IT, respectively. Prospective test design should contain interpretation variability with respect to dialectal and/or DLD outcomes, and scoring (cf. Leivada et al., 2019). First steps have already been explored by, for example, Hamann and Abed-Ibrahim (2017); Theodorou et al. (2017); Abed-Ibrahim and Fekete (2019); Chilla et al. (in press).

Further studies might moreover investigate the specific heritage language situation of the IT dialect: Most IT-speaking children have no access to formal Turkish or literacy education. Education and assessment should further withdraw from the construction of homogeneous groups of "first language" children and adults in diglossia, bilingual and heritage language populations, implying sufficient language testing with assessment tools for monolingual contexts.

Sensitive qualitative research with respect to language attrition vs. IT vs. DLD features at different ages with broader cross-sectional studies would contribute to a dialectal-fair development of testing materials for bilectals, and especially for a population as large as this of Immigrant Turkish as dialect speakers in Germany.

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Children with Hearing Impairment in a Diglossic Context – The Case of Palestinian-Arabic Speaking Children

Rama Novogrodsky, Nardeen Maalouf-Zraik, and Irit Meir

1 Introduction

1.1 Diglossia as a Sociolinguistic Context of the Arabic Language

In diglossic Arabic, the language targeted in the current chapter, there are two language varieties: Spoken Arabic, also referred to as the Low variety (Ferguson, 1959), is the mother tongue of Arabic speakers; Standard Arabic, also referred to as the High variety, is used mainly for reading, writing and formal oral interactions (Ferguson, 1959; Saiegh-Haddad, 2012). There are differences between the two language varieties in all linguistic domains (Saiegh-Haddad & Henkin-Roitfarb, 2014), leading some researchers to argue that Arabic speakers are in fact similar to bilinguals (e.g., Eviatar & Ibrahim, 2000).

Arabic-speaking children grow up speaking Spoken Arabic but are exposed to Standard Arabic at home through television programs, and in school through textbooks and literacy instruction. Saiegh-Haddad and Spolsky (2014) showed that only 20% of the spoken words used by 5-year-old children keep an identical form in Spoken and Standard Arabic. An additional 40% are cognates, meaning the phonological form of the words in the two language varieties overlaps partially. The remaining 40% are specific to each language variety. Thus, for young children, most of the Standard Arabic lexicon is learned as part of becoming literate in the

Irit Meir, our colleague and dear friend, who developed the ideas presented in the current chapter, passed away in February 2018.

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language (Saiegh-Haddad, 2003). Research has shown that, for typically developing children, this lexical distance between the two language varieties affects lexical representations in memory (Saiegh-Haddad & Haj, 2018) and this, in turn, should affect learning during school age. For example, words that depict different phonological and lexical forms in Standard Arabic compared with Spoken Arabic have poorer lexico-phonological representations. It has also been shown that phonological distance between the two varieties negatively impacts children's phonological processing in memory (Saiegh-Haddad & Ghawi-Dakwar, 2017) and phonological awareness, both at the phoneme and the syllable levels (Saiegh-Haddad, 2003, 2004, 2007; Saiegh-Haddad et al., 2020). Furthermore, this distance affects word-level reading skills of children (Saiegh-Haddad & Schiff, 2016; Schiff & Saiegh-Haddad, 2018). Another clear distance is in the domain of syntax, including word order, negation and other syntactic features which are different in the two language varieties. For example, children performed better on a syntactic judgment task of sentences presented in Spoken Arabic compared with Standard Arabic (with the exception of syntactic structures involving negation), or on syntactic structures that were similar in both language varieties (Khamis-Dakwar et al., 2012). Based on the findings from the above studies, it is suggested that differences between the two language varieties affect language learning.

1.2 The Challenges Children with HI Face Growing Up in Diglossia

The current study focused on the challenges Arabic-speaking school age children with severe to profound HI face growing up in a diglossic context. Spoken Arabic is their mother tongue and they use it for daily communication but they lack incidental exposure to it due to their HI. Furthermore, Spoken Arabic is not represented in writing, thus they cannot be assisted by the written modality as is the case for children with HI in non-diglossic conditions. With regard to Standard Arabic, at preschool age, hearing children are exposed to it through the media and literacy input, mainly when they listen to stories. In contrast, children with HI lack this experience at preschool age due to the HI.

HI is a developmental disorder and is diagnosed based on behavioral and objective measures of hearing loss. In many countries, including Israel, children are diagnosed at an early age, based on newborn screening programs and they receive interventions during the first year of life (Novogrodsky & Kreiser, 2019). The intervention includes hearing aids, cochlear implants, hearing training (using different techniques to enhance listening skills and improve speech understanding), language intervention and speech therapy aiming to improve speech ineligibility. Furthermore, emotional support and additional intervention is provided to families, according to the child's needs. During school age, a special education teacher joins the team to support each child in academic tasks. Although intervention starts early, as a group,

children with HI show difficulties in language capacity, as compared with their hearing peers, due to language deprivation. The term language deprivation is used here to describe inconsistent exposure and lack of incidental exposure to language because of the HI (a broad discussion of this term can be found in Henner et al., 2018). The language difficulties are found in different age groups and different tasks (e.g. Boons et al., 2013; Friedmann et al., 2008). For example, narrative productions of children with HI were found to be shorter and lacked narrative aspects in the domains of vocabulary, morphology and syntax, compared with narratives of typically hearing peers (e.g., Crosson & Geers, 2001; Iluz-Cohen & Walters, 2012; Soares et al., 2010; Worsfold et al., 2010; Yoshinaga-Itano, 1986).

1.3 Narratives as a Window onto the Language Difficulties of Children with HI

Narrative production can be used as a window into children's language ability (Berman & Slobin, 1994, Botting, 2002; Gagarina et al., 2012), as it presents lexical ability, complex syntax and pragmatic knowledge (e.g., story structure and discourse features) within one task, representing developmental trajectories in these domains. In addition, narratives represent an index of children's cognitive and social abilities (Liles, 1993). For example, Berman and Slobin (1994) showed that at age 3–4-years when children tell narratives based on picture books, they describe each picture as a separate event. At age 5, they start using linguistic forms to connect the event in a temporal way, and at age 9 they can produce a coherent narrative. Throughout school age, children's narrative abilities develop and move towards the target level of adults' (e.g., Bamberg & Damrad-Frye, 1991; Botting, 2002; Ravid et al., 2014).

Narrative skills are linked to literacy abilities, as they involve planning and producing cohesive discourse (Gagarina et al., 2012; McCabe, 1996) and abstract language that children experience and use in written texts (e.g., Hadley, 1998). Importantly, narrative abilities at the macrostructure level (i.e., telling sequences of events), echo language abilities beyond a specific language and is agreed as a sensitive tool for testing bilingual children (Gagarina et al., 2012; Paradis et al., 2011).

The characteristics of narratives allows for a comparison in bilingual children between their two languages (Gagarina et al., 2012; Pearson, 2002). Narratives can be analyzed for macrostructure and microstructure abilities, which are distinctive but also related. While macrostructure examines the story structure, microstructure focuses on language-specific abilities such as vocabulary and grammar. For example, in a study that compared 17 languages, bilingual children performed similarly on macrostructure measures in their two languages, even when their parents reported dominance of just one language (Gagarina et al., 2012). Similar results have been reported for English-Spanish school-age bilinguals (Pearson, 2002) and for English-Hebrew preschoolers (Iluz-Cohen & Walters, 2012). Thus, narratives are suggested as a tool for exploring a wide range of linguistic abilities in an ecological way.

Diglossia shares with bilingualism the fact that children grow up with two languages (in Arabic diglossa, there are two language varieties). In the case of Arabic, Ravid et al. (2014) tested narrative skills in 97 Palestinian-Arabic-speaking children, with the aim of understanding developmental path of Arabic language acquisition. Preschool to adult participants, who spoke the Arabic dialect of northern Israel were tested on a retelling task of a story that was read to them in Standard Arabic. Children were asked to retell the story with no specific instruction regarding the language (Standard Arabic versus Spoken Arabic). The results showed that as children aged, they performed higher on measures of narrative length, Standard Arabic lexicon and morpho-syntax, meaning they used less Spoken Arabic in their narratives. Henkin (1998) found that school age children who heard stories in Standard Arabic choose to retell them in Spoken Arabic. These results suggest that during school age, hearing children are influenced by diglossia and they tend to use Spoken Arabic even when the story is presented to them in Standard Arabic. However, they become more aware of the two language varieties and are able to maintain the Standard variety in a narrative task as they age.

In another study, 30 preschoolers aged 5:3–5:8 were asked to retell a narrative: one was read to them in Standard Arabic and one was told to them in Spoken Arabic (Leikin et al., 2014). A significant advantage was shown in the retelling task of Spoken Arabic compared with Standard Arabic. Similar findings were shown in a comprehension test of these narratives with comprehension in Spoken Arabic higher than that in Standard Arabic. However, children were still capable of retelling the stories in Standard Arabic. The authors suggested that despite the fact that exposure to Standard Arabic at a young age is informal and indirect, preschoolers are able to use linguistic structures of Standard Arabic and comprehend narrative texts in this language variety though to a lower degree than Spoken Arabic. These results are crucial for the current study, as they suggest that children with typical hearing enter school with the ability to use linguistic structures from Standard Arabic and to achieve some level of comprehension of narrative texts in this language variety.

A recent study explored narrative abilities of school age children with HI. 124 Palestinian-Arabic-speaking children aged 12–16 years: 61 with HI and 63 with typical hearing told a personal narrative in Spoken Arabic (Kawar et al., 2019). Children with HI produced more morpho-syntactic errors and fewer complex sentences than their hearing peers did. The results showed high correlation between severity of HI and morpho-syntactic errors. However, the two groups scored similarly in five measures of story grammar (e.g., introduction to the narrative and closing of the sequence of events). The findings suggest that although children with HI acquire the narrative structure, they have difficulties with language specific aspects such as morpho-syntax, even at school age.

The current study followed previous research, aiming to explore the ability of school age children with HI to tell narratives based on picture sequences without a model in the two language varieties. Aiming to explore children's skills in each language variety, we instructed them explicitly to tell a story in Spoken Arabic and

in Standard Arabic (emphasizing that in Standard Arabic we mean the language used at school). We predicted that children with HI will lag behind children with typical hearing due to language deprivation. Additionally, we predicted that because both groups have more linguistic experience with Spoken Arabic compared with Standard Arabic they would perform better on the former compared with the latter in microstructure measures which represent language specific abilities. However, in macrostructure measures, which echo language abilities beyond a specific language, we predicted no differences between the language varieties in both groups.

2 Method

2.1 Participants

Following Berman and Slobin (1994), we tested school age children older than 9 years, as it is agreed that at this age children are expected to produce a coherent narrative. 40 Palestinian-Arabic-speaking children were recruited from the north of Israel through personal connections and advertising the research in audiology clinics. They all used the northern Palestinian-Arabic dialect.

Children with HI Twenty Palestinian-Arabic-speaking children (10 boys and 10 girls) with HI, ages 10–15 years were recruited. All children were diagnosed with bilateral, severe-profound sensorineural HI (Table 1) at preschool age and use bilateral hearing devices. These include hearing aids, cochlear implants or a combination of both (Table 1). They study in mainstream education, meaning they attend hearing schools, use oral communication (the dialect of Palestinian-Arabic spoken in northern Israel) and receive individual intervention support during and after school hours. Intervention is delivered individually and in group sessions by speech and language therapists and teachers who are specialized in HI education. None of the children had additional cognitive or neurologic disorders based on reports from their speech-language therapists. They represent a subgroup of children with HI, those with severe hearing loss and with high communication abilities and strong academic achievement, which allow them to participate in mainstream education (for more information about the different intervention programs of special education in Israel, see Novogrodsky & Kreiser, 2019). The children in the current study were a subgroup of a larger study that explored the relationship between speech perception skills and language abilities of children with HI (Daoud, 2017; Daoud & Novogrodsky, accepted for publication). Though studying in mainstream education, they showed difficulties in speech perception and language tests. They scored below the hearing norm in tests of speech perception that included recognition and repetition of phonemes, words and sentences (Daoud & Novogrodsky, accepted for publication). Furthermore, they showed difficulties in four language tasks: picture

Table 1 Characteristics of children with HI (n = 20)

Participant	Age (years: months)	Gender F/M	Hearing Device[a]	Hearing-Loss
1	10	F	HA+HA	Severe
2	10	F	CI+CI	Profound
3	10	M	HA+HA	Severe
4	10:1	M	HA+HA	Severe
5	10:9	M	HA+HA	Severe-Profound
6	11:1	F	CI+CI	Profound
7	11:1	F	CI+CI	Profound
8	11:8	M	CI+HA	Profound
9	12	M	HA+HA	Severe
10	12:2	F	HA+HA	Severe
11	12:2	M	HA+HA	Severe
12	12:6	M	CI+CI	Profound
13	13	F	CI+HA	Severe-Profound
14	13:2	F	HA+HA	Severe
15	14	M	HA+HA	Severe
16	14	F	CI+HA	Severe-Profound
17	14:1	F	CI+HA	Severe-Profound
18	14:11	M	HA+HA	Severe
19	15	F	CI+CI	Profound
20	15	M	CI RT	Profound

[a]*CI* cochlear-implant, *HA* hearing aid

naming (Haddad-Hanna et al., 2010), sentence completion (Novogrodsky & Kreiser, 2015, adapted into Arabic), complex sentence comprehension and production (Friedmann & Haddad-Hanna, 2010). A regression model for the language performance showed that speech perception scores accounted for most of the variance and predicted language performance better than did age. These findings suggest that although these children with HI appeared to have been relatively skilled academically, they experience communication difficulties in both hearing function and language abilities.

Children with Typical Hearing Twenty Palestinian-Arabic-speaking children with typical-hearing (6 boys and 14 girls), aged 10–15 from northern Israel were recruited. They had no developmental disorders, based on parental reports. Their age range was matched to the HI group. They represent the same ethnic groups of the HI group, all come from Palestinian-Arabic-speaking families from villages and towns in northern Israel and they attend the same education system as that of the HI group. Parents provided signed informed consent for all study participants. The study was approved by the Ethics Committee at the University of Haifa.

2.2 Materials

A story telling task was used to elicit narratives with two sets of parallel six-picture sequences that are controlled for macro- and microstructural features and the structure of the plot (Gagarina et al., 2012). The task was originally developed in multiple languages to screen children in both their languages for Developmental Language Disorder. This unique characteristic of the task allowed us to investigate each child's performance in a within-subject design in the two language varieties he/she used in addition to the groups comparison. Children saw two sets of six-pictures and told a story for each set, one in Standard Arabic and one in Spoken Arabic (see details in the procedure section), using the pictures provided as prompts.

In the *Baby Birds* story, baby birds are hungry, so the mother bird flies to bring food and comes back with a worm. Then a cat climbs the tree to eat the baby birds and catches one bird. A dog who sees it, comes to rescue the birds, he pulls the cat by its tail, who then runs away while the dog chases him (Fig. 1). In the *Baby Goat* story, a baby goat falls into the water and its mother runs to rescue him. While the mother rescues her baby, a fox comes and tries to catch the other baby goat. A crow sees the fox, rescues the baby goat and chases the fox away (Fig. 2).

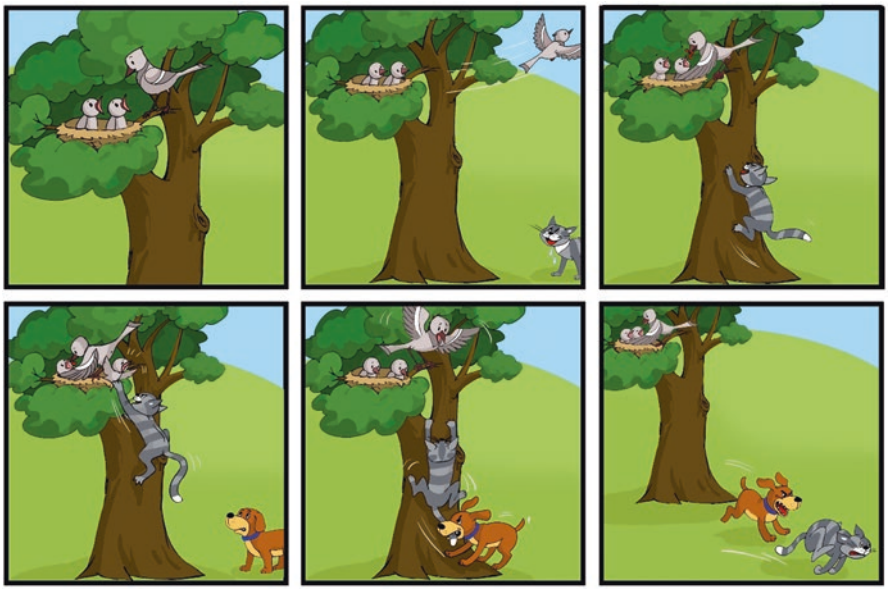

Fig. 1 The pictures for The Baby Birds Story. (Gagarina et al., 2012)

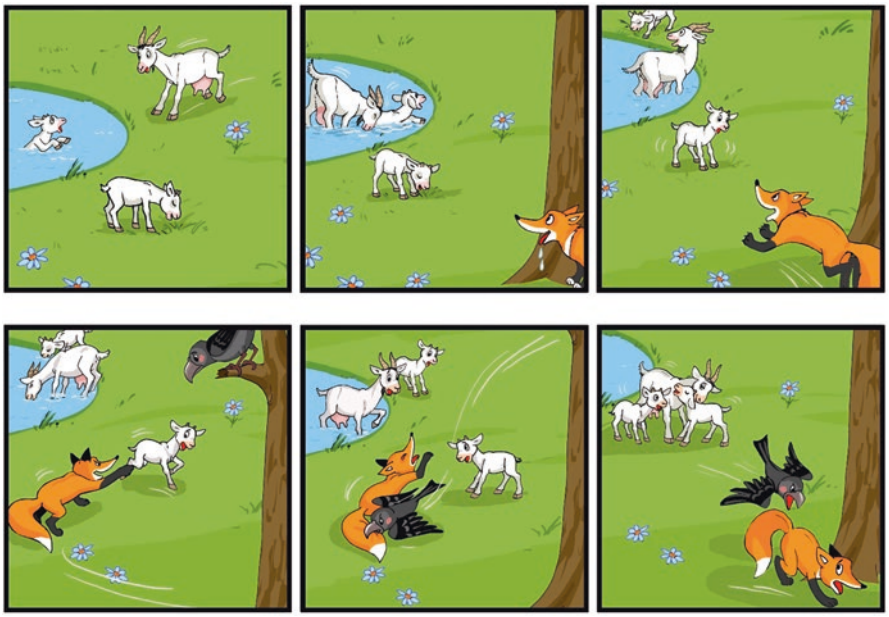

Fig. 2 The pictures for The Baby Goats Story. (Gagarina et al., 2012)

2.3 Procedure

Children were asked to tell each story after viewing the six-picture sequence. Each story was told in a different language variety: one in Standard Arabic and one in Spoken Arabic. Order of language variety was counterbalanced across participants. The examiner showed the child two envelopes, each containing the pictures from one of the stories and said: "each envelope contains one story, I don't know which envelope includes which story. Choose one of these envelopes." After the child chose one, the examiner said, "First, look at all the pictures." Then she asked the participant to tell the best story that he/she could in Standard Arabic (the language used in school) and one in Spoken Arabic (the daily used language). The first story was told in one language variety and the second in the other language variety (stories were counter balanced as described above). Participants received an example of the target language when needed. While the participant was telling the story, the examiner remained silent. When it was necessary to motivate the elicitation of the story, the examiner used utterances such as "that's interesting, what else?", and "Uh-huh". The story telling were audio recorded and transcribed for subsequent coding. Note that the only clear evidence that children told a story in Standard Arabic is when they included words that are unique to Standard Arabic in their production (e.g., *dʰiʔib*, wolf in Standard Arabic, compared with *di:b* in Spoken Arabic; *raʔa*, saw in Standard Arabic, compared with *ša:f* in Spoken Arabic). Indeed all children showed evidence of understanding the task. However, there were also code

mixing in both groups. Code mixing occurred more in the group of children with HI, and they mixed more unique words of Spoken Arabic in the story they told in Standard Arabic than vice versa (Maalouf-Zraik, 2017). This limitation of the task is further discussed in the discussion section.

2.4 Coding and Scoring the Narratives

All 80 narratives were transcribed and coded by a native Arabic speaker (the second author of the current chapter). A second graduate student who was blinded to group status transcribed 16 (20%) of the narratives for cross-reliability. Agreement between transcribers exceeded 90%. The few inconsistencies were discussed and corrected. Length of narrative was calculated based on the number of words. A word was defined based on its transcript with space in print (Ravid et al., 2014). Additionally, narratives were coded for two macrostructure measures (also term as Global measure): story grammar (1) and connectivity (2) (Gagarina et al., 2012) and two microstructure measures (also termed as Local measure): morpho-syntactic errors (3) and lexical diversity (4). The coding of the morpho-syntactic errors was retested by a linguist familiar with Arabic.

(1) *Story grammar*. This measure explored the setting and the episodes of the narratives. The setting includes time and/or place reference (score 0–2 points). Each story included three episodes and each episode included five components: initiating event, a goal, an attempt, an outcome, and a reaction. Each component can be scored one point. The maximum score for each episode was 5 and the maximum possible score for story structure is 17 (Gagarina et al., 2012).
(2) *Connectivity*. We scored connectivity based on Gagarina et al. (2012). For each of the following connections (a–f), the participant received one point. For parts d-f, if the child described just the goal without an attempt and an outcome, she received one point for d and 0 for e and f. If a child described an attempt and an outcome, he/she received 2 points (1 for e and 1 for f), and the score for that event was partial, as it lacked the complete episode structure.

    (a) Descriptive. Describing what is seen in the picture without referring to temporal relations or actions taking place.
    (b) Temporal. Describing the actions of the story in chronological order and relations (e.g., "The birds were hungry and mother went to search for food").
    (c) Causal. Expressing causal relation between the clauses (e.g., "The birds were happy because they weren't in danger").
    (d) Abbreviated episode. Expressing a goal, but no attempt and no outcome (e.g., "The cat wanted to prey one chick").
    (e) Incomplete episode. Expressing a goal and an attempt, but no outcome (e.g., "The cat wanted to prey one chick and he climbed the tree").
    (f) Complete episode. Expressing a goal, an attempt, and an outcome (e.g., "The brave dog wanted to save the birds and he pulled the cat's tail and then ran away").

(3) *Morpho-syntactic errors* aimed to allow a comparison of microstructure aspects of morpho-syntax (Botting, 2002; Kawar et al., 2019). Each morpho-syntactic error received one point. Errors included mainly agreement errors (e.g., *lɛanzi ʔanqadʰat ʔibno*, "The.goat.FEM (feminine gender) save.FEM.past tense son. HIS" (masculine possessive)", "The goat saved his son") and inconsistent tense use (e.g., *wbaɛde:n talat ɛanza:t kajjafu wl-ɛasfu:r j.tur ttaɛlab*, "and.then three sheep were.happy (past tense) and.the.bird oust (present tense) the.fox", "and then three sheep were happy and the bird ousts the fox". The total score per narrative was the sum of these errors. Thus, in this measure, high scores represent low performance.

(4) *Lexical diversity.* Lexical diversity was measured based on the ratio of Types/Tokens. This index represents the ratio between the number of different words (Type) and the total number of words (Token) and is a common method in evaluating lexical diversity in narratives (e.g., Baldimtsi et al., 2016).

For each measure, a two way mixed-model analysis of variance (ANOVA) was conducted, with Group (children with HI and children with typical hearing) as a between subject factor and language variety (Spoken Arabic and Standard Arabic) as a within-subject factor.

3 Results

Average narrative length (in tokens) and average of the four narrative measures in the two language varieties by group are shown in Table 2. Analysis of variance testing the effects of group and language variety on all measures is presented below.

The length of the narratives showed no significant effect for group ($F(1, 38) = 0.32$, $p = 0.57$), for language variety ($F(1, 38) = 0.32$, $p = 0.57$), or for the interaction between group and language variety ($F(1, 38) = 0.05$, $p = 0.82$). These findings suggest that narrative length cannot explain the differences found in the following comparisons.

Story grammar scores revealed a significant main effect of group ($F(1, 38) = 7.48$, $p = .01$), such that children with typical hearing scored higher than

Table 2. Average scores of the two groups (SD) in the two language varieties for the four narrative measures

Measure (score range)/Group	HI ($n = 20$)		Typical Hearing ($n = 20$)	
	Spoken	Standard	Spoken	Standard
Narrative length in words	60 (18)	59 (23)	62 (23)	57 (23)
Story grammar (1–17)	8.55 (1.7)	8.85 (1.9)	10.1 (2.17)	10.2 (2.04)
Connectivity (1–18)	12.9 (1.71)	13 (2.02)	13 (1.72)	13.3 (2.15)
Morpho-syntactic errors	3.45 (4.76)	2.8 (4.37)	0.3 (0.47)	0.35 (0.59)
Lexical diversity (0–1)	0.77 (0.08)	0.78 (0.07)	0.78 (0.07)	0.83 (0.1)

children with HI (Table 2). No significant effect was shown for language variety (F (1, 38) = 0.05, p = .83 (or for the interaction of group and language variety (F (1, 38) = 0.1, p = .76). **Connectivity** scores showed a significant main effect of group, the children with typical hearing scored higher than those with HI (F (1, 38) = 9.44, p = *.01*) (Table 2). No significant effect for language variety (F (1, 38) = 0.92, p = .34) or for the interaction between group and language variety (F (1, 38) = 0.06, p = .81) were found.

At the **syntactic level**, we tested morpho-syntactic errors. In this measure, higher scores indicated more errors. Note that in both groups the average errors were small (ranged from 0.3 to 3.45). One possible explanation for this finding is that both groups used more morpho-syntax of Spoken Arabic than morpho-syntax of Standard Arabic. This is further explained in the discussion section. In the typical hearing group, errors ranged between 0 and 2 errors per narrative and only nine children produced morpho-syntactic errors. In contrast, in the HI group, errors ranged from 0 to 17 per narrative and 16 of the 20 children produced morpho-syntactic errors. The results indicated a significant main effect of group (F (1, 38) = 8.67, *p<.01*), meaning that children with HI produced more morpho-syntactic errors, as compared with children with typical hearing (Table 2). No significant effect was shown for language variety (F (1, 38) = 0.01, p = *.93* (or for the interaction of group and language variety (F (1, 38) = 0.79, p = .38). Another qualitative finding was observed between the two groups. In the group of typical hearing, most children who produced morpho-syntactic errors corrected themselves immediately. For example one child produced a gender agreement error: *lgʰuraːb ʔižat,* "The.crow.MASC (masculine gender) came.FEM (feminine gender verb agreement past tense)" and immediately corrected himself to: *ʔiža,* meaning masculine gender verb agreement in past tense. In contrast, the children with HI did not show error correction.

Finally, for the **lexical diversity** measure a significant main effect for group was found (F (1, 38) = 6.09, p = *.02*), such that children with typical hearing showed higher lexical diversity scores in their narratives compared with the HI group (Table 2). A marginally significant effect was found for language variety (F (1, 38) = 3.86, p = *.06*), such that the lexical diversity scores were higher in Standard Arabic narratives than in Spoken Arabic. Interestingly, a significant effect was found for the interaction between group and language variety (F (1, 38) = 5.31, p = *.03*). Post-hoc t-test showed that children with typical hearing scored higher in Standard Arabic, as compared with Spoken Arabic (0.83 versus 0.78, Table 2) with marginally significant difference (t (19) = 2.01, p = .06). The children with HI performed similarly in the two language varieties (t (19) = 1.26, p = *.22*).

To summarize, school age children with HI and typical hearing told similar narratives in terms of length in both Spoken and Standard Arabic conditions. Note however that the difference between the two conditions was in the instructions given to the children. Although there was evidence that the children used unique Standard Arabic words and morpho-syntax, they also tended to mix the two language varieties, especially in the Standard Arabic condition, which is common during school age. In the four measures: story grammar, connectivity, morpho-syntactic errors, and lexical diversity, children with typical hearing scored better than children with

HI in all measures. Unexpectedly, however, the results did not show significant differences between the two languages varieties, except in the lexical diversity measure, which showed higher scores on Standard Arabic compared with Spoken Arabic, and only in the hearing group.

4 Discussion

Narrative is a multilayered, linguistic task allowing a glance into different language abilities within the same task. In the current study, we explored narratives at macro and micro levels in Standard Arabic and Spoken Arabic conditions of storytelling among children with severe to profound HI and compared their performance to that of children with typical hearing.

The variables which are the main focus of the study were hearing status: HI versus typical hearing, language variety: Spoken Arabic versus Standard Arabic, and the interaction between these two variables. The study revealed three main findings. **First**, in line with previous studies of monolingual children (e.g., Boons et al., 2013; Friedmann et al., 2008), diglossic school age children with HI lagged behind their typical hearing peers on all measures, supporting language deprivation as a core explanation for the delay. **Second**, both groups had similar scores across the two language varieties except that children with typical hearing had higher lexical diversity score in the Standard Arabic telling condition as compared with Spoken Arabic**. Finally**, for children with HI, despite having fewer years of exposure to Standard Arabic, as they acquire it mainly in school context, they showed similar performance across the two language varieties.

The first finding showed that school age children with HI lagged in their language abilities compared with their typical hearing peers. This is in line with previous findings that tested monolingual children with HI (Boons et al., 2013; Friedmann et al., 2008; Norbury et al., 2001; Tomblin et al., 2005; Tuller & Delage, 2014), bilingual children with HI (Bunta & Douglas 2013; Deriaz et al., 2014; Guiberson 2014; Waltzman et al., 2003) and diglossic children (Kawar et al., 2019). In these studies, school age and preschool children with HI scored significantly lower than their typically hearing peers did in a range of language tasks. The current findings indicate that children with severe-profound HI show incomplete language abilities in different aspects of the language in narratives: macrostructure measures, including story grammar and connectivity, and microstructure levels such as morpho-syntax and lexical diversity. The current findings are in line with Kawar et al. (2019) who showed that children with HI produced more morpho-syntactic errors and fewer complex sentences than their hearing peers. However, our findings showed a gap between the two groups in story grammar measures, contradicting Kawar et al. (2019), who found similar scores across the two groups in story grammar measures. The task in Kawar et al. (2019) was a personal narrative, not telling a story based on a set of pictures, as in the current study. Further, the task was conducted only in Spoken Arabic. However, the children were the same age range (12–16 years) as in

the current study and in both studies, the linguistic setting of language acquisition was similar, acquiring language in a diglossic context. In both studies children spoke the dialect of northern Israel and received similar education and intervention programs. Although the differences between the two studies can be accounted for by many methodological differences, we highlight an important one, which relates to the hearing profile of the children in the two studies. Whereas all children in the current study had severe-profound HI, in Kawar et al. (2019), the group was heterogeneous, and included children with moderate HI. It is possible that the children with less severe hearing loss, have better hearing function and thus performed better on the narrative task, which obscured the gap between the two groups in some of the measures. Support for this assumption comes from the results of high correlation between severity of HI and morpho-syntactic errors. The results revealed that children with moderate hearing loss showed the fewest morpho-syntactic errors in their narratives, those with severe HI showed more errors and those with profound HI showed the most morpho-syntactic errors (Kawar et al., 2019). Crosson and Geers (2001) who tested English-speaking children ages 8–9 years with HI on a narrative task found similar results. In their study, children with better hearing function, measured by speech perception tests, performed better on a narrative task and some of them scored similar to their hearing peers. Researchers and clinicians agree that accessibility to the spoken language is the key for both monolingual and bilingual children with HI. The current study adds evidence to this growing literature based on a unique group of children with HI growing in diglossic condition. It is suggested that for children with HI, the core delay in acquiring spoken language is language deprivation, because of their hearing loss, not a deficit in the linguistic mechanism (Hall et al., 2017; Novogrodsky et al., 2017).

Importantly, as noted above, children with HI and with less severe hearing loss experience minimal language deprivation and perform better on language tasks (Crosson & Geers, 2001; Kawar et al., 2019). This suggests that HI is an audibility barrier and not a language barrier. For example, a recent study of monolingual Hebrew-speaking toddlers with HI and typical hearing found comparable syntactic abilities between the two groups on a sentence repetition task (Novogrodsky et al., 2018). The findings showed similar scores on the repetition task and equal error patterns (e.g., both groups showed the same tendency of omitting function words). The explanation for the no language gap in the study of Novogrodsky et al. (2018) between the two groups was the close physical proximity of toddlers to their caregivers at this young age. This physical proximity for children who use hearing devices (hearing aids and cochlear implants), allows audible linguistic input. The current study tested older children with HI. These children experience limited accessibility to both language varieties. It is suggested that the limited language accessibility explains the gap between the scores of the children with HI and their hearing peers.

The second finding showed that both groups had similar scores across the two language varieties, with no significant differences between Spoken and Standard Arabic, except in the lexical diversity measure, which showed higher scores on Standard compared with Spoken Arabic (marginally significant) in the hearing group.

We start with discussing this pattern in the typical hearing group. Leikin et al. (2014) showed that at preschool age, hearing children were able to use linguistic structures of Standard Arabic in narratives. Ravid et al. (2014) showed that with age, hearing children, speakers of the northern Palestinian-Arabic dialect demonstrated longer narratives, which included more Standard Arabic words. These findings suggest that with age, children show higher proficiency in Standard Arabic. Thus, it is possible that the children in the current study presented equal knowledge of the two language varieties. However, it is also possible that they used more Spoken Arabic in the Standard Arabic condition, resulting with similar language outcomes across the two conditions. The finding of higher lexical diversity in the Standard Arabic condition supports the latter explanation. In the spoken condition children use only the spoken lexicon. However, in the Standard Arabic condition, they might try to use the Standard lexicon but they also turned to the spoken because it is easier and retrieved more atomaticlly. Thus, they probably had both lexicons to draw upon. It is thus suggested that children mixed both lexicons (standard and spoken) in the Standard Arabic condition, which might increase the lexical diversity of their stories. These two explanations await future study that will analyze the narratives for spoken versus standard lexicons and morpho-syntax of the two language varieties in each condition to determine the scope of mixing in the Standard Arabic condition.

Finally, children with HI showed no significant differences between Spoken Arabic and Standard Arabic. This result can be related to the linguistic accessibility of Standard Arabic for children with HI. Hearing children have many opportunities for exposure to Standard Arabic before entering the school system. Although children with HI are exposed to input in Standard Arabic before they start formal and direct learning at school, their ability to access this input is limited. For example, when watching television, they can enjoy the visual stimuli presented to them but in most cases not the language that goes along with it, as it is presented in the background without the support of speech-reading (also termed as lip-reading)[1] (e.g., Cambra et al., 2008). Thus, Standard Arabic input is limited for children with HI, due to their limited auditory function. During school, Standard Arabic is taught in a formal and direct way and is facilitated by the written modality, which is accessible in the visually unimpaired modality of children with HI. This condition might support their learning, resulting in similar levels of both language varieties with fewer years of exposure to Standard Arabic compared with Spoken Arabic. This assumption requires further testing in future research.

The similar scores of Spoken Arabic and Standard Arabic within the group of children with HI has both theoretical and clinical implications. **Theoretically**, the findings support the notion of intact language mechanism in children with HI (compare with the case for children with Developmental Language Disorders, both monolingual and bilingual, see for example, Novogrodsky, 2015; Degani et al., 2019). Our findings showed that even with unstable and delayed spoken language,

[1] Later in life children with HI can learn language through television, when they can rely on subtitles.

children with HI can learn another language (in the current study, a new language variety, Standard Arabic), when it is accessible to them. **Clinically**, findings from studies that showed no disadvantage of bilingualism for children with HI who speak two languages (Bunta & Douglas, 2013; Guiberson, 2014; Novogrodsky & Meir, 2020; Waltzman et al., 2003) suggest that supporting the language spoken at home for a bilingual child with HI (who uses cochlear implants or hearing aids) does not delay his/her ability to acquire the societal language.

The current findings support the need to enhance Standard Arabic for children with HI (in addition to Spoken Arabic). Standard Arabic is not the first language of school age Arabic-speaking children with HI, but this language is supported by a written representation, thus, it might be easier for them. This makes diglossia different from bilingualism where the assumption is that both languages of bilinguals receive support from the written language. In diglossic languages, the first language does not have a written representation to support language development. Two implications result from this unique condition for children with HI in diglossic languages: (a) early exposure to the written language (Standard Arabic) to support language acquisition (as suggested also for monolingual children, Dostal & Wolbers, 2014; Williams & Mayer, 2015), (b) using an invented written representation for Spoken Arabic to support its acquisition (which is used today in texting via phone communication). These two implications should be a variable for professional decision making, when evaluating which language to teach. It could be that with greater exposure to Standard Arabic, which is not the case today in intervention programs for children with HI,[2] they will close the gap between them and their hearing peers. The effect of intervention in Standard Arabic awaits future studies.

The current study revealed that Spoken Arabic does not harm Standard Arabic, as found in studies on bilingual children with HI (Bunta & Douglas, 2013; Guiberson, 2014; Novogrodsky & Meir, 2020; Waltzman et al., 2003), and it might even function as a bridge to Standard Arabic learning, through interaction of the two language varieties (Schiff & Saiegh-Haddad, 2018). For example, Schiff and Saiegh-Haddad (2018) found that Spoken Arabic metalinguistic skills predicted Standard Arabic metalinguistic skills and reading. The bridge might be from Spoken Arabic to Standard Arabic, as shown for children with typical hearing (Arafat et al., 2017), but can also be from Standard Arabic, the formal language variety to Spoken Arabic. This assumption awaits future interventional studies that will compare long-term outcomes of Standard Arabic interventions on Spoken Arabic.

To summarize, the study showed low performance of children with HI on both language varieties in different measures of a narrative task; reflecting language deprivation. Furthermore, the findings suggest that in diglossic languages the support from the written formal language variety (in the current study, Standard Arabic) benefits its development of children with HI.

[2] Most intervention programs for Palestinian-Arabic speaking children with HI focus on Spoken Arabic, aiming to support the children's daily communication needs. Standard Arabic is considered an advanced skill. It is taught but is not the main target in intervention (Personal communication, 2018).

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Impact of Nonmainstream Dialect Use in Language Assessment with Young African American English-Speaking Children

Ryan Lee-James and Lakeisha Johnson

1 Difference, Disadvantage, and Disorder

The impact of cultural dialect use in assessment and diagnosis of language disorders has been a central focus of research for at least the last three and a half decades, fueled largely by the publication of the Position Statement on *Social Dialects* (American Speech-Language-Hearing Association, ASHA, 1983). Such a document was needed to address the social and educational controversy in the late 1970s surrounding language rights and accessibility to appropriate instruction for African American children (Martin Luther King, Jr. Elementary School Children v. Ann Arbor School District, 1979; Oakland Unified School District, 1996). The Position Statement was theoretically and clinically significant as it acknowledged nonmainstream dialects as functional language systems warranting expertise and certain considerations in clinical practice – especially in assessment. In doing so, the Position Statement (ASHA, 1983) established the professional stance of ASHA as the governing body for speech-language pathologists and audiologists in the United States. Situated in the historical contexts of *difference vs. disorder,* the contents of this chapter are relevant for nonmainstream dialect speakers of other languages, namely cultural dialects primarily spoken by individuals from lower social classes.

In terms of culturally and linguistically diverse populations in the United States, speakers of AAE have been at the center of language assessment research as African Americans represent the second largest minority group after Latinos. Long regarded as a low prestige dialect, AAE has been heavily stigmatized in academic and mainstream social contexts. Sociolinguists posit that the stigmatization of AAE is largely based on adverse stereotypes and misconceptions of African Americans themselves and less on the actual language system itself (Wolfram et al., 1999). On the other

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hand, dialects spoken by majority culture are regarded as the standard (e.g., Mainstream American English) and viewed as high prestige (e.g., British English dialect spoken by the monarchy). The earliest accounts of AAE characterized the dialect as a "broken" and "simplified" version of English; however, sociolinguistic and developmental studies confirm AAE as a complex variety of English and suggest that young AAE speakers are sophisticated language users (Craig & Washington, 1994).

AAE is distinguished from Mainstream American English (MAE, the "standard" in the United States and the language of instruction in school) in all language domains, but most significantly in morphology and syntax. Specifically, AAE is characterized by zero-marking and substitutions of tense and agreement morphemes (e.g., zero plural, zero copula, subject verb agreement) in contexts that are otherwise obligatory in MAE (see the Appendix A for a list of common AAE features). On the surface, zero-marking and substitutions may mirror morphosyntactic productions of children with language impairment.

Speakers of AAE use dialect along a continuum from low to very high (Craig & Washington, 2004; Washington & Craig, 1998; Terry et al., 2010). The rate at which speakers produce dialect features is defined as *dialect density.* Children with high dialect densities are further from the standard than children on the low end of the dialect continuum whose spoken language more closely approximates MAE. MAE as the "standard" or point of reference is clinically and educationally relevant as the magnitude of linguistic distance from the standard is directly (Craig & Washington, 2004; Washington et al., 2018) and indirectly (Mitri & Terry, 2014; Terry, 2012) tied to oral language and reading, such that high dialect users are most vulnerable for poor language outcomes (See Washington and Seidenberg, Chapter "Language and Dialect of African American Children", this volume). The same is true for children from other language backgrounds whose spoken language differs systematically from the language of instruction in school (Saiegh-Haddad, 2003, 2018).

A child's dialect density depends on several sociodemographic variables including age, gender, geographic region in United States., and socioeconomic status (Charity et al., 2004; Craig & Washington, 2004; Washington & Craig, 1998). Socioeconomic status (indexed by maternal education level or free/reduced priced school lunch eligibility) is the most consistent predictor of dialect density, and the relationship between these variables is negative. The relationship between dialect density and income status has been especially problematic for identification of language impairment. This is because language weaknesses (e.g., limited vocabulary breadth and depth) associated with economic disadvantage and linguistic features of AAE are inextricably tied and overlap with clinical indicators of language impairment. Figure 1 represents the overlap that has been central to concepts of difference vs. disorder.

Determining whether oral language productions are a symptom of socioeconomic disadvantage, a source of linguistic difference, or indicative of true language disorder has been the premise of *difference vs. disorder* research. In fact, the Position Statement (ASHA, 1983) calls for professionals to be able to "…distinguish between those aspects of linguistic variation that represent the diversity of the [English]

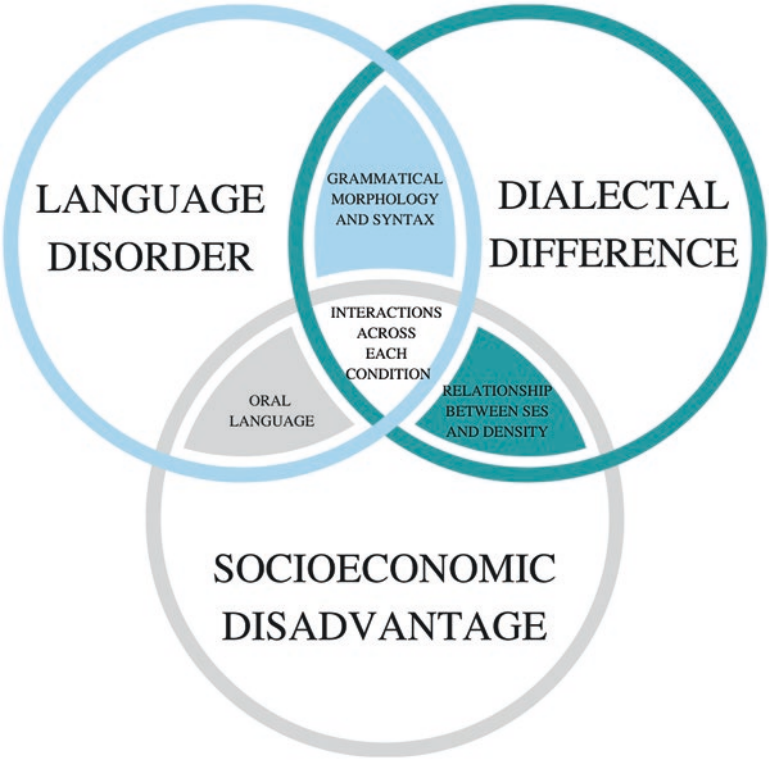

Fig. 1 Venn diagram representing the overlap of dialectal difference, language disorder, and socioeconomic disadvantage

language from those that represent speech, language, and hearing disorders." An unintended consequence of this statement is that it has led to a perpetual binary approach in practice, such that many clinicians embark upon assessment with the goal of teasing apart aspects of language difference from those of language disorder without consistent consideration for the fact that disorder (and disabilities) can and does exist within the context of linguistic difference and economic disadvantage (Oetting et al., 2016a. Oetting and colleagues (2016a) explain that, "the preposition *versus* within the phrase suggests that dialects and disorders are conceptually equivalent and mutually exclusive, which is inaccurate" and that, "the placement of dialect [difference] first within the phrase leads to conversations about dialects rather than conversations about the nature, identification, and treatment of childhood language disorder" (pp. 29). The focus of this argument is to underscore the urgent need to change the narrative and the way in which we conceptualize all types of differences and the implications for assessment and treatment of language disorder (Oetting et al., 2016a). In spite of this, the reality is that norm-referenced assessments, the diagnostic gold standard, lack sufficient sensitivity and specificity with culturally and linguistically diverse groups and children from low socioeconomic

status backgrounds. Lack of psychometrically- sound measures and limited clinical expertise with culturally and linguistically diverse populations remain practical challenges for clinicians and put diverse groups at risk of being over-diagnosed or not receiving services they are entitled to by law.

Early reports on this topic scrutinized the validity and reliability of standardized assessments as empirical data consistently revealed potential cultural and linguistic bias on widely used norm-referenced language assessments (Champion et al., 2003; Kresheck & Nicolosi, 1973; Restrepo et al., 2006; Washington & Craig, 1992, 1999). As a result, researchers have used experimental probes and alternative methods of assessment in order to establish a typical profile of child AAE including features and functions, but also to identify a profile of language disorder *within* the context of AAE and socioeconomic disadvantage. Fast-forward almost four decades, and much progress has been made as evidenced by a substantial and continually growing body of literature on this topic.

Arguably, like most areas of scientific inquiry, the field needs more emphasis on implementation science. The remaining sections of the chapter address two overarching, clinically-motivated questions that remain unresolved:

- Which aspects of language are critical for inclusion in assessment given the overlap among clinical indicators of language impairment, dialect appropriate characteristics of AAE, and risks associated with economic disadvantage?
- During early childhood, what are evidence-based assessment recommendations for AA children and children from economically disadvantaged backgrounds?

We chose to focus on African American children during the period of school entry through third grade, which is when children are expected to be proficient readers. In the United States, this includes children from around 4 to 9 years old. Third grade is also the point at which dialect density stabilizes in oral reading after undergoing a systematic decrease, reflecting children's accumulated experience with academic English (Craig et al., 2003). For these reasons, it is crucial that children with language impairment are accurately identified early and provided with evidence-based instruction because, without it, the development of literate language will suffer. In a similar vein, it is equally important that children with oral language weaknesses resulting from lack of exposure and access receive targeted instruction, especially during the early childhood years, to maximize learning.

2 Language Skills for Assessment with African American Children

Several areas of language have been identified as critical components of assessment with African American children. Interestingly, these areas are also considered critical for assessment of those with suspected language impairments. Grammatical morphology and syntax, vocabulary, and language comprehension are especially informative for children in the 4- to 9-years-old age range and will be described in this section.

2.1 Grammatical Morphology and Syntax

AAE is primarily morphological and syntactic in nature and teasing apart the source of nonmainstream grammatical feature production has been a primary focus of research investigations. *Contrastive* features are governed by linguistic rules that are distinct from MAE. In spoken language, contrastive features largely include morphosyntactic patterns that impact tense and agreement (e.g., zero-marking and substitutions) (Seymour et al., 1998). At least two studies suggest that dialect use also impacts development of receptive language knowledge of certain morphosyntactic structures that are contrastive with MAE (de Villiers & Johnson, 2007; Johnson, 2005). Some early studies included assessment of *noncontrastive* features (i.e., characteristics shared between AAE and MAE), in lieu of contrastive in order to reduce ambiguity in assessment (Craig & Washington, 2000; Seymour et al., 1998; Washington & Craig, 2004).

In a seminal study, Seymour et al. (1998) provided empirical evidence for the clinical utility of noncontrastive features in assessment. The language skills of 14 African American children ranging in age from 5- to 8-years-old were examined using spontaneous language samples. Half of the group had an existing diagnosis of language impairment and the other half of the participants were typically developing. Overall, data from the children's spontaneous oral language samples revealed statistical differences in the productions of noncontrastive features between the two groups, with fewer language impaired children demonstrating mastery (criterion of 90% or above produced in obligatory contexts) of articles, modals, prepositions, and complex syntax. When contrastive features were collapsed in analyses, there was no significant difference between clinical groups with regard to productions that reached mastery. However, when productions of individual features were compared between groups, regular past tense -ed was the only contrastive feature that yielded a significant difference in mean rate of production (typical = 91% vs. LI = 50%). Though both groups produced more noncontrastive than contrastive features in obligatory contexts, the findings suggest that only noncontrastive feature production overall differentiated the two groups and that children's productions of contrastive features as a whole (with the exception of regular past tense-ed) was not indicative of their clinical status.

The publication of Seymour et al. (1998) was innovative and informative for its time. However, in spite of more current evidence, the notion that grammatical morphology and syntax are overall problematic in assessment is pervasive among clinicians and the scholars who train them. In fairness to scholars, there has been no published consensus in the form of a systematic review or meta-analysis synthesizing the decades of research on this topic. While Seymour's (1998) findings demonstrate how contrastive features can confound assessment, current work utilizing rigorous methodology, indicates that certain contrastive features are indeed clinical indicators of language impairment for child speakers of AAE, including those reared in poverty. Most notably, a combination of contrastive and noncontrastive aspects of language should yield increased diagnostic accuracy in language assessment (Oetting & McDonald, 2001).

From a validity standpoint, assessing noncontrastive language targets in assessment is logical. However, doing so may solve one problem while creating another. For example, ambiguity in language assessment may be minimized while thoroughness will be compromised. Exclusion of morphosyntax from assessment with children in early childhood may be especially problematic (i.e., reduce sensitivity) as tense and agreement errors are an early clinical indicator in English (Redmond & Rice, 2001; Rice et al., 1999, 2009) and other languages (Bortolini et al., 2002; Hansson & Nettelbladt, 1995; Paradis, 2010). There is now a growing evidence base for inclusion of grammatical morphology and syntax in assessment with AAE speakers.

During early childhood, African American children with language impairment have a protracted pattern development of grammatical morphology and syntax similar to MAE-speaking children with language impairment, though there is some variation in the features that reliably distinguish between clinical groups (Oetting & McDonald, 2001). From this work, two major findings emerge that are relevant for clinicians and researchers. The first is that contrastive morphosyntactic features should be considered along a continuum in relation to their use and clinical utility in language assessment. Features that starkly contrast with MAE, on the basis of zero-marking, are less reliable clinically than features that contrast minimally with MAE. The concept of contrastive as fluid rather than absolute was offered by Seymour et al. (1998) as an explanation for why past tense -ed was the only contrastive feature to yield significant differences between clinical groups of AAE speakers. However, discriminant function analysis from subsequent work using data from language samples, with a larger sample size, confirm marking of irregular past tense as clinical indicators but not regular past tense -ed for AAE- speaking children with language impairment (Oetting & McDonald, 2001; Pruitt & Oetting, 2009). Use of regular past tense in AAE contrasts minimally with MAE in that zero-marking in simple past contexts is infrequent once children reach 6 years of age (Craig & Washington, 2004; Lee & Oetting, 2014; Pruitt & Oetting, 2009 Washington & Craig, 1998). On the other hand, compared with past tense, use of third-person singular and copula and auxiliary BE strongly contrasts with MAE (Rickford, 1999; Wolfram, 1969). As such, these two features have been determined to be less reliable clinical indicators with only auxiliary BE (am, is, and are) yielding significant differences in production between clinical groups when standard and nonstandard marking (e.g., substitutions), were considered together (Cleveland & Oetting, 2013; Garrity & Oetting, 2010). An important consideration is that task effects have been observed to impact production rates of certain grammatical features. For example, Garrity and Oetting (2010) found that differences in elicitation method lead to varying rates of production for auxiliary am, is, and are. Specifically, the experimental elicitation probe, a cloze task (e.g., *Gonzo is (riding) a bike.*) yielded higher rates of standard marking (e.g., *He is eating a sandwich*.) compared with spontaneous language samples, which yielded few obligatory contexts for BE. Appendix B provides a list of grammatical structures that research studies have identified as having clinical value. The majority of the work that looks in-depth at the clinical utility of grammatical structures has been focused on children with an average age range from 4 to

6 years; however, weaknesses in morphosyntax have been observed as a clinical indicator with AAE speakers as young as 3 (Stockman et al., 2013, 2016). The information in Appendix B should be considered relative to chronological age and in relation to a comprehensive assessment battery that includes other domains of language. Dialect-appropriate marking options can either be dialect-specific or dialect-neutral. *Dialect-specific* and *dialect-universal* refer to features that are "differentially represented, used, or acquired within and across dialects" and "similarly represented, used, or acquired within and across dialects", respectively (Oetting et al., 2013. Again using the example of past tense, dialect-universal marking options include MAE overt marking for simple past (e.g., *The boy kicked the ball.*) and passive voice (e.g., *The ball was kicked.*). Examples of dialect-specific include overt marking with participles (e.g., *I seen it*) and use of preterite had +verb (e.g., *Then the boy had kicked the ball.*). The preterite *had* can occur with tensed (e.g., *had drove*) or zero-marked verb forms (e.g., *had drive*) (Lee & Oetting, 2014; Ross et al., 2004). Finally, overregularized marking (e.g., *The boy falled down.*) is a dialect-specific option though different from the others in that it appears to be constrained by development. Overregularizations are common in development for MAE speakers up until age 4. However, AAE-speaking children show protracted use of overregularization to around the age of 6 (Oetting & McDonald, 2001; Pruitt & Oetting, 2009). There is little evidence to support the idea that this marking option persists beyond school entry (Horton-Ikard & Miller, 2004). Appendix C includes dialect-specific marking options for common AAE features.

Clinicians should approach assessment of morphology and syntax from a systems-based lens (Oetting et al., 2013). Rather than focusing solely on presence or absence of grammatical morphemes, clinicians should examine *dialect-specific* and *dialect-universal* aspects of grammatical structures to glean a more comprehensive understanding of the child's linguistic knowledge. When using norm-referenced assessments, clinicians should carefully analyze response patterns of AAE-speaking children and use caution in the application of scoring corrections so as not to misrepresent children's language knowledge.

2.2 Vocabulary and Word Learning

The extant literature on vocabulary and background knowledge is indisputable: Children reared in economically disadvantaged communities have a limited vocabulary (Dollaghan et al., 1999; Hart & Risley, 1995; Rowe, 2008) and, by implication, limited background knowledge. In part, these differences can be attributed to caregiver interaction in the early years of life (Rowe, 2008). Both vocabulary breadth and depth have been identified as clinical indicators of impairment in the general population (McGregor et al., 2013). Importantly, the former is tied to decoding and word recognition whereas the latter is tied to reading comprehension (Ouellette, 2006). Thus, vocabulary knowledge plays a major role in the development of reading.

Given the negative association between AAE and socioeconomic status, the relation between AAE and vocabulary is confounded, though being a dialect speaker in and of itself does not result in limited vocabulary knowledge. Sensitivity of norm-referenced assessments is questionable because of the inevitable influence of culture and socioeconomic status (Champion et al., 2003; Kresheck & Nicolosi, 1973; Restrepo et al., 2006; Washington & Craig, 1992, 1999), though empirical data from spontaneous language samples consistently implicate vocabulary as a salient clinical indicator of language impairment for AAE- speaking children. Early childhood studies show that African American children with language impairment are distinguished from their same-age, typically-developing peers in lexical diversity using number of different words as an index of expressive vocabulary (Craig & Washington, 2000; Stockman, 2008; Stockman et al., 2013; Washington & Craig, 2004). The two groups are also distinguished in their ability to learn novel words. Johnson and de Villiers (2009) reported that children with language impairment had significant difficulty learning novel verbs across various argument structures. Taken together, these studies confirm vocabulary and word learning as clinical indicators of language impairment for AAE speakers. These studies included African American children from low socioeconomic status backgrounds, underscoring the fact that, in the face of overlap, assessment of vocabulary and word learning provides valuable clinical information.

2.3 Language Comprehension

Deficits in oral language comprehension, like vocabulary, are a hallmark clinical indicator of language impairment for MAE speakers and a language skill that is impacted by socioeconomic status. A handful of studies have focused on assessment of language comprehension in African American children from low socioeconomic status backgrounds in the form of Wh-questions and active and passive sentences. These studies reveal that typically-developing AAE-speaking children outperformed their peers with language impairment. The work on Wh-questions reported significant performance differences by clinical group and qualitative differences in response errors such that children with language impairment more often, (1) provided unrelated answers or no response, (2) answered *how* questions as *why* questions, (3) answered false clause questions incorrectly (e.g., *What did the mother say she bought?* where what the mother *bought* and *said she bought* are incongruent), and, (4) answered the medial complementizer clause instead of the intended question (Craig & Washington, 2000; de Villiers et al., 2008).

Craig and Washington (2000) and Washington and Craig (2004) also reported data from another language comprehension measure that assessed children's understanding of active and passive sentences. Employing a two-option, forced-choice picture selection task, Craig and Washington (2000) found that children with language impairment performed significantly lower than typically developing controls while Washington and Craig (2004) found no significant performance differences by group. These two studies differed in their targeted age groups in that one study

included 4- to 11-year-olds (Craig & Washington, 2000) and the other included 4- to 6-year-olds (Washington & Craig, 2004) suggesting that comprehension of complex sentences, such as passives, is a language skill more diagnostically informative for children in later development. Importantly, for each study, the majority of the sample was comprised of African American children from low socioeconomic status backgrounds.

2.4 Sentence Recall

Sentence repetition is worth mentioning here as it has been identified as critical for language assessment within the general population (Conti-Ramsden et al., 2001; Redmond, 2005; Redmond et al., 2011), though the evidence of the clinical utility with African American children is minimal. In a study including 5- and 6-year-old AAE and Southern White English speakers, Oetting et al. (2016b) examined performance across same- dialect clinical groups on a sentence recall task. The task consisted of pre-recorded sentences designed to assess recall of one functional category: tense and agreement (e.g., Minnie *is* cleaning the dirty dishes in the sink.); two functional categories: tense and agreement and negation (e.g., Minnie *is not* cleaning the dirty dishes in the sink.); and three functional categories: tense and agreement, negation, and complement structures (e.g., Mickey wonders *if* Minnie *is not* cleaning the dishes.). Results showed statistically significant differences in group performance, favoring the typically developing groups in ability to recall sentences, with a large effect for clinical status. The clinical groups also differed qualitatively in their recalls, with the language impaired groups producing more tense and negation errors than the typically developing controls. The groups demonstrated comparable rates of errors on complement structures.

This study also examined the diagnostic accuracy of the sentence recall task by using three different scoring methods. The first method was a two-point scoring system based on accuracy which involved assigning two points for exact recalls, one point for one to three errors, and no points for more than four errors. There were 36 items total, making the maximum possible score 72. Using a clinical cut point of 40, this method yielded adequate levels of sensitivity (.89) and specificity (.86). The second method was based on grammaticality and calculated in two ways. First, using 12 exact recalls as the cut point and then using 24% ungrammatical recalls as the cut point. Children who produced fewer than 12 exact sentence recalls were classified as having language impairment. This method yielded almost identical values for sensitivity (.89) and specificity (.87) as the accuracy-based method. Using 24% ungrammatical recalls as the cut point yielded slightly lower levels of sensitivity (.86) and specificity (.80). The findings of this work implicate sentence recall as a clinical indicator of language impairment for young AAE-speaking children. More research with African American children is needed to understand how deficits in sentence recall manifest in children who are older, though research suggests that sentence recall ability is a salient clinical indicator through adolescence (Conti-Ramsden et al., 2001).

2.5 Nonword Repetition

Coupling assessments that tap both knowledge- and processing-based skills yields increased diagnostic accuracy compared to assessment batteries that include only one or the other (Oetting & Cleveland, 2006). Measures that are heavily influenced by prior knowledge and experiences, and, therefore, influenced by cultural, linguistic, and socioeconomic factors, are considered knowledge-based – for example, measures of vocabulary. Processing-based measures place less emphasis on accumulation of language knowledge or experiences and increased emphasis on child's ability to process and manipulate linguistic information (Campbell et al., 1997; Oetting & Cleveland, 2006; Rodekohr & Haynes, 2001). Laing and Kamhi (2003) provide several examples of various types of processing-based measures, such as "memory tasks (e.g., digit span, working memory, nonword repetition), certain perceptual tasks (e.g., discrimination of rapidly presented tones, sequencing tones presented in rapid sequence) and competing stimuli tasks (e.g., filtered words, auditory figure ground, competing words)" (p. 46). The aforementioned processing-based tasks may be helpful in identifying African American children who have language-based difficulties, but normal processing abilities. When using this type of alternate measure with AAE-speaking children, the assumption is that while there may be variable use of MAE vocabulary and grammar, children should perform similarly to typically developing peers if they have normal language processing ability (Moyle et al., 2014).

Nonword repetition (NWR) is a widely used task that involves children repeating novel nonsense words that are presumably equally unfamiliar to all participants regardless of cultural background. Several studies have examined the clinical utility of NWR with African American children and reported that children with language impairment were outperformed by their typically developing peers (Rodekohr & Haynes, 2001; Oetting & Cleveland, 2006; Washington & Craig, 2004). Washington and Craig (2004) reported that NWR and two other measures significantly contributed to the performance differences between pass/fail groups, accounting for 51% of the total variance in scores; the effect size for the group comparison on NWR was moderate. Oetting and Cleveland (2006) reported a significant increase in diagnostic accuracy when NWR was used in conjunction with knowledge-based language measures. When NWR was considered in isolation, specificity was extremely low (56%); yet when combined with a measure of language comprehension, sensitivity and specificity increased to 81% and 94%, respectively. An important observation of these studies was that participants in both clinical groups showed similarities in their repetition patterns. Specifically, repetition accuracy decreased with increases in syllable length, indicating that children in both groups were impacted by increasing processing demands imposed by having to retain and repeat lengthening novel words though, children with language impairment were impacted to a greater degree in each syllable condition (Oetting & Cleveland, 2006; Rodekohr & Haynes, 2001). As with the other skills reviewed in this section, the ability to repeat nonsense words is a clinical indicator of impairment in MAE (Estes et al., 2007).

3 Assessment Methods

The gold standard for diagnosis of language disorder and confirming eligibility of services remains norm-referenced assessments. Because norm-referenced assessments lack sensitivity with culturally and linguistically diverse populations, the inclusion of other forms of assessments are necessary for ensuring diagnostic accuracy and, ultimately, appropriate intervention. For school-age children, in order for children to qualify for intervention, the child's disability must be linked to difficulties with academic performance. For this reason, it is important to understand how assessment for language impairment ties into the larger scheme of assessment for learning.

3.1 Universal Screening

During early childhood, implementation of universal screeners is critical for identification of students at-risk for language disorders and later literacy challenges. Routine implementation of universal screeners are especially important for culturally and linguistically diverse children and children from low socioeconomic status backgrounds who will, arguably, enter school with language differences. Coupling psychometrically-sound universal screeners with a detailed family case history provides a reliable foundation for developing a progress monitoring plan for each child who is determined to be at-risk (Oetting et al., 2016a).

Universal screeners should be administered at school entry and at the beginning of each academic year in early elementary grades. Appendix D provides a review of non-negotiable oral language and emergent literacy skills to be included in screening; these are directly tied to later language development and reading achievement. Screeners for older children should include assessment of skills in the same domains, but at a level that is appropriate based on age expectations for language and literacy. In addition, a screening measure that provides information, at a glance, on the children's capacity in processes that support learning provides another measure of school readiness. For example, stronger performances in executive functions that support learning, including working memory, cognitive flexibility, and inhibition, have been positively correlated with later language and literacy outcomes (Booth & Boyle, 2009; Locascio et al., 2010; Sesma et al., 2009). Universal screeners should have at least "good" (i.e., 80+) or "excellent" (i.e., .90+) sensitivity and specificity. Importantly, universal screeners are central to response to intervention(s) (RTI). At the classroom level, results of universal screening should inform Tier 1 instruction and provide a starting point for determining groupings of children at Tier II.

3.2 Response to Intervention: An Achievement-Based Framework

RTI is a multi-tiered academic intervention used for the systematic, early identification and support of students who are at risk or are underperforming in relation to predetermined standards. The essential components of RTI include high-quality, evidence-based classroom instruction; ongoing student assessment and progress monitoring; tiered instruction; and parental involvement (RTI Action Network, 2011). Figure 2 represents the ideal classroom distribution of students at each level of instruction.

This figure assumes that at least 80% of children will be at Tier I and have the prerequisite knowledge to learn new skills. The remaining 20% are distributed at Tiers II and III representing, respectively, children who need more intensive support and those who may need specialized intervention. Importantly, this model assumes that children at Tier II have not been able to "catch on" (for various reasons such as lack of school readiness or ineffective instruction) through receiving evidence-based instruction at the classroom level only. However, it is unclear at this stage whether children's lack of achievement is due to language or learning disabilities. Instead, it is expected that, provided with more intensive support, children may be able to "catch on." For the small percentage of children who do not, a referral for a special education evaluation may be recommended.

The reality in the United States is that the percentage of children who require Tier II instruction is far higher than the RTI model intends. More specifically, as children progress through school and oral language weaknesses become increasingly apparent, the development of higher level literacy skills hinge upon a solid

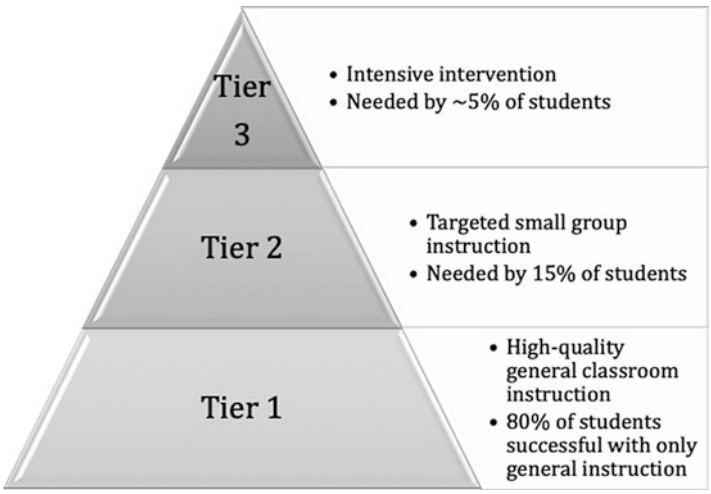

Fig. 2 Response to intervention tiers of instruction

oral language foundation. This is especially the case in schools where there are high percentages of children from low socioeconomic homes. The model is essentially flipped in these schools, where 80% of students are in need of Tier II or Tier III instruction.

RTI is analogous to dynamic assessment and is grounded in Vygotsky's theory of the zone of proximal development. The zone of proximal development is the space between what a child can do on their own and what they can do with scaffolding from an adult (Vygotsky, 1978). In both dynamic assessment and RTI, determining what a child can do includes assessment and intervention taking place together (Grigorenko, 2009). In this view, diagnostic accuracy is increased such that children with true language impairment or learning disability are identified through an iterative process of identifying how they learn, rather than relying solely on static norm-referenced assessments that are limited to identifying deficits in certain skills. In the face of norm-referenced assessments that lack sensitivity, RTI provides an alternative to the reliance solely on test scores to determine whether an impairment exists. Instead, after moving through the tiers of RTI as intended, children have had evidence-based instruction, small group intensive support, and regular progress monitoring before being referred for an evaluation. Therefore, professionals have increased confidence in clinical decision-making should a diagnosis be confirmed. To this end, effective RTI should reduce the proportion of students being referred for special education and increase diagnostic accuracy of students who are being referred.

Because the development of language and literacy are inextricably tied, speech-language pathologists are uniquely equipped to support classroom teachers in the implementation of RTI providing consultation and working collaboratively to improve language and literacy skills for children identified as "at-risk". Classroom support from the speech-language pathologist may include the following:

- Educating teachers on the relationship between speech, language, and literacy and risk factors for language and reading achievement.
- Planning collaboratively for targeted literacy blocks, including speech-language pathologist support around using data from universal screeners, diagnostic assessments and progress monitoring tools to inform instruction and develop small groups based on student's ability.
- Supporting targeted small group instruction in the classroom focused on oral and written language skill development and progress monitoring.

The more involvement from speech-language pathologists, as well as other school personnel (e.g., paraprofessionals, literacy coaches and reading specialists), in the RTI processes pre- referral, the more learning opportunities students have to receive evidence-based instruction fit to their specific areas of needs. Should a referral be warranted, a contextualized learning profile for the student will exist and can be used in the evaluation process.

3.3 Language Sample Analysis

An additional assessment method that has been found to be appropriate for culturally and linguistically diverse populations is language sample analysis (LSA). LSA is the process of thoroughly describing language production. Samples may be conversational (e.g., free or scripted play) or narratives (e.g., story retell, picture description, wordless picture book). LSA can be used for all age groups to monitor changes in production associated with development and those from intervention. LSA has high ecological validity (Stockman, 1996) and while collecting and analyzing a language sample takes considerable time and expertise, samples provide a wealth of knowledge regarding a student's language ability (Miller et al., 2016) SLPs can glean valuable information about a child's grammatical knowledge, vocabulary, phonological, and pragmatic skills dependent upon the type of sample elicited.

Both macro- and microstructure of a narrative sample can be analyzed to get a full picture of the child's authentic language abilities. Macrostructure analyses focuses on the global hierarchical organization of the sample, such as use of story grammar and episode complexity. Microstructure, on the other hand, focuses on the internal linguistic structure of the sample. Lexical diversity and complexity can be analyzed through mean length of utterance, total number of words, number of different words, and type-token ratio. Cohesion and sentence structure complexity may also be assessed. Microstructure level analyses can be clinically useful for identifying African American children with language impairment.

Burns et al. (2012) used picture sequences to gather a language sample in order to assess four elements of narrative production. The four elements included reference contrasting (i.e., distinguishing characters using noun and prepositional phrases), temporal expressions (i.e., using adverbial conjunctions such *next, then,* or *later*), mental state descriptions (i.e., demonstrating theory of mind), and understanding behavior based on false beliefs (i.e., being able to inhibit one's own beliefs and identify the character's beliefs). A composite index was calculated across performance on all four elements and results revealed scores favoring typically developing children. Considered individually, results suggest that cohesion elements (i.e., reference contrasting and temporal expressions) were most informative for differentiating clinical status for children ages 4- to 6-years old. In contrast, differences in evaluation elements (i.e., mental state descriptions and understanding of false beliefs) between clinical groups were robust across the entire sample of children from 4- to 9-years-old.

Much of the research done to learn more about the characteristics of AAE utilized LSA in their methods. Craig and Washington (2000) found that mean length of communication unit, number of different words produced, and frequency of complex sentences accurately distinguished African American children diagnosed as language impaired from typically developing chronologically age-matched peers. In 2004, Washington and Craig utilized the aforementioned language sample microstructure analyses as a part of a larger assessment battery to determine the

specificity and sensitivity of a screener in accurately identifying children ages 3–5 with language impairment. The screening, which included a picture description task, accurately identified all children with language impairment when compared to performance on the more comprehensive language assessment (Washington & Craig, 2004). Coupled together, these findings suggest that LSA can be utilized in clinical practice with African American children as an ecologically valid addition to a norm-referenced language assessment battery.

4 General Conclusions & Discussion

This chapter examined how language assessment, and ultimately the diagnosis of language disorder, is impacted by cultural dialect differences and socioeconomic disadvantage using AAE- speaking children as a case in point. As the most researched cultural dialect in the United States, the findings of this body of work has implications for the study of language development and disorders with other cultural dialects primarily spoken by individuals from a lower social class. The study of language assessment and disorders in the context of AAE also has implications for multilingual children whose first language differs from the standard and the language of instruction in school. African Americans, language-minorities, and children from low socioeconomic status backgrounds are underdiagnosed as having language impairment and are significantly less likely to receive government-funded early intervention (Morgan et al., 2016b). These same groups, in spite of having the highest incidence of language impairment (Tomblin et al., 1997), are disproportionately underrepresented in government-funded special education for school-age children (Hibel et al., 2010; Morgan et al., 2015). Undoubtedly, this disparity in access to intervention services contributes to increased risk for academic failure.

Introduced by the American Speech-Language-Hearing Association in the early 1980s, the phrase *difference versus disorder* was used to represent the complicated nature of diagnosing language impairment in culturally and linguistically diverse populations. When the Position Statement (ASHA, 1983) was published, there was a dearth of empirical evidence on the manifestation of language disorders in children whose first language (or dialect) was different from MAE. Therefore, professionals had limited information to reference as a guide in clinical decision-making. Fast-forward almost four decades and there is now a substantial and ever- growing evidence base as it relates to a clinical profile of language disorders, not only with AAE-speaking children, but with other nonmainstream dialect groups, such as Southern White English (Oetting & McDonald, 2001). Now, we also know a great deal about similarities in the manifestation of language disorder across various languages (Bortolini et al., 2002; Gutierrez-Clellen et al., 2006; Hansson & Nettelbladt, 1995; Paradis, 2010). The findings of this body of work warrant a shift in mindsets, to be reflected in practice, regarding the way in which the field of language development and disorders has been conceptualized in the context of cultural, linguistic, and socioeconomic differences.

Like the Position Statement (1983), the reauthorization of the Individuals with Disabilities Education Improvement Act (IDEA, 2004) was well-intended in that one of the core purposes was to reduce misdiagnosis of learning disabilities in the form of overrepresentation in special education on the basis of race/ethnicity, culture, language background, and socioeconomic status. However, the unintended fallout from the exclusionary language has led to educational practices motivated by mutually exclusive thinking (*disability* OR *difference*). In fact, Morgan et al. (2016a) suggests that the reauthorization of Individuals with Disabilities Education Improvement Act (2004) may have been misguided by early accounts of supposed overrepresentation. In a recent systematic review, Morgan et al. (2016a) found studies that robustly controlled for individual-level factors, such as socioeconomic status and academic achievement, were more likely to report underrepresentation of Black children, whereas studies that included fewer control variables or inadequate covariates more often reported overrepresentation. Another possible explanation for contrary findings is research methodology. The fact that a child's special education status can change as they progress through school suggests that findings from cross-sectional studies should not solely be used to characterize the current landscape of special education. Instead, longitudinal studies can be used to model trends in disproportionality over time. Other methodological differences in studies include sample size, geographic region of the sample, and overall school demographics. Hibel et al. (2010) have described a significant "frog-pond" effect where school-level factors, including achievement and proportion of minority students, have significantly predicted special education placement. Specifically, low-performing children attending high-performing schools were more likely to be identified as manifesting a learning disability than children attending schools made up of majority-minority students. In fact, Hibel et al. (2010) found that controlling for school proportion of minority students completely accounted for underrepresentation of Black children. This body of work suggests, at least to a certain degree, that findings of overrepresentation perpetuated by earlier work may have been due to cursory methodology.

To increase sensitivity, revisions of widely used assessments have been published. Most often, the revisions have included incorporating a stratified sampling method to develop norms, modifications of existing items to try and reduce cultural and/or linguistic interference, and the introduction of recommendations for scoring modifications. However, these adjustments have not been enough. In the field of language disorders and learning disabilities there is a critical need for the development of norm-referenced assessments wherein the norming sample is representative of the intended population (Washington & Lee-James, 2020). Other factors cited in the literature include lack of consideration for level of English proficiency (Sullivan & Bal, 2013), oversensitivity to disproportionate representation on behalf of teachers and other educational personnel which may lead to more caution when referring children from diverse backgrounds (Hibel et al., 2010), and family's lack of access to quality healthcare and childcare (Blanchett et al., 2009; Morgan et al., 2016b).

The assertion that a specific learning disability, "does not include a learning problem that is primarily the result of… visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or

economic disadvantage" (IDEA, 2004) is immensely detrimental language. As it is written, this language could be misinterpreted and erroneously applied in evaluation – especially by professionals who lack experience with culturally and linguistically diverse populations and in-depth understanding of developmental disabilities. In the most extreme circumstances, this excerpt could be used as justification for denying services to children who desperately need it.

To this end, the field of learning disabilities is shifting away from the pervasive notion that reading disabilities cannot exist with linguistic differences and socioeconomic disadvantage. Additionally, the field is recognizing the fact that the perspective that certain groups of children are immune to disabilities is unfounded scientifically, ethically immoral, and serves to systematically exclude children from receiving educational services to which they are entitled by federal law. Specifically concerning African American children, scholars have begun to investigate how reading difficulties manifest in child dialect speakers from low socioeconomic status backgrounds and the implications for assessment and diagnosis from emergent literacy development to the point at which children are expected to read for comprehension (Washington et al., 2018).

As the scientific community continues to investigate language disorders and/or learning disabilities *within* linguistic and socioeconomic differences, it is equally important to ensure that this dialogue is encouraged among in-service professionals as they have the capacity to make an immediate impact with children. Most notably, if we are to impact the illiteracy crisis plaguing the United States., the next generation of educators and speech-language pathologists, and every generation thereafter, must receive explicit pre-service education and clinical training with culturally and linguistically diverse populations.

The two guiding questions of this chapter were motivated by general lack of consensus in the field surrounding best practices in assessment with African American children who are considered vulnerable for underachievement in language and literacy due to cultural dialect use and income status. The first question was *which aspects of language are critical for inclusion in assessment given the overlap among clinical indicators of language impairment, dialect appropriate characteristics of AAE, and risks associated with economic disadvantage?* It is critical to focus on aspects of language that could be indicative of one or all of the three conditions in order to underscore, even in the face of feature overlap, that identified clinical indicators of impairment for African American children are consistent with indicators of impairment identified for the general population. Furthermore, it is crucial to demystify the value of contrastive aspects of language, especially in early childhood, in order to emphasize the importance of developing a comprehensive language profile inclusive of a child's strengths and weaknesses. Doing so bolsters sound clinical decision-making and provides an informative baseline for an individualized intervention program.

The review of the literature has revealed that grammatical morphology and syntax, expressive vocabulary, language comprehension, nonword repetition, and sentence recall are reliable clinical indicators of impairment with African American children. The study of grammatical morphology and syntax has centered on

children from approximately ages 4 to 7 years old, given that children with language impairment evidence protracted development, namely in tense marking, although these deficits appear to dissipate, at least to some degree, by age 8 (Oetting & Hadley, 2009). In addition, there is limited published work to date examining the impact of dialect use on sentence repetition skills for African American children with language impairment. While deficits in sentence recall ability have been documented for older children (Conti-Ramsden et al., 2001), published data with AAE speakers are limited for children older than 6-years-old. Thus, the literature on grammatical morphology, syntax, and sentence recall, in conjunction with the aforementioned measures, should be considered for assessment with children during the first years of formal education. Taken together, grammatical morphology and syntax, expressive vocabulary, language comprehension, nonword repetition, and sentence recall ability, though not exclusive, comprise a core set of assessment targets to be evaluated in assessment with African American children.

The second question we addressed was the following: *During early childhood, what are evidence-based assessment recommendations for African American children and children reared in poverty?* The impetus for this question was the need to highlight methods of assessment that have the potential to increase confidence in clinical decision making in an effort to improve service delivery for African American children. In spite of their shortcomings, norm-referenced assessments remain the gold standard in evaluation and must be employed to qualify children for early intervention and special education. However, if implemented, universal screening, RTI, and LSA will provide a comprehensive profile of the child's ability in both contextualized and decontextualized situations. There are two important points to mention with regard to assessment. The first is that, in order to qualify for special education, the child's weaknesses, in this case suspected language disorder, must negatively impact their academic performance. This is why assessing within an RTI framework is important and should provide an opportunity to develop a learning profile for the child, as well as facilitating the gathering of achievement data. Universal screening and RTI are tied together such that universal screening is the starting point for implementing high quality, evidence-based tiered instruction. Secondly, speech-language pathologists should be involved in the RTI process prereferral in the ways discussed above to support teachers in providing instruction for all students but especially those who are suspected of having a language or learning disability. Given their unique training in typical and atypical oral and written language acquisition, speech-language pathologists have the knowledge and skill to support students' learning, including those who are considered "at-risk."

Using LSA as a form of assessment takes considerable time and clinical expertise if reliable information is to be gleaned. LSA can be used as a criterion-referenced assessment to provide support for or clarify norm-referenced data. For example, considering the child who omits grammatical morphemes on a norm-referenced measure, LSA provides an opportunity to examine whether the child produces any dialect-appropriate marking options that the standardized assessment paradigm either did not elicit or permit. In addition, LSA offers clinicians an ecologically valid measure of all language domains, including form, content, and use.

What the field needs is published expectations for grammatical morphology and syntactic features for African American children. Having standardized expectations or cut points for dialect groups with and without language impairment would allow speech-language pathologists to make objective decisions based on naturalistic and authentic data gathered from LSA. We know that dialect density varies by age, socioeconomic status, and geographic region; therefore, future research to develop such standards must take these factors into consideration.

Through utilizing the assessment methods detailed in this chapter to inform instruction and intervention, we hope to see the academic trajectory of African American students in the United States. rise. It is imperative that these evidence-based methods are disseminated to speech-language pathologists, educators, and other practitioners. Being able to accurately identify language impairment in the face of dialectal and socioeconomic differences in early childhood is obligatory for the development of literacy.

Appendices

Appendix A: Features Common Across African American English (AAE)

Feature	AAE	MAE
Zero copula	You _ mad at Betty.	You are mad at Betty.
Zero plural	The two girl_ like to play.	The two girls like to play.
Zero past -ed	He kick_ the ball.	He kicked the ball.
Subject verb agreement, also known as omission of third person plural	She go_ to the store.	She goes to the store.
Multiple negatives	He didn't do nothing bad.	He didn't do anything bad.
Habitual be	It be warm outside.	It is [usually] warm outside.
Zero possessive	The girl_ mom taught her to bake cookies.	The girl's mom taught her to bake cookies.
Preiterite had	It had rained all day.	It rained all day.
Wh-noninversion	Why this one won't sit?	Why won't this one sit?
Omission of Do	How _ you get up here?	How do you get up here?
Omission of Have	I _ only been there a few times.	I have only been there a few times.

Note. Features based on Craig and Washington (2004) and Oetting and McDonald (2001)

Appendix B: Clinically Informative Structures from Extant Literature

Past tense irregular[a]
Third-person irregular[a]
Non Inversion of WH-questions[a]
Auxiliary *am, is,* and *are*[b]
Subject Relatives *that, who,* and *which*[c]

[a]Based on Oetting and McDonald (2001)
[b]Based on Garritty and Oetting (2010)
[c]Based on Oetting and Newkirk (2008)

Appendix C: Dialect-Appropriate Marking Options for Major African American English Features

Past Tense (Simple past contexts)	Overt Zero Participle Preterite Had Overregularization	The boy kicked the ball. The boy kick the ball. The boy seen the cat. The boy had kicked the ball. The boy falled down.
Copula & Auxiliary BE	Overt	The boy is tired. They are sleeping. The boy was tired. They were sleeping.
	Zero	The boy _ tired. The boy _ riding his bike.
	Substitution	They is tired. (is for are) They was tired. (was for were)
	Nonstandard[a, b]	I'm are ringing. I'm is singing.
	Habitual	They be tired. They be playing that game all the time.
Third-Person Singular	Overt	He plays basketball after school.
	Zero	He play_ basketball after school.

[a]Constrained to early development
[b]Observed with auxiliary verb forms
[c]Used to mark an ongoing or extended event

Appendix D: Oral Language and Literacy Screener Components for Pre-K Through Primary Grades

Pre & K	1st – 3rd
Listening comprehension	Listening & reading comprehension
Vocabulary	Vocabulary
Nonsense word repetition	Nonsense word repetition
Phonological & Phonemic awareness	Phonemic awareness
Rapid automated naming	Rapid automated naming
Alphabet knowledge	Nonsense word reading[a]
Letter-sound correspondence	Fluency

[a]Nonsense word reading may also be appropriate for later in Kindergarten

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Assessing Diglossic Knowledge and Awareness in Language and Literacy: Pilot Results from the Syria Holistic Assessment for Learning (SHAL)

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1 Introduction

1.1 Literacy Assessment and Diglossia in Arabic

Several unique characteristics are associated with the experience of language and literacy learning in bidialectal/diglossic situations (Ferguson, 1959). The first relates to a differentially-perceived status of the two language varieties, whereby the dialect/variety used for literacy is perceived to be more prestigious and used for formal communication, whereas the one used for daily communication is mostly perceived to be less prestigious by members of the speech community. The second characteristic relates to the different learning mechanisms associated with acquiring or learning the two varieties. In the early stages of learning, one is associated with explicit linguistic knowledge supported by declarative memory mechanisms, while the other is associated with implicit linguistic knowledge and underpinned by implicit memory mechanisms (Khamis-Dakwar, 2019). In Arabic-speaking communities, Modern Standard Arabic (MSA) is used for reading and writing, perceived as the prestigious variety, and is acquired only if it is accessed through formal education (Ferguson, 1959). On the other hand, the various spoken dialects of Arabic are

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acquired naturalistically, are not dependent on formal education for acquisition, and are perceived as less prestigious by speech community members. Thirdly, the two language varieties in diglossic situations may exhibit linguistic features that overlap or that instantiate mismatches within all language domains.

Overall, these features of diglossic situations suggest there exists a characteristic trajectory of language representation and processing for the two language varieties, dependent on input and experiences with MSA. Under typical circumstances, such MSA-mediated experiences would peak on school entry in diglossic communities; this contrasts with learning contexts in which a uniform linguistic system is used for both daily communication and for literacy development (for a review, see Khamis-Dakwar, 2019). The sparse research into diglossia and language assessment has already provided useful insights into the impact of diglossic features on the typical development of phonological representations (Khamis-Dakwar & Makhoul, 2014; Saiegh-Haddad & Haj, 2018), phonological awareness (e.g., Asadi & Abu-Rabia, 2019; Saiegh-Haddad, 2003, 2007; Saiegh-Haddad et al., 2020), morphological awareness (Khamis-Dakwar et al., 2012; Khamis-Dakwar & Makhoul, 2014; Schiff & Saiegh-Haddad, 2018) and decoding accuracy and fluency skills in children (Saiegh-Haddad & Schiff, 2016), as well as in individuals with different language and communication disorders including aphasia, stuttering, autism spectrum disorders (ASD), and dyslexia and developmental Language Disorders (Khamis-Dakwar et al., 2018; Khamis-Dakwar & Froud, 2019; Khamis-Dakwar, 2019; Kissine et al., 2018, Saiegh-Haddad & Ghawi-Dakwar, 2017).

Despite this, most language assessments for Arabic are monodialectal by design and are likely to overlook the presence of diglossia, contrary to what one might expect (however see, Khamis-Dakwar & Froud, 2019; Saiegh-Haddad & Everatt, 2017; Saiegh-Haddad, 2018). Similarly, assessments of emergent literacy in Arabic appear to be administered either in MSA or the dialectal variety, depending on the modality of presentation; that is, oral tasks are mainly presented in the spoken dialect while reading and writing tasks are presented in MSA, reflecting the complementary functional distribution of the two varieties (e.g., Abu-Ahmad et al., 2014; Abu-Rabia et al., 2003; Saeigh-Haddad, 2003; Saiegh-Haddad & Haj, 2018; Tibi & Kirby, 2019). While assessing language and emergent literacy skills in only one language variety may not be the ideal ultimate goal, evaluations that control for diglossic distance have the potential to provide a more comprehensive understanding of children's linguistic abilities given the specific context of language and literacy learning in Arabic diglossia.

Interpreting the state of current practices in the assessment of language and emergent literacy in Arabic diglossia should take into consideration that Arabic language is generally understudied, with a small but growing body of research into Arabic language acquisition (Eligibali, 1996) and clinical linguistics (Khamis-Dakwar, 2020). This may be due to the long-lasting impact of early studies of the spoken dialects, that were conducted mainly by Western scholars or in Western institutions (Versteegh, 1996), and that correspondingly focused on MSA from a traditional grammarians' perspective. Also, there are still only a few academic training programs in speech-language pathology and linguistic studies in the Arab world

(Khamis-Dakwar, 2020). Against this background, we find many scholars and professionals relying on translated or adapted versions of assessments that do not account for diglossia in scoring or administration, because they were created from practices developed for mainstream American or British English-speaking communities where diglossia is not instantiated. Hence, there is a need to develop and standardize authentic assessment tools for Arabic and other diglossic situations, given the impact of language assessment on academic success and access to support services.

Several assessments have been specifically developed to address diglossic contexts in different speech communities, and recent developments in this domain include the addition of controls for diglossic distance in the investigation of emergent literacy skills (e.g. Khamis-Dakwar et al., 2012; Saeigh-Haddad, 2003, 2004) and assessment of emergent literacy. For instance, the Diagnostic Evaluation of Language Variation Screening Test (DELV-ST) (Seymour et al., 2003) and the Dialect Density Metric (DDM) measure (Puranik et al., 2019) were developed for the language evaluation of non-mainstream English dialect speakers. The DELV screener is considered a culturally and linguistically sensitive measure because it features contexts and people from diverse background, and it examines both non-contrastive and contrastive linguistic items. The standardization sample was constructed to reflect the racial and ethnic diversity in the overall population of the United States, and included African American, Asian, Hispanic, Other, and White children aged from 4;0 to 9;11. The DELV linguistic tasks were designed to assess both shared and non-shared features of African-American English (AAE) and Mainstream American English (MAE), and include items that assess universal linguistic features and items for identifying processing difficulties such as nonword repetition tasks. The screener includes 32 items organized into two sections that yield information about the testee's Language Variation Status and Diagnostic Risk Status. The Language Variation part of the screener assesses children's production of specific phonemes and morphosyntactic structures. For example, production of the third person singular marker (s, es) is elicited through a sentence completion paradigm, where the examiner shows a picture and provides a language model: "I see horses. I see a bike. The girls always ride horses, but the boy always…" The testee is then supposed to complete the sentence by producing either the inflected MAE verb ("rides a bike") or the more typically AAE construction without the explicit 3rd person marker ("ride a bike"). Children's responses to the items are analyzed to classify the child's dialect as MAE, some variation from MAE, or strong variation from MAE. The DELV also assesses production of universal morphosyntactic features, such as items to assess knowledge of barriers to syntactic movement (a picture of children playing musical instruments, with the examiner's cue: "This girl played different things in different ways. She played the drums with her feet and the piano with her hands. How did the girl play what?"). The child's responses to items from this section are analyzed as indicating lowest, low, medium, or high risk for a language disorder.

The Dialect Density Metric (DDM; Puranik et al., 2019) is calculated by dividing the number of AAE tokens by the total number of words or utterances produced

by the testee. While the DELV provides information about language variation, the DDM has been used in research to derive some insights into the interplay between language variation and literacy success (Puranik et al., 2019). For Arabic speakers, the Arabic Diglossic Knowledge and Awareness Test (ADAT) was similarly developed to provide insight into the interactions between the two language varieties, and to evaluate explicit understanding of diglossia as well as its implicit processing (Khamis-Dakwar & Makhoul, 2014). The ADAT represents a collaboration between a speech-language pathologist and a learning specialist, and was designed to examine PreK-3rd grade children's explicit knowledge and awareness of diglossia (EKAD) as well as their phonological, lexical, and grammatical knowledge, while controlling for structural differences between the two language varieties. The EKAD subtest of the ADAT asks children directly about their knowledge of the two language varieties in diglossia, the relevant contexts of use, the interrelationships between the two systems, and how diglossia interacts with reading and writing (further description of the specific EKAD tasks is provided in Sect. 2.3 below). As a result of the direct probes, this subtest provides unique access to children's explicit knowledge of diglossia, in contrast to phonological or morphological awareness tasks that provide only indirect perspectives on diglossic awareness. Makhoul et al. (2015) reported on the administration of the EKAD subtest from the ADAT to 40 typically developing Palestinian children in Israel (ages 6;11–11;3). Findings revealed that children's awareness of the existence of the two language varieties, and their understanding of the differences between them, develops throughout elementary school (1st–5th grades) and approaches mastery by 4th grade.

There is growing evidence that the mismatch between the language variety/dialect used for daily communication and the one used for reading and writing can impact literacy achievement across diglossic contexts. These effects have been shown in speakers of Cypriot Greek (Grohmann et al., 2016); in speakers of African American English (Washington et al., 2019); and in Arabic-speaking children (Khamis-Dakwar & Froud, 2019; Saiegh-Haddad, 2018) – among others. The impact of diglossia on children's literacy and language can also be seen across different domains, including phonological and morphological awareness (Schiff & Saiegh-Haddad, 2018), morphosyntax, and narrative productions (Leitkin et al., 2013; Ravid et al., 2014). Still, little is understood about the mechanisms that support such effects, and one domain that has received little attention to date is the role of explicit diglossic knowledge and awareness on literacy success, in diglossic speech communities in general and Arabic-speaking communities in particular.

The impact on literacy development of a metalinguistic awareness of diglossic variation has been explored in students who are speakers of African American English (Devereaux & Palmer, 2019; Pearson et al., 2013), and those who are speakers of Cypriot Greek (Tsiplakou et al., 2018). These observations align with evidence supporting the effectiveness of training in codeswitching for academic success in diglossic/bidialectal situations (Devereaux & Palmer, 2019; Pearson et al., 2013; Tsiplakou et al., 2018). This approach derives from an

acknowledgment of the importance of linguistic awareness and codeswitching for reading success in diglossic communities (e.g. Puranik et al., 2019; Terry et al., 2010). According to the linguistic awareness/flexibility hypothesis (Terry et al., 2010), the transition between diglossic language varieties in service of the differentially distributed sociolinguistic functions associated with each language variety may not always be a smooth process. The ability to introspect into the linguistic features of the variety used for communication versus that used for reading and writing can support success, especially where this interacts with literacy. Such metalinguistic awareness has been measured by children's ability to shift between the two linguistic systems in diglossia (e.g., Terry et al., 2010), but it may be possible to explicitly and directly assess children's knowledge of the distinctive features of diglossia in their speech community contexts.

Preliminary evidence from administration of the EKAD subtest in the ADAT indicates that children in diglossic speech communities develop explicit awareness of the existence and functions of the two language varieties during elementary school years, up to around the 4th grade (Makhoul et al., 2015). Many other skills are emerging during this developmental period, and it is important to understand the ways that diglossic awareness might support or interact with those skills. Further understanding of children's successful literacy development in diglossic situations would benefit from more comprehensive insights into children's knowledge and their exposure to MSA during the process of learning to read and write, including explicit knowledge of diglossia. But the influence of diglossic awareness likely extends further, into domains that rely on language processing for successful engagement such as mathematical reasoning. The creation of an assessment of holistic learning for use in Syrian educational contexts provided an opportunity to investigate those inter-domain interactions and dependencies while primarily serving the specific educational needs of those working in war-impacted communities.

The effects of geopolitical conflict and war on education have been recognized in light of the social, economic, and familial changes associated with migration and family separation and loss in these contexts. Studies reveal impacts on academic success (e.g. Trani et al., 2019) as well as on social-emotional and behavioral development (e.g. Al-Krenawi & Graham, 2012; Shaw, 2003; Thabet et al., 2009). Similar findings are reported as a result of the Syrian crisis for children living in Syria and neighboring host countries, showing that the war is impacting children's academic (International Rescue Committee, 2017) and social emotional development (Khamis, 2019; Perkins et al., 2018; Sirin & Rogers-Sirin, 2015). Another effect of the conflict is to significantly reduce children's opportunities for exposure to, and use of, MSA which is considered the "High" variety of Arabic (Ferguson, 1959); we argue that this is likely to have negative effects on literacy development, which depends on exposure and use of the standard variety within speech communities.

1.2 Assessing Diglossia in the Emergency Context of Syria

Humanitarian emergencies impact children in many ways: not only survival, but any sense of dignity, normalcy, continuity and hope are endangered. Education ameliorates these effects, but refugee crises compromise access to education for those most in need. For example, the Education for All Global Monitoring Report (UNESCO, 2011) showed that most marginalized community members do not get access to education, and highlighted the need for valid and reliable measurement tools: "Post-2015 education goals will only be achieved if they are accompanied by clear, measurable targets with indicators tracking that no one is left behind" (UNESCO, 2011, p.5).

Since the UNESCO report, comparatively more effort has been dedicated to the development and adaptation of culturally sensitive, psychometrically sound formative assessment tools for field evaluation and monitoring of holistic education in crisis contexts; but there remains a need for more work in this direction. Holistic approaches to assessment are critical given the well-documented interrelationships between different cognitive and learning domains (Kim et al., 2020) and the limited feasibility of administering many separate tests in humanitarian field-based contexts. Nevertheless, the most commonly-used literacy and social emotional assessment tools are designed within an Anglo-centric perspective and do not account for the cultural and linguistic variations and characteristics specific to the languages and cultures of the assessed populations. For example, in a scoping review conducted by NYU's Global TIES for Children in 2018, 138 researchers and practitioners reported that they use bespoke and/or established measurement tools, especially the Early Grade Reading Assessment (EGRA) (RTI International, 2009) and the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997); but the EGRA examines literacy alone[1] while the SDQ examines social-emotional skills in isolation. This siloed approach means that there is effectively no holistic evaluation of the child's skills, and the assessments derived from tests originally developed in English (and within Western lived experiences) offer limited reliability and validity when used in crisis contexts (e.g., Bartlett et al., 2015; Dowd & Bartlett, 2019; Halpin & Torrente, 2014). Montjourides (2013) further highlights the need for valid and reliable data to evaluate the extent to which children are learning in conflict-affected contexts. The quality and quantity of data collected are often compromised in these contexts for a number of reasons, such as security concerns restricting the amount of time assessors and children can spend in one area, traumatic stress reactions that may impact the child's and assessors' attention, and/or funding restrictions meaning that other needs are prioritized (Tubbs Dolan, 2019).

[1] In addition to the silo effect, assessments like EGRA are known for serious psychometric limitations that should also limit their use as standalone assessments. For example, EGRA's propensity for floor effects, whereby a majority of children score zero on the test, has been demonstrated in the Democratic Republic of Congo (Halpin & Torrente, 2014), Niger (Kim et al., 2019), Ethiopia (Piper, 2010), and Mali (Spratt et al., 2013).

Prior to the civil war, Syria had developed a series of formative assessments that were central to the Syrian curriculum (UNESCO & ALESCO, 2014). However, the Syrian educational system was severely impacted by the war when around 150,000 teachers either fled or were killed. Currently about three million Syrian children do not have access to schooling, and those who do attend school are exposed to different curricular approaches depending on location. They may also experience rapid and repeated shifts in curricula as they undergo forced migration. Such situational limitations mean that educational infrastructure, training, teacher skill, and quality are all compromised, rendering even more imperative the efforts to develop culturally appropriate, feasible, and psychometrically sound formative assessment tools that are linked to support materials and classroom activities (Tubbs Dolan, 2019).

Despite increasing recognition of the need for a holistic approach to learning in humanitarian contexts, elementary-level assessments still focus on assessing academic skills such as literacy (e.g., Annual Status of Education Review (ASER), Pratham, 2013; EGRA, RTI International, 2009) or numeracy (ASER, Pratham, 2013; EGMA, RTI International, 2009); or emphasize social-emotional skills, either via comprehensive assessment (SDQ, Goodman, 1997; Children and Youth Resilience Measure-12 (CYRM-12), Panter-Brick et al., 2017; International Social-Emotional Learning Assessment (ISELA), Save the Children, 2019; Developmental Assets Profile – Emergency (DAP-E), Scales et al., 2015) or via discrete skill assessments (3EA Technical Memo, 2018, Dodge et al., 2015, Ford et al., 2019) (for review, see Tubbs Dolan, 2019). In crisis contexts it is largely not feasible for staff to administer multiple measures – each of which can take 20–30 min – for routine monitoring and evaluation purposes. The usual alternative is a kind of "Frankenstein's Monster approach" (Tubbs-Dolan, 2019, p.10) whereby measures are assembled from various assessments, based on alignment with program goals and contextual relevance. However, this approach ignores the consequences for the psychometric validity of the assessment measures, compromising the accuracy, reliability, and usefulness of the resulting data.

2 The Syria Holistic Assessment for Learning (SHAL)

2.1 Introduction

The Whole of Syria (WoS)/Education Cannot Wait (ECW) Syria Holistic Assessment for Learning (SHAL) tool is one of the first holistic measurement tools designed for use with primary school-aged children to result from investments following the creation of ECW as part of the Grand Bargain at the World Humanitarian Summit in 2016. The SHAL tool – and the process of developing, adapting, and testing the tool – are unique in several ways. First, very few early grade learning assessments have been designed from the outset for use in conflict- and post-conflict settings,

which pose unique challenges to the assessment process. Second, the tool is designed to prioritize a holistic approach to learning – capturing social-emotional as well as academic skills – without compromising the feasibility of assessment. Third, while many initiatives focus on applying rigorous methods to the development of assessments for monitoring and accountability purposes, the WoS/ECW project did so for an assessment designed for formative purposes. The tool is intended to provide teachers and schools in the WoS response region with information about the Arabic literacy, numeracy, and social-emotional skills 2nd and 3rd grade students have mastered and those that require further support, enabling teachers to identify and implement activities responsive to learning levels. Fourth, the tool was assembled and revised based on a consultative process convened by Save the Children and UNICEF to triangulate child developmental research, psychometric, and policy insights from regional literacy and numeracy experts, practitioners with knowledge of the Syrian curriculum, and developmental psychologists with expertise in applied psychometric analysis. Finally, the tool was not only piloted with a sample of children in Syria (1456 in grades 2 and 3) to understand the psychometric properties, but was additionally piloted with teachers in Syria (26 in 4 schools) to understand the feasibility of its administration in the classroom by educators with varied levels of professional training as well as the utility of the results to inform instructional practice. Given often limited time and resources, such an intensive and rigorous measure development and piloting process is rare in crisis contexts (Tubbs Dolan, 2019).

2.2 Development Process

The SHAL assessment was designed with specific assessment content, purpose, and context in mind: it is a holistic assessment intended to provide data for formative purposes to teachers in the Whole of Syria response. This clarity of purpose and form – and knowledge of the necessary implications for test content, structure, and psychometric criteria – guided decision-making through a consultative and collaborative test development and piloting process. This consultative process proceeded in seven phases: (1) secondary analyses of existing and relevant literacy, numeracy, and social-emotional assessment data in the Syrian response region; (2) triangulation of secondary psychometric results with theory and practice at a workshop with regional experts, curriculum specialists, and developmental psychologists with expertise in applied psychometrics; (3) integration, assembly, and piloting of the SHAL; (4) pilot psychometric analyses; (5) triangulation of psychometric results with theory and practice at a second consultative workshop; (6) piloting with teachers in Syria to test the feasibility of administration and the appropriateness of classroom activities linked with the results of the assessment; and (7) final revisions of the tool and associated components of the toolkit following the feasibility pilot (Tubbs Dolan, 2019).

2.3 Measure Structure

The pilot version of the SHAL was organized into three sections corresponding to three developmental domains – literacy, numeracy, and social-emotional. Responses to and a description of the social-emotional domain are not reported here because there is no hypothesized link between EKAD, which is dependent on exposure to MSA, and performance on the social-emotional domain tasks, which are administered and responded to in the spoken variety. The literacy and numeracy domains each contain 6 subtasks, or groupings of items hypothesized to capture information about a specific skill within a developmental domain (e.g., letter sound identification within the literacy domain). The EKAD subtask was added to the literacy domain, for a total of 7 subtasks in that domain. Items refer to discrete questions or prompts within subtasks that are scored on a binary (0 = incorrect/no, 1 = correct/yes) scale, with an additional option to record nonresponse/don't know (999). SHAL subtasks were largely inspired by and assembled from subtasks of existing early learning international assessments (e.g., the Early Grade Reading Assessment, the International Social Emotional Learning Assessment) that upon extensive review demonstrated good psychometric properties in use in the Syrian response region, made conceptual sense based on child developmental theory and research specific to Arabic children, and aligned with Syrian curriculum goals. Before piloting, however, items within subtasks were revised by a team of regional experts to ensure contextual, developmental, and linguistic appropriateness, and subtasks were further adapted for use as a formative assessment in the Syrian context. Below we present the structure of the pilot holistic measure, providing a summary of the subtasks and items within the literacy and numeracy domains (Tubbs Dolan, 2019).

2.3.1 Literacy Domain

The literacy domain contains six subtasks designed to assess children's Arabic linguistic processing, decoding, and comprehension skills, as well as their knowledge of Arabic language structure. Subtasks were designed and adapted to account for diglossia and other unique characteristics of the Arabic language (e.g., multiple letter forms, orthography). Metalinguistic awareness was measured using items from the Arabic Diglossia Awareness Test (ADAT: Khamis-Dakwar & Makhoul, 2014). The ADAT examines explicit knowledge and awareness of diglossia as well as phonological, lexical, and morphosyntactic abilities while controlling for matching of the examined features between the two language varieties. The SHAL included two items examining explicit knowledge and awareness of diglossia (EKAD) from the ADAT: (1) Do you know that in Arabic there is a Fusha (common term in Arabic for MSA) and Ammiya (common term in Arabic for the spoken variety in a particular community)? (grade 2: 28% aware; grade 3: 49% aware); and (2) If yes, can you give me an example of when you use Fusha and when you use Ammiya? (grade 2: 39% gave a correct example; grade 3: 50% gave a correct example). The ratings of

children's answers to the explicit knowledge and awareness of diglossia tasks were based on the ADAT coding (Makhoul et al., 2015). The answer key assigns a numerical value for full or partial answers, and zero for irrelevant/no answer. For example, for the first question asking, "Do you know that in Arabic there is a Fusha and Ammiya, what are these two?", a child's answer is considered complete and assigned 2 points if they address differential contexts of use of Fusha and Ammiya (e.g., "Yes, we use Fusha for writing and Ammiya when we speak at home") or the interrelationship between Fusha and Ammiya (e.g., "Yes, we say X in Fusha but in Ammiya Y"). If the child only explains about one variety and does not draw a connection or comparison between the two varieties (e.g., "In Fusha we say X," without also explaining how X is expressed in Ammiya), that is coded as a partial answer and assigned 1 point. If the child's response does not address either Fusha or Ammiya, or relates to a different topic, that is coded as irrelevant/lack of answer and assigned zero points. Hence, EKAD item 1 was scored on a binary (0 = no, 1 = yes), and item 2 was asked conditional upon a "yes" response to item 1. This skip pattern results in a so-called "Guttman scale," which implies structural zeros in the two-way tables between items. Because this limits traditional psychometric analysis, the two items were combined into a single item with 3 response categories: (0 = no, 1 = partial, 2 = complete).

The SHAL controls for diglossic features in its design by ordering the items in the letter sounds[2] and familiar words subtasks from least difficult to most difficult, as hypothesized by the match between MSA and Syrian Arabic. The results from the pilot largely confirmed the hypothesized difficulty of the items based on this match. Table 1 below summarizes the SHAL literacy domain subtasks.

2.3.2 Numeracy Skills Domain

The numeracy domain contains six subtasks designed to assess children's number and operations proficiency with Eastern Arabic/Indian numerals. Subtasks were designed and adapted to account for when and how numeracy concepts are introduced and tested in the Syrian curriculum and to provide procedural information important for formative purposes. Table 2 below summarizes the SHAL numeracy domain subtasks.

[2] The task included 50 letter sounds. The letter sounds were categorized based on their age of acquisition (i.e., Early, Intermediate, or Late) as well their overlap with MSA and shape consistency. Age of acquisition was determined with respect to the closest Arabic dialect with available milestones, due to the lack of research on phonological development in the Syrian dialect. For example, the letter sound ء is one of the first presented items in this subtest, because (a) it is acquired early in phonological development; (b) the /du/ sound fully matches in MSA and Syrian Arabic; and (c) the shape of the letter does not change depending on its location in the world. At the other end of the continuum is the item ﺙ /θi/, a phoneme that is acquired late in the course of phonological development, is absent from the Syrian dialect (commonly substituted with /t/ as in θaʕlab (MSA) ➔ taʕlab (Syrian) for fox, θalʒ (MSA) ➔ talʒ (Syrian) for snow), and a letter shape that changes depending on where it appears in written contexts.

Table 1 Summary of SHAL Literacy Subtasks

Subtask	Number of items	Description	Different grade versions?
Metalinguistic awareness (Explicit knowledge and awareness of diglossia – EKAD)	2	Child asked to demonstrate awareness and understanding of the difference between MSA and dialect through responses to two orally-administered questions	No
Letter sounds	50	Child asked to orally identify letter sounds plus following vowel based on the different diacritics on the letter; order of presentation was based on match between MSA and dialect	No
Familiar words	25	Child asked to read out loud high-frequency unvoweled words from Syrian curriculum, ordered based on match between MSA and dialect	Yes
Oral passage reading	82 words (grade 2) 128 words (grade 3)	Child asked to read out loud a short passage in MSA (with vowel diacritics)	Yes
Reading comprehension	6	Child asked to respond to four literal and two inferential questions about the reading passage read in the previous subtask	Yes
Listening comprehension	6	Child asked to listen to a pre-recorded passage in MSA and respond to questions orally	No
Word definition	6	Child asked to provide definition of words from the reading passage	No

3 Methods

3.1 Participants and Measures

Data for this study come from a sample of Syrian children (N = 1456) in grades 2 and 3, the majority of whom were randomly sampled from formal and non-formal education sites (J = 263) in the Northeast (n = 259, j = 93), Northwest (n = 969, j = 234), and Euphrates Shield (n = 137, j = 27) regions of Syria. Sampled sites were 47.9% urban, 42.6% rural, 5.7% mixed, and 3.8% camps for IDPs. On average, five children were sampled per site, although the range varied from two students to fifteen students. An additional 91 children were assessed as enumerators went door-to-door in certain locations given difficulty in locating schools on administrative lists. These home administrations comprised 5% of children sampled in Northwest Syria, 12% of children sampled in Northeast Syria, and 1% of children

Table 2 Summary of SHAL Numeracy Subtasks

Subtask	Number of items	Description	Different grade versions?
Number identification	20	Child asked to orally identify numbers on a stimulus, ordered by difficulty	No
Number discrimination	10	Child asked to orally identify larger number between two numbers on a stimulus	No
Missing number	10	Child asked to orally identify missing number in a series of numbers with increasing pattern difficulty	No
Addition	7	Child asked to add single and double digit numbers presented on a stimulus, ordered by difficulty	No
Subtraction	6	Child asked to subtract single and double digit numbers presented on a stimulus, ordered by difficulty	No
Word problems	6	Word problems including: Traditional approach: simple solution of problem provided orally and in written form to child New approach: child asked to explain comprehension of problem, plan the process of solving, execution of the plan, and/or verification of the solution	Yes

in the Euphrates Shield. All children were administered the SHAL pilot assessment tool.

Children in grade 2 (n = 741) were on average 8.05 years old (SD = .92, range = 6–12 years) and children in grade 3 were on average 9.15 years old (SD = 0.88, range = 8–14 years). On average across the sample, students were 8.6 years old (SD = 1.05, range = 6–14 years) and 48% female. The majority of students reported speaking Arabic at home (97.3%), with a small minority reporting speaking Kurdish (1.72%) or multiple languages at home (1%). A majority of children reported living with both their mother and father (88.0%; n = 1281). About half of children reported that their caregiver reads to them and that they see other people reading in the home (54.3%; n = 790) but 20.67% of children reported experiencing neither.

3.2 Predictions

Based on the linguistic flexibility hypothesis (Terry et al., 2010), and the observed dependence on explicit learning mechanisms (through education) for the early stages of learning MSA for reading and writing, we predicted that increased explicit knowledge and awareness of diglossia would be associated with enhanced reading skills in Arabic diglossia. We further predicted that explicit knowledge and

awareness of diglossia would be negatively impacted in the context of the geopolitical conflict in Syria, and that measurements of such explicit diglossic awareness could predict other aspects of academic attainment for Syrian Arabic-speaking children who are living through that situation.

3.3 Analyses

To reduce measurement error as well as to avoid the likelihood of Type I errors, refined factor scores were created for overall literacy and numeracy competency. Factor scoring is preferable in this case to traditional sum scoring methods given that factor scores account for: (1) the weight of individual item loadings; and (2) shared variance between the items and the factors and measurement error (DiStefano & Zhu, 2009). The factor scores were calculated by fitting confirmatory factor models separately by grade, using a maximum likelihood estimator with standard errors that are robust to non-normality and non-independence of the data (Muthén & Muthén, 1998; for an overview of psychometric analyses, see Tubbs Dolan, 2019). For literacy, the observed indicators in the confirmatory factor analysis (CFA) models were familiar word reading, oral passage reading fluency, and reading comprehension subtask scores. For numeracy, the observed indicators in the CFA models were missing numbers, addition, subtraction, and word problem subtask scores.

There was a small amount of missing data (<2%) on the following variables: age, read to by caregiver, seeing anyone in the home reading, letter sound identification, and number identification. A multiple imputation by chained equations (MICE) approach was applied to impute each variable, using a model tailored to its distribution (e.g., continuous, binary, interval, etc.; White et al., 2011). Data were imputed separately by grade, using as predictor variables literacy and numeracy subtasks scores as well as multi-level modeling (MLM) covariates, resulting in 25 multiply-imputed datasets (Graham et al., 2007).

Since there was significant variation in literacy and numeracy factor scores by school, a multilevel mixture modeling analysis was applied to the imputed data, with children nested in schools. Predictors (age, and the literacy and numeracy factors) were school-mean centered, resulting in unbiased estimates of within-cluster regression coefficients by removing between-cluster variation (Enders & Tofighi, 2007). This provided an interpretation of the extent to which EKAD is associated with higher or lower scores in a particular school.

3.4 Results

Findings from the multilevel mixture modeling analysis on literacy and numeracy skills are reported in Tables 3, 4, 5, and 6 below.

Table 3 2nd grade literacy: significant predictors

		b	SE	t	p
Demographic covariates	Gender	0.028	0.042	0.660	0.511
	Age	0.013	0.031	0.420	0.673
	Caregiver reads to child	0.272	0.056	4.880	<0.001**
	Seeing someone reading	0.107	0.058	1.840	0.066
Literacy and numeracy predictors (school-mean centered)	Combined Numeracy	0.241	0.044	5.500	<0.001**
	Letter sound ID	0.020	0.002	9.370	<0.001**
	Vocabulary (definitions)	0.082	0.022	3.740	<0.001**
	Listening Comprehension (MSA)	0.037	0.022	1.720	0.085
	EKAD	0.196	0.056	3.500	<0.001**

Table 4 3rd grade literacy: significant predictors

		b	SE	t	p
Demographic covariates	Gender	0.111	0.041	2.740	0.006*
	Age	−0.091	0.034	−2.680	0.007*
	Caregiver reads to child	0.172	0.061	2.840	0.005**
	Seeing someone reading	0.144	0.057	2.520	0.012*
Literacy and numeracy predictors (school-mean centered)	Combined Numeracy	0.317	0.046	6.930	<0.001**
	Letter sound ID	0.023	0.003	9.170	<0.001**
	Vocabulary (definitions)	0.071	0.023	3.140	0.002**
	Listening Comprehension (MSA)	0.045	0.022	2.010	0.044*
	EKAD	0.130	0.049	2.630	0.009*

Table 5 2nd grade numeracy: significant predictors

		b	SE	t	p
Demographic covariates	Gender	0.028	0.042	0.660	0.511
	Age	0.013	0.031	0.420	0.673
	Caregiver reads to child	0.272	0.056	4.880	<0.001**
	Seeing someone reading	0.107	0.058	1.840	0.066
Literacy and numeracy predictors (school-mean centered)	Combined Literacy	0.190	0.036	5.250	<0.001**
	Number ID	0.048	0.009	5.100	<0.001**
	Number Discrimination	0.132	0.014	9.250	<0.001**
	EKAD	0.065	0.051	1.290	0.198

Table 6 3rd grade numeracy: significant predictors

		b	SE	t	p
Demographic covariates	Gender	−0.045	0.039	−1.160	0.244
	Age	−0.008	0.032	−0.240	0.812
	Caregiver reads to child	0.266	0.057	4.660	<0.001**
	Seeing someone reading	0.218	0.054	4.010	<0.001**
Literacy and numeracy predictors (school-mean centered)	Combined Literacy	0.291	0.038	7.610	<0.001**
	Number ID	0.021	0.011	1.930	0.053
	Number Discrimination	0.135	0.018	7.630	<0.001**
	EKAD	0.130	0.049	2.630	0.009*

Abbreviations: *b* standardized coefficient, *SE* standard error, *EKAD* Explicit knowledge and awareness of diglossia (based on SHAL metalinguistic awareness subtest scores). *significant at $\alpha = 0.05$; **significant at $\alpha = 0.005$

As well as expected effects of literacy covariates (letter identification and vocabulary), and an interaction between literacy and overall numeracy, multiple linear regression analyses (MLRA) revealed significant effects of EKAD at both 2nd and 3rd grade for literacy predictors. The hypothesized link between EKAD and literacy skills emerges clearly, but the significant connection between EKAD and math skills in older children was unexpected. In addition to EKAD, literacy skills were significantly linked to reports of shared book reading at home, letter naming, & vocabulary knowledge, but not to gender, age, or oral comprehension in Standard Arabic for second graders. Similar links were found for third graders between EKAD, shared book reading, letter naming, and vocabulary knowledge in third grade. Additional significant links were found between third graders' literacy skills and gender, age, reports of others reading to the child at home, and Standard Arabic oral comprehension.

For numeracy skills, combined literacy skills were important for both age groups, as was having someone at home who reads to the child. For the younger children, both numeracy factors (number ID and number discrimination) were significant predictors of numeracy skill, but the older children only showed significant effects for number discrimination. Two factors were significant predictors of numeracy for the older age group that were not significant for the younger age group: seeing someone reading at home, and EKAD.

4 Discussion and Conclusions

The reported study investigated the link between explicit knowledge and awareness of the presence of diglossia (EKAD) and literacy attainment, in the conflict learning context of Syria. According to the linguistic awareness hypothesis (Terry et al., 2010), children's ability to use and switch between the two language varieties in

bidialectal/diglossic learning contexts is an index of their awareness of diglossic linguistic variation within their language profile, and is linked to literacy skill development. The overall purpose of this study was to assess whether EKAD, as probed by the two subtest questions in the SHAL, is associated with skill acquisition in related (literacy) and less-related (numeracy) learning domains, specifically in contexts where the exposure to – and usage of – Modern Standard Arabic is reduced, due to conflict and forced migration that impacts schooling and parenting practices.

Language skills in general are widely understood as foundational for literacy. For example, Roskos et al. stated: "Children's speaking and listening skills lead the way for their reading and writing skills, and together these language skills are the primary tools of the mind for all future learning" (p. v). However, the evidence for the interactive role of diglossia in language acquisition and, later in development, literacy, is still growing. Our analyses support the view that there are relationships between EKAD and literacy, and between EKAD and other learning domains not usually considered to be related to language (mathematical reasoning). Hence, the design of language and literacy assessment tools in diglossic/bidialectal situations needs to evolve so as to contextualize the specific linguistic and cultural features of the targeted communities. Such evolution should be reflected in the skills examined, the tasks developed, and in the interpretation of results. We argue that such change is essential for evaluating the learning needs of diverse populations, and for developing effective and efficient literacy programs towards the goal of making literacy accessible to all. Moreover, the impact of diglossia on literacy attainment in conflict-impacted learning contexts has hardly been explored; this is much needed in light of the prediction that such contexts entail a reduction in exposure and use of the standard variety, which is an indicator of literacy attainment at all ages.

Our results revealed that, at 2nd grade, the ability to comprehend MSA accurately did not predict reading skills, even though EKAD is already playing a role at this age in determining literacy skills. This suggests that explicit awareness of diglossia dissociates from the actual familiarity with MSA or the instantiation of diglossic skill in language use, likely reflecting that EKAD taps into metalinguistic awareness. Metalinguistic awareness is a complex skillset that involves domain-general conscious knowledge and reflective skills beyond implicit knowledge of language. Reading has been described as "fundamentally metalinguistic" (Nagy & Anderson, 1995, p. 2), in that it involves recognizing the mapping between print and speech within the confines of a specific orthographic system. In the setting of Arabic diglossia, the standard variety is not only formally taught in schools, but it is also the sole vehicle for literacy. In this context, it is not surprising that EKAD interacts with reading in diglossia, nor that it takes time and greater exposure before actual knowledge of MSA catches up with the metalinguistic awareness of the existence of different language varieties.

Of the demographic variables, only having a caregiver in the home who reads to the child was found to be predictive of literacy skill at this age. By 3rd grade, however, it is clear that literacy skill is significantly predicted by skills in multiple other domains. Being female predicts higher literacy attainment than being male, as does being older; this may indicate relative roles in the home and opportunities for other

kinds of social engagement that increase towards the end of this age group (bearing in mind that the older children in the 3rd grade group were into their teen years). Having someone in the home who reads to the child or seeing someone read at home are both significant predictors of literacy skill by 3rd grade, as are the literacy covariates and the combined numeracy scores. Interestingly, however, by 3rd grade MSA comprehension and EKAD are both significant predictors of literacy skill, showing a developmental shift and perhaps suggesting that EKAD eventually brings along MSA comprehension as a covariate.

EKAD was not initially expected to predict numeracy skill, and the findings from the 2nd graders showed no connection between these two factors. Clearly the numeracy covariates (number identification and number discrimination) are significant predictors for overall numeracy, as are overall literacy and having a caregiver who reads to the child. This suggests that a familiarity with books and written symbols favorably dispose the child to the numeracy learning situation, but does not strongly indicate any crossover of literacy abilities into the acquisition of numeracy skill. By 3rd grade, however, the situation is different. At this age, the ability to simply identify numbers no longer predicts numeracy scores, though number discrimination is still relevant – showing that the ability to conduct operations over representations is increasingly important, even as number representations themselves stabilize. Similarly, the familiarity with written materials is increasingly important for predicting numeracy attainment at 3rd grade, resulting in significant predictive power of seeing someone reading in the home. And most relevant for our research questions, EKAD significantly predicts numeracy attainment for this older age group, suggesting that diglossic awareness is a skillset with cross-domain utility. This finding is consistent with the observation that math is largely taught in MSA in Syrian educational contexts, so students need MSA comprehension skills to engage in and succeed at math; furthermore, word problems are frequently a medium of teaching and evaluation in 3rd grade (and higher) math, and these require a linguistic skillset that is mediated by (as shown in the literacy skills analysis) both MSA comprehension *and* EKAD.

As reflected in the overall structure of the SHAL, there has been a recent focus on social-emotional learning in education in crisis areas (Kim & Tubbs Dolan, 2019). By assumption, the increase in such practices in diglossic communities would lead to more formal educational initiatives conducted in the spoken dialect, which is more fitting than the standard language variety for targeting social-emotional learning goals. This is one way in which the exposure to MSA could potentially be limited for children in conflict zones, alongside (for example) less access to television and other formal communicative contexts. Alongside the impact of war on educational institutions and parenting, it is likely that children in conflict situations therefore receive substantially less exposure to the standard variety, perhaps contributing to the various impacts on literacy achievement.

In this light, there is a need for evidenced-based adaptations to educational initiatives, harnessing the best approaches to reduce the potential negative impact of reduced diglossic exposure on literacy achievement. We argue that the incorporation of explicit diglossic awareness in assessment and evaluation programs for

conflict-affected communities that exhibit diglossia could be an effective tool for increasing literacy success, though there remains a need to develop and pilot effective training strategies to enhance diglossic awareness when this is identified as a factor affecting educational success.

Methodologically, this study has several lessons to offer. First, by identifying the role of EKAD in both literacy and numeracy attainment, it provides evidence that assessment of EKAD should be included in evaluations of educational success in bidialectal/diglossic situations. This calls into question the use of assessment tools that are adapted from communities without diglossia, typically Western and/or English-speaking communities. Such tools may be less effective for usage in communities exhibiting diglossia and may have limited impact in informing humanitarian educational programs in conflict-affected regions. The "one size fits all" approach to educational assessment is inadequate for the goal of addressing specific needs based on the cultural, linguistic characteristics of a targeted population, while taking into consideration the specific learning context and its ramifications for learning. One unique characteristic of the assessment presented here is its focus on examining children's *explicit* awareness of the presence of diglossia, rather than evaluating linguistic shifting or codeswitching abilities as a proxy for this knowledge. The EKAD subtest from the Arabic Diglossia Awareness Test (ADAT: Khamis-Dakwar & Makhoul, 2014; Makhoul et al., 2015) may be a viable addition to the assessment of literacy and emergent literacy in Arabic-speaking children.

Second, this study applied a multilevel mixture model to literacy and numeracy achievement data, collected from individual students who are nested within schools. This approach is underused in health (Merlo et al., 2005) and educational studies (Flunger et al., 2019), despite its utility in identifying factors that directly predict and interact with educational attainment, and for directing attention to person-centered contextually based methods in educational investigations (Tubbs Dolan, 2019). Adopting analyses like this for future research could permit the identification and evaluation of factor variables that impact various educational domains, and the interactions between them. Such factors might include (for example): the intrinsic abilities of the group or the individual child; the use and exposure to MSA at the level of individual, family, or community; educational programs and frameworks that are available in schools or other settings; and societal norms and expectations. This study constitutes a step in that direction by examining the influence of EKAD on literacy and numeracy attainment for students nested within different schools. Multilevel mixture modeling has the potential to characterize the complex, multidimensional nature of data like these, and hence can offer insights into otherwise opaque interrelationships between multiple factors influencing educational achievement (Flunger et al., 2019).

Several limitations affected this study, some related to the nature of assessment administration and scoring in conflict contexts. Due to the need for rapid assessment protocols that could readily be administered in a conflict area, only two questions out of the eight EKAD subtest items from the ADAT were selected (the EKAD

subtest record form is provided in the appendix) and scored post-administration as a single item. As such, we cannot assess the reliability of the scale; nonetheless, the association of the EKAD item with literacy and numeracy scores does provide evidence of convergent validity. The inclusion of only two items for probing EKAD remains a study limitation, though there is precedent for even single-item scales showing predictive value in health, education, psychology and organizational psychology, among others – and indeed, the two EKAD items included in the SHAL show robust associations with literacy in the current analysis. Nevertheless, future research is needed to pilot the full ADAT in humanitarian contexts.

In addition, due to the nature of data collection in war zones, the specific responses provided by the children were not provided to the researchers – just scores. As a result, no qualitative analysis of responses was possible. Additionally, because these results come from a late-stage piloting of the SHAL, there were some inconsistencies in the structure of the assessment: some of the assessment tasks for 2nd and 3rd grade children differed from one another, to ensure a matching to curricular level, while some did not. In the pilot version of the instrument, there were different grade versions for the familiar word reading, oral passage reading, and reading comprehension subtasks in the literacy domain, but not for the letter sounds subtask, as the letter sounds presented were thought to be relevant to both grade 2 and 3. The pilot data for this task, along with data for the familiar word reading task, revealed ceiling effects. Based on this observation, the SHAL is undergoing revision and future iterations will include more long vowels and a greater range of word classes (abstract nouns, verbs, and function words instead of mainly imageable nouns) in these two tasks. Similarly, for the numeracy domain, different grade versions are undergoing development for the addition and subtraction subtasks where only a single version is present in the pilot instrument. The decision to develop different grade items was based on both the data presented here, and on a review of the Syrian curriculum that further demonstrated the necessity of different grade versions.

The obverse is also important to note: that where tasks were deliberately varied between the grades, it becomes more difficult to clearly interpret differences in results between the different grades. This situation also resulted in a two groups analysis, with 2nd and 3rd graders being addressed separately; given the spread of ages across the two grades, a different age-related breakdown might have been preferable to more accurately identify the predictive contributions of the various factors at different developmental stages.

More generally, the study is limited by the lack of a general assessment of cognitive function, especially memory and attention. Some items were also non-optimal; for instance, the linguistic items included in the pilot version of the SHAL were selected based on curriculum level, but were not controlled for orthographic, phonological, and semantic properties known to affect literacy acquisition (e.g., see Sawi & Rueckl, 2019, for review of the statistical regularities known to impact literacy acquisition), but it was not possible in this context to add assessments or to

manipulate the items that were already flagged for inclusion. The SHAL itself is still in the preliminary stages of standardization, and therefore reliability and validity data are currently being collected. All these factors may limit the generalization of findings, though not the findings themselves: explicit knowledge and awareness of diglossia interact with educational attainment in ways that have hitherto not been explicitly investigated, and children from diglossic speech communities who are in conflict zones will be impacted in terms of literacy and numeracy skill development by a reduction in exposure and use of both diglossic language varieties.

Finally, as we have described, there is a need to minimize demands on time and attention in educational contexts in conflict zones, while maximizing the efficiency and what each measure and item can tell us about the child's attainment. Our study is based on an understanding of the nature of diglossia and how linguistic knowledge develops in two language varieties. Diglossic situations require children to be able to navigate between two systems, a situation that depends on linguistic awareness/flexibility (Terry et al., 2010). Conceptually, the idea of linguistic awareness does not relate directly to externally-imposed educational standards or assessments, that are typically biased and poorly suited for students from diglossic speech communities. Instead, the child is placed at the center of the learning process, because their own linguistic awareness depends on their own understanding. In this way an equal weighting is associated with both language varieties in diglossic contexts – both make contributions to learning in various domains, and both are mediated by the child's own awareness and understanding.

This study shows that the skills probed by the EKAD subtest are related to skill acquisition in multiple learning domains –numeracy as well as literacy. This observation supports the view that metalinguistic awareness is a crucial skill, mediating connections between language development and literacy development, as expected. Usefully, though, we have also been able to demonstrate that there is a connection between language development and mathematical reasoning, two domains not typically considered to be directly related, but here showing a clear association mediated in diglossic contexts by awareness and use of the standard variety.

Implications of these findings for teaching and assessment clearly follow. Teachers in conflict situations are often themselves compromised in terms of their safety and wellbeing, while trying to educate and assess children who are experiencing trauma and insecurity on a daily basis. Approaches to support efficient and insightful assessment in such contexts will be useful, and if connections between learning domains can be demonstrated, this provides an evidence base to support multi-dimensional teaching as well as assessment. Evaluation of the whole child is more than just a buzzword – it is an educational approach that supports children and their educators and that has the potential to maximize efficiency in the most challenging educational contexts imaginable.

EKAD Subtest Record Form

Evaluation and scoring			Student's answer	Question
2	1	0		
2	1	0		Definitions (terms): Do you know that in Arabic there is a Fusha and Ammiya? What are these two?
2	1	0		Definitions: contexts of use When do we use each one of those? can you give me an example of when you use Fusha and when you use Ammiya?
2	1	0		Interrelationships: Differences Are there any differences between these two languages? Can you give some examples?
2	1	0		Interrelationships: Similarities Are there any common things between the two languages? Can you give me some examples?
2	1	0		Text knowledge: Preferences Which texts do you like to read?
2	1	0		Awareness of cognitive processes: Perceived challenges Do you at times feel it is hard for you to understand Fusha?
2	1	0		Awareness of cognitive processes: Writing versus speaking Do you like writing in Fusha or just speaking it?
2	1	0		Awareness to cognitive processes: Code Switching When you are about to write about a specific topic, do you think about the topic in Fusha and write it directly in Fusha or do you think about the topic first in Ammiya and later write it in Fusha?
			Columns subtotal	
			Raw score	

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Theory-Based Approaches to Language Instruction for Primary School Poor Readers Who Speak Nonmainstream American English

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1 Introduction

National- and state-level data indicate that African American children in the United States perform significantly below their peers on achievement tests (McFarland et al., 2019). These achievement gaps have been observed regardless of children's socioeconomic status or school poverty levels (Jencks & Philips, 1998). Thus, researchers have investigated whether these gaps could be alleviated by considering children's spoken Nonmainstream American English (NMAE) because NMAE use has been observed among African American children across age, income, and school contexts. Indeed, findings from recent studies have provided converging evidence of significant, moderate, and often negative associations between children's spoken NMAE use and specific reading skills (e.g., Charity et al., 2004; Gatlin & Wanzek, 2015; Terry et al., 2010).

For instance, a series of longitudinal studies with different samples resulted in several key findings (Terry & Connor, 2012; Terry et al., 2012). First, significant decreases in NMAE use were apparent between the beginning of pre-kindergarten and the end of 1st grade, but not during 2nd grade. Second, changes in children's NMAE use during the pre- kindergarten and kindergarten years did not predict letter and word reading outcomes above and beyond initial skill. Next, change between 1st and 2nd grade predicted letter and word reading and passage comprehension outcomes at the end of 2nd grade, even after statistically controlling for initial skill.

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Finally, children who had not reduced their NMAE use significantly by the end of first grade demonstrated less growth in reading skill during first and second grades.

Collectively, these findings suggest that: (a) spoken NMAE use changes rapidly among many children at the same time that they are gaining the language and print knowledge required to read proficiently; (b) change in NMAE use independently predicts children's reading outcomes, above and beyond initial reading skill; and (c) children who begin formal reading instruction using substantial amounts of NMAE in school may be at risk for experiencing reading difficulties. The obvious question remains: Should interventions addressing spoken dialect differences be designed to improve reading outcomes?

Answering this question is imperative, but has been quite elusive because almost all previous intervention studies have used designs that prevented the examination of causal relations between spoken dialect differences and reading outcomes. Moreover, it is not clear whether teaching children Mainstream American English (MAE) directly has any added value to reading outcomes above and beyond what is already known to support struggling readers (i.e., explicit, systematic reading instruction). We addressed this gap in existing research in a pilot study contrasting instructional approaches supported by hypotheses proposed to explain the relationship between spoken dialect variation and reading.

1.1 The Prevailing Hypothesis: Linguistic Interference-Mismatch Informed Instruction

Originally proposed by prominent linguists studying language variation in the 1960s, the Linguistic Interference-Mismatch Hypothesis emphasizes speech production differences between NMAE and MAE as causal in the poor reading performance of NMAE speakers (Labov, 1995). Although all children must reconcile speech-print differences while learning to read, the Linguistic Interference-Mismatch Hypothesis suggests that the challenge is even greater for NMAE speakers because the mismatches between their speech and print occur more frequently. For example, a child who often reduces final consonant clusters in speech (e.g., who says "fas" for *fast*) might be confused that the word ends with two consonant letters. It is proposed that the child who encounters such mismatches more frequently might find the learning of phoneme- grapheme correspondences to be a complex and confusing task. Because speech mismatches between NMAE and MAE are the central focus of the Linguistic Interference-Mismatch Hypothesis, it follows that interventions designed according to this hypothesis would teach NMAE speakers to speak MAE in academic contexts. The prevailing Linguistic Interference- Mismatch Hypothesis-based instructional approach is contrastive analysis. The focus is typically on morphosyntactic NMAE features and writing (because NMAE features are often present in students' writing samples). Thus, students are taught to contrast their NMAE productions with MAE renderings of the same sentence or phrase (e.g.,

She don't have no money/She doesn't have any money). Few empirical studies have examined the effectiveness of contrastive analysis experimentally, but reports suggest that contrastive analysis can have a robust effect on children's grammatical writing proficiency (Fogel & Ehri, 2000; Wheeler, 2006; Wheeler & Swords, 2006). That is, children are observed to use more MAE forms and fewer NMAE forms in print. It is unclear whether these outcomes persist or extend to reading achievement.

1.2 A New Hypothesis: Linguistic Awareness-Flexibility Hypothesis

The Linguistic Awareness-Flexibility Hypothesis emphasizes children's developing linguistic sophistication as accounting for NMAE speakers' reading achievement (Terry & Scarborough, 2011; Terry et al., 2010, 2012). Here "sophistication" refers to *awareness* of language as something that can be thought about and manipulated, which enables *flexible* use of language form and content for a variety of contexts and purposes. Children who are attuned to language will typically exhibit their emerging sophistication in a variety of ways (e.g., increasing proficiency with phonemic awareness tasks). Importantly, children with greater facility with language tend to exhibit stronger reading skills (National Early Literacy Panel, 2009; National Reading Panel, 2000; Scarborough, 2001). The Linguistic Awareness-Flexibility Hypothesis suggests that children's NMAE use in specific contexts is an indicator of their linguistic sophistication.

Code-switching (also referred to as style-shifting or dialect-shifting) also requires metalinguistic awareness because a speaker must be aware (at some level) of his/her communicative context to increase, decrease, or modify their native dialect use (Wolfram & Schilling, 2016). According to the Linguistic Awareness-Flexibility Hypothesis, a child who produces many NMAE features in a formal context that presupposes MAE (e.g., academic tasks) may be demonstrating a lack of appreciation (or awareness) for how language can or should be used flexibly for different contexts, and this behavior may be indicative of a more general insensitivity to language. It is this generalized linguistic and metalinguistic weakness that accounts more for some NMAE speakers' reading difficulties than their NMAE use itself (Craig et al., 2014; Terry & Scarborough, 2011). Because sensitivity to language in general is the central focus of the Linguistic Awareness-Flexibility Hypothesis, then teaching children to explicitly manipulate language and use it flexibly in multiple contexts, irrespective of dialect differences, can be hypothesized to result in improved reading.

Although not applied to the construct of spoken dialect differences, there is ample research evidence supporting the efficacy of instructional approaches to improve children's language awareness, including phonological, morphological, and syntactic awareness and vocabulary instruction (e.g., Carlisle, 2010; Nation & Snowling, 2000; National Reading Panel, 2000). Moreover, most recent contrastive

analysis applications have begun to incorporate aspects of generalized linguistic awareness, whereby children are taught to code-switch by treating NMAE and MAE as objects of study in the context of formal and informal language use (Wheeler, 2006; Wheeler & Swords, 2006). For instance, in two randomized control trials with struggling readers in second, third, and fourth grades, Johnson et al. (2017) found that students who were assigned to a dialect awareness condition (i.e., contrastive analysis contrasting MAE and NMAE with explicit focus on formal and informal language use) demonstrated increased use of MAE forms in speech and print compared to students who were assigned to an editing (i.e., contrastive analysis without a focus on formal and informal language use) or business-as-usual control conditions. In both studies, students in the dialect awareness condition were significantly more likely to use MAE on narrative writing and morphosyntactic awareness tasks. In turn, this dialect-shifting ability, or decrease in use of NMAE, was related to their performance on a measure of reading comprehension. Edwards and Rosin (2016) found similar results in a study with pre-kindergarteners, where students who participated in instruction that contrasted between MAE and African American English demonstrated improved phonological awareness performance.

1.3 Purpose of Study

Taken together, these behavioral and applied studies suggest that dialect-shifting is indeed malleable among children in early elementary grades. Further, instruction that increases children's awareness of dialect use may contribute to an increase in the production of MAE forms in writing and improved reading achievement overall. The purpose of this pilot study was to extend the literature on applied research in this area by examining changes in children's spoken dialect use in response to instructional conditions that varied in their application of the Linguistic Awareness-Flexibility Hypothesis. Specifically, we targeted poor readers in 2nd and 3rd grades who spoke NMAE frequently in school and provided them with four weeks of language instruction that varied in its explicit emphasis on spoken dialect variation: (1) instruction using contrastive analysis to teach children to say and write MAE and NMAE forms (Contrastive Analysis condition), (2) instruction using oral language instruction to improve children's morphological awareness on forms that do not contrast between NMAE and MAE (Morphological Awareness condition), (3) a combination of conditions 1 and 2, and (4) a control condition (math instruction). We examined performance on contrastive analysis (i.e., dialect- shifting) and morphological awareness measures before and after instruction. By comparing these conditions, we investigated whether teaching children to speak MAE or to become more linguistically aware would result in changes in NMAE use (e.g., increased or decreased substitutions of inflections like the regular past tense *-ed* or possessive *-'s*), morphological awareness (e.g., increased or decreased use of derived forms like *-ful* or *-ly*), both, or neither.

We targeted 2nd and 3rd graders who were also poor readers because previous research findings suggested that many dense NMAE speakers begin to shift towards more MAE production in speech and print without instruction focused on spoken dialect differences, and that those who do not demonstrate this shift tend to demonstrate poorer reading outcomes (Johnson et al., 2017; Terry et al., 2012). Thus, if dialect-informed instruction has any added value to literacy achievement, then this student population would benefit most from such instruction. However, given the increased likelihood that these students would demonstrate difficulty with reading and writing, such interventions may need to rely more on oral language practice, as opposed to written language practice. Thus, unlike previous studies, the intervention conditions in this study required responses in speech and not writing. In sum, we examined struggling readers' oral language and dialect-shifting performance before and after participating in four different conditions with varying emphases on language-based instruction focused on NMAE and MAE differences (i.e., contrastive analysis) and language-based instruction not focused on dialect differences (i.e., morphological awareness).

2 Methods

2.1 Participants

The participants in this pilot study were 43 African American second- and third-grade students from a large metropolitan area in the southeastern part of the United States who were recruited from school-based afterschool programs. Results are reported for 21 children who had complete pre- and post-test data (see Table 1). Twelve (57%) of the students were boys, and the mean age for the group was 8.93 years ($SD = 0.68$). All participants were native English speakers and attended public schools where the percentage of children who qualified for free and reduced lunch programs was greater than 75%.

Table 1 Participants' mean reading fluency and dialect variation scores at pre-test by condition (standard deviations in parentheses)

Condition	GORT-4 Fluency (scaled score)	Dialect Variation (percentage)
Contrastive Analysis $n = 5$ students	6.17 (0.75)	74.87% (25.69)
Morphological Awareness $n = 6$ students	5.40 (2.88)	79.38% (13.1)
Combined $n = 6$ students	5.60 (2.30)	70.23% (33.74)
Math $n = 5$ students	6.20 (3.11)	41.42% (29.86)

Note. GORT = Gray Oral Reading Test – 4th Edition ($M = 10$, $SD = 3$)

Because one outcome of interest was change in spoken dialect use, students' dialect density was measured at the beginning of the study using the *Diagnostic Evaluation of Language Variation-Screening Test* (DELV-S; Seymour et al., 2003). The DELV-S is a standardized, norm-referenced screening tool that can be used to determine whether children are speaking with little, some, or strong variation from MAE. All students performed in a manner that categorized them as speaking with some or strong variation from MAE. In addition, following procedures established by Terry et al. (2010), students' performance on Part I was used to create a dialect variation score representing the rate of students' NMAE feature production in speech. Dialect variation is a percentage, where 0 indicates that the speaker used only MAE forms and 100% indicates that the speaker used on NMAE forms. Mean performance is presented in Table 1.

In addition, because we targeted struggling readers, students' reading ability was measured at the beginning of the study using the *Gray Oral Reading Tests, 4th Edition* (GORT-4; Wiederholt & Bryant, 2001). The GORT-4 is a standardized, norm-referenced measure of passage reading, where students read passages of increasingly difficulty orally and then answer questions about the passage. Two reading skills are measured: fluency (rate and accuracy of passage reading) and comprehension (response to questions after each passage read). In this study, fluency performance (scaled scores, $M = 10$, $SD = 3$) was used as an indicator of reading ability. All participants performed at least one standard deviation below the mean in fluency, indicating that all participants were reading below grade level expectations at the beginning of the study. Mean performances are presented in Table 1.

2.2 Instructional Conditions

Children were randomly assigned to one of four instructional conditions. Language-based instruction, informed by the Linguistic Interference-Mismatch and the Linguistic Awareness- Flexibility Hypothesis, was designed for the study, resulting in four distinct conditions that targeted the different skills (see Table 2). In the Contrastive Analysis condition, students received explicit instruction in shifting

Table 2 Participants' mean performance, represented as proportion correct, on the dialect-shifting and morphological awareness tasks at pre- and post-test by condition

Condition	Dialect-Shifting Task (out of 27 items)		Morphological Awareness Task (out of 22 items)	
	Pre-Test	Post-Test	Pre-Test	Post-Test
Contrastive Analysis	.44	.70	.18	.09
Morphological Awareness	.52	.59	.09	.55
Combined	.41	.55	.18	.45
Math	.56	.41	.27	.50

between NMAE and MAE and in how and why language use varies by context. Instruction in this condition focused on two morphosyntactic features that could be produced differently in NMAE and MAE and that are frequently present in 2nd and 3rd grade texts: the regular past tense *-ed* (e.g., *He jumped for his treats*) and possessive -*'s* (e.g., *My mom's necklace*). In the Morphological Awareness condition, students received explicit instruction in morphological awareness. Instruction in this condition focused on two morphosyntactic features that could be produced the same in NMAE and MAE and that are also frequently present in 2nd and 3rd grade texts: derivational suffixes -ful (e.g., *He is thankful*) and - less (e.g., *Dad was restless*). In the combined condition (Contrastive Analysis + Morphological Awareness), students received explicit instruction in both contrastive analysis and morphological awareness, specifically the regular past tense -ed, and the derivational suffix -ful. Finally, in the Math condition, students received instruction in neither contrastive analysis nor morphological awareness. Instead, instruction focused on two-digit addition and subtraction (e.g., 24 + 16), a skill that is also frequently present in 2nd and 3rd grade math texts.

Instruction took place for a total of four weeks, three times per week, in 45-minute sessions during afterschool programming in small groups in a quiet area of the school.

Instruction was delivered by trained graduate research assistants. For each condition, a cyclical *I do-We do-You do* approach was used to teach the targeted forms each week. The general framework for the instructional programs was an introduction to and direct explanation of the concept in Week 1; direct explanation, guided, and independent practice using the first targeted form in Week 2; direct explanation, guided, and independent practice using the first targeted form in Week 3; and independent practice with both forms in Week 4.

2.3 Experimental Measures

Two oral measures were created for this study and administered at the beginning and end of the intervention to measure changes in awareness of language variation and NMAE use in speech in response to treatment. All measures were administered to each student individually, and scored by trained research staff members who were, to the extent possible, unaware of the students' assigned condition. Items for each measure are presented in the Appendix.

Dialect-Shifting Task This 27-item near-transfer task was designed to measure whether or not children used two morphemes that could be produced differently in MAE and NMAE in formal and informal contexts: regular past tense -ed and regular possessive –'s. On this task, children were presented with pictures (receptive items) and cloze or open-ended prompts (expressive items) asking them to determine if a target was formal or informal (e.g., picture of a child receiving an award) or to produce a targeted morpheme in a given situation (e.g., *Tamika wants to show President*

Obama a necklace that belongs to her mother. She tells President Obama: This necklace belongs to my mom. It's my _____ necklace.).

Morphological Awareness Task This 22-item near-transfer task was designed to measure whether or not children used morphemes that are produced the same in MAE and NMAE irrespective of context: -less and -ful. On this task, children were presented with words and asked to use a targeted morpheme in a given context. Example items included: *Someone that has a lot of thanks is: [thankful]* or *Tell me what you think the word Graceful means*. We also used nonwords to test for knowledge of morphological structure, beyond vocabulary knowledge, similar to the work of Berko Gleason (1958) and McBride-Chang et al. (2005). For instance, items included: *Someone without ling is: [lingless]* or *Tell me what you think the word Dundful means.* Words and nonwords were used interchangeably throughout the task (see Appendix).

3 Results

Given the small sample size for each group and the increased likelihood of type I and type II error, only descriptive results are reported for this pilot study. In particular, we focused on performance on the two experimental measures and questioned whether there were any indicators of differences in performance on the measures by instructional group. If differences were observed, then follow up studies with larger sample sizes might be plausible. Student's raw scores on each of the experimental tasks were converted to proportions to reflect the number of items correct out of the total. See Figs. 1 and 2 for a visual representation of difference by group on the experimental measures.

An examination of the group means by condition reveals two important observations.

First, on average, students in the math group were less dense speakers than students in the other groups at the beginning of the study. This difference is likely an artifact of the random assignment, but nonetheless may be associated with outcomes observed after the intervention. Students in the other three conditions demonstrated similar dialect density, with means above 70%. Meanwhile, on average, students in all four conditions demonstrated similar reading fluency on the GORT-4; means for all four groups were below age- and grade-level expectations.

Second, as shown in Figs. 1 and 2, group means differed on the experimental measures by condition. Specifically, on the dialect-shifting task (Fig. 1), the Contrastive Analysis group showed the greatest increase from pre-test to post-test, followed by the combined group (Contrastive Analysis + Morphological Awareness), and then the Morphological Awareness group. Mean performance for the math control group decreased from pre-test to post-test on the dialect-shifting task. On the

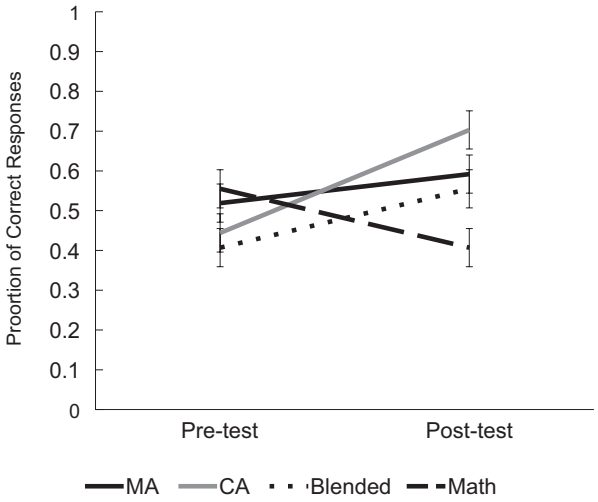

Fig. 1 Proportion of correct responses on the dialect-shifting task, by condition

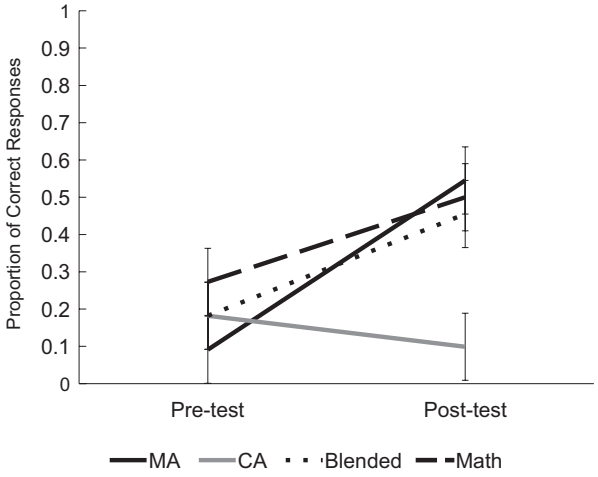

Fig. 2 Proportion of correct responses on the morphological awareness task, by condition

morphological awareness task (Fig. 2), students in the Morphological Awareness condition showed the greatest increase from pre-test to post-test, followed by the combined group (Contrastive Analysis + Morphological Awareness), and then the control math group. Mean performance for the Contrastive Analysis group decreased from pre- to post-test on the morphological awareness task.

4 Discussion

For this pilot study, we examined students' response to instruction based on varying hypotheses about the relation between spoken dialect use and literacy performance. Specifically, proponents of the Linguistic Awareness-Flexibility Hypothesis have suggested that spoken dialect differences, in and of itself, may not be causal in the poor reading achievement observed among many NMAE speakers. Rather, like all readers, NMAE speakers must use their linguistic knowledge to read. Thus, students who demonstrate dense NMAE use in contexts that presuppose MAE (e.g., spoken and written language tasks in school) may also be demonstrating a general lack of linguistic awareness that would impede reading and writing achievement. Therefore, instruction that improves children's linguistic awareness, irrespective of its focus on specific NMAE or MAE forms, may improve linguistic knowledge directly and reading performance indirectly. To test this hypothesis, we contrasted student performance before and after participating in four different conditions with varying emphases on contrastive analysis (language-based instruction focused on NMAE and MAE differences) and morphological awareness (language-based instruction not focused on dialect differences). Importantly, these students were dense NMAE speakers who were reading below grade level expectations—the very student population for whom dialect-informed instruction is proposed to be most beneficial for improving reading outcomes.

Three important findings emerged from this pilot study. First, we found that changes in children's language performance for the target behaviors were aligned with the instruction they received in each condition. That is, students who were assigned to the instructional language group focusing on contrastive analysis, where students were explicitly taught to contrast features of NMAE and MAE, demonstrated the greatest gains overall on the dialect-shifting task.

Similarly, students who were assigned to the instructional language group focusing on morphological awareness, where students were explicitly taught to use derivational suffixes that do not differ in their pronunciation between NMAE and MAE, made the greatest increases on the morphological awareness task. Students who were in the combination condition, who were taught both skill sets, made the second greatest gains from pre- to post-tests on both the dialect shifting and the morphological awareness tasks. Students who were in the control condition, who were taught math, demonstrated inconsistent performance, with increases in performance on the morphological awareness task and decreases on the dialect-shifting task.

Second, we found that instruction in each condition produced change in student's spoken dialect-shifting and morphological awareness. That is, a relatively brief small group intervention delivered over four weeks, three times per week, in 45-minute sessions during afterschool programming resulted in changes in both language skills. Keeping in mind that previous research findings indicate not only that the rate of spontaneous dialect-shifting tends to slow in second grade (e.g., Terry et al., 2012), but also that poor reading performance is more difficult to ameliorate as children progress in school (e.g., Foorman et al., 1997; National Reading

Panel, 2000; Wanzek et al., 2018) and that language instruction improves reading performance (e.g., Carlisle, 2010; Nation & Snowling, 2000; National Early Literacy Panel, 2009), these findings provide encouraging evidence that older dense NMAE speakers experiencing reading difficulty can be responsive to explicit instruction designed to improve their oral language abilities.

Moreover, although this pilot was not focused on reading outcomes, these results provide preliminary evidence that these experimental conditions could be implemented in a larger study to examine changes in reading achievement in response to each type of language-based instruction. This next step would provide a more stringent test of the Linguistic Awareness- Flexibility Hypothesis.

Third, although we found that both dialect-shifting and morphological awareness were malleable skills in this student population, these skills may not be transferable. That is, students in the Contrastive Analysis condition did not demonstrate improved morphological awareness and students in the Morphological Awareness condition did not demonstrate improved contrastive analysis (i.e., dialect-shifting). Only students who were taught both contrastive analysis and morphological awareness demonstrated improved contrastive analysis and morphological awareness. Thus, dialect informed instruction, in the absence of language awareness instruction, may not produce improved reading and language outcomes. And, conversely, language awareness instruction, in the absence of dialect informed instruction, may not produce improved reading and language outcomes. Moreover, these changes were observed in oral language; it is not clear if changes in oral language performance would transfer to written language (e.g., changes in using inflections like -ed or derivations like -ly in speech may not transfer to changes in using these forms when spelling words or composing extended texts).

Obviously, the results of this study are preliminary and only provide emerging evidence that must be expanded upon in a much more comprehensive study, with a larger participant sample, and outcomes focused on reading and language achievement. Nonetheless, the findings align with those reported in previous studies (e.g., Edwards & Rosin, 2016; Johnson et al., 2017) and suggest that NMAE speakers may benefit from explicit language-based instruction.

Moreover, the results indicate that research investigating spoken language variation is important to understanding how best to respond to language and literacy difficulties among NMAE speakers.

Appendix Items on the Morphological Awareness Task

Directions: I am going to ask you some questions about how to make words. Please do your best to answer them. If you don't know the answer, you can say "I don't know."

1) *Some words are 2 words put together – can you tell me what word is made of these two?*

a. A box for shoes is a _____.
b. A bird that is blue is a _____.

2) *Sometimes we add endings to words to make new words. I'm going to say definitions and I'd like you to tell me what you think the word is:*

a. Someone that has a lot of thanks is: _____.
b. Someone that is full of green is: _____.
c. How much a bag can hold is called: _____.
d. Someone who isn't able to rest is: _____.
e. Something without motion is: _____.
f. Something without ling is: _____.
g. Something that has a lot of success: _____.
h. Something without dust is: _____.
i. Someone without any purple is: _____.
j. How much a blerk can hold is called a: _____.

3) *Now, I'm going to say a word. I would like you to tell me what you think the word means*

a. Graceful
b. Dundful
c. Boatful
d. Luckless
e. Rickless
f. Beardless
g. Orangeful
h. Delightful
i. Brainless
j. Blueless

Items on Dialect-Shifting Task

Directions: I am going to show you some pictures and ask you some questions about them. Please do your best to answer them. If you don't know the answer, you can say "I don't know."

Picture Set 1: *child is shown picture of The White House, President Barack Obama, a trophy, and pictures of clothing (e.g., school clothes, formal dress, soccer uniform, swimsuit) and given the following stem:* "Because Tamika wrote such a good essay in Civics class, Tamika will receive an award from President Obama at the White House. "

1. Is the White House a formal or informal place? (yes or no)
2. Is receiving an award from President Obama a formal or informal event? (yes or no)

3. Do you think this situation is formal or informal? (yes or no)
4. What should Tamika wear to the White House? (choose clothing)
5. Now see if you can finish Tamika's sentences for her. Tamika wants to show President Obama a necklace that belongs to her mother. She tells President Obama: *This necklace belongs to my mom. It's my _____ necklace.*
6. Tamika wants to tell President Obama about what she did last summer. She tells President Obama: *I like to visit my aunt. Last summer, I _____ my aunt.*
7. Tamika wants to show President Obama a computer that belongs to her brother. She tells President Obama: *This computer belongs to my brother. It's my _____ computer.*
8. Every afternoon First Dog Bo likes to jump for his treats. *Yesterday afternoon Bo _____ for his treats.*
9. What type of language did Tamika choose to use? Tell me why.

Picture Set 2: *child is shown picture of an outdoor basketball court, a child shooting a basketball, a basketball, and pictures of clothing (e.g., school clothes, a business suit, soccer uniform, swimsuit) and given the following stem:* **"**Billy is at the playground, playing basketball with his little cousin, Jamal. "

1. Is the playground a formal or informal place? (yes or no)
2. Is playing basketball with Jamal a formal or informal event? (yes or no)
3. Do you think this situation is formal or informal? (yes or no)
4. What should Billy wear to the playground? (choose clothing)
5. Now see if you can finish Billy's sentences for him. Billy wants to show Jamal a football that belongs to his cousin. He tells Danny: *This football belongs to my cousin. It's my _____ football.*
6. Every week Jamal tells Billy a funny joke: *Billy loves to laugh. Last week, Billy _____ at Danny's joke.*
7. Billy is wearing a new baseball cap. Jamal asks where Billy found it. Billy says: *This baseball cap belongs to my Dad. It's my _____ baseball cap.*
8. Every time Billy gets a rebound, he points to the basketball. *Yesterday afternoon Billy _____ at the basketball.*
9. Do you think this situation is formal or informal? Tell me why.

Picture Set 3: *child is shown picture of a beach, a bride and groom at their wedding, a clown, and pictures of clothing (e.g., school clothes, a business suit, soccer uniform, swimsuit) and given the following stem:* "Billy is attending his sister's wedding on the beach with his friend Bob the clown."

1. Is the beach a formal or informal place? (yes or no)
2. Is Bob the clown wearing formal or informal clothing? (yes or no)
3. Do you think this situation is formal or informal? (yes or no)
4. What should Billy wear to the wedding at the beach? (choose clothing)
5. Now see if you can finish Billy's sentences for him. Billy wants to show Bob the clown a book that belongs to his mother. He tells Bob: *This book belongs to my mom. It's my _____ book.*

6. Every night, Billy calls his grandma on the phone. *Tonight Billy calls his grandma. Last night, Billy _____ his grandma.*
7. During the wedding, Bob shows Billy an action figure. Bob says: *This action figure belongs to my friend. It's my _____ action figure.*
8. Billy is old enough to pour his own glass of juice. *Yesterday afternoon Billy _____ a glass of juice.*
9. What type of language did Billy choose to use? Tell me why.

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