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Alessandro G. Benati *Editors*

Challenges Encountered by Chinese ESL Learners

Problems and Solutions from Complementary Perspectives

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Preface

The aim of this edited collection of articles is to present, analyse and discuss empirical research investigating the acquisition of English by native speakers of Mandarin Chinese and Cantonese. This research is based on a number of theoretical models and hypotheses of second language acquisition. The articles are written from various theoretical perspectives. They examine properties of English that are known to cause "problems" for Mandarin- and Cantonese-speaking learners. The purpose of the studies is twofold:

- to offer readers a comprehensive account of these problems;
- to outline possible pedagogical solutions for the language classroom.

This introduction consists of four sections: (i) a reflection on some of the key issues in second language acquisition relevant to the research reported in the articles; (ii) a short synopsis of the studies themselves; (iii) a brief outline of the main implications that can be drawn for theory and language pedagogy; and (iv) some suggestions for possible avenues of further research.

What are the Key Issues in Second Language Acquisition?

Second language acquisition is a research field that focuses on how L2 learners come to learn another language. There are two fundamental questions in the field:

- how L2 learners come to internalise the linguistic system of another language;
- how L2 learners make use of that linguistic system during comprehension and speech production.

Classroom findings on second language acquisition (VanPatten et al., 2020) indicate the following:

- L2 learners create an implicit and abstract system in the mind.
- This system exists outside of awareness.
- Input provides raw data for the system to develop and grow.

Is There an Initial State?

The initial state refers to the starting point for L2 learners. There have been quite some views on the initial state, one of which is *full transfer* position, indicating that L2 learners transfer all properties of the first language into the second language. Native speakers of Italian, for example, begin the acquisition of English by unconsciously assuming that English is +null subject and has the same null subject properties as Italian. They believe that *speak Italian* is a perfectly fine sentence in English. Then, learners have to reset the parameter during acquisition and eventually produce correct sentences such as "*I speak Italian*". Many other theories of second language acquisition consider the influence of the L1 properties in different ways such as form–function relationships and meaning (functional and usage-based approaches), and processing and parsing routines (how learners compute syntactic relationships in real time while listening or reading). The main point is that the L1 is the starting point and L2 learners must "overwrite" the properties to create a new system.

An alternative view called *no transfer* position suggests that L2 learners do not transfer any properties from the L1 as they have access to universals of language. They begin acquisition much like children learning their first language. Returning to the example of null subject from above, L2 learners begin acquisition without making any assumptions; that is, they are "open" to the language being +null subject or -null subject. Rather than "reset" the parameter, they simply "set" it based on the evidence received. Errors made by learners do not necessarily reflect the influence from the L1, and tests for probing their underlying competence should likewise not reveal any L1 influence. For researchers not using the universal grammar (UG) perspective, the universals may be related to computational complexity (O'Grady, 2003) and subject *who* appears in speech before object *who*. Thus, processing accounts are more concerned about how learners compute syntactic relations during comprehension and how this affects acquisition (remembering that acquisition is input dependent; thus, learners have to process the input before they can actually acquire anything). Computational complexity falls under universals because complexity is the same for all learners regardless of the first language; that is, learners have more difficulty computing grammatical information that crosses multiple syntactic boundaries compared to computing those that cross only one, for example.

Scholars working from a linguistic perspective believe that there is L1 transfer, but it is partial (Vanikka & Young-Scholten, 1996). According to them, L2 learners might transfer lexicon and its syntactic properties but not the functional features of

language related to things such as tense, person number and agreement. Pienneman and Kessler (2011) argued that L1 output procedures (how people put together syntax and lexicon in real time while speaking) are not fully transferred to second language acquisition.

The role of L1 transfer is still very much debated in second language acquisition. L2 learners seem to go through predictable and specific orders of acquisition of morphemes despite their L1s. The errors they make are not simply the result of L1 interference. There are other linguistic and cognitive processes explaining why L2 learners make errors.

What are the Main Characteristics of Language Growth?

Language learners develop an internal language system. This system is of neither the first language nor the second language, but something in between that learners build from environmental data (input). Language development requires making connections between language forms and functions. The forms are morphological inflections and word order patterns. The functions are grammatical functions with specific semantic properties. A language system is slow to develop as learners' minds constantly work on various aspects of language simultaneously. Only over time an internal system builds up and begins to resemble a second language. Language development is also stage-like and ordered-like. In the acquisition of structure, there are stages that learners go through regardless of their L1. There is no evidence that stages can be skipped or orders can be altered. Both stage-like and ordered second language development offer clear evidence that learners must possess internal mechanisms that process and organise language material over time in a systematic manner. Language learners create a language system in an organised way that seem little affected by external factors such as instruction and correction. The system is implicit and is principally guided by learners' interaction with L2 input (Carroll, 2001).

Explicit knowledge of language is defined as conscious knowledge (VanPatten, 2016). It is often verbalisable knowledge about language such as to talk about something in the past, you add *–ed* to the stem at the end of the verb. Implicit knowledge is defined as unconscious knowledge and is not verbalisable. It can be described as the ability to understand or supply *played* and not *play* in contexts that require the use of the past tense in English, and to do so without a conscious effort to retrieve the form. Explicit knowledge does not turn into implicit knowledge (VanPatten et al., 2020).

The acquisition of grammatical properties is implicit. Language is too abstract and complex to teach and learn explicitly. L2 learners create linguistic systems in an organised way that seems little affected by external forces such as instruction and correction. In short, language is not the rules and paradigms that appear on textbook pages. Explicit rules and paradigm lists cannot become an abstract and complex system because the two things are completely different. What winds up in the human mind has no resemblance to anything on textbook pages or what teachers say. This

implication stems from the fact that there are no internal mechanisms that can convert explicit textbook rules into implicit mental representation.

What are the Main Linguistic and Processing Constraints in Second Language Acquisition?

The development of formal features of language may be constrained by universal properties of language (Chomsky, 1965). Two kinds of linguistic constraint have been studied in second language acquisition: universal grammar and typological universals.

From a universal grammar (UG) perspective, the idea is that language is composed of abstract principles and these principles constrain the way in which acquisition happens. L2 learners may not be allowed to make certain errors because UG does not allow the options that the errors might imply. In the case of the *Structure Dependence Principle,* for example, all syntactic operations are structure dependent. What this principle does is to keep learners from thinking that syntactic operations happen in words or the order of elements in a sentence. Instead, words are part of syntactic structures such as phrases which are the foci of syntactic operations. Therefore, L2 learners come to "know" certain things about what languages can and cannot do and these things are the principles of UG (Schwartz & Sprouse, 1996; White, 2003).

Typological universals are those aspects of language that are derived from the study of a large sampling of languages and exist as implicational statements; that is, if languages have object relative clauses, then they will have subject relative clauses. The term markedness refers to how typical something is relative to something else. How do typological universals and markedness affect second language acquisition? It has been shown that more marked things are more difficult to acquire. They either appear later in acquisition than less marked things or are more difficult to master.

There are also cognitive constraints on second language acquisition. The more difficult the processing operation is for a feature or structure, the more difficult it is to acquire that feature or structure (O'Grady, 2003). Empirical findings have demonstrated that there is asymmetry in the acquisition of subject *wh*-questions and object *wh*-questions, with subject questions being easier than object questions to acquire. Pienemann and Kessler (2011) suggested that output processing has constraints. The way L2 learners can string together elements to produce a sentence is constrained by processing procedures, with some being simpler than others.

Second language acquisition is constrained by the quantity and quality of input (Krashen, 2009). The input L2 learners are exposed to in a classroom environment is not the same as the one of natural context. Context may constrain acquisition because it constrains access to the amount and type of input L2 learners are exposed to. It is also constrained by access to interaction (Gass & Mackey, 2006). An L2 learner living abroad and attending a language course has good access to native speakers and opportunities to interact. Second language acquisition is complex, and a variety

of linguistic, processing and contextual factors interact that shape and constrain the course of acquisition.

What is the Role of Instruction?

Instruction has a limited and constrained role in second language acquisition (Long, 2007). However, it can be beneficial under certain conditions. Acquisition is an unconscious and implicit process, and learners acquire a second language through exposure to comprehensible and meaning-bearing input rather than learning grammar consciously through explicit grammatical rules. Language learners acquire grammatical features (e.g. morphemes) of a target language in a predictable order regardless of their first language or the context in which they acquire them. Instruction is also constrained by developmental stages, as language learners follow a very rigid route in the acquisition of grammatical features. If instruction is targeted to grammatical features for which language learners are developmentally ready, then instruction can be beneficial in helping them to move faster along their natural route of development. Instruction might also have a facilitative role in helping learners to pay selective attention to form and form-meaning connections in the input (VanPatten, 2015). Learners make form-meaning connections from the input they receive as they connect particular meanings to particular forms (grammatical or lexical). Evidence in second language research shows that the route of acquisition cannot be altered. However, instruction might in certain conditions speed up the rate of acquisition (Benati, 2021). What are the conditions that might facilitate the speed at which languages are learned? The first condition is that L2 learners must be exposed to sufficient input. The second condition is that L2 learners must be developmentally ready for instruction to be effective. The third condition is that instruction must take into consideration how L2 learners process input. Input plays a key role in the acquisition of a second language.

Using different theoretical models and hypotheses of second language acquisition, how can this edited collection of articles better our understanding of the key issues of second language acquisition?

What are the Main Contributions and Who are the Main Contributors in This Volume?

In this volume, Suying Yang discusses the constraints on Chinese ESL learners in relation to the acquisition of meanings and forms of English tense–aspect morphology. With reference to empirical findings, she outlines linguistics and processing constraints: typological differences between Chinese and English; universal tendency of the primacy of aspect; information structure; the type of input; the structure

of sentences and the developmental sequence. This paper also provides useful suggestions for language pedagogy.

Derek Ho Leung Chan and Yasuhiro Shirai present the results of a study examining the use and appropriateness of the English present perfect in L1 Cantonese ESL learners. The main findings from the study indicate the following: (i) L2 learners strongly associate the present perfect with accomplishments than with states; (ii) prototypical pairings of morphology and lexical aspect are used more appropriately than non-prototypical combination; (iii) there is evidence of L1-based lexicon-grammatical pairing between present perfect progressive and state verbs modified by durative adverbials. Implications for theory and practice are provided.

Chi Wui Ng outlines how traditional grammar instruction which conceptualises grammar as "rules of thumb dissociating syntax from semantics and segregating language use from human cognition" is totally inadequate "in providing second and foreign language learners with comprehensive, accurate or systematic knowledge on language systems such as the English tense system".

Zoe Pei-sui Luk presents the main results of a study investigating whether lexical aspect of the predicate of a sentence affects the supply of English past marking by native Cantonese-speaking learners of English. As argued in this paper, the main findings show that lexical aspect affects the supply of English past marking. This chapter also discusses the potential advantages of pedagogical approaches such as processing instruction and cognitive-grammar-inspired instruction over traditional grammar explanation in mitigating these effects.

Alessandro G. Benati reviews the findings of two empirical studies investigating the effects of processing instruction in altering two processing strategies (the lexical preference principle and the first noun principle) and facilitating the acquisition of passive constructions and English causative forms by Chinese L1 speakers.

Junhua Mo and Jinting Cai discuss the results of a study exploring between-verb variations in Chinese learners' acquisition of English alternating unaccusatives. They found that there are significant between-verb variations in Chinese learners' acquisition of English alternating unaccusatives. Both theoretical and pedagogical implications of their findings are outlined.

Hai Xu investigates the acquisition of English ditransitives by Mandarin Chinese learners. Three main outcomes are outlined from this study: (i) L2 proficiency does not play a key role in the usage of English ditransitives; (ii) the dativisable verb type plays a significant role; (iii) the "top-down" approach of instruction seems more effective than the "bottom-up" approach.

Hye K. Pae, Jing Sun and Detong Xia examined how Chinese learners of English formulate verbal phrases in expository writing using a learner corpus. Their findings provide important evidence for language pedagogy.

Mable Chan carried out a study investigating the perception of local English teachers and Cantonese ESL learners towards learning and pedagogy of English articles. The main results of this study provide the following insights: (i) Cantonese ESL learners understand the important roles played by English articles; (ii) more advanced L2 learners are better at articulating specific roles, functions and usages of English articles; (iii) there are difficulties common to all L2 learners of different

proficiency levels involving linguistics concepts such as generality, referentiality, specificity and noun countability; (iv) teachers' own understanding of English article use is significant.

Helen Zhao and Yasuhiro Shirai present the results of a study investigating the usage patterns of articles by Chinese learners of English. Results showed that (i) learners expanded their variation in article usages as they accumulated language experiences in college. Their overall (ii) accuracies of supplying articles also increased. However, (iii) there was a clear avoidance of using idiosyncratic usages which was accompanied by a serious overuse of other types of determiner such as quantifiers and possessives. Pedagogical implications from this study are outlined.

Elaine Lopez, Yuhuan An and Heather Marsden examine if article choice in L1-Mandarin influences use of the definite and indefinite articles in high-proficiency L2-English. Results show that the participants were highly accurate in supplying English articles in obligatory contexts and the L1 does not seem to have a role to play. According to the writers, proficiency and task type are the two factors which may account for such findings. Theoretical and pedagogical implications are discussed.

Snape Neal conducted a comparative study measuring production of articles between two different populations of ESL (L1 Chinese L2 learning English in China vs. L1 Chinese learning English in Canada). The aim of the study is to find out whether both groups of learners supply and/or delete articles. The main finding indicates that despite high suppliance of articles in obligatory contexts, suppliance is far from target-like. The main conclusion is that L2 learners continue to have full access to universal grammar post-critical period as further restructuring of prosodic structures is still possible.

Ziming Lu and Yicheng Wu outline that in two typologically different languages, one of the main differences between English and Chinese lies in their grammatical strategies for plurality. The main finding of their study is that the main challenge facing Chinese ESL learners of the English plural system is the cross-linguistic differences in the conceptualisation and lexicalisation of countability of entities.

Jing Sun, Haiyang Ai, Yeon-Jin Kwon and Hye K. Pae examined how the typological characteristics of the first language affect the motion-path formulation of motion events in English as a second language (L2) among native speakers of Chinese and Korean, compared to native English speakers' encoding. Results showed that both native speakers of equipollently framed Chinese and verb-framed Korean were less likely to use satellites to encode the path of motion than native speakers of satellite-framed English. Chinese speakers used more satellites to encode the path of motion than their Korean counterparts. Five pivotal features—underuse, replacement, misuse, pragmatic inadequacy and confusion of word class—emerged in the use of multi-verbal phrases in Chinese and Korean speakers' expressions of motion events.

What are the Main Theoretical and Pedagogical Implications?

Findings from the research works from this edited collection of articles on second language acquisition provide the following insights:

- Language is not learned the same way as other complex mental phenomena. Humans are hardwired to learn a language and have special cognitive mechanisms specifically designed to deal with it. Language is not a set of rules or patterns, but something much more abstract and generative in nature.
- Language is abstract and complex and should not be taught and learnt explicitly. There is no mechanism that turns explicit rules into an abstract and complex mental representation we call "language". A linguistic system evolves in the mind over time.
- Language development is slow and piecemeal. L2 learners do not acquire one thing and then move on to another, as suggested by typical syllabi and textbooks. L2 learners' minds are constantly working on various aspects of language simultaneously. Only over time, an internal system builds up and begins to resemble a second language.
- Language development is stage-like and ordered-like. The acquisition of formal features of language (grammatical aspects of language) is ordered. In the acquisition of structure, there are stages that learners go through regardless of their L1. There is no evidence that stages can be skipped or orders can be altered.
- The acquisition of formal features of language is constrained. Such things as markedness, universal grammar and perhaps general learning mechanisms all work to push and guide acquisition in particular directions. The role of the L1 is also constrained.
- Language input provides the data for acquisition. Languages that L2 learners hear and see in communicative contexts form the data on which internal mechanisms operate.
- How we measure acquisition (i.e. the type of data we examine) influences how we talk about acquisition and how we make of the conclusions. There is a qualitative difference between explicit and implicit knowledge of a language. Researchers are interested in the development of implicit knowledge.

Language pedagogy cannot ignore the findings on second language research (Benati, 2020, 2022) and must be informed by them. For example, if we know that particular linguistic structures are acquired in a particular order over time, what is the purpose of instruction on those structures? If an instructor believes he or she can get learners to learn something early that is normally acquired later, is that instructor making the best use of his or her time? When researchers in the field of second language acquisition choose to examine the effects of formal instruction, how do they select the linguistic features and why do they select them? These are important questions, and it is second language research that can help inform instructors and researchers about the choices they make.

Our perspective is that even though a significant gap exists between research on second language acquisition and teacher expectations, there is still enough research on second language acquisition research useful for general teacher edification. The traditional practice of grammar teaching is that language teachers (i) instruct L2 learners about specific grammatical forms (often using paradigms for explicit information); (ii) L2 learners practise target forms through mechanical practice; (iii) language teachers assess learners using paper–pencil tests.

There are two problems with this type of instruction aiming at developing explicit knowledge: (1) it does not correspond to the way languages develop in our mind/brain; (2) it does not correspond to the way L2 learners process information. Practices of the kind used in traditional grammar instruction do little to foster the development of mental representation and tend to develop a learning-like behaviour.

Instruction does not have an effect on L2 learners' acquisition of implicit knowledge unless it is of a particular type that can facilitate acquisition. Instruction must therefore be devised in a way that, on the one hand, enhances the grammatical features in the input, and on the other hand, provides L2 learners with opportunities to focus on meaning (e.g. processing instruction). L2 learners must be exposed to input, and input must be comprehensible and message-oriented in order to facilitate language development. Languages that L2 learners hear and see in communicative contexts form the data on which internal mechanisms operate. The only effective way to facilitate language development (implicit knowledge) is the provision of quality input.

What are the Future Avenues of Research?

Second language research investigating the acquisition of English by Chinese and Cantonese L1 speakers and, more in general second, language acquisition research must continue to investigate the nature of language itself by researching the following:

(i) how language is represented in the mind/brain (theoretical linguistics);
(ii) how language is produced and comprehended (applied language research, psycholinguistics);
(iii) how universality/constraints imposed by the human mind/brain along with the effects of bilingualism affect acquisition (first, second and third language acquisition);
(iv) how languages can be replicated, modelled and evaluated through technology. Future research on SLA should make use of new technology (e.g. EEG, eye tracking, computational modelling and assessment) to track what happens within language learners' brains in real teaching/acquisition contexts.

While behaviour studies can track only the automatisation of (second) language knowledge, multidisciplinary and high-tech research can track the internalisation of this knowledge. This research significantly widens the horizons of language acquisition research and will have a major impact on the speed at which we learn languages

(people skills), the way languages are taught (teacher skills), and the way languages are taught and assessed (educational policies, policy-makers).

The empirical research measuring the effects of instruction is not always clear. One of the problems with the research is the way scholars measure outcomes. Just how do we know acquisition has happened after an intervention? Some scholars have argued that there is a huge bias towards explicit testing and tapping of explicit knowledge in the research on the role of instruction. What is more, given what we know about the slow and piecemeal nature of acquisition, it is hardly probable that instruction causes instantaneous acquisition of a particular property of a language. In fact, it is probably impossible. That is, if we conduct one experiment, what do we really show in that one experiment? What is the nature of the treatment? How does the treatment reflect what we know about language development? What are we trying to alter in the learner? But researchers and teachers cling to the idea that we can make a difference in acquisition in some way by focusing on grammar. After all, isn't that what instruction is supposed to do? Since language acquisition is an implicit, complex, abstract and long process, instruction must be designed to help the L2 learner effectively.

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This book is developed out of genuine interest in the challenges encountered by Chinese English as a second language (ESL) learners in L2 acquisition, and ways to address the gap between theoretical research and pedagogy.

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The co-editor of this book, Professor Alessandro G. Benati, is well known for his research in processing instruction and Second Language Acquisition (SLA). I am very glad that he accepted my invitation to be the co-editor of this book. I learned a lot from his research experience and insights.

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I am very glad that I finally made it. In order to explain from different linguistic perspectives the constraints or difficulties Cantonese ESL learners encountered and how they might be dealt with in this book, I needed expertise from different contributing authors and I am grateful to have had all of them on board.

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Alessandro G. Benati is known for his research in second language acquisition. He has researched how L2 learners process information and what internal strategies they use in language processing across romance and non-romance languages. Most recently, his groundbreaking research on the pedagogical framework called processing instruction has been driven by the use of new online measurement/technology (e.g. eye tracking, self-paced reading, and reaction times) to track what happens within language learners' brains in real teaching/acquisition contexts. He has coordinated high-impact research projects funded by the EU, Leverhulme

Trust, British Academy, and other research bodies. He is Co-Editor of a new series for Cambridge University Press called *Elements in Second Language Acquisition* and Member of the UK-REF Panel 2021. He is currently Director of CAES at The University of Hong Kong (HKU) and an Honorary/Visiting Professor in various institutions in Europe and the USA.

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The Acquisition of the English Tense-Aspect System by Cantonese ESL Learners

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Abstract The effect of lexical aspect has been observed in learners' tense-aspect marking, and it has been shown that there are three stages in learners' development of the tense-aspect system. However, these observations have been challenged with discussion on new foci of first language (L1) influence and input biases. In the present study, production data of five groups of Hong Kong English as a Second Language (ESL) learners were examined to address the challenges. The results of the study show that lexical aspect indeed affects learners' tense-aspect marking but the developmental path suggested in previous studies should be modified with added factors of relevant L1 features and classroom input patterns. The results also indicate that learners' development of the tense-aspect system is a continuum rather than a process with three stages. Pedagogical implications of the findings are also discussed.

Keywords Tense-aspect acquisition · Aspect hypothesis · Three-stage sequence · L1 transfer · Input biases

1 Introduction

In previous studies on systematic variation in tense use, beginning learners have been found to associate past perfective marking with [+telic] verbs and progressive marking with [-telic] verbs. This widely observed tendency was first referred to as "primacy of aspect" and later summarised as the Aspect Hypothesis (AH) (Shirai & Andersen, 1995). Along another line of research focusing on how the concept of time is expressed, learners have been observed to follow a three-stage sequence in using linguistic devices to express temporality from pragmatic to lexical and then to grammatical devices (Bardovi-Harlig, 1999). Although both the AH and the three-stage sequence have been attested in various studies, there have also been research findings showing that input biases or typological differences are more important contributing factors to the acquisition process of tense-aspect morphology.

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There are two reasons of particular interest to study the English tense-aspect acquisition process of Hong Kong ESL learners. First, there are correspondences between Hong Kong learners' first language properties and the learner tendencies observed in previous studies, so a study of Hong Kong learners' acquisition processes should shed light on the effects of language typologies on tense-aspect acquisition. In Chinese/Cantonese, the first language of Hong Kong learners, aspect marking is sensitive to lexical aspect just as learners' tense-aspect marking is sensitive to lexical aspect. And as a tenseless language, Chinese relies more on pragmatic and lexical devices to express temporality just as learners do during the first two stages of the three-stage acquisition sequence. Second, Hong Kong learners depend mainly on classroom instruction to learn English, so a study of their English production should allow us to examine the effect of language input in classroom settings.

There have been only a limited number of studies focusing on the tense-aspect acquisition by Hong Kong students. For example, Chan (2019) examined the roles of three different forms of classroom intervention, namely Processing Instruction, Traditional Instruction and Implicit Instruction, in the acquisition of the English simple past. Hong (2008) focused on the impact of lexical aspect and L1 transfer on the acquisition of the English simple past by Hong Kong secondary students. However, these studies have not dealt with the aforementioned correspondences between Chinese, the AH and the three-stage acquisition sequence. By focusing on the correspondences, the present research aims at identifying the roles of lexical aspect, typological differences, different linguistic devices of temporality and language input. The study will have direct implications for English language teaching in Hong Kong and second language acquisition theories in general.

2 The AH and the Three-Stage Sequence

2.1 The Aspect Hypothesis

A number of studies of the 1970s found that children tend to, at the beginning stages of learning their mother tongue, restrict their use of the simple past to [+telic] verbs, namely achievements and accomplishments such as *win the game*, *write a letter*; and restrict their use of imperfective aspect (progressive in English) to durative activities such as *run*, *work* (Antinucci & Miller, 1976; Bloom et al., 1980; Bronckart & Sinclair, 1973). These tendencies have come to be known as "primacy of aspect" (Andersen, 1989, 1991; Robison, 1990), according to which the semantic distinctions of aspectual prototypes of state and process, between telicity and atelicity, and also between punctuality and non-punctuality, are cognitively determined and early verbal morphology encodes these distinctions rather than distinctions of different time locations.

The ideas of "primacy of aspect" have also been applied to analyses of L2 tense-aspect acquisition and found support in many studies (Anderson, 1989, 1991;

Robison, 1990; Bardovi-Harlig & Bergström, 1996; Collins, 2002; among others). Shirai and Andersen (1995) summarised the learner tendencies in their Aspect Hypothesis, which makes two key predictions: (1) learners will initially restrict past or perfective marking to achievements and accomplishments, and later gradually extend the marking to activities and then statives; and (2) in languages that have progressive aspect, progressive marking begins with activities and then extends to accomplishments and achievements.

Although the AH has gained widespread support, there have also been studies that challenge the claims of the AH. One early criticism levelled against the ideas of "primacy of aspect" arose from Andersen's (1993) Distributional Bias Hypothesis (DBH), which suggests that the learner tendencies of associating the past perfect to telic situations and the progressive to durative activities can also be found in the interaction among adults. The skewed distribution in learners' use of tense-aspect morphology may be the effect of bias in input. To avoid input bias, Mueller (2018) carried out an experimental study to teach 40 English native speakers an artificial language in which "types and tokens of lexical aspect and past and present morphology were balanced". His results showed that the interaction between lexical aspect and morphological marking is non-significant. Mueller suggested that the effects of lexical aspect may be absent in the early stages of second language acquisition or may be caused by distributional biases in second language input. Bertinetto et al. (2015) also challenged the AH and argued for a typologically oriented and morphologically sensitive approach. They believed that children do not have a predefined strategy and it is the morphological structure of individual languages that children rely on for relevant information. They provided data to show that the explicitly marked categories are learned before latent categories. For example, temporality morphology may be developed earlier than aspect-related morphology in German because German "first and foremost provides overt marking of the past/present/future contrast" (p. 1163). Ayoun and Salasberry (2008) also showed the strong impact of input biases. Their learners' data show that states are consistently past-tense marked more often than telic events, which, they argued, is the result of the fact that states are, in input data, not only few and frequent, but also consistently past-tense marked.

2.2 The Three-Stage Acquisition Sequence

The AH describes learners' systematic variation in tense use. Along another line of research, how the concept of time is expressed by L2 learners has been examined. It is found that pragmatic and lexical devices are used to express temporality in learner varieties that lack verbal morphology or even verbs (von Stutterheim & Klein, 1987; among others). Schumann (1987) studied the language of five uninstructed basilang (the earliest stage of second language development) speakers and his findings showed that "there is a stage prior to either aspect or tense where learners rely solely on the pragmatic functions of adverbs, calendric expressions, sequentiality, and context (implicit reference) to express temporality" (Schumann, 1987, p. 38).

Trévise (1987) and Véronique (1987) also noted that beginning learners tend to use conjunctions, chronological ordering and adverbials rather than tense morphology to express temporality. As Bardovi-Harlig (1999) summarised, studies along this line "basically agree as to the linguistic devices employed and the order in which they apply: The expression of temporality exhibits a sequence from pragmatic to lexical to grammatical devices".

The term "three stages" has been used to describe this sequence. However, as Bardovi-Harlig (2000) suggested, the characteristic use of a certain kind of device is not equal to the exclusive use of that kind and the shift from relying more on pragmatic devices and lexical devices to relying more on grammatical devices is gradual. The term "three stages" does not provide an accurate description of the gradual and overlapping shift from pragmatic to lexical and then to grammatical devices.

Scholars from different theoretical standpoints have developed different theories to account for the staged tense-aspect acquisition process. Schumann (1987) distinguished the pragmatic component (general cognition) from the computational component (specialised for the acquisition of morphosyntax) in the human cognitive system and assumed that basilang speakers may have acquired their language by applying the pragmatic component rather than the specialised computational component to linguistic input (Schumann, 1987, p. 38). Giacaline Ramat (1992) explained the staged development by paralleling the language-learning process and the grammaticalisation process of historical language change. In terms of historical language change, the expressions of temporality have not been grammaticalised into the tenses in Chinese, and the Chinese relies more on pragmatic and lexical devices to express time. There has been no research on how a tenseless first language affects the "staged" development.

3 The Present Study

As discussed in the above subsections, the AH faces the challenges of input biases and the effect of typological differences, and there has been no research on how a tenseless first language affects the "three-stage" sequence. To address these challenges, a study of Hong Kong ESL learners' production data is needed for two reasons. First, the typological differences of English and Chinese will shed light on our understanding of the roles of lexical aspect, L1 transfer and different linguistic devices of temporality. Second, the learning setting of Hong Kong students also allows examination of the role of input.

3.1 Research Questions

To examine the roles of lexical aspect, typological differences, different linguistic devices of temporality and classroom input in the tense-aspect acquisition of Hong Kong ESL learners, a cross-sectional study was designed to answer the following questions:

- What are the developmental features of Cantonese ESL learners' acquisition of the English tense-aspect system?
- In what ways do typological differences affect the predictions of the Aspect Hypothesis?
- In what ways do typological differences affect the three-stage development of temporality expressions?
- In what ways does classroom input affect the tense-aspect acquisition process?

Answers to these questions will enhance our understanding of Cantonese ESL learners' development of the English tense-aspect system and shed new light on tense-aspect teaching and learning.

3.2 Participants

The present cross-sectional study involved five groups of Hong Kong learners: Grade Five (10 years old) in primary schools, Form One (12 years old), Form Three (14 years old) and Form Five (16 years old) in secondary schools, and university year one (19 years old) (hereafter P5, F1, F3, F5 and U1, respectively). The five groups represented five English proficiency levels from the late beginning to the advanced. As practical constraints did not allow us to administer placement tests, the participants were chosen with much deliberation to ensure their representativeness. The secondary school participants were chosen from two different Band 3 schools (out of a scale of five bands with Band 1 having the highest scoring students and Band 5 the lowest scoring students).[1] Primary schools have no banding, so several classes were chosen from three different government-funded schools. The university participants were from two University English I classes from a middle ranking university. University English I at this university is offered to students from different departments: History, Humanities, Geography and so on (not including students from the English Department). The deliberate selection of participants, together with the large sample size and statistical support, was sufficient in ensuring the representativeness of the sample population.

P5 was chosen as the lowest level because an examination of textbooks and the government language education guide has shown that some major tense-aspect forms have not yet been taught to students before P5. Hong Kong students mainly depend on

[1] Each of the final three years of primary schools concludes with examinations, which determines the secondary school banding.

Table 1 Details of the data

Level	No. of students involved	No. of sentences coded
P5	270	2235
F1	49	519
F3	56	1212
F5	30	686
U1	48	823

classroom instruction to learn English. English textbooks introduce language features from the simpler to the more complex. For P1 and P2, only the simple present and the present continuous are used. The simple past is introduced in the final chapters of P3 textbooks. The past continuous and the present perfect are introduced in P5 (Yang et al., 2000; *CDC English Language Curriculum Guide*, 2004; *CDC English Language Education Key learning Area Curriculum Guide*, 2017).

3.3 Data

To identify the developmental features of Cantonese ESL learners' acquisition of the English tense-aspect system, written data produced by the participants during class time of 50–60 min were collected. To elicit more variety in tense-aspect marking, the genre of narration was chosen because it usually requires more past tense-aspect forms (Biber et al., 1999). The participants were asked to narrate a personal story or a news story. Only the P5 participants were given the beginning of a story and asked to continue the story. The researchers were told that the P5 participants had no experience of writing narratives in English and that they could not think of anything interesting to write during a given period of time. The given beginning goes like this: "*Once upon a time, in a faraway place, there lived a queen who was mean and greedy. One Day a stranger knocked at the castle door*…." (Table 1).[2]

Although we did not obtain equal numbers of participants for the five levels due to practical constraints,[3] we managed to involve at least 30 students for each group and obtain at least 500 coded sentences for each level. More importantly, with the help of χ^2 statistic, the significance levels of the figures were tested as presented in Sect. 4.

[2] The given introductory sentences were not coded for examination.

[3] First, more P5 students were recruited to make up for their inability to write much. Second, the classes involved for other levels were of different sizes.

3.4 Data Processing

All data collected were entered into computer, and sentences were coded in different ways for different purposes. We excluded from data analysis: i. formulaic expressions like *hello*, *how are you* and *bye*; ii. imperative sentences like *come in*, *go away* and *sit down*; iii. verb-less sentences like *Now that man in prison*; and iv. sentences containing verbs whose past tense form and present tense form are the same orthographically, such as *put*, *cut* and *read*; because all these are not useful indicators of tense-aspect use.

The data, either personal stories or news stories, were all about narratives of past events, so in the majority of cases only past tenses (including largely the simple past, the past progressive and the past perfect) were required. When the sentences were examined in context, it was not difficult to figure out whether a sentence was describing a past situation, but there were difficulties in dealing with morphological tense marking. For example, there were cases where the regular past form *–ed* was used for irregular verbs like *understanded* for *understood*; there were also cases where either the simple past tense or another past tense-aspect form was acceptable because different factors interacted in determining the choice of temporal marking. To solve these problems, two principles were followed: (1) whenever a regular past tense ending *–ed* is used for an irregular verb, *understanded* for example, consider it "the simple past tense intended" but not "the simple past tense correctly used"; and (2) whenever a sequence of clauses describes situations/events in chronological order, assume that the English simple past is appropriate for the finite verbs in them. Other past tense-aspect forms were considered required only when they were used by the students in an acceptable way or when they were definitely needed due to reverse-order report or juxtaposition of one foreground event against the background of one on-going event.

All the finite verbs[4] in the past time sentences were examined to: (1) find out what past tense-aspect form was actually used; and (2) determine what tense-aspect form should be appropriate.

To examine the impact of aspect, the aspectual class of each verb was coded. Several linguistic tests developed or used by Verkuyl (1972, 1989), Dowty (1979) and Smith (1997) were used to determine the membership of a verb in its linguistic context.

To find out what linguistic devices were more relied upon to express temporality, the sentences in our database were divided into two types:

> Type (a): sentences that contain temporal adverbials, including deictic temporal expressions like *long ago* and *yesterday*; anaphoric adverbials like *then*, *after*, *at that time* and *on that*

[4] In any recognisable clause, only one verb was considered to be finite unless two finite verbs were conjoined by *and* as in *The police arrived and caught the robbys* (1026:01–12).

Table 2 Different past tense-aspect forms required at different levels

Levels	Sp		Ppr		Pp		Pppr		Other	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
P5	1908	99.3	10	0.5	2	0.1	0	0	2	0.1
F1	544	95.1	13	2.3	12	2.1	0	0	3	0.5
F3	1447	97.1	28	1.9	15	1	0	0	0	0
F5	717	91.8	22	2.8	28	3.6	0	0	14	1.8
U1	1027	90.6	30	2.7	52	4.6	2	0.2	22	1.9

f = frequency; Sp = simple past; Ppr = past progressive; Pp = past perfect; Pppr = past perfect progressive; Other = past tense-aspect forms other than the above listed

day; calendric temporal phrases like *in 1993*; temporal adverbial clauses introduced by *when*, *before*, *while*, etc.; and other temporal expressions like *in my primary school years*.[5]

Type (b): sentences that contain no temporal adverbials.

The coding was done by two researchers independently. Disagreements were solved by discussions among members of the research group.

4 Tense-Aspect Developmental Features

Table 2 summarises what past tense-aspect forms are required for all the finite verbs in past contexts.

Table 2 shows a gradual change in the participants' narrative structure. At the lowest level, namely P5, the students relied on chronological ordering and created few obligatory contexts (less than 1%) for tense-aspect forms other than the simple past. At F1 and F3, the percentages are much higher at 4.9% and 2.9%, respectively. At higher levels, namely P5 and U1, more and more obligatory contexts (close to 10%) were created for tense-aspect forms other than the simple past because the participants constructed more varied narrative structures with some cases of reverse-order report and more temporal adverbial clauses to provide background information therein. The differences between P5 and F1 and between P5 and F3 were significant (P5 versus F1:$\chi^2 = 46.22$, $p < 0.001$; P5 versus F3: $\chi^2 = 23.78$, $p < 0.001$). The difference between F3 and F5 + U1 was also significant ($\chi^2 = 51.349$, $p < 0.001$).

The following table presents what tense-aspect forms were actually supplied by the participants (Table 3).

While past forms were predominantly required, they were seriously underused. Three important patterns can be observed:

- High percentages of the verbs were not tense-aspect marked;

[5] Temporal adverbials of these types were selected because they help organise temporal sequences or indicate temporal location in narratives. Frequency adverbials, like *always* and *often*, were not included because they do not help indicate temporal sequences.

Table 3 Different tense-aspect forms supplied by the students

Form / Levels	Base	%	SP	%	Prp	%	Pp	%	Prc	%	Pc	%	Oth	%	Total No. of finite verbs
P5	1023	53.2	838	43.6	0	0	3	0.16	32	1.7	4	0.2	22	1.2	1922
F1	274	47.9	248	43.4	14	2.4	3	0.5	4	0.7	2	0.3	27	4.7	572
F3	586	39	797	53.5	6	0.4	17	1.1	0	0	25	1.7	59	4	1490
F5	158	20	476	61	22	2.8	28	3.6	18	2.3	13	1.6	66	8.4	781
U1	154	14	859	75.8	14	1.2	35	3	2	0.17	29	2.6	40	3.5	1133
Total	2195	37.2	3218	54.5	56	0.95	86	1.5	56	1	73	1.2	214	3.6	5898

* Base = simple present or base form, Sp = simple past; Prp = present perfect, Pp = past perfect; Prc = present continuous; Pc = past continuous; Oth. = other forms

- The percentages of tense-aspect marked verbs grew with proficiency levels;
- Of the tense-aspect marked verbs, the simple past was the most frequently used form. The percentages of complex tense-aspect forms were very low and only slowly increased with proficiency levels.

The above two tables give a general view of patterns in the development of tense-aspect acquisition of Cantonese ESL learners. The learners indeed had serious problems using appropriate tense-aspect forms. They also seriously underused tense-aspect morphology. Even when they did tense-aspect mark verbs, they used mostly the simple past. The other tense-aspect forms only added up to small percentages of the total tensed verb tokens.[6]

5 Lexical Aspect and Tense-Aspect Marking

5.1 Lexical Aspect and Perfective Past Marking

Table 4 shows the relationship between different types of verb constellation and the use of perfective past morphology (simple past and past perfect). In addition to the traditional four aspectual types, modal verbs were added because they appear frequently and show special characteristics.

The five types of verb can be roughly put into three groups: i. modals; ii. telic types, namely states and activities; and iii. atelic types, namely accomplishments and achievements. The following are the tendencies observed for the three groups:

- Correct rates with modals were low from P5 to F5, and there was a great improvement for U1;
- Correct rates of the atelic group (states and activities) were much lower than those of the telic group (accomplishments and achievements).

It is also worth noting that the second and third groups were not monolithic. There were differences among their members:

- Of the atelic group, correct rates of activities were in general lower than those of states.
- Of the telic group, correct rates for accomplishments were consistently lower than those for achievements.

To sum up, the findings suggest an expansion path of tense-aspect morphology like this:

$$\text{achievements} > \text{accomplishments} > \text{states} > \text{activities} \quad (1)$$

[6] In the data examined, there were instances of overused *be*s (ungrammatically inserted before verbs of various kinds, e.g. *Then the queen is shouted*.). See Yang (2014) for an in-depth discussion on the reasons and functions of overused *be*s.

Table 4 Lexical aspect and perfective past marking

Levels	Modal		State[7]		Activity		Accomplishment		Achievement	
	Inst.*	Cor. rates** (%)	Inst	Cor. rates (%)	Inst	Cor. rates (%)	Inst	Cor. rates (%)	Inst	Cor. rates (%)
P5	35	43	487	39.8	90	34.1	417	48.4	628	82.4
F1	20	45	119	36	56	43	179	55	102	70
F3	50	46	333	63.7	181	50.3	392	72.4	337	86.9
F5	65	51.1	189	61.5	73	54.8	239	74.5	138	87.7
U1	117	77.8	379	83.9	138	82.6	257	87.9	128	87.5

* Inst. = Instances that require perfective past marking (including simple past tense and past perfect tense)
** Cor. Rate = rate of correct past marking tokens supplied

[7] Passive voice sentences and sentences with overused *be*s were excluded because the kind of *be* in them becomes the main carrier of tense and the nature of the main verb is no longer important.

Table 5 Distribution of temporal adverbials across levels

Levels	Type (a) sentences (with temporal adverbials)	%	Type (b) sentences (without temporal adverbials)	%
P5	165	9.7	1538	90.3
F1	174	34.9	325	65
F3	254	21.5	925	78.5
F5	153	26.7	419	73.3
U1	228	30.9	509	69

Finally, it is worth noticing that there was a very long non-acquisition period for past marking on modals, states and activities and only at university level. The participants' marking of these verbs reached or was close to the generally recognised acquisition level (80–90% of appropriate use).

5.2 Lexical Aspect and Progressive Marking

The participants used a limited number of progressive tokens. In total, only 128 tokens were found: 5 on states, 80 on activities, 44 on accomplishments and 1 on achievements. The overall picture seems to support the AH, but the spread of the progressive form from activities to accomplishments as hypothesised by Shirai and Andersen (1995) is not obvious. The numbers of tokens will not be pursued any further as they are too small to carry much statistical significance.

6 The Presence/Absence of Temporal Adverbials and Tense-Aspect Marking[8]

All the data sentences were put under two categories: Type (a) with temporal adverbials and Type (b) without temporal adverbials. The following table presents their distribution (Table 5).

The following observations can be made: (1) at P5, a very low percentage (9.7%) of sentences contained temporal adverbials; (2) at F1, many more sentences contained temporal adverbials (34.9%); (3) at the higher levels (from F3 to U1), the percentages seemingly stabilising within the range from 21.5 to 30.9%. χ^2 values showed that there was a significant increase of Type (a) sentences from P5 to F1 ($\chi^2 = 187.87$, $p < 0.001$) and there was a significant decrease of Type (a) sentences from F1 to F3

[8] Sections 6 and 7.4 are parts of a published paper by Yang and Huang (2004). They were revised and incorporated into this chapter to present a more comprehensive view of Hong Kong ESL learners' tense-aspect acquisition process.

Table 6 Presence/absence of temporal adverbials and tense-aspect use

Levels	Type (a) sentences			Type (b) sentences			Overall past marking
	Finite verbs	Verbs with acceptable past marking*	%	Finite verbs	Verbs with acceptable past marking	%	%
P5	206	67	32.5	1716	778	45.3	44
F1	172	66	38.4	400	187	46.8	44.2
F3	293	170	58	1197	675	56.4	56.7
F5	165	136	82.4	616	391	63.5	67.5
U1	298	255	85.6	835	676	81	82.2

* Including different past tense-aspect forms

($\chi^2 = 32.77$, $p < 0.001$). Differences between F3 and F5 ($\chi^2 = 5.848$, $p > 0.01$) and between F5 and U1 ($\chi^2 = 2.74$, $p > 0.05$) were not very significant.

Table 6 summarises the relationship between appropriate or acceptable past marking and the presence/absence of temporal adverbials in past contexts.

At P5, significantly fewer finite verbs in Type (a) sentences (**with** temporal adverbials) bore past marking than finite verbs in Type (b) sentences (**without** temporal adverbials) (32.5 versus 45.3%, $\chi^2 = 754.87$, $p < 0.001$). A similar phenomenon occurred to F1 with 38.4% of the finite verbs in Type (a) sentences and 46.8% of the finite verbs in Type (b) sentences bearing past marking ($\chi^2 = 77.45$, $p < 0.001$). However, from F3 up, the reverse of what was found between P5 and F1 was observed: significantly more finite verbs in Type (a) sentences were past-tense marked than finite verbs in Type (b) sentences (F3: 58 versus 56.4%, $\chi^2 = 179$, $p < 0.001$; F5: 82.4 versus 63.5%, $\chi^2 = 21.9$, $p < 0.001$; U1: 85.6 versus 81%, $\chi^2 = 22.26$, $p < 0.001$).

7 Discussion

7.1 L1 Reinforcement of the Aspect Hypothesis

The study results presented in Sect. 5.1 showed a clear spread of the appropriate use of the perfective past marking from the telic group to the atelic group. At P5, correct rates for accomplishments and achievements (48.4% and 82.4% respectively) were much higher than those of states and activities (39.8% and 34.1% respectively). For the higher levels, the correct rates of the atelic group rose gradually and the gap between the two groups narrowed. The results in general support the AH. However, compared with the results of the previous studies, the participants' non-acquisition period of the atelic group seems much longer. At F5, after the students had received

formal instruction of English for 11 years (at least 1760 class hours), the correct rates of states and activities were still low at 61.5% and 54.8%, respectively. Even at U1, correct rates of states and activities were still significantly lower than those of accomplishments and achievements.

The tendency predicted by the AH is generally regarded as a phenomenon in early stages of language acquisition. For example, in Bardovi-Harlig and Reynolds's (1995) study of 182 speakers of different first languages, only the learners at the beginning level (Level 1 out of a seven-level programme) performed more poorly than the F5 students in the present study.

A study by Zhao and Shen (1984) showed that 75% of the use of the Chinese perfective marker *le/jo* matched the English simple past, so it is highly likely for the participants to take *le/jo* as the equivalent of the English simple past. While the English simple past freely occurs on any kind of verbs, *le/jo* occurs only in sentences that present situations with endpoints (Yang, 2011). Accomplishments and achievements are telic situations containing intrinsic natural endpoints, and *le/jo* can freely occur with them, whereas states and activities are atelic events and *le/jo* usually does not co-occur with them. The occurrence pattern of *le/jo* in Chinese corresponds to the universal learner tendency of marking telic verbs only in the early stages of language acquisition. As both the learner tendency and the constraint on *le/jo* occurrences reflect a natural tendency in morphology attachments as captured in Bybee's Relevance Principle (1985), they seem to reinforce each other. It is this reinforcement that leads to a delay in the spread of the past tense marking to atelic verb types.

7.2 The Expansion Path of Perfective Past Marking

The two key predictions of the AH lump achievements and accomplishments together as the ([+telic]) group, and activities and states together as the ([-telic]) group. Are these two groups truly monolithic? Conflicting answers can be found in different studies. Bardovi-Harlig and Bergström (1996) found that the [+telic] group showed the same level of past marking (46.4% and 47.1% of appropriate marking, respectively), and the [-telic] group showed similar levels of past marking (15% and 17.2% appropriate marking, respectively). Bardovi-Harlig and Reynolds' study (1995) produced similar findings. However, Andersen's (1986) study found that both [punctual] and [dynamic] were important features to distinguish achievements ([+punctual]) from accomplishments ([-punctual]) in the [+telic] group and activities ([+dynamic]) from states ([-dynamic]) in the [-telic] group. He suggested that the perfective past spreads from achievements, to accomplishments, then to activities and finally to states; and the imperfective past spreads in the opposite direction from states, to activities, to accomplishments and finally to achievements. Bardovi-Harlig's (1998) oral data also showed that many more achievements received perfective past marking than accomplishments, although her written data suggested that achievements and accomplishments seemed to pattern together. Andersen and Shirai (1996)

proposed a four-stage expansion path of the perfective past:

achievements > accomplishments > activities > states (2)

The findings of the present study support the path in (1) repeated in (3) below:

achievements > accomplishments > states > activities (3)

The first half of (3) is the same as (2) but the second half is different in which states go before activities. In Bardovi-Harlig and Bergström's (1996) study, states also showed higher appropriate past marking than activities. As their study emphasised only the spread of past marking from telic verbs to activities, the differences between states and activities were not pursued.

In the following subsections, it will be argued that the four-stage expansion path suggested by Andersen and Shirai (1996) is theoretically sound but it should be modified.

7.2.1 The Modified Four-Stage Expansion Path of Perfective Past Marking

The difference between achievements and accomplishments is the presence/absence of the feature [punctual], and the difference between states and activities is the presence/absence of the feature of [dynamic]. The function of perfective past marking is to locate a situation in the past and provide an entirety view of the situation, so its basic meanings are [+past] and [+entirety]. Punctuality is not one of the basic meanings. It is only indirectly relevant to the basic meanings because punctual events are more likely to view in their entirety. As an indirectly relevant feature, punctuality creates a shorter distance between achievements and accomplishments than that between the telic group and the atelic group. This distance can be shortened or even erased by the factors discussed in the later part of this subsection.

Like the [±punctual] feature, [±dynamic] is not one of the meaning components of the perfective past either. It may be argued that dynamic events are more likely to terminate than states and thus easier to view in their entirety, because it takes energy to maintain them while states can sustain without provision of energy. However, this argument is not strong, and it is very likely that the distance between activities and states is even shorter than that between achievements and accomplishments.

Of the three features that distinguish aspectual verb classes, [±telic] is the most important one in determining the expansion path of perfective past marking. The other two features are only indirectly relevant to the meanings of the perfective past, and the distinctions created by them can be weakened or even erased. That is why the distinction between the [+telic] group and the [-telic] group is always attested, but the distinction among members within each of the two groups is not always there. Andersen and Shirai's (1996) expansion path can be maintained with some modifications as shown below:

(Achievements ≥ Accomplishments) > (Activities ≥ States) (4)

First, the path in (4) acknowledges the two stages: the telic group > (precedes) the atelic group. Then within each of the two groups, the symbol " ≥ " is used to indicate that there may be two separate stages, namely Type A > Type B; or the two stages may merge, namely Type A = Type B. Either " > " or " = " will obtain in learner language depending on two factors.

7.2.2 The Factors that Affect the Order Within the [+telic] Group and the [-telic] Group

The first factor is the types of language production. The inconsistent findings in the previous studies resulted partly from the fact that different types of language production data were examined. One of the strengths of the present study is the use of free production data, but this strength also led to one of its limitations: the verbs available for investigation were not evenly distributed. The uneven distribution may be a factor that affected the judgement of the expansion path of perfective past marking.

First, the verbs were not evenly distributed across different aspectual classes (Table 7).

The numbers of different activity verbs were more than twice as many as those of states, and the same was true of accomplishments verbs against achievements verbs.

Second, more states and achievements were found among the top most frequently used verbs.

A total of 10 out of the 19 different verbs listed in Table 8 were either states (*be*, *have*, *feel, want* and *know*) or achievements (*say*, *see*, *ask*, *shout* and *find*). The top two most frequent verbs were *be* (state) and *say* (achievement). The past marking of these two verbs as shown in Table 9 may affect the overall correct rates presented in Table 4.

A comparison of Tables 9 with 4 shows that the correct past marking rates of either *be* or *say* were higher than the overall rates of states and achievements.

According to Giacalone Ramat (1992), *be* seldom occurs untensed. As Table 9 shows, there was a higher percentage of past marking on *be* than on other stative verbs. This higher percentage may counterbalance the disadvantageous [-dynamic]

Table 7 Numbers of different verbs in each aspectual class at different levels

Level	States	Activities	Accomplishments	Achievements
P5	13	32	49	19
F1	11	33	47	18
F3	15	43	47	20
F5	17	56	82	21
U1	30	66	99	32

Table 8 Top 8 most frequently used finite verbs

Levels	Verbs and numbers of tokens							
P5	Say (397)	Be (377)	See (83)	Go (95)	Open (74)	Want (41)	Ask (50)	Give (37)
F1	Be (88)	Go (87)	Say (57)	Come (15)	Wait (14)	Take (12)	Find (9)	Give (9)
F3	Be (188)	Say (134)	See (93)	Go (117)	Run (60)	Ask (46)	Tell (33)	Catch (26)
F5	Be (142)	Say (53)	Go (41)	think (35)	Have (25)	know (22)	want (21)	see (19)
U1	Be (314)	Have (34)	Feel (28)	Go (38)	Know (25)	See (27)	get (24)	Think (18)

Note Auxiliary and overused *bes* are not included. Auxiliary *haves* are not included either.

Table 9 Perfective past marking for *be* and *say*

Levels	Tokens of *be* requiring perfective past marking	Correct rate (%)	Tokens of *say* requiring perfective past marking	Correct rate
P5	337	45	389	91.4
F1	72	48.8	52	84.6
F3	170	74	129	86.6
F5	138	74	51	98
U1	274	89.5	10	90

Table 10 Distribution of different verbs in the textbooks

States	Activities	Accomplishments	Achievements
30	90	93	46

feature of states and cause the order change of activities and states in the four-stage expansion.

The second factor is the uneven distribution in classroom input. The uneven distribution of verbs in our data may be a true reflection of the language input to the students. To test this, we examined all finite verbs in one set of popular English textbooks[9] used in Hong Kong primary schools and identified the distribution patterns (Table 10):

[9] To identify the most commonly used English textbooks, we randomly selected 50 schools and phoned each of them. The results showed that all of them used one or two of the six sets of textbooks. Then one from the six sets was chosen for examination here.

Table 11 Top 8 most frequent verbs in the textbooks

Textbooks		
Verb	Frequency	Verb type
be	984	State
say	431	Achievement
go	135	Accomplishment
take	134	Accomplishment
have	105	State
get	89	Accomplishment
want	77	State
like	60	State

Similar to what was found in the participants' production data, there were also more different activities and accomplishments than different states and achievements in the textbooks. Also similar to what was found in the participants' production data, more states and achievements appeared on the list of top 8 most frequent verbs. *Be* and *say* greatly outnumbered the other verbs on the top list.

The outstanding similarities between our data and the textbooks make it reasonable to say that the verb distribution patterns in our data reflect the patterns of the classroom input. As Table 11 shows, a few states and achievements such as *be* and *say* occurred very frequently in the textbook input so that the participants might get more familiar with their different tense-aspect forms. High rates of repetition may have deeply ingrained the past tense form of these verbs (*was, were, had*, *liked*, *said*, *found*, *stopped*, etc.) in the minds of the learners. Therefore, when they write, they may provide more correct verbal marking for these familiar verbs. On the other hand, the participants might have encountered only a few times many of the larger numbers of activity and accomplishment verbs. They might have had just enough time to process the core meanings and basic forms of these verbs and so they tended to ignore the past inflections for them. We formulated this phenomenon as the Frequency Effect:

(5) A number of states and achievements such as *be* and *say* are highly frequent in language input to students; their different morphological forms may be the first thing learned by learners.

The Frequency Effect explains the higher correct rates of copula *be* and some other states and achievements. The higher correct rates may raise the overall correct rates of states and achievements to a lesser or greater extent, depending on the nature of tasks students perform. For free production, especially when learners have a limited vocabulary to manoeuvre because of low language proficiency, students may use certain familiar states and achievements frequently (like the participants of lower levels in our study), and the overall correct rates of states and achievements will rise to a greater extent. For cloze tests, if the test verbs distribute evenly across the four aspectual types, the Frequency Effect will not obtain.

Our argument here is also partially supported by Ayoun and Salaberry's (2008) findings. Their cloze test results supported the AH, but the results of their narrative

data showed that states were consistently marked with perfective past more often than even telic events. They suggested this be the result of a distributional bias in input: states were few, frequent and consistently marked with perfective past while accomplishments and achievements were more open-ended and were marked with both perfective past and progressive. However, their narrative data size was small with only 21 learners, and no detailed analysis of the input was given in their paper.

7.3 Lack of Past Marking for Modal Verbs and L1 Transfer

The correct rates for modal verbs were consistently low. Even at university level, the students did not achieve 80% of appropriate past marking for modal verbs. The Chinese perfective marker *le/jo* may be mistaken as the equivalent of the English simple past. In English, tense marking is compulsory for all finite verbs; however, in Chinese, aspect markers are grammatically optional and their use is subject to various constraints, one of which is that modal verbs never take aspect markers. The participants might have transferred this constraint from Chinese to their use of English modal verbs and therefore had persistent difficulties in appropriately marking modal verbs with past tense morphology. In past contexts, they often used *can* instead of *could*, *will* instead of *would*, etc.

7.4 Developmental Stages of Tense-Aspect Acquisition

As Table 5 shows, at the lowest level (P5), a very low percentage of sentences contained temporal adverbials (9.7%). There may be two reasons for it. First, the given beginning could have reduced the chances of participants' writing an introductory sentence that contained a temporal adverbial. Second, the students relied heavily on context and chronological ordering (pragmatic devices) to locate events temporally. The fact that they created, in narrating past events, a small percentage of contexts (less than 1%, Table 2) for tense-aspect forms other than the simple past is strong evidence that they indeed relied heavily on context and chronological ordering to express temporality. Only a couple of reverse-order report sentences were found. And there were only a few complex sentences that contained adverbial clauses introduced by *when*, *while*, *before*, *after* or other kinds of subordinate clause. The rates of appropriate tense-aspect marking were low for both Type (a) and Type (b) sentences (32.5% and 45.3% respectively). In general, the participants at this level relied heavily on pragmatic devices to make temporal references.

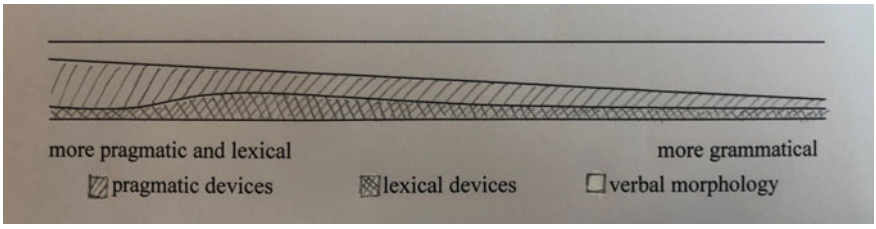
The F1 participants used more temporal adverbials (34.9% Type (a) sentences) and more finite verbs in past time contexts that required different past tense-aspect forms other than the simple past (4.9%). They produced more complex sentences containing temporal adverbial clauses or other kinds of subordinate clause. The correct past marking rates were higher, 38.4% with Type (a) sentences and 46.8%

with Type (b) sentences. Compared with the P5 students, the students at this level seemed to rely heavily on lexical means to make temporal references.

At the even higher levels, namely F3, F5 and U1, the rates of Type (a) sentences (with temporal adverbials) ranged from 21.5% to 30.9% (Table 5) and the overall rates of past marking went steadily higher: 56.7% at F3 and 67.5% at F5. At the highest level U1, the participants showed a fairly good command of the tense-aspect system with an overall past marking rate of 82.2% (Table 6), and they also created many more contexts (9.36%, Table 2) for different past tense-aspect forms other than the simple past.

The picture that emerges from the figures in Tables 2, 5 and 6 seems to match the developmental sequence from pragmatic to lexical and then to morphological devices. However, the sequence is not one of the three stages. It is more like a continuum with three parallel streams, "the stream of pragmatic devices" being the widest at the beginning; "the stream of lexical devices" being wider towards the middle, and "the stream of morphological devices' being the widest at the end, as shown in (6):

(6) Continuum of tense-aspect system acquisition



To sum up, there are no three clear stages from pragmatic to lexical and to grammatical devices. Rather, there is a slow shift from relying more on pragmatic devices to more on lexical devices and then to more on morphological devices. Our data argue strongly for a continuum description rather than a three-stage description of the tense-aspect system development.

In addition to the continuum, the results lead to three more observations. First, even at the lowest level, when the learners relied heavily on pragmatic devices to make temporal references, they also used tense morphology to mark 32.5% of the (a) type sentences and 45.3% of the (b) type sentences (Table 6). Second, the presence of temporal adverbials was related to the lower past marking rates at the lower levels (P5 and F1) and the reverse happened at the higher levels (F3, F5 and U1) (Table 6). Third, the shift from relying more on pragmatic and lexical devices to relying more on grammatical devices was very slow. There should be an extended "more pragmatic and lexical" period from P5 to F5, a span of 6 years. These special observations will be explained in the following subsections.

7.4.1 Classroom Instruction and Our Learners' Early Start in Tense-Aspect Use

Hong Kong ESL students are instructed L2 learners. Outside the classroom, they have little exposure to English. According to the *English Language Curriculum Guide* (Primary 1–6) (2004) and *English Language Education Key learning Area Curriculum Guide* (Primary 1–Second 6) (2017) published by the Curriculum Development Council of the Education Bureau in Hong Kong, the different tense-aspect forms are mostly introduced to students in the six primary school years and expected to be used by them in the following sequence:

Key stage 1 (Primary 1–3).
Simple present tense; present continuous tense; simple past tense.
Key stage 2 (Primary 4–6).
Present perfect tense; future tense; to be going to; past continuous tense.
Key stages 3 & 4 (Secondary 1–6).
A variety of tenses; the passive voice; reported speech.

By the end of Key Stage 2 (Primary 6), all major tense-aspect forms have been introduced to students in the classroom. In other words, when the students' overall knowledge of English is still at the beginning level, they have already received some formal instruction on different tense-aspect forms and have had some vague ideas about tense-aspect use. The formal instruction and the vague ideas in students' mind lead to an early start in their tense-aspect use. However, the limited language exposure (e.g. illustrative examples in texts, specially designed exercises and classroom activities) does not guarantee that students have acquired the meanings and functions of different tense-aspect forms, so they still rely heavily on pragmatic and lexical devices to locate events temporally.

7.4.2 The Function Shift of Temporal Adverbials

The fact that the presence of temporal adverbials led to the lower rates of past marking at P5 and F1 is clear evidence to support the argument that the participants of lower levels relied very much on temporal adverbials for making temporal references. Temporal adverbials at these levels were a kind of tense substitutes. From F3 up, however, the presence of temporal adverbials was related to higher rates of past marking. Temporal adverbials seemed to be gradually shedding its responsibility as tense substitutes and assuming a different function: reminders for the use of verbal morphology. This is something which has not been discussed in previous studies, and we believe that it is a special feature in the interlanguage of our instructed students.

As discussed earlier, the formal classroom introduction of different tense-aspect forms is responsible for an early start in tense-aspect use, and a particular kind of training should be the reason why temporal adverbials can function as a kind of reminder for the use of certain tense-aspect forms. Yang et al.'s (2000) examination of the Hong Kong English textbooks revealed that textbook writers depend heavily on adverbials of frequency (*every day*, *always*, *usually*) to cue the simple present,

on deictic and calendric temporal adverbials (*yesterday*, *in 1990*, *now*) to cue the simple past or the progressive, and on adverbials like *recently*, *already* to cue the present perfect form. The following sentences are typical examples taken from the textbooks.

(7) Where are Tony and Jenny **now**?

(8) Where were they **at 8:00**?

(9) Tony cleans his room **every day** but he did not clean it **yesterday**.

The dependence upon different temporal phrases to cue the use of certain tense-aspect forms could give inaccurate information to learners so that they may "under-generalise" the meanings associated with verbal morphology (Bardovi-Harlig, 1992). This kind of formal training makes students more and more conscious of the need to use certain kinds of verbal morphology in the presence of certain types of temporal adverbial, and as a result, the presence of temporal adverbials becomes a kind of reminder for tense-aspect marking. This is exactly what our data have shown: as levels increased, there was a shift in the function of adverbials from tense substitutes to reminders of tense marking.

7.4.3 The Reinforcement of the Initial Tendencies to Use Pragmatic and Lexical Devices by L1 Transfer

As discussed in Sect. 2, there was a coincidence between the learners' initial tendencies of relying on pragmatic and lexical devices and the Chinese way of expressing temporality. This coincidence was not a mere accident.

It has been assumed that "the results of language change coincide with or parallel (or are not totally unrelated to, at least) the language learning processes" (Giacalone Ramat, 1992, pp. 298–299). This assumption finds strong support in the particular semantic area of temporality. English and many other languages have gone through the historical development from "more lexical and pragmatic" to "more grammatical" (Giacalone Ramat, 1992), and learners of these languages are shown to go through the same developmental processes. However, Chinese retains the natural tendencies of using pragmatic and lexical devices to indicate deictic temporal relations, although there is grammatical aspect to indicate different ways of viewing situations. As the reliance on pragmatic and lexical devices for expressing temporality in Chinese and the learners' initial tendencies result from the same source, which is a natural pattern in the human language development, it is not surprising to find that Chinese, as L1, has a reinforcing effect on the learners' initial natural tendencies and the reinforcement results in an extended "more lexical and pragmatic" period from P5 to F5, a span of 6 years.

The reinforcing effect of [-tense] L1 Chinese on our learners' acquisition of the English temporal system can be seen more clearly in light of the studies on learners whose L1 and L2 are both [+tense] languages. Although it is not possible for us to find studies directly comparable to the present one in terms of sampling methods and learning environment, some relevant studies can provide us with valuable references. In the classroom environment investigated by Salaberry (1999), one semester

of intensive training produced tremendous improvement in students' use of tense-aspect morphology. In the natural learning environment investigated by Andersen (1991), the two learners progressed from stages 2 and 4 to stages 6 and 8 respectively within a period of two years. In Housen's (2000) longitudinal study of instructed L2 acquisition, the learner made great progress within the period of three years. In sharp contrast to the participants of these studies, it took much longer for the participants of our study to make progress in tense-aspect development. They had 8–9 English lessons (an average of 4.5 h) per week in primary schools and 8–10 English lessons (an average of 5 h) per week in secondary schools. In the period of 6 years from P5 to F5, after about 1200 h of English lessons, their acceptable past marking rates for verbs in past contexts only rose from 44% to 67.5%. Only at university level, our learners can be said to have basically acquired the norms of English tense-aspect use.

8 Pedagogical Implications

8.1 Teachers and Textbook Writers Need to Be Aware of Verb Classes

The results of the study suggest that students' appropriate past marking rates for accomplishments and achievements are higher than those for states and activities. To counterbalance this effect of lexical aspect, it is necessary to enhance teachers' and textbook writers' awareness of aspectual verb classes. In writing textbooks or designing exercises, more deliberation is needed to include more different states and activities in past time contexts. More importantly, more texts should contain scenarios which require the use of different tense-aspect forms on different types of verb so that teachers could use them to illustrate and compare the meanings of tense-aspect forms.

8.2 Some Measures Should Be Taken to Mitigate Negative L1 Transfer

The results of the study suggest that L1 transfer manifests in two ways: (1) the lexical constraints on the use of the Chinese perfective aspect marker strengthen the association between past tense marking and telic events, thus delaying the spread of past tense marking to atelic verbs; and (2) the Chinese ways of expressing temporality reinforce learners' tendency to rely on pragmatic and lexical devices. These two ways of L1 influence work together, leading to a prolonged non-acquisition period of the English tense-aspect system. Some measures could be taken to overcome the problems of L1 transfer. First, a comparison of the Chinese perfective marker *le/jo* and the English simple past could be done to let students understand the different

functions of *le/jo* and the English simple past. Second, different narrative orders, such as chronological order, reverse order and juxtaposition, could be used in narrative texts to let students understand that past contexts require past tense-aspect forms regardless of narrative order. Third, different types of adverbial could be included in the same past time contexts to show that temporal adverbials cannot substitute tense marking.

8.3 More Balanced Classroom Input is Needed

As discussed in Sect. 7, uneven distribution of verbs across different aspectual classes and the frequent repetitions of a few states and achievements, such as *be*, *have* and *say*, in the classroom input have negative impacts on the spread of the perfective past within the [+telic] group and [-telic] group of verbs. To mitigate the impact, more deliberation is needed to include more different states and achievements and reduce the number of repetitions of certain highly frequent states and achievements in texts and exercises.

It has also been argued that students' tendency of using certain tense-aspect forms in the presence of certain types of temporal adverbial could result from classroom training. To avoid the negative effect of this tendency, contexts rather than individual sentences with temporal adverbials should be used to elicit the use of different morphological forms.

9 Conclusion

The results of the present study showed that more [+telic] verbs (i.e. accomplishments and achievements) were appropriately tense-aspect marked than [-telic] verbs (i.e. states and activities). This basically supports the AH. However, the four-stage expansion path of the perfective past should be modified. A new expansion path (Achievements $\geq$ Accomplishments) > (Activities $\geq$ States) was proposed, and how L1 morphological structure and/or input pattern might affect the expansion order within the [+telic] group and the [-telic] group was explained. The results of the study also indicate that learners' shift from relying more on pragmatic to more on lexical and then to more on grammatical devices of temporality is a continuum rather than a three-stage process, and the prolonged non-acquisition period comes from the reinforcing effect of L1 transfer. The implications of the findings have also been discussed.

The present large-scale study has produced some original findings which have pedagogical implications. However, further research is needed to make up for its limitations. First, in addition to cross-sectional design, a longitudinal study could be done to clearly delineate the developmental path of Hong Kong ESL learners' tense-aspect system. Second, cloze test data could be coupled with production data

to counterbalance the problem of biased verb distribution across different aspectual types.

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The Role of Lexical Aspect in L2 Acquisition of the Present Perfect

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Abstract The present study examined the use and appropriateness of the English present perfect in 24 advanced L1 Cantonese ESL learners using a rational cloze test. Results suggested that the learners strongly associated the present perfect with accomplishments than with states. Mixed-effects statistical analyses confirmed that prototypical pairings of morphology and lexical aspect (i.e. accomplishments and the present perfect) tended to be used more appropriately than non-prototypical combination (i.e. states and the present perfect). Yet, another finding revealed a robust L1-based lexico-grammatical pairing between present perfect progressive and state verbs modified by durative adverbials. These patterns of findings are interpreted as supporting the strong effect of lexical aspect and L1 transfer, which demonstrates a very complex relationship between putatively universal and language-specific mechanisms in second language acquisition. In sum, this study has provided new impetus to a possibility of extending the Aspect Hypothesis to the perfect aspect. More L2 acquisition research is called for to investigate the more complex yet less frequent English present perfect and present perfect progressive. Pedagogical implications of the findings are also discussed.

Keywords Aspect hypothesis · Lexical aspect · Present perfect · State · Accomplishment · Cantonese

1 Introduction

In English, we can use the simple past or the present perfect (PP) to describe past situations, as exemplified in *He died* versus *He has died* (i.e. He is dead). The perfect encoded by PP adds a subtle aspectual meaning of "continuing present relevance of

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a past situation" (Comrie, 1976, p. 52) that is unavailable to the simple past. Such a perfect/non-perfect contrast presents some unique difficulties to language learners.

First and foremost, the perfect has complex semantic and pragmatic meaning. Comrie (1976) posited four types of meaning for the perfect (see Sect. 2.2). The multiple perfect meanings, plus other linguistic factors such as verb forms, adverbial context, lexical verb and meaning, are found to be responsible for the late emergence of PP forms (present perfect progressive included) relative to the simple past between both preschool children (e.g. Johnson, 1985) and adult English as second language (ESL) learners (e.g. Bardovi-Harlig, 1997, 2001). The multiple perfect meanings, in addition to the perfect/non-perfect contrast, further exacerbate the learning difficulty of PP (Bardovi-Harlig, 2001, pp. 223–4).

Another stumbling block arises from the differential use of PP in British English (BrE) and American English (AmE). Comrie (1976, p. 54) observed "American English overall shows a greater preference for the non-perfect, in cases where British English would prefer or require the perfect". Corpus research corroborates this observation that "written AmE in the 1990s still uses significantly fewer PPs than BrE" (Hundt & Smith, 2009, p. 48). Yao and Collins (2012) also adduced corpus evidence to show the highly dynamic use of PP among major varieties of English, as well as across genres such as conversations, news reportage, academic and fictional writing. These dialectal and discourse variations in usage, plus the subjective perspective of the writer/speaker, render PP an elusive learning target as its use is largely non-obligatory and context dependent.

Third, the infelicitous combination of PP and deictic past adverbials (e.g. **I have eaten cookies yesterday*) poses an interesting typological problem known as the present perfect puzzle (Klein, 1992). Such a combinatory restriction applies to English, but the equivalent combinations are perfectly permissible in closely related languages such as German, Dutch and French. Previous research has suggested that language learners from these language backgrounds, depending on specific L1-L2 pairings, may struggle in processing the semantics of the English present perfect and interactions with temporal adverbials (e.g. Roberts & Liszka, 2013).

To date, little research has focused on the acquisition of the English present perfect. Much attention has been devoted to initial and subsequent acquisition and processing of the English simple past and present progressive morphology inspired by the Aspect Hypothesis in the last two decades (e.g. Andersen & Shirai, 1994; Bardovi-Harlig, 2000; Bardovi-Harlig & Comajoan-Colomé, 2020). Although the influential Aspect Hypothesis does not make predictions about the emergence of PP forms, prototypical associations between lexical aspect and related morphological forms at the crux of the Aspect Hypothesis may underlie the interlanguage development of the perfect, similar to those of the past tense yet on a more advanced structure characterised by complex form-meaning mappings, variations in input and use and cross-linguistic puzzle (i.e. combinatory restrictions between PP and deictic past adverbials unique to English). Against this gap, this chapter examines the role of lexical aspect in L2 acquisition of the English present perfect in advanced ESL learners from Hong Kong. The goal is twofold. First, in the spirit of prototype, it seeks to extend the Aspect Hypothesis to the study of the perfect. Second, it provides empirical data to help us

understand the interlanguage development of advanced knowledge of the perfect in L2 tense-aspect acquisition.

The chapter consists of four sections. Section 1 outlines learning problems and theoretical issues unique to the English present perfect. Section 2 describes the perfect within the purview of the tense and aspect system. Section 3 reviews the acquisition literature pertaining to the English present perfect. Section 4 reports findings of the current study, followed by a discussion of research and pedagogical implications and conclusion.

2 Tense and Aspect

2.1 Linguistic Background

Time is abstract. Klein (2009) listed six linguistic devices that encode time in language, including tense, aspect, *Aktionsart*, temporal adverbials, temporal particles and discourse principles. Tense and aspect, in particular, have been the subjects of many scholarly debates in the theory of temporality in linguistics.

Tense refers to "the grammaticalisation of location in time" (Comrie, 1985, p. 1). Tense is deictic; it refers to a time interval in relation to another temporal reference, usually the moment of speaking. Common grammatical tenses include the past, the present and the future. Unlike tense, aspect is non-deictic; it concerns "the internal temporal constituency of a situation" (Comrie, 1976, p. 3), independent of a situation's temporal reference.

Smith (1991, 1997) proposed a compositional model of aspect that subsumes two levels of aspect—viewpoint aspect and situation aspect. Viewpoint aspect distinguishes between a perfective viewpoint and an imperfective viewpoint. According to Comrie (1976), "perfectivity indicates the view of a situation as a single whole, without distinction of the various separate phases that make up that situation" (p. 16). The perfective viewpoint, hence, construes a situation as complete. By contrast, the imperfective viewpoint construes a situation "from within" and presents it as incomplete, with explicit reference to its internal temporal structure (Comrie, 1976, p. 24). Viewpoint aspect is also known as grammatical aspect, because it is often marked morphosyntactically. One thing to note is that viewpoint aspect is subject to cross-linguistic and speaker differences, as languages differ in how aspect is encoded grammatically, and speakers of a language have options to take different viewpoints (if available) even when dealing with the same situation. For example, one can talk about the same situation perfectively (*he studied math*) or imperfectively (*he was studying math*), depending on the speaker's perspective.

Situation aspect, or lexical aspect, refers to the inherent temporal properties of a verbal predicate. It is also referred to as *Aktionsart* ("kind of action" in

German). Vendler (1967) distinguished four lexical aspectual classes—states, activities, accomplishments and achievements. Both states (e.g. *know* and *love*) and activities (e.g. *walk* and *swim*) are atelic for their temporal semantic representations do not specify an inherent endpoint. This is in contrast to accomplishments (e.g. *cross the road* and *build a house*) and achievements (e.g. *fall* and *win the race*), which are telic as they encode an inherent endpoint. Although there is some general agreement, the classification of telicity and situation aspect remains controversial. Smith's (1997) two-component theory of aspect remains influential as it provides a unified account of aspect in which viewpoint aspect and situation aspect, though orthogonal to each other, interact to yield a particular temporal interpretation of a situation. Notably, Smith (1997) catered to both universal and language-specific properties of aspect that are distributed across lexical aspect and grammatical aspect.

The above linguistic background, though quite brief, is useful to help understand the focus of this chapter (i.e. semantics and acquisition of the perfect as a linguistic category).

2.2 The Perfect

The perfect is a controversial category in the theory of aspect (Binnick, 1991; see Ritz (2012) for a general discussion). One defining property of the perfect that Comrie adopted is the continuing relevance of a previous situation (1976, p. 56). In the utterance *John has arrived*, PP denotes the relation between a past situation (i.e. *John's arrival*) and a present state (i.e. *John is here*). Although the perfect partakes of the past and the present, it mainly refers to the aspectual meaning of a situation (i.e. *John's arrival* and the ensuing state).

Comrie (1976, pp. 56–61) posited four senses for the perfect. They are the perfect of result, experiential perfect, the perfect of recent past and the perfect of persistent situation. The perfect of result emphasises an outcome due to some past situation(s). For example, the utterance *John has arrived* highlights a result state of John's arrival, implying that John is here at the moment of speech. This is in contrast to *John arrived*, in which the simple past does not necessarily denote a resultative meaning. Another meaning of the perfect is experiential perfect, as in *Tom has watched the documentary before*. The utterance suggests that Tom watched the documentary on at least one occasion before. The perfect of recent past denotes a recent past situation that often calls for temporal adverbials such as *just*, *lately* and *recently* (e.g. *The boys have just finished their homework*). The perfect of persistent situation depicts a situation that began in the past and persists to the present (e.g. *Ann has practised law for ten years*), for which the same situation can be depicted by the present perfect progressive, often collocated with durative adverbials such as *for ten years* and *since* (e.g. *Ann has been practising law for ten years*).

Table 1 summarises several tense-aspect categories in English, listed according to simplex viewpoint and complex viewpoint (Xiao & McEnery, 2004). The simplex viewpoint consists of simple, progressive and perfect, whereas the complex viewpoint

Table 1 Tense-aspect categories in English (based on Xiao & McEnery, 2004, p. 246)

	Aspect	Tense	Label	Linguistic form
Simplex viewpoint	Simple	Present	Simple present	V(-s)
		Past	Simple past	V-ed
	Progressive	Present	Present progressive	Is/am/are V-ing
		Past	Past progressive	Was/were V-ing
	Perfect	Present	Present perfect	Has/ have V-en
		Past	Pluperfect	Had V-en
Complex viewpoint	Perfect progressive	Present	Present perfect progressive	Has/have been V-ing
		Past	Pluperfect progressive	Had been V-ing

refers to the compound aspect of perfect progressive. Such a distinction becomes relevant when we compare nuanced meanings of two forms of present perfect—the present perfect (PP) and the present perfect progressive (PP-PROG) in the current study.

2.3 The Present Perfect, the Perfect Progressive and the Simple Past

As shown in Table 1, PP in the periphrastic form (*has/have V-en*) encodes the perfect in the present tense. PP-PROG, which is also periphrastic (*has/have been V-ing*), encodes both the perfect and the progressive aspects in the present tense. In comparison, the simple past in the inflected form (*V-ed*) encodes the simple aspect in the past tense. The three categories differ in form and meaning as they distinguish between perfective/imperfective, perfect/non-perfect, as well as past/non-past contrasts.

One useful heuristics to differentiate them is to observe the distribution of morphology according to lexical aspect. Perfective morphology (PP or the simple past) expressing a complete situation is most compatible with telic situations. Notably, change-of-state telic verbs can express direct results of some past situations [e.g. *Someone has stolen my wallet* (= The wallet is gone)]. According to Comrie (1976, p. 56), the perfect of result represents the most central form of current relevance meaning. Quirk et al. (1985) asserted that "because of its resultative meaning, the simple perfective (i.e. the present perfect) cannot be used with accomplishment verbs when the clause contains an adverbial of duration" (p. 212), as exemplified in the sentence pair **They've repaired the road for months* vs. *They've been repairing the road for months.* In some cases, however, PP and PP-PROG have equivalent meaning (e.g. *He has lived/been living here for three years*). The difference between

Table 2 Tense-aspect categories' prototypical associations with lexical aspect and combinatorial conditions with temporal adverbials

Categories	Telicity	Perfectivity	Canonical perfect meaning	Temporal adverbial
Present perfect	Telic *Accomplishment with durative adverbials	Perfective	Perfect of result	Already, just, since
Present perfect progressive	Activity *State	Imperfective	Perfect of persistent situation	For three days
Simple past	Telic	Perfective	–	Yesterday

the two forms in such cases is that PP-PROG overtly marks the imperfective viewpoint and/or duration involved, which is the default interpretation of the perfect of persistent situation (see Xiao & McEnery, 2004, pp. 269–272). PP-PROG is often compatible with activity verbs, which are durative and dynamic in nature (e.g. *She has been drinking*). Also, PP-PROG is generally incompatible with stative predicates (e.g. **I have been knowing him since childhood*).

As noted above, the co-occurrence conditions with temporal adverbials are also important. For instance, the simple past can readily take a temporal adverbial denoting a deictic past situation (e.g. *Mary arrived yesterday*). Unlike the simple past, PP rejects definite past adverbials (e.g. **Mary has arrived yesterday*). It can only occur felicitously with temporal adverbials denoting indefinite past. Some examples include *already*, *yet*, *ever*, *never*, *just* and *since*. Among them, *already*, *just* and *since* have been reported in corpus-based studies to co-occur more frequently with PP than others (Werner, 2013, p. 213). In comparison, PP-PROG can readily take durative adverbials (e.g. *for three days* and *for a long time*) to convey a durative, imperfective meaning. Table 2 summarises the three tense-aspect categories' prototypical associations with lexical aspect, as well as combinatorial conditions with temporal adverbials.

2.4 Perfective Zo in Cantonese

The current study concerns Cantonese ESL learners from Hong Kong. A brief description of the Cantonese aspectual system is in order. Cantonese, a Yue dialect spoken mainly in South China including Hong Kong, Macau and Guangdong, is often characterised as a tenseless language (Matthews & Yip, 1994, 2011). That is, Cantonese verbs do not vary in form in the past, the present or the future. It is a non-inflectional language and has a rich system of temporal particles (i.e. aspect markers), temporal adverbials and pragmatic devices to express temporality.

Cantonese overtly distinguishes between perfective and imperfective viewpoints. As shown in (1), the perfective marker (PERF) *zo* occurs after the activity verb *sik*

"eat" to indicate a situation that took place and concluded at a prior time. According to Matthews and Yip (2011), the function of perfective *zo* is threefold—to convey a resultative (perfect) meaning; to report past events without referring to a resultative meaning; and to express a period of time up to and including the present. Matthews and Yip added that the third usage "may correspond to the perfect progressive in English" (p. 234), as exemplified in (2), in which *zo* co-occurs with a durative adverbial *loeng nin gei* "over two years".

(1) 我 已經 食 咗 飯
ngo ji ging sik zo faan
I already eat PERF rice
'I have already eaten/ I ate already.'

(2) 我 架 車 揸 咗 兩 年 幾
ngo gaa ce zaa zo loeng nin gei
I CL car drive PERF two years some
'I have been driving the car for over two years.'

Cantonese differs from English in two principal aspects as far as tense-aspect is concerned. First, Cantonese lacks both the perfect and past tenses (similar to Mandarin Chinese, Xiao & McEnery, 2004, p. 26). In the domain of morphosyntax, perfective *zo* is deemed the closest functional equivalence to the present perfect and the simple past (Matthews & Yip, 1994). The absence of grammaticised perfect[1] and past may cause problems for Cantonese ESL learners, who must learn the difference between perfect and non-perfect as well as that between past and non-past—both dimensions are not grammatically encoded in Cantonese grammar.

Another key difference is that Cantonese (and Chinese in general) organises temporality in discourse via a mix of temporal particles, temporal adverbials and pragmatic devices. The use of these devices remains optional/non-obligatory if context suffices. Given these characteristics and L1-L2 differences, it is predicted that Cantonese ESL learners may take a much longer time to acquire and establish nuanced semantics of the perfect relative to past tense, as well as PP combinations with temporal adverbials in context.

3 The Acquisition of Tense-Aspect

3.1 The Aspect Hypothesis

The Aspect Hypothesis (hereafter the AH; Andersen & Shirai, 1994; Bardovi-Harlig, 2000) predicts developmental emergence and acquisition of perfective/past

[1] One exception to this description is that Cantonese has experiential *gwo* (Matthews & Yip, 2011, equivalent to Mandarin *guò*), which denotes experiential perfect (Smith, 1991). This might facilitate the acquisition of the experiential meaning of the English perfect by Cantonese learners, although this is beyond the scope of this present study.

and imperfective (progressive) morphology in relation to lexical aspect. Central to the AH are four tenets:

1. Learners first use past marking or perfective making on achievement and accomplishment verbs, eventually extending its use to activity and state verbs.
2. In languages that encode the perfective/imperfective distinction, imperfective past appears later than perfective past, and imperfective past marking begins with state and activity verbs, and then extends to accomplishment and achievement verbs.
3. In languages that have progressive aspect, progressive marking begins with activity verbs, and then extends to accomplishment or achievement verbs.
4. Progressive markings are not incorrectly overextended to state verbs (in L1 acquisition).

(Andersen & Shirai, 1996, p. 533; originally Shirai, 1991, pp. 11–12)

Although these four tenets focus on the emergence of morphology, not on appropriate use, Comajoan (2006) proposed that researching appropriateness of use can ascertain the AH and strengthen its predictive power, especially when the distribution of morphology comes close in advanced learners and native speakers (e.g. Salaberry, 1998, 1999).

One thing to note is that the AH does not make any claim about the acquisitional sequence of the perfect forms, let alone appropriate use. In a classic child language acquisition study about the present perfect, Johnson (1985, p. 342) reported that English preschool children aged four to five were systematically aware of semantic distinctions encoded by PP, PP-PROG and the simple past across various lexical verbs and adverbial contexts. If the AH assumes a semantic bias in the acquisition of tense and aspect (i.e. prototypical associations between morphology and lexical aspect), there is no reason not to consider the perfect in general or its instantiation in English in particular. This section reviews the state-of-the-art, albeit limited, research on L2 acquisition of the present perfect, with due attention to methodological details that inform the current study.

3.2 General Developmental Path of PP in L2 English

Bardovi-Harlig (1997) examined the emergence and subsequent development of the present perfect in instructed adult ESL learners from multiple L1 backgrounds, who were enrolled in an intensive English programme in the United States. Bardovi-Harlig analysed a total of 502 tokens in written samples and 105 tokens in oral samples with respect to appropriate use, coding non-target-like use as either overgeneralisation (use of PP where native speakers prefer another morphology) or undergeneralisation (salient non-use where native speakers prefer PP).

Two findings were illuminating. First, an overwhelming majority of the PP forms (86.9% of PP and 88.9% of PP-PROG) were used appropriately. For non-target-like use, learners used PP in the environments of the simple past, the pluperfect and the

simple present, when they tried to establish target form-meaning mappings in the interlanguage. Second, there was a clear acquisition order in which PP emerged after the simple past but well before PP-PROG, similar to Johnson's (1985) findings in child language acquisition. Bardovi-Harlig (1997) remarked that "for spontaneous use, the use of present perfect is a necessary (but not sufficient) condition for the emergence of the perfect progressive" (p. 391). The study, however, did not examine the role of lexical aspect—a key factor investigated by several later studies.

3.3 Lexical Aspect

Liszka (2002; also reported in Liszka, 2004) analysed oral and written narrative data to compare the development of the present perfect relative to present and past tenses among proficiency-matched ESL learners who speak typologically different languages such as Chinese, Japanese and German. The main finding is that all the learners had difficulties using PP regardless of their proficiency levels, and only the advanced Chinese and Japanese ESL learners exhibited a moderate bias to use PP with telic verbs—a prototypical association between morphology and lexical aspect, as previously discussed in Sect. 2.3. All the intermediate learners did not exhibit any effect of lexical aspect. Liszka interpreted these findings as support for L1 effect, which will be discussed more fully in Sect. 3.4 below.

Uno (2014), arguably the first study to extend the Aspect Hypothesis to the study of the present perfect, examined the role of lexical aspect in the use of PP by 29 adult Japanese learners of English as a foreign language (EFL) by means of a carefully controlled written cloze task normed by native English speakers. The main finding is that the learners' use of PP did not show any strong association with telic sentences without durative adverbs. Instead, the learners tended to use PP with atelic verbs in a context specified by a durative adverbial, as in *She has lived (live) mostly in California since she finished her degree course* (Uno, 2014, p. 41). Uno concluded that telicity is only one factor affecting the use of PP and proposed that perceptual saliency, cognitive processing principles and prototype formation in the early use of tense-aspect morphology may jointly account for acquisition.

Teran (2014) examined 85 Argentine Spanish EFL learners' use of PP in a fill-in-the-blank task, focusing on two perfect functions (experiential perfect and the perfect of persistent situation, see Sect. 2.2) distributed across four levels of lexical aspect. Two findings concern us here. First, language proficiency seems to play an important role, as the advanced learners showed a more appropriate use of PP overall. Second, in terms of specific perfect functions, both the intermediate and advanced learners tended to use PP more and with higher accuracy in a non-prototypical association (i.e. the perfect of persistent situation with atelic verbs) than a prototypical association (i.e. experiential perfect with telic verbs), contrary to the general assumption of the AH. Looking more closely, Teran stated that all the stimuli sentences for the non-prototypical association with atelic verbs contained durative adverbs such as *since*, *ever since* and *yet*. She posited that such favourable combinatory patterns

were responsible for a higher rate of appropriate use, similar to an observation made in Uno (2014). In sum, Teran argued that instruction, input frequency, sentence type and rote learning could be the underlying causes for the observed results.

The three studies reviewed above seem to suggest that the emergence of PP and appropriate use could be affected by lexical aspect, possibly in a direction inconsistent with the general assumption of the AH, coupled with other factors such as specific perfect functions, temporal adverbial contexts, learners' proficiency as well as L1.

3.4 L1 Influence

Collins (2002, 2004) and Ayoun and Salaberry (2008) observed some transfer effects involving the present perfect in their investigation of L2 acquisition of the English past tense. A common observation across these studies is that Francophone learners tend to overuse the present perfect in contexts where past tense marking is obligatory. This tendency is often reported as an instance of negative transfer, triggered by the formal similarity between the compound past tense *passé composé* in French (*be/have* + past participle) and the present perfect in English (*have* + past participle), which may have led Francophone learners to overuse PP in a context where the simple past is required.

Collins (2002) investigated the use of tense-aspect morphology among 70 Quebec French ESL learners across six levels of proficiency by means of a written cloze task developed by Bardovi-Harlig and Reynolds (1995). Findings were largely consistent with the AH. However, PP was found to be the most frequently used alternative to the simple past in telic predicates. Collins explained that "for instructors of Francophone learners of English, the inappropriate use of the present perfect in past contexts is perceived to be a predictable and pervasive feature of their students' interlanguage" (p. 49). Collins concluded that transfer alone does not override the lexical aspect effect observed, though L2 proficiency may mitigate the results. Collins proposed the notion of developmentally constrained L1 influence and found support for this proposal in a follow-up study involving Quebec French ESL learners and Japanese EFL learners (Collins, 2004).

Language-processing studies also show L1 influence. Roberts and Liszka (2013) employed a cloze comprehension task to examine advanced L2 learners' tacit knowledge of the perfect and past tenses. The reading performance was similar for both French EFL and German EFL learners in an offline cloze task, judging mismatch sentences such as **Last week, James has gone swimming every day* equally as less acceptable. In the online self-paced reading task, however, only the French EFL learners but not the German EFL learners were sensitive to mismatched items. The researchers contended that transfer is a viable explanation for the performance difference. That is although both French and German have a compound past tense (*passé composé* and *perfekt*), the two languages differ in viewpoint aspect—French distinguishes between perfective and imperfective viewpoints, whereas German does not, which may in turn affect speakers' implicit sensitivity and attention to aspectual

contrasts in L2 English. The researchers reasoned that there was positive transfer for the French EFL learners but negative transfer for the German EFL learners.

Turning to ESL learners, Hong (2008) examined the roles of L1 and lexical aspect on the acquisition of the past tense and the perfect among 138 Hong Kong secondary school students. One methodological novelty was a translation task in which some stimuli sentences contained perfective *zo* and others the zero marking. Results showed that *zo* affected the use of the present perfect. That is the Cantonese ESL learners used PP more frequently when *zo* was present in the prompts, whereas they opted for the simple past when *zo* was omitted. Interestingly, this complementary distribution was consistent across the four lexical aspect classes examined. Hong argued that the findings provided strong support for transfer but less so for lexical aspect.

Previous research, as reviewed in Sects. 3.2–3.4 above, has shed some light on the complexity of the acquisition of the English present perfect. Further research must seek to clarify a number of issues. Among them, what is the role of lexical aspect in L2 acquisition of the present perfect? Do PP forms (PP and PP-PROG) follow a universal sequence of development following some prototype formation? What is the role of the L1, if any?

4 The Current Study

4.1 Research Questions and Hypotheses

The current study examines Cantonese ESL learners' acquisition and appropriate use of the present perfect with particular emphasis on the role of lexical aspect. The goal is twofold. First, it seeks to extend the Aspect Hypothesis to study the lexical aspect effect on the perfect. Second, it provides empirical data to assess the interlanguage development of advanced knowledge of the perfect in L2 tense-aspect acquisition. The research questions are:

1. What is the effect of lexical aspect on the use of PP?
2. Is the appropriate use of PP related to the lexical aspectual properties of the predicates?

The following predictions are made with respect to the general assumption of the AH as well as empirical findings from previous research. We predict that the use of the present perfect will not be uniform across classes of lexical aspect. In the current study, lexical aspect is operationally defined by a two-level contrast, state *versus* accomplishment. Notably, Teran (2014) reported that intermediate and advanced learners used PP most appropriately in states and accomplishment predicates. The two-level contrast, thus, allows a good comparison focusing on lexical aspect while keeping the cloze task simple and short. With regard to the first research question, it is hypothesised that PP associates with accomplishment predicates more frequently than with stative predicates.

For the second research question, a similar prediction is also made for appropriate use of PP, following some preliminary evidence (e.g. Teran, 2014) that there will be a greater appropriate use of PP forms in prototypical combinations of morphology and lexical aspect. Because the perfect encodes perfective and imperfective meaning (see Sect. 2.3), perfective meaning (i.e. the perfect of result, experiential perfect and the perfect of recent past) of PP is expected to be used more appropriately in accomplishment predicates than in stative predicates in the current study. Again, the former combination is more prototypical than the latter one. Similarly, imperfective meaning (i.e. the perfect of persistent situation) explicitly marked by PP-PROG is hypothesised to be used more appropriately with stative predicates than accomplishment predicates.

4.2 Participants

A total of 73 undergraduate students participated in the current study. They included 24 Cantonese ESL learners (11 women, 13 men, M_{age} = 21.04 years, age range: 20–26 years) and 49 native speakers of British English (31 women, 18 men, M_{age} = 20.96 years, age range: 19–24 years) as native comparison group. The ESL learners were in their third or fourth year of study, majoring in English, English language education and/or translation at a bilingual university in Hong Kong. All of them scored 5* or 5** in HKDSE's English Language Examination, a local matriculation examination. Results were comparable to IELTS band scores between 7 and 9, according to the Hong Kong Examinations and Assessment Authority's benchmarking study (2013). The learner group was, thus, considered advanced ESL learners in the continuum of L2 development. Forty-nine native speakers of British English, who were undergraduates at a major university in the northeast of England, were recruited as the native control group. All the participants provided informed consent and volunteered to take part. The data collected were all anonymous. The Survey and Behavioural Research Ethics Committee at the first author's former institution approved the current study.

4.3 Materials and Procedures

A sentence-based written cloze task was designed to elicit the use of PP forms by learners and native speakers of English. The cloze task was pilot-tested with 8 native speakers of Canadian English. A total of 28 experimental items (see Appendix A) was constructed to target the use of PP forms, amid the potential for other tense-aspect forms. The experimental items were distributed equally across states and accomplishments (14 per category). Each category included a variety of verb types. The verbs were classified based on operational tests (see Shirai & Andersen, 1995, for details; also Smith, 1997). Cloze-type tasks were successfully used to investigate the

L2 acquisition of tense-aspect forms in relation to lexical aspect (Bardovi-Harlig & Reynolds, 1995; Collins, 2002). Learners' knowledge of English was also considered to ensure accessibility of materials. Twelve filler items unrelated to PP were added to the stimuli mix, yielding 40 items in total. All items were randomised for presentation.

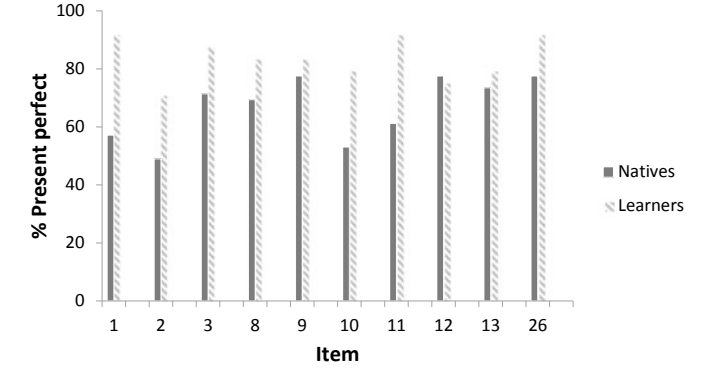
The participants completed the cloze task, followed by a short language history questionnaire to describe their language background and experience (Chan, 2012). In the cloze task, the participants were asked to read each sentence and then provide an appropriate inflected form of the given verb. The cloze task was administered via Google Form or by email attachment as an untimed written production task. The majority of the participants reported that they spent less than 20 minutes to complete the cloze task.

4.4 Data Analysis

For each participant, cloze responses were analysed (1) on the distribution of verb forms through descriptive statistics and (2) appropriateness through mixed-effects models, both in relation to lexical aspect. As for determining the target context for appropriate use in the second analysis, decisions were made with respect to the baseline data from the native control group ($N = 49$). If native speakers preferred PP to some other verb forms for a particular item, that item was qualified as the target context for appropriate use.[2] This yielded 20 experimental items from the pool of 28 deemed the target context for appropriate use of PP, with 8 items discarded from analyses. For consistency, the first analyses on the distribution of verb forms were also performed on the 20 items only (see Figs. 1 and 2 and Appendix for the complete set of items).

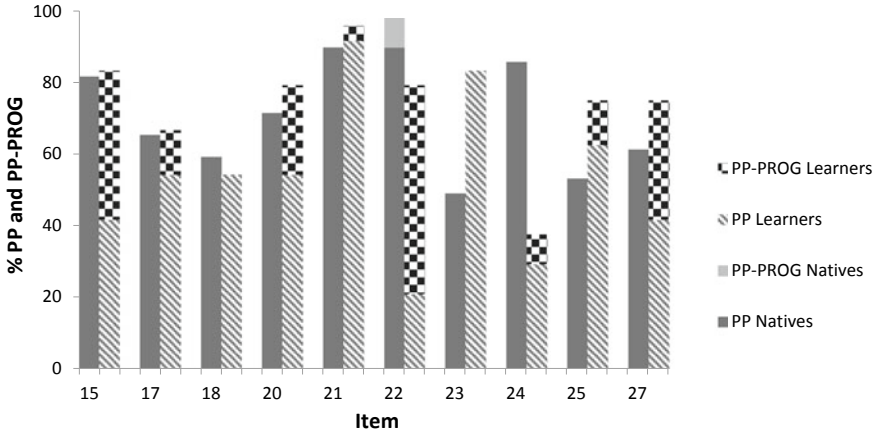
The cloze responses were coded as 1 (using PP in target context) or 0 (not using PP in target context) in the second analysis on appropriate use of PP. Responses of PP-PROG were coded as 0. This binary scheme described the relative proportion of use of PP for each item. Responses coded as 0 were not necessarily wrong. Instead, the score served to identify the frequency of use of PP in the target context.

[2] More specifically, PP was considered appropriate when it was the choice made by the largest number of native speaker participants. Since both PP and the simple past are often acceptable, the simple past should be the strongest competitor for both state verbs and accomplishment verbs for all items. When the simple past was preferred by more participants, the item was not considered appropriate use of PP, to be on the safe side. For most items included as appropriate PP use, the margin was wide except for a few items.



1 = *prepare*
2 = *buy*
3 = *write*
8 = *write*
9 = *watch*
10 = *buy*
11 = *clean*
12 = *wash*
13 = *create*
26 = *listen*

Fig. 1 Distribution of PP in accomplishment verbs by group



15 = *love*
17 = *hate*
18 = *experience*
20 = *believe*
21 = *know*
22 = *feel*
23 = *want*
24 = *need*
25 = *doubt*
27 = *live*

Fig. 2 Distribution of PP and PP-PROG in state verbs by group

4.5 Result

4.5.1 Distribution of Morphology

The cloze task collected a total of 1460 tokens of tense-aspect forms (480 from 24 learners and 980 from 49 native speakers), given the 20 items. The distribution is summarised in Table 3. The verb forms most frequently used include the simple present (PRESENT), PP, PP-PROG, the simple past (PAST) and others (i.e. future tense, the past perfect and occasional missing information). The percentage in each cell is calculated over the total number of verb forms within each class of lexical aspect. It was, therefore, a within-category analysis, fit for the purpose of studying the distribution of verb forms according to lexical aspect (Bardovi-Harlig, 2000).

Concerning the average distribution of verb forms (highlighted in grey in Table 3), PP received the highest frequency of use by the learners (68.3%), followed by PAST (11.7%), PP-PROG (9.8%), PRESENT (8.8%) and others (1.5%). As for the native speakers, PP also enjoyed the highest frequency of use (68.7%), followed by PAST (28.3%), PRESENT (1.5%), others (1.1%) and lastly PP-PROG (0.4%).

The interpretation of some observations is straightforward. First, the cloze task was effective in eliciting the use of PP in cloze sentences. PP was the prevailing choice with about 68% of the time across the board for both groups of participants. The Cronbach's alpha coefficient of 20 items combined was 0.84.

Second, while the native speakers and learners favoured PP, they differed considerably in the use of other verb forms in the cloze task. The native speakers used PAST (28.3% on average) as a major alternative to PP. Together, these two choices amounted to a predominant 97% of use, almost to the exclusion of other forms. The learners, on the other hand, appeared less homogeneous when it came to the distribution of other forms alternative to PP. The use of PAST (11.7%), PP-PROG (9.8%) and PRESENT (8.8%) all hovered at close margins. Seemingly, the learners tended to be more heterogeneous in their choice of alternative verb forms. That is

Table 3 Distribution of verb forms by lexical aspect

	PRESENT % (*n*)	PP % (*n*)	PP-PROG % (*n*)	PAST % (*n*)	Others % (*n*)	Total % (*n*)
Learners						
STA	16.3 (39)	53.3 (128)	19.6 (47)	9.2 (22)	1.7 (4)	100 (240)
ACC	1.3 (3)	83.3 (200)	0 (0)	14.2 (34)	1.3 (3)	100 (240)
Average	8.8 (42)	68.3 (328)	9.8 (47)	11.7 (56)	1.5 (7)	100 (480)
Native speakers						
STA	1.4 (7)	70.6 (346)	0.8 (4)	26.1 (128)	1.0 (5)	100 (490)
ACC	1.6 (8)	66.7 (327)	0 (0)	30.4 (149)	1.2 (6)	100 (490)
Average	1.5 (15)	68.7 (673)	0.4 (4)	28.3 (277)	1.1 (11)	100 (980)

Note STA = states, ACC = accomplishments, raw tokens in parenthesis ()

the natives mostly converged on PP and possibly on PAST, whereas the learners used many different forms, including PP-PROG and PRESENT.

Third, Table 3 shows interesting trends regarding the distribution of PP with lexical aspect. First, the learners showed a prevalence of PP in accomplishment predicates (83.3%) compared to that in states (53.3%), whereas the reverse was true for the native speakers with a higher percentage of PP in states (70.6%) than in accomplishments (66.7%). Despite these differences, the use of PP overall was comparable at an average of about 68% in the learners and native speakers.

In contrast, the participants used PAST considerably more with accomplishments (14.2% for the learners and 30.4% for the native speakers, respectively) than with states (9.2% for the learners and 26.1% for the native speakers, respectively). Overall, these quantitative trends suggest the following—1) the learners and native speakers differed in the breakdown of use of PP according to lexical aspect, despite the prevalence of PP and 2) the two groups exhibited similar tendencies when they used PAST with respect to lexical aspect, which is in line with the AH, which predicts that telic verbs (in the case of the current study, accomplishments) are more strongly associated with PAST than with atelic verbs (in this case, states). Evidently, the learners used PP sufficiently different from PAST, and the acquisition of PAST followed the acquisitional predictions of the AH.

Another notable observation concerns the distribution of PP-PROG. The average use of PP-PROG was markedly more frequent in the Cantonese ESL learners (9.8%) than in the native speakers of British English (0.4%). Interestingly, both groups used PP-PROG in stative predicates exclusively (e.g. *He has been living in Hong Kong*) relative to 0% in accomplishments. There was a clear complementary distribution of PP-PROG according to lexical aspect. The frequency results by item and lexical aspect are presented in Figs. 1 and 2. Take Item 22 for example: *I ____ (not feel) well for three days already. Should I go to see the doctor?*, 14 out of the 24 learners (or 58.3%) preferred PP-PROG to PP. In comparison, only 4 out of the 49 native speakers (or 8.2%) chose to use PP-PROG, whereas the majority (44 out of 49, or 89.8%) opted for PP. An item-based analysis further revealed that stative predicates involving verbs such as *love, hate, believe, know, feel, need, doubt* and *live* contributed to the bulk of PP-PROG tokens. One characteristic common to these eight items was that they were all modified by durative adverbials such as *the whole day, for three days, for many years, for a long time, since the very beginning* and *since Grade 1*. The co-occurrence of stative predicates, PP-PROG and durative adverbials was highly frequent in the learners' interlanguage.

4.5.2 Distribution of Appropriateness

Next, mixed-effects statistical analyses were performed on the appropriateness of PP in learner data using the software package R (R Core Team, 2011). According to Cunnings (2012), there are at least two advantages of conducting such analyses. First, mixed-effects statistical procedures can model crossed random effects by taking

participant and item variance into account in a single analysis, overcoming the so-called language-as-fixed-effect fallacy (Clark, 1973). Also, they can satisfy the data independence assumption that is often violated in repeated measures parametric statistics such as ANOVA and *t*-tests.

In what follows, we used the glmer() function in the lme4 library in R to build generalised linear mixed-effects models for binary responses of appropriateness data (Bates et al., 2015). To begin, we created model1 using the following syntax:

$$> \text{model1} = \text{glmer}(\text{appropriateness lexical.aspect} + (1|\text{subject}) + (1|\text{item}), \text{data} = \text{perfect}, \text{family} = ''\text{binomial}'')$$

As shown above, the glmer() function analysed the dependent variable appropriateness as a function of the independent variable lexical.aspect. The next part of the command specified a random intercept term for subjects (i.e. participants) and items. The final part selected the data frame called perfect and a binomial distribution as indicated by the logistic link function family = "binomial". The summary() function spelt out the model detail below:

```
Generalised linear mixed model fit by maximum likelihood (Laplace
Approximation) ['glmerMod']
        Family: binomial  ( logit )
        Formula: appropriateness ~ lexical.aspect + (1 | subject) + (1 | item)
          Data: perfect

           AIC      BIC   logLik deviance df.resid
         514.4    531.1   -253.2    506.4      476

        Scaled residuals:
            Min      1Q      Median      3Q     Max
        -3.8105 -0.6031  0.3344  0.5437  3.5318

        Random effects:
         Groups  Name        Variance Std.Dev.
         subject (Intercept) 1.0065   1.0033
         item    (Intercept)  0.8425   0.9179
        Number of obs: 480, groups:  subject, 24; item, 20

        Fixed effects:
                             Estimate Std. Error z value Pr(>|z|)
        (Intercept)           1.9340     0.4234   4.567   4.94e-06 ***

lexical.aspectSta  -1.5160     0.4820  -3.145  0.00166 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
            (Intr)
lxcl.spctSt -0.662
```

The output reports some general summary statistics including Akaike's information criterion (AIC), which indicates how much variance remains unaccounted for by the model. A lower AIC score is generally preferred. The standard deviation values in the random effects output suggest that item has relatively less variability than subject. In the fixed effects output, the coefficient "lexical.aspectSta" refers to the slope for the categorical effect of lexical.aspect. It means one has to go down to -1.516 in value from accomplishments to states. In other words, appropriateness is lower in states than in accomplishments. Note that model1 contains random intercepts, which allow mean values for each participant and each item to vary.

Because the participants were repeatedly measured on different verbs across levels of lexical aspect and lexical aspect was repeatedly measured within the stimuli sentences, it was, therefore, apt to consider a subject random slope and an item random slope for the repeated measures fixed effects. Below is the syntax of model2, followed by the model summary:

```
> model2 = glmer(appropriateness ~ lexical.aspect + (1+lexical.aspect|subject) + (1+ lexical.aspect|item), data=perfect, family="binomial")

Generalised linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: binomial  ( logit )
 Formula: appropriateness ~ lexical.aspect + (1 + lexical.aspect | subject) +  (1 + lexical.aspect | item)
   Data: perfect
      AIC      BIC   logLik deviance df.resid
    502.7    536.0   -243.3    486.7      472

Scaled residuals:
    Min      1Q  Median      3Q     Max
-2.9131 -0.5738  0.2160  0.4926  2.5458

Random effects:
 Groups  Name           Variance Std.Dev. Corr
 subject (Intercept)    2.94841  1.7171
         lexical.aspectSta 2.73827  1.6548   -0.79
 item (Intercept)       0.03005  0.1734
         lexical.aspectSta 1.59921  1.2646   -0.03
Number of obs: 480, groups:  subject, 24; item, 20

Fixed effects:
                   Estimate Std. Error z value Pr(>|z|)
(Intercept)          2.3255     0.5276   4.408  1.04e-05 ***
lexical.aspectSta  -1.8685     0.6659  -2.806   0.00502 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
            (Intr)
lxcl.spctSt -0.710
```

```
> anova(model1,model2)

Data: perfect
Models:
model1: appropriateness ~ lexical.aspect + (1 | subject) + (1 | item)
model2: appropriateness ~ lexical.aspect + (1 + lexical.aspect | subject)
+       model2:     (1 + lexical.aspect | item)
           Df    AIC    BIC      logLik deviance  Chisq Chi Df Pr(>Chisq)
```

The AIC score for model2 (502.7) is lower than for model1 (514.4), suggesting that model2 is explaining more of the variance in the data. We compared and tested the two models using likelihood ratio tests with the anova() function in R. Below is the resulting output:

```
model1  4 514.37 531.07 -253.19   506.37
model2  8 502.65 536.04 -243.33   486.65   19.721      4  0.0005669 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

The chi-square statistic shows that model2 provides a significantly improved fit for the data than model1 ($\chi^2(4) = 19.721, p < 0.001$), indicating that random slopes have better fit and thus need to be included in subsequent model building.

To further explore whether the temporal adverbial *already* has any potential influence on the appropriate use of PP, we built another model (model3) by adding the control variable already and its main effect and all possible interactions with the fixed effect lexical.aspect. Similarly, the fourth model was built (model4) but without the interaction terms. We compared all models and examined whether any of these additional main effects and interactions yielded a significantly improved model fit to the data. The syntax and output are reported below:

```
> model3 = glmer(appropriateness ~ lexical.aspect*already +
(1+lexical.aspect|subject) + (1+lexical.aspect|item), data=perfect,
family = "binomial" )
> model4 = glmer(appropriateness ~ lexical.aspect + already +
(1+lexical.aspect|subject) + (1+lexical.aspect|item), data=perfect,
family = "binomial" )

> anova(model1,model2,model3,model4)

          Df    AIC    BIC    logLik  deviance  Chisq Chi Df Pr(>Chisq)
model1  4 514.37 531.07 -253.19   506.37
model2  8 502.65 536.04 -243.33    486.65  19.7208      4  0.0005669
***
model4  9 503.47 541.03 -242.73   485.47   1.1875      1  0.2758293
model3 10 504.83 546.57 -242.41   484.83  0.6378       1  0.4245131
```

As seen above, either model3 or model4 does not provide any better fit than model1. Instead, model2 provides a significantly better fit over any other model. Neither the main effect of already nor any interaction provides any improved fit. Hence, model2 is the most complex model justified by the data, based on an exploratory and somewhat data-driven approach in the above analyses.

Indeed, model2 turns out to be the one with "maximal" random effects structures (Barr et al., 2013). One of the main theoretical interests in the current study is the fixed effect of lexical aspect, which is used to probe the L2 acquisition of PP and appropriate use. As a result, the "maximal" model, which happened to be justified by the data, is the one that contains subject and item random intercepts and subject and item random slopes for lexical aspect.

In sum, we used the glmer() function in the lme4 library in R to perform generalised linear mixed-effects analyses on the relationship between appropriateness of PP and lexical aspect. As for fixed effects, we entered lexical aspect and the control variable already with and without interaction terms into the model(s). The likelihood ratio tests revealed that the control variable did not improve model fit and was discarded subsequently. As for random effects, we had random intercepts for subjects and items, as well as by-subject and by-item random slopes for the effect of lexical aspect. The results (model2) indicated that lexical aspect significantly affected the appropriate use of PP ($\chi^2(4) = 19.721$, $p < 0.001$). To be specific, the appropriate use of PP was significantly less in stative predicates than in accomplishment ones (estimate $= -1.87$, $SE = 2.33$, $p < 0.01$).

4.6 Discussion

The gist of the findings is that the learners used the two PP forms in ways distinct from the native speakers. The distribution and appropriateness data revealed some discrepancies between the two groups.

4.6.1 Lexical Aspect and PP Use

In response to the first research question "What is the effect of lexical aspect in the use of PP?", two distributional findings are clear. First, the learners used PP significantly more in accomplishment predicates (83.3%) than in states (53.3%) as shown in Table 3, whereas a reverse trend was observed in the native speakers. The percentage difference suggested that the association between PP and accomplishments was much stronger than that with states in the Cantonese ESL learners. This asymmetry was verified by the mixed-effects statistical analyses on appropriateness data that the learners' use of PP in accomplishment predicates was significantly more appropriate than in states ($p < 0.01$), which in turn also addresses the second research question "Is the appropriate use of PP related to the lexical aspectual properties of the predicates?"

4.6.2 Lexical Aspect and PP-PROG

Second, the learners produced 47 tokens of PP-PROG, all occurring exclusively in stative predicates. This was somewhat unusual, both in terms of number and

distribution. The 47 tokens of PP-PROG represented nearly a quarter of all present perfect forms produced in the stative predicates by the learners. Intriguingly, there was zero token of PP-PROG in accomplishments, which is in a stark contrast to the reported prevalence of PP-accomplishment pairing in the learners. Remarkably, the combination of complex viewpoint aspect (e.g. perfective progressive) and situation aspect (e.g. state) is generally not permissible in standard English grammar (e.g. **I have been knowing him since childhood*), although such a co-occurrence was also borne out in native speaker data (4 tokens, or 0.6%). Taken together, the robust pairing of PP-PROG in stative predicates in learner data looks like an idiosyncratic finding in the current study, which only included stative and accomplishment verbs. In contrast to the present finding, Johnson (1985, pp. 344–345) reported that L1 English preschool children used PP-PROG with atelic verbs in durative contexts (e.g. *have been riding… for a long time*). The atelic verbs refer to activity ones, presumably. Uno (2014) also speculated that Japanese EFL learners may have "formulated a prototype of the present perfect form and associate the form with atelic verbs to express unitary continuous situations in contexts with a durative adverb" (p. 48). The items analysis described earlier corroborates the role of durative adverbials in the association of stative verbs and PP-PROG. Although it is not clear why the Cantonese ESL learners robustly use PP-PROG in stative predicates modified by durative adverbials, one possible explanation is, following Uno's (2014) suggestion, prototype formation.

4.6.3 Prototype Account for PP and PP-PROG

Inspired by Rosch and colleagues' (1973, 1975, 1978; Rosch & Mervis, 1975) prototype theory on the cognitive representation of semantic categories and categorisation, Shirai and Andersen (1995), among others, appealed to a prototype account for the development of L1 and L2 tense-aspect morphology. The basic idea of the prototype account is that learning starts from the most representative member of a linguistic category—the prototype. Prototypical form-meaning associations are established first and gradually being extended to peripheral, non-prototypical ones via some general language-processing principles of category induction (Ellis, 2006). Ellis and Sagarra (2010) further suggested that the distributional biases present in language input promote the acquisition of more frequent, distinctive and prototypical exemplars of a category. As a result, the semantic-based prototype account has a universal appeal.

First, the PP form expressing perfective meaning of the perfect (i.e. the perfect of result, experiential perfect and the perfect of recent past) is used more with telic verbs (i.e. accomplishment in the current study) because presumably the pairing between lexical aspect and morphology is semantically congruent and thus forms a prototype of the "perfective" perfect. This prediction is borne out by the main finding from both the distribution and appropriateness data that the learners used PP more frequently and appropriately in accomplishment predicates.

Next, the imperfective meaning of the perfect (i.e. the perfect of persistent situation), which is afforded by either PP or PP-PROG, is used more with atelic verbs (i.e. state in the current study). Such a pairing is also congruent, following the prototype account. The only difference between PP and PP-PROG is that PP-PROG overtly marks the imperfective/progressive viewpoint and/or duration involved. Returning to the data, the fact that the learners robustly used 47 tokens of PP-PROG distributed across 8 types of stative predicate (recall that there was zero token of PP-PROG in accomplishments for both the learners and native speakers) suggests this is not accidental. As previously noted, similar findings were also reported in Uno (2014), and much more clearly articulated by Teran (2014, p. 25) that learners use PP in atelic situations (i.e. activity and stative predicates), a prototypical combination emerges only when learners approach advanced proficiency. Here, the question bears down on the highly constrained finding of PP-PROG in stative predicates modified by durative adverbials. Transfer seems to offer a plausible explanation.

4.6.4 Negative Transfer from Cantonese to English

As was outlined in Sect. 2.4, the threefold meaning of perfective *zo* in Cantonese is mapped to PP (notably, the perfect of result), PAST and PP-PROG in English. One language-specific fact that has yet to be noted is that perfective *zo* is versatile in combining with all verbs of lexical aspect except states, as shown in (3) (Sybesma, 2004, p. 171; also see Xiao & McEnery, 2004, p. 80 for a similar description about Mandarin Chinese perfective aspect marker *-le*). One way to remove the semantic restriction is to modify the stative-*zo* construction by a durative adverbial (Sybesma, 2004, p. 179), as exemplified in (4). Note that (3) and (4) differ minimally in the durative adverbial *hou noi* "for a long time". Its absence renders (3) ungrammatical in Cantonese; its presence warrants the well-formedness in (4).

(3) *我 識 咗 佢
ngo sik zo keoi
I know PERF him
'I knew/have known him.'

(4) 我 識 咗 佢 好 耐
ngo sik zo keoi hou noi
I know PERF him long time
'I knew/have known him for a long time.'

In other words, *-zo* is incompatible with states unless the combination is modified by a durative adverbial in Cantonese. By contrast, English does not have such a combinatory restriction for PP and state verbs, as shown in the English glosses in (3) and (4). Imagine such a typological tension in the interlanguage of Cantonese ESL learners. The juxtaposition of (3) and (4) highlights a very tricky case of use of two present perfect forms. One solution to resolve the conflict is to accommodate the target norm. That is Cantonese ESL learners could faithfully use PP in stative predicates as required by English grammar. Such an observation is indeed borne out

in the quantitative data as summarised in Table 3. The learners used PP in stative predicates at 53.3% of the time even though such a combination is prohibited in Cantonese.

Meanwhile, a non-negligible 19.6% (or 47 tokens) of stative predicates were marked in PP-PROG, all modified by durative adverbials. As noted above, PP-PROG is generally incompatible with stative predicates (e.g.**I have been knowing him since childhood*). The elevated token frequencies of the present perfect progressive construction with stative predicates could be evidence that the advanced Cantonese ESL learners understood its composite aspectual meaning for it is acceptable and indeed grammatically preferred in native Cantonese. The elevated token frequencies of the construction presented a compelling *prima facie* case of negative transfer (e.g. Bardovi-Harlig & Sprouse, 2017). The condition inducing negative transfer arose from durative adverbials. One important implication is that the Cantonese ESL learners appear to have navigated the interlanguage between Cantonese and English unavailable to native English speakers and derived a finer-grained distinction between the use of PP and PP-PROG when it came to collocating lexical aspect, grammatical aspect and temporal adverbials, though possibly at the expense of hindering L2 ultimate attainment. One can regard PP-PROG in stative predicates as a case of overgeneralisation in learners' interlanguage. Recall that Bardovi-Harlig (1997, p. 385) described overgeneralisations as the use of PP where native speakers prefer another morphology. In the current study, the learners produced 12.5% (or 47 tokens) of PP-PROG out of 375 present perfect forms in total, whereas the native English speakers produced a meagre 0.6% of PP-PROG (4 tokens out of 677 present perfect forms in total). Accordingly, 43 tokens of PP-PROG by raw token frequency counts ought to be considered overgeneralisation. The robust non-target-like use shows that the learners attempted to carve out a lexico-grammatical pairing for PP-PROG distinct from previously established associations pertaining to PP and PAST. This very task is deemed only possible for highly advanced learners. Either way, the overgeneralisation account is well-justified by L1 Cantonese grammar, lending additional support to the transfer account.

In sum, the dual patterns of PP-accomplishment and PP-PROG-state (not acceptable in L2 English, but its functional equivalence, namely stative predicates plus *zo* specified by durative adverbials, is required by L1 Cantonese grammar) provide evidence in support of prototype and transfer at the same time. Most importantly, transfer is highly restricted and does not seem to override the main effect of lexical aspect, reminiscent of Collin's (2004) idea of developmentally constrained L1 influence.

Finally, what about ultimate attainment (UA)? Chan (2018) stated that "UA subsumes the process of continuous second/foreign language (L2) learning, leading to and culminating in an outcome of highest possible development" (p. 933). The idiosyncratic combination of PP-PROG in stative predicates modified by durative adverbials can constitute evidence of learner attention shaped by L1-specific biases that may account for limited L2 attainment. In the spirit of language-specific influence in L2 aspect acquisition, Von Stutterheim and Carroll (2006) were probably right when they argued that "the central factor impeding the acquisitional process at

advanced stages ultimately is grammatical in nature, in that learners have to uncover the role accorded to grammaticized meanings and what their presence, or absence, entails in information organization" (p. 51). What makes the perfect uniquely difficult for Cantonese ESL learners is likely to be a mix of various factors, including the absence of the grammaticised perfect and tense, the availability of the perfective *zo* and its various meanings and ambiguities, the complex multiple meaning of the perfect and usage conditions related to optional use, input variations and combinatorial restrictions with temporal adverbials (i.e. the present perfect puzzle), which may all conspire to create a vulnerable interlanguage condition. Thus, it seems entirely plausible that advanced Cantonese ESL learners are prone to negative transfer in deploying PP *versus* PP-PROG in stative predicates—a locus where Cantonese and English maximally differ in terms of tense-aspect system.

4.7 Conclusion and Pedagogical Implications

Although the main vantage point of the current study is lexical aspect, it remains doubtful lexical aspect alone, or jointly with L1 influence, can account for all variations in L2 acquisition of the perfect. The state of affairs is bound to be more complicated than that. Other factors such as L2 proficiency, discourse function (foreground/background), learning context (ESL/EFL) and method (task and stimuli) may have important roles to play. This said, PP distribution and appropriate use data from the current study have provided new impetus to an exciting possibility of extending the Aspect Hypothesis to the perfect. To make progress in this direction, more empirical research is called for in L2 acquisition of the more complex yet less frequent present perfect in English.

The current study contributed new evidence to L2 acquisition of the English present perfect—an advanced grammatical structure that merits extensive investigations. Overall, results are in favour of the primary role of lexical aspect, a conclusion which is in line with previous theoretical analyses and empirical studies inspired by the Aspect Hypothesis (e.g. Teran, 2014; Uno, 2014). However, a novel finding was L1 transfer in advanced Cantonese ESL learners, specifically in terms of the lexico-grammatical pairing between the perfect progressive form and state verbs modified by durative adverbials that native speakers steer clear of. These findings are interpreted as support of both lexical aspect and transfer. Indeed, there has been a long-standing debate on SLA research to discern what is universal for all *versus* what is specific for certain learners/groups and how they fare in various stages of learning. In the domain of tense and aspect, the current study has gone to great lengths to investigate the use of present perfect forms (PP and PP-PROG) by advanced Cantonese ESL learners. It turned out that the learners and native speakers converged 68% of the time on PP use, yet they diverged the most in PP-PROG in stative predicates, exposing the biggest stumbling block for learners who are English majors in the third and fourth years of university study.

The current study also sheds light on the question of why certain L1 tendencies are so difficult to overcome. Cantonese learners maintaining L1-based profile may in turn impede their L2 aspect acquisition *en route* to the highest possible development. To better understand transfer mechanisms in L2 tense-aspect acquisition, future studies will need to examine closely all four classes of lexical aspect, in addition to the subtle distinction between simplex and complex viewpoint aspects instantiated by PP and PP-PROG, different types of temporal adverbial (e.g. frequency, recency and duration) and employing various tasks (e.g. controlled cloze task *versus* naturalistic elicitation crossing various spoken and written registers). The above-mentioned variables are indeed the limitations of the current study. In a follow-up study, it would be particularly fruitful to investigate how proficiency-matched Francophone and Cantonese learners use the English present perfect to identify differential L1 effects.

A pedagogical implication is that Cantonese learners, or Chinese learners in general, may benefit from L1-sensitive ESL instruction, including negative evidence, which aims to re-introduce and clarify the various functions and discourse usage of PP, PP-PROG and PAST, which are actually more complicated than they appear to be. Based on the results of the present study, we now know that Cantonese learners have particular difficulty attaining nativelike mastery of PP due to restricted prototypes, induced by L1-L2 difference. It would be useful to introduce pedagogical interventions that focus on consciousness-raising activities with regard to the errors often made by learners, providing contrastive analysis and explicit negative evidence to the extent appropriate for learners at different levels of proficiency. Needless to say, research on the effectiveness of such intervention is a step that needs to be taken next, in order to verify the validity of such pedagogical approaches.

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Appendix

Cloze Task (* items retained in data analysis)

Instruction: Please fill in the blank below with an appropriate form of the given verb (in brackets). In case there is more than one answer, please provide the best choice possible.

Accomplishment predicates

1. *I _____ (prepare) dinner already. Why didn't you tell me earlier that you're not coming back for dinner?

2. *My sister _____ (buy) a very expensive handbag already. Don't give her money to buy stuff anymore.
3. *This writer _____ (write) five books already. His books are on the bestseller list every time.
4. I _____ (bake) you a cake, and it's your favorite cheese flavor!
5. I _____ (clean) the toilet, so you can take a rest today.
6. Grandma's birthday is coming soon so I _____ (make) her a card.
7. This earthquake _____ (destroy) the home of many people. Organizations around the world are trying hard to help survivors.
8. *How's your essay? I _____ (write) half of it only.
9. *I really want to watch Monsters University. But everyone _____ (watch) it and no one wants to go to the cinema with me.
10. *I _____ (buy) all the ingredients for tonight's hotpot already. Just come!
11. *My sister behaved really well today. She _____ (clean) her bedroom already.
12. *_____ you _____ (wash) your hands? You are not allowed to eat before washing your hands.
13. *Human activities _____ (create) many environmental problems already. We should reflect on our behaviour.

Stative predicates

14. The worker _____ (paint) the wall, so you can go and take a look tonight. The wall looks quite nice.
15. *I _____ (love) her for many years already but I don't dare to tell her.
16. SiuMing _____ (think) about the topic the whole day, but he still hasn't got a clue about it.
17. *Don't tell me anything about him anymore! I _____ (hate) him for a long time.
18. *He _____ (experience) a lot of different things. He is way more mature now.
19. Don't worry! Mum _____ (agree) to let us keep the puppy! Remember what she said?
20. *Mr. Chan _____ (believe) in Christianity for many years already. He goes to church every week.
21. *We _____ (know) each other for many years already and we are very close.
22. *I _____ (not feel) well for three days already. Should I go to see the doctor?
23. *Since I was young I _____ (want/already) to be a good lawyer.
24. *I _____ (need) to wear eyeglasses since Grade 1 and I find it really inconvenient.

25. *I _____ (doubt) his ability since the very beginning. I don't have much confidence on him.
26. *I _____ (listen) to his fairy tale more than ten times already. This is so boring.
27. *I _____ (live) in Sha Tin for many years, so I am very familiar with the neighbourhood.
28. After he is released from the jail, he _____ (hope) to lead a normal life.

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Systemic Theoretical Instruction and Cognitive Grammar: Acquisition of the English Tense System

Chi Wui Ng

Abstract Traditional grammar pedagogy conceptualising grammar as rules of thumb fails to provide learners with comprehensive, accurate, or systematic knowledge on the English present simple and past simple. This classroom-based study aims at investigating the application of an alternative pedagogical grammar method integrating the pedagogical framework of systemic theoretical instruction and the linguistic framework of cognitive grammar to the instruction on the English tense system. Four instructional sessions were conducted in an English language classroom in a Hong Kong secondary school, and impacts of the pedagogy on students' grammatical comprehension were examined by means of truth-value judgement tests and focus group interviews. The pedagogical approach was found to exert limited impacts on students' grammatical comprehension statistically. Factors of length of instructional time and instructional order ought to be taken into consideration in application of the pedagogy to second language grammar instruction.

Keywords Systemic theoretical instruction · Cognitive grammar · English tenses

1 Introduction

Pedagogical grammar (henceforth PG) concerns teaching and learning of grammar in L2 classrooms (Keck & Kim, 2014; Odlin, 1994). With reference to Wang's (2003) investigative study of PG courses in tertiary institutions, Keck and Kim (2014) contended that PG involves an interplay amongst three interlocking domains, namely videlicet grammar description, L2 grammar acquisition, and L2 grammar instruction. The overriding goal of PG research is to address the challenges of grammar learning encountered by L2 learners.

Drawing upon Halliday's (1977) systemic-functional linguistics (SFL), Larsen-Freeman (2003) has incorporated dimensions of form, meaning, and use into her pedagogical framework for grammar description (see Fig. 1 below); students are

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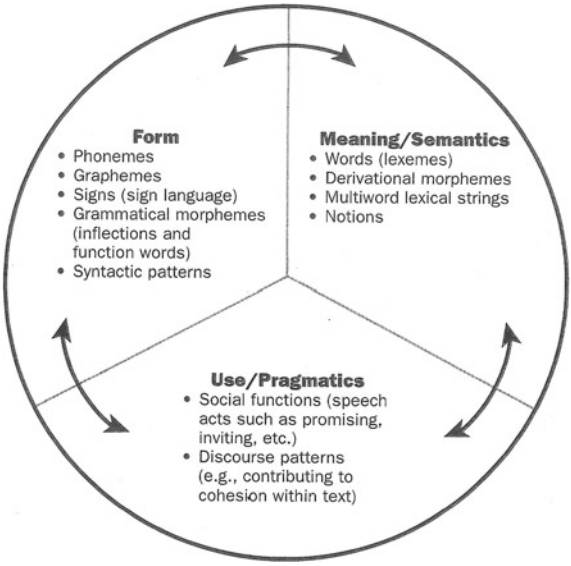


Fig. 1 Pedagogical framework for grammar description (Larsen-Freeman, 2003)

expected to be equipped with the skill of "grammaring", which denotes the ability to exploit language forms to convey meanings in appropriate social contexts. The grammaring skill is influential in learners' mastery of form-meaning mapping of language structures, which is one of the challenges confronted by learners in their learning of the English tense system.

The English tense system, which comprises the present simple and past simple, poses substantial challenges to L2 learners in terms of form-meaning mapping. Learners' failure in form-meaning mapping entails that they have mastered the form but not necessarily the meaning of the English present simple and past simple. It is thereby vital to provide learners with comprehensive, accurate, and systematic knowledge on the meaning of the English tense system. Such a goal appears to deviate from the instructional goals of existing pedagogical approaches.

Existing grammar pedagogy observed in second language classrooms (Nassaji & Fotos, 2011) dissociates syntax from semantics and segregates language use from human cognition. Conceptualising grammar as static rules with one-to-one form-meaning mapping and existing pedagogical grammar methods in L2 classrooms presents each usage of a verb form to learners in an isolated fashion and expects learners to master individual grammar rules separately (Negueruela., 2008; Tyler, 2012). As a result, those pedagogical grammar methods fail to truly reflect the semantics of the English present simple and past simple, where multiple usages ought to be presented in an integrated and interconnected fashion.

A combination of systemic theoretical instruction, which is grounded upon a learning theory named sociocultural theory, and cognitive grammar, which is a hyponym of a usage-based linguistic theory named cognitive linguistics, is a pedagogical grammar method aiming at advancing students' development of semantic

concepts underlying the English tense system. Such a combination unequivocally offers an alternative to existing pedagogical approaches, yet empirical support for such an alternative appears rather limited. This study attempts to discuss the impacts of such pedagogy on learners' grammatical comprehension of the English present simple and past simple in the context of a Hong Kong secondary school.

2 Second Language Learners' Difficulties in Acquisition of English Tenses

Making inextricable links amongst time, action, and event, tense is construed as the bedrock of human cognition (Dahl, 1985). Defined as "grammaticalised expression of location in time" (Comrie, 1985, p. 9), tense is conceived by descriptive grammarians to be a "deictic category" closely correlated with time in descriptive grammar (de Haan, 2013, p. 446). However, amongst the eight usages of the present simple, videlicet (1) present habitual actions, (2) timeless truths, (3) present states, (4) subordinate clauses of future conditionals, (5) scheduled future, (6) present actions in demonstrations, (7) present speech acts, and (8) historical present, and the six usages of the past simple, videlicet (1) completed events, (2) past habitual actions, (3) past events with duration, (4) past states, (5) imaginative conditionals, and (6) social distancing, only can the aforementioned descriptive grammarians' conceptualisation of tense account for certain usages of the two tenses, such as the usage of "present states" of the present simple and the usage of "completed events" of the past simple, while some usages cannot be conceptualised in terms of time at all (Larsen-Freeman et al., 2016).

Attributed to its complexity and polysemous nature, the semantics of the English tense system is difficult for second language learners to master. Bardovi-Harlig (1992) as well as Bardovi-Harlig and Bofman (1989) reported that even though advanced L2 learners were capable of producing the English present simple and past simple with accurate morphological markings, they failed to use the two forms to express their intended meanings appropriately. For instance, although learners possess the knowledge of the past tense suffix in English, as observed in their ability to use the past simple to describe completed events, some are unaware of a need to use the past simple to maintain social distance with other people, as in "Did you know…" in conversations with strangers, as use of the past simple in this case is totally unrelated to the "past time". This entails that learners have mastered the form yet not all meanings associated with the English simple past.

Cross-linguistic factors are influential in L2 learners' difficulty in acquisition of the English tense system. Odlin (1989, 2005) contended that knowledge on the first language may adversely influence learners' acquisition of an L2, especially when the two languages are significantly disparate from each other. Examining cross-linguistic influences with respect to the English tense system, Collins (2007), Hong (2008), Tickoo (2001), as well as Yang and Huang (2004) suggested that the lack of tense

marking in languages like Cantonese plausibly hinders learners' comprehension of the concept of tense marking in English, which is unnecessary in their L1.

3 Instruction of the English Tense System

A number of methods are commonly exploited by second language educators for grammar instruction.

3.1 Processing Instruction

Targeting learners' language processing pitfalls resulting from their input processing strategies, processing instruction aims at assisting learners in processing target forms correctly for meaning by means of structured input activities (VanPatten, 1996, 2004). For instance, in the instruction on the English present simple and past simple, temporal adverbs are removed to draw learners' attention to tense-marking suffixes in verbs to comprehend the meaning of verb forms as indication of the time of occurrence of events (Benati, 2005). Processing instruction is found to be efficacious in improving learners' performance in both interpretation and production of the English past simple, but research on application of processing instruction to instruction on the English past simple mainly focuses on its usage for description of completed events without considering other usages (ibid.). In such cases, even if learners possess the ability to use the past simple to describe completed events, they may fail to use it to express other meanings, such as imaginative conditionals and social distancing.

3.2 Collaborative Output Tasks

Grounded upon Swain's (1985, 1995) output hypothesis, collaborative output tasks, such as dictogloss tasks, are meaning-based communicative tasks intended to promote learning of target structures through provision of primary language data and elicitation of pushed output from learners (Wajnryb, 1990). For instance, in the instruction on the English present simple and past simple, a passage with abundant instances of the two verb forms was read to students, who were subsequently required to reconstruct the passage and compare the reconstructed and original versions to notice the gap (Qin, 2008). Previous research has provided evidence for efficacy of collaborative output tasks in improving learners' production of the English past simple, but the pedagogy was solely used for instruction on the usage of completed events (Benati, 2005).

3.3 Discourse-Based Grammar Instruction

Merging discourse analysis and grammar instruction, form-focused discourse draws learners' attention to authentic grammar use at a discourse level (Celce-Murcia & Olshtain, 2001). For instance, specific usages of the English present simple and past simple, such as use of the present simple for generalisations and use of the past simple for summarising findings of specific studies, are presented to learners using authentic texts, such as academic writing, to draw their attention to actual use of language in context (Celce-Murcia & Yoo, 2014). However, even if learners are able to apply specific usages of the present simple and past simple in their academic writing, they may be uncertain about the rationale for such choices, which is not taught, and learners may simply memorise usages of the two verb forms. Treating every usage of a certain verb form as one separate grammar rule will exert a huge cognitive burden on learners eventually. The proposed pedagogical approach enables students to integrate their knowledge on the English present simple and past simple by using theoretical concepts to elucidate why one verb form (i.e. present simple or past simple) can be used to convey particular meanings.

4 The Proposed Pedagogical Grammar Method

The one-to-one form-meaning mapping embraced by the three aforementioned instructional methods fails to reflect the polysemous nature of form-meaning mapping of the English tense system, where one form is mapped to multiple meanings, or the complexity of human cognition, where tense is not only used to convey time but also relative immediacy of depicted situations. Learners who have been taught the English present simple and past simple using existing grammar pedagogy may possess a misconception that tenses are only used to mark time. Only learning core usages of the present simple and past simple, which can be explained using the concept of time, students may fail to communicate with other interlocutors effectively in contexts where peripheral and exceptional usages are needed. Therefore, while elementary learners, who refer to primary students in the context of Hong Kong, may start with core usages, advanced learners, who are secondary students in Hong Kong, are expected to proceed to peripheral usages. As these peripheral usages are not addressed by existing pedagogy, an alternative is needed.

4.1 Linguistic Framework of the Pedagogical Grammar Method

The linguistic framework supporting design of instructional materials of the proposed pedagogical grammar method is cognitive grammar. Deviating from formal linguistics substantially, cognitive linguistics (henceforth CL) and cognitive grammar (henceforth CG) take an empiricist view of the world and hold that linguistic structures are reflection of human beings' embodied experience (Evans & Green, 2006).

The English tense system is conceptualised by cognitive grammarians using an epistemic model (see Fig. 2 below). The English present simple and past simple are utilised to delineate reality (R), which is metaphorically compared to a growing cylinder with growth occurring continuously at its leading face representing current reality (Langacker, 2008). The portion of current reality accepted by conceptualisers (C), who are human beings experiencing incidents happening in reality, is known as immediate reality (IR) while the remaining portion of reality accepted by conceptualisers to be real is known as conceived reality (Rc) or non-immediate reality (ibid.). One feature of the conceptualisation of the English tense system using an epistemic model is that all usages of the English present simple and past simple can be connected to human beings' embodied experience.

In accordance with the epistemic model, the entirety of the English tense system can be explicated using the semantic concept of epistemic reality in the sense that all situations depicted using the present simple and past simple are part of the reality (Langacker, 2008). The concept of reality can further be divided into concepts of immediate reality and non-immediate reality, under which all usages of the present simple and past simple are subsumed, respectively, as presented in the instructional materials shown in Appendix 1 (Langacker, 2011). Usages of the English present simple and past simple that can be explained using the concept of time, such as present states and completed events, are located in the region of immediate or non-immediate reality temporally. On the other hand, usages that cannot be explained using the concept of time, such as timeless truths and social distancing, are said to

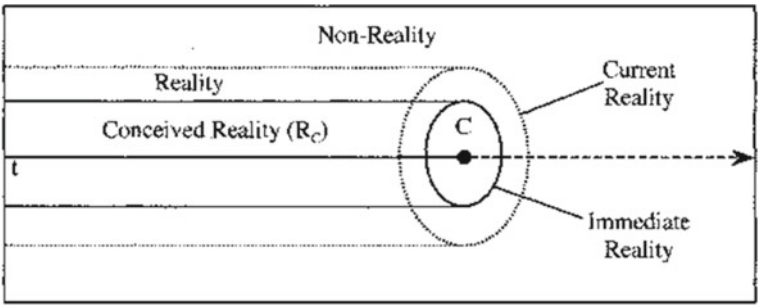


Fig. 2 Epistemic model (Langacker, 2008)

be located in the two regions virtually, which means that learners have to imagine certain events being immediate or non-immediate to them. This epistemic model is a linguistic framework supporting the design of instructional materials.

CG has been experimented with instruction on the English present simple and past simple in L2 classrooms. Bielan and Pawlak (2013) as well as Kermer (2016) implemented CG-inspired instruction, where instructional materials were presumed to be designed on the basis of concepts in CG, to teach English tenses and aspects in L2 classrooms and compare its impacts on learners' receptive and productive knowledge on target structures with those of instruction based on descriptive grammar rules. CG-informed instruction was found to be inefficacious in enhancing learners' receptive nor productive knowledge on target structures in Bielan and Pawlak (2013) as well as Kermer (2016). One plausible explication for low pedagogical efficacy of CG-informed instruction in those two studies was that by no means were those CG instructional materials congruent with the principle of CG that linguistic structures are reflection of human beings' embodied experience. More specifically, each of the two tenses was not treated as one symbolic unit or represented using a concept based on embodied experience as suggested by cognitive grammarians, but distinct usages of the present simple and past simple were presented as independent rules as in descriptive grammar, which deviated from human beings' embodied experience, in both studies (Bielan & Pawlak, 2013; Kermer, 2016). Also, opportunities for internalisation of knowledge learnt from those instructional materials were absent. Follow-up studies ought to use instructional materials truly reflecting CG principles, videlicet Langacker's (2008) epistemic model, and comprise activities facilitating internalisation of learnt knowledge in the instructional design. Conceptualising the English tense system using Langacker's (2008) epistemic model, instructional materials developed for the present study (see Appendix 1) reflect CG principles.

4.2 Pedagogical Framework of the Pedagogical Grammar Method

CG is a fully developed theory of language but not a pedagogical model, so a pedagogical framework outlining teaching steps is needed to put CG into practice. The pedagogical framework of the pedagogical grammar method is systemic theoretical instruction (henceforth STI), which was developed by Gal'perin (1969). STI possesses four tenets: concepts as minimal units of instruction, materialisation of concepts, verbalisation of concepts, and interconnection amongst categories of meaning (Negueruela, 2003, 2008).

STI commences with orienting and material(ised) stages. Semantic and pragmatic concepts underlying the target structure, which are psychological and didactic tools mediating the mind, are expected to be presented to learners by means of a Schema of a Complete Orienting Basis of an Action (SCOBA henceforth), which

provides learners with a holistic cognitive map showing them the interconnection amongst multiple semantic concepts (Gal'perin, 1989, 1992; Haenen, 1996; Lantolf & Poehner, 2014; Negueruela, 2008). Learners are assisted by teachers in studying the SCOBA and comprehending the concepts involved. In the instruction on the English tense system, the underlying semantic concepts are the four concepts in Langacker's (2008) epistemic model, videlicet temporal immediacy, virtual immediacy, temporal non-immediacy, and virtual non-immediacy. These four concepts are based on two pairs of contrasts: immediate reality versus non-immediacy reality, and temporal versus virtual location in specified regions of reality.

Having comprehended semantic and pragmatic concepts underlying target structures materialised in the SCOBA, students proceed to two subsequent stages involving verbalisation of concepts: stages of overt speech and covert speech. At the stage of overt speech, learners are provided with primary language data with instances of target language structures and are required to explicate their understanding of target forms in the primary language data in relation to learnt concepts to their peers (Gal'perin, 1969; Haenen, 1996; Lantolf & Poehner, 2014). At the stage of covert speech, the instructional activity is basically the same except that students no longer talk to their peers but to themselves. Learners engage in communicated thinking, which requires learners to communicate their thoughts to their peers explicitly, and dialogic thinking, which requires learners to carry out self-talk to externalise their thoughts in the course of thinking, at the two stages, respectively (Haenen, 2001; Lantolf & Poehner, 2014). Having mastered concepts underlying target language structures at the two stages of verbal action, students eventually reach the final stage of STI: the mental stage, where overt and covert speeches are transformed into inner speech.

All in all, the stages of materialisation of concepts and verbalisation of concepts make the pedagogical model of STI different from existing grammar pedagogy observed in second language classrooms. Teachers' instruction in existing approaches is largely based on the frameworks of descriptive grammar and formal linguistics, and the goal of such instruction is to provide students with knowledge of different usages of the English present simple and past simple. In contrast, teachers' instructions given in STI present semantic concepts, such as immediate reality and non-immediate reality, to students with an assumption that grammar instruction is the instruction of semantic concepts in lieu of instruction of grammatical rules (Negueruela, 2003, 2008). Verbalisation of concepts is another distinctive attribute of STI. Overt speech is present in approaches like collaborative output tasks, where learners engage in language-related episodes to talk about language produced (Wajnryb, 1990), yet students are expected to verbalise concepts in STI by making use of abstract theoretical concepts to explain language use.

Attempts have been made to apply STI to instruction on the English tense and aspect system in tertiary L2 classrooms (e.g. Ganem-Gutierrez & Harun, 2011; Harun et al., 2014, 2017, 2019; Ng & Zhao, 2017; Poehner & Infante, 2015, 2017). Having analysed learners' individual and dyadic verbalisation during and after instruction, Ganem-Gutierrez and Harun (2011), Harun et al. (2014), as well as Ng and Zhao (2017) identified learners' ability to use metalanguage in the course of verbalisation

as a regulatory tool revolutionising or deepening their conceptual understanding of the language system, which means that their understanding of English tenses and aspects was advanced. In spite of pedagogical efficacy of STI demonstrated in the aforementioned studies, more studies ought to be conducted in non-tertiary L2 classrooms in a bid to probe into the applicability of STI in disparate contexts. A major difference between tertiary and non-tertiary settings is students' cognitive level. Materialisation and verbalisation, which are instructional activities in STI, require high levels of cognitive processing, so it is worth investigating whether such pedagogy is applicable to learners at a secondary level, who possess a lower cognitive level.

4.3 The Present Study

The present paper is a segment of a larger study exploring application of a pedagogical method integrating STI with CG to instruction on the English present simple and past simple in an L2 classroom in a Hong Kong secondary school. Integration of the two assists learners in mapping one language form (i.e. the English present simple or past simple) to multiple meanings. It also aims at addressing learners' failure to map the form and meaning of the English tense system.

The focus of the study is the impact of the intervention on learners' grammatical performance, which is conceptualised by Purpura (2004) to be manifestation of grammatical knowledge. Grammatical performance possesses both receptive and productive dimensions (ibid.). Grammatical comprehension is the realisation of receptive grammatical knowledge and is concerned about the ability to decode meaning from form while grammatical production is the realisation of productive grammatical knowledge and is concerned about the ability to encode form from meaning (ibid.).

Impacts of the pedagogical grammar method on learners' grammatical production are presented in Ng (2020), and the current paper focuses on grammatical comprehension and addresses the following research question:

> To what extent does instruction integrating STI with CG ameliorate students' grammatical comprehension of English simple present and simple past?

5 Methodology

A mixed-method approach was exploited in analysing impacts of instruction integrating STI with CG on students' grammatical comprehension of the English present simple and past simple, which denotes comprehensive and accurate interpretation of meanings expressed by the use of the two verb forms.

5.1 Participants

The research was conducted in a secondary three L2 classroom in a Hong Kong secondary school, where the researcher conducted his seven-week English Language teaching practice. At a junior secondary level, the participants were introduced to the English tense system and should have mastered the core usages of the English present simple and past simple, so the goal of the instruction was to build upon their prior knowledge and cover the peripheral usages through introducing semantic concepts in grammar instruction. Twenty-nine secondary three students, 10 and 19 of whom were male and female, respectively, were recruited for the study.

5.2 Instructional Instruments

Instrumental instruments employed in instructional sessions comprised a collection of SCOBAs and verbalisation tasks. SCOBAs of the study (see Appendix 1) were designed on the basis of Langacker's (2008) epistemic model and adapted from materials developed by Langacker (2011). In accordance with Langacker's (2008) epistemic model, the English present simple and past simple are conceptualised using the semantic concept of epistemic reality. Such a concept is divided into immediate reality and non-immediate reality, and the temporal and virtual distinction within each of the two concepts of immediate reality and non-immediate reality eventually gives the four semantic concepts underlying the English tense system, videlicet temporal immediacy, virtual immediacy, temporal non-immediacy, and virtual non-immediacy. The SCOBAs comprised three segments. They were a simplified epistemic model, which introduces the concept of epistemic reality, three didactic charts presenting the four semantic concepts underlying the English tense system as well as mapping various usages of the two tenses onto the four concepts, and four diagrams elucidating the four semantic concepts at length. In-class verbalisation tasks (see Appendix 2) and after-class written verbalisation tasks (see Appendix 3) required the participants to explicate their understanding of tenses of verbs in primary language data in relation to the four learnt concepts. These instructional materials aimed at facilitating materialisation and verbalisation of the four semantic concepts underlying the English tense system, which eventually paved the way for internalisation of those concepts as the ultimate goal of STI.

5.3 Data Collection Instruments

Data were collected through a pretest and a post-test, each of which comprised a total of 24 truth-value judgement test items. Learners' grammatical comprehension was measured by means of truth-value judgement tests. Being a type of discrimination

Table 1 Sample truth-value judgement test item

There are two sentences in each question. Decide whether the second sentence is a correct interpretation of the first sentence. Tick the correct boxes.		
Question	True	False
Example: I do believe she helped you with it **I believe in the statement that she helped you with it at the moment**		

Source of sentence:Davies (2008)

task presenting learners with language input along with two response choices that are polar opposites, truth-value judgement tests assess sentences interpretation and were adopted to gauge the learners' grammatical comprehension of English present simple and past simple in this study (Gass & Mackey, 2007; Purpura, 2004). Table 1 shows a sample truth-value judgement test item.

In the test, presented with two sentences, the learners were required to comprehend the meaning of the use of the present simple or past simple of a verb in the first sentence accurately to judge the truth-value of the second sentence. For instance, in the above example, use of the present simple of the verb "believe" in the first sentence demonstrates that the speaker's belief occurs at the moment, so the second sentence is a correct interpretation of the first sentence.

The two tests comprised an equal token of four test items targeting the four semantic concepts and eight filler items, which manifested use of verb forms other than the present simple and past simple, for fair comparisons of students' grammatical performance in relation to the four concepts. Three sets of tests had been prepared in advance and were randomly assigned to participants as pretest and posttest (Mackey & Gass, 2016); such counterbalancing enhanced the internal validity of the study. Both descriptive and inferential statistics of the participants' test scores were computed to compare the students' performance in the two tests. With the elimination of filler items, the total score of each test was 16 with four marks covering each of the four target concepts, namely temporal immediacy, virtual immediacy, temporal non-immediacy, and virtual non-immediacy.

Focus group interviews assembled the participants' elaborate responses regarding their perceptions of the entirety of the learning experience, which illuminated impacts of the pedagogical approach on their grammatical comprehension. Even though the study was largely quantitative in nature with changes in the participants' grammatical comprehension of the English present simple and past simple measured by the truth-value judgement test, test scores only showed changes in the learners' grammatical comprehension after the intervention but could not provide qualitative explanation for such changes. Being abstract concepts, mediation and internalisation cannot be measured, and therefore, interviews were needed to gauge the learners' perceptions of their own learning experience, which might illuminate factors associated with any improvement in their grammatical comprehension (Patton, 1980).

Thirteen out of 29 participants of the study were selected for exit focus group interviews by means of critical case sampling and snowball sampling. Each interview comprised three to five participants. An interview protocol with 11 questions was predetermined on the basis of Lee (2012). The interviews were conducted in Cantonese, which was the students' first language, to ensure that ideas were clearly expressed to the students (Mackey & Gass, 2016). The content of the interviews was analysed by identifying recurring themes and extracting quotes providing evidence for each theme (Krippendorp, 2004).

5.4 Procedures

The entirety of the study lasted for seven weeks. The participants signed a consent form and completed an entry questionnaire adapted from Li et al. (2014), which assembled information on their language proficiency, language history, and experience of learning English tenses, as well as a pretest in the first week.

Instructional sessions were held on a weekly basis from the second week to the fifth week with each session focusing on one of the four semantic concepts underlying the English tense system. There were four instructional sessions of 100 minutes in total focusing on the concepts of temporal immediacy, virtual immediacy, temporal non-immediacy, and virtual non-immediacy, respectively. Each instructional session lasted for 25 minutes and followed the pedagogical procedures of STI put forward by Gal'perin (1969) and outlined by Haenen (1996) as presented in Sect. 4.2. The pedagogical grammar method was under investigation, so the optimal instructional time was unknown. For such a reason, the instructional organisation of the present study, with four instructional sessions and each lasting for 25 minutes, simulated Ng and Zhao (2017) and took the following practical factors into consideration. In accordance with the consent to participate in research given by the participating school, the instruction on the English tense system ought to be an integral segment of the students' English language learning experience, so instructional sessions had to be conducted in regular English lessons within a specified time period of four weeks. Admittedly the instructional time provided might not be adequate, yet it was the best possible time provided under practical constraints. Factors influencing the pedagogical efficacy of the pedagogical grammar method ought to be identified in the study to optimise the instructional organisation in the future.

Each instructional session began with a 5-minute lead-in stage, where primary language data (see Appendix 4) were presented to the students to inform them of the target tense. Following the lead-in stage was a 10-minute materialisation stage, where the target semantic concept of each instructional session was presented and elucidated to the students with assistance of SCOBAs (see Appendix 1). For instance, in the first instructional session, the concept of temporal immediacy was presented to the students using the simplified epistemic model, didactic charts, diagrams, and sample sentences of the simple present. After the materialisation stage was a 10-minute verbalisation stage, where the students were required to explicate tenses of verbs in

primary language data (see Appendix 2) in relation to the learnt concept to their peers. Written verbalisation tasks (see Appendix 3) were also provided for completion after class as homework for the students to verbalise to themselves through covert speech. Both in-class verbalisation tasks and after-class written verbalisation tasks were prepared for the internalisation of concepts at the mental stage. An equal number of sentences were presented to the students in each instructional session to ensure that the same amount of input of the four concepts was provided for the students for a fair comparison.

A post-test was administered after the final instructional session in the fifth week to examine impacts of the instruction on the participants' grammatical comprehension of the English tense system. Focus group interviews were conducted after the post-test.

6 Results and Discussion

The presentation of the findings is divided into three parts: overall analysis, between-participant analysis, where the level of English proficiency is an independent variable, and within-participant analysis, where the target concepts under investigation constitute an independent variable.

The participants were divided into three groups of high, mid, and low levels of English proficiency on the basis of their scores of daily writing assignments, which reflected their English proficiency, for between-participant analysis. The high and low proficiency groups comprised ten students each while the mid proficiency group comprised nine students. Two daily writing assignments were graded by the researcher using the criteria of content (34 marks), language (33 marks), and organisation (33 marks) with a full mark of 100. Such grading criteria are conventionally used in standardised English language examinations in Hong Kong to assess students' English language writing skills and validated as a measure of students' level of English proficiency (Curriculum Development Council & Hong Kong Examinations and Assessment Authority, 2007). Based on their performance in their two daily writing assignments, the top one-third of the students and the bottom one-third of the students were categorised into the high and low proficiency groups, respectively, whereas the remaining students were categorised into the mid proficiency group. Use of daily writing assignments as an indicator of language proficiency is not as accurate as standardised proficiency tests, yet such tests could not be administered while the research was being conducted due to limited lesson time.

6.1 *Participants' Overall Grammatical Comprehension of the English Simple Present and Simple Past*

A paired-samples t-test was conducted to investigate impacts of the intervention on the participants' grammatical comprehension by means of comparison between the participants' grammatical comprehension in truth-value judgement tests in the pretest and in the post-test. Descriptive statistics of the participants' overall grammatical comprehension are presented numerically and graphically in Table 2 and Fig. 3, respectively.

The results of the t-test ($t_{28} = 1.27$, $p = 0.22$, 95% BCa CI = [−0.34, 2.07], $d = 0.52$) exhibited no statistical difference in the participants' grammatical comprehension between the pretest and the post-test in the sense that the p-value was statistically insignificant at a 0.05 level while the confidence interval passed through zero. Such findings appeared to suggest that the instruction does not ameliorate students' overall grammatical comprehension of the English tense system; this finding could be attributable to limited instructional time as suggested by the participants in focus group interviews.

> (Interviewer: What do you think were difficulties in the learning process?) … it was [our] first encounter, so it might take more time to digest and comprehend. Perhaps we have to spend more time looking [at the flow chart] independently to become familiar with it.

Table 2 Descriptive statistics of the participants' overall grammatical comprehension

Test	N	Min	Max	Mean	SD	Skewness	Kurtosis	BCa bootstrapped 95% CI of mean
Pretest	29	3	15	9.83	2.92	− 0.48	0.54	[8.96, 10.90]
Post-test	29	7	15	10.62	1.84	0.16	0.48	[9.97, 11.28]

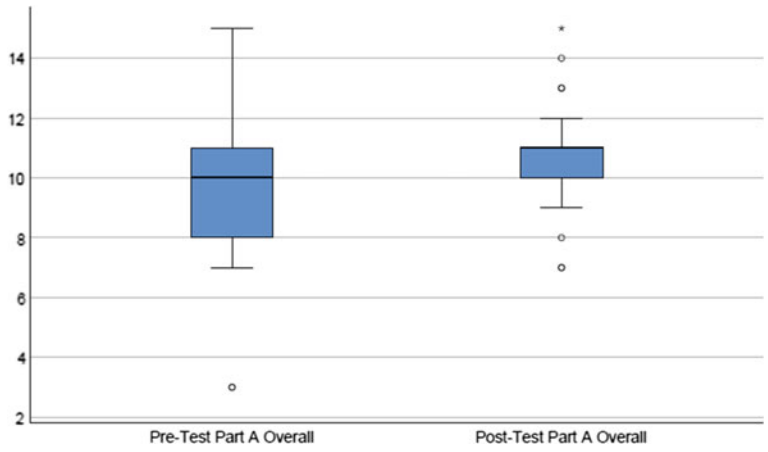


Fig. 3 Descriptive statistics of the participants' overall grammatical comprehension

(Focus Group 2, Student 3, High-Level)

… we only have two months to learn through this instructional approach. I have just learnt [the concepts] but then cannot continue learning anymore, so it is difficult to apply [them] to learning in the future.

(Focus Group 2, Student 1, Mid-Level)

The participants suggested that they possessed insufficient opportunities and inadequate time for the internalisation of explicit knowledge acquired. Sociocultural theory contends that mediation, which is defined as "creation and use of artificial auxiliary means of acting—physically, socially, and mentally" is a premise for internalisation, where knowledge is appropriated into an individual's mind (Lantolf, 2011, p. 25). Limited mediation during instruction hinders complete internalisation and application of such knowledge to grammatical comprehension (Lantolf & Thorne, 2006; Winegar, 1997). As the sentences in truth-value judgement tests involved the four target concepts, the participants were required to possess solid knowledge on those concepts to answer those test items correctly. However, the above quotes from the focus group interviews suggest that the participants possessed insufficient time for digestion and comprehension of concepts presented in the SCOBA, let alone internalisation of such concepts. Failing to ameliorate their understanding of those concepts by virtue of limited instructional time and insufficient time for internalisation, the participants could hardly ameliorate their grammatical comprehension of the English tense system.

Being the first attempt to incorporate such a pedagogical grammar method into instruction on the English tense system in local secondary classrooms, the present experience offers valuable feedback on the amount of time for internalisation of concepts and suggests that 100 minutes in total is insufficient for complete internalisation of concepts. While the optimal or "sufficient" time for internalisation of target concepts remains unknown, longer instructional sessions with more verbalisation activities might be useful. As a suggestion, students should not be required to complete internalisation tasks within a given time limit, but they should be given as much time as needed to complete tasks for complete internalisation of concepts. That said, unlike research in tertiary settings, research in secondary settings is less flexible in terms of instructional arrangements because of a relatively fixed timetable and tight teaching schedule. Such institutional factors ought to be overcome for the pedagogical grammar method to be feasible in local settings.

6.2 Grammatical Comprehension of Participants at Different Levels of English Proficiency

Three paired-samples t-tests were conducted to compare grammatical comprehension in truth-value judgement tests in the pretest and the post-test for the participants in the three proficiency groups. Descriptive statistics of grammatical comprehension of the participants in the distinct proficiency groups are presented numerically and

Table 3 Descriptive statistics of grammatical comprehension of participants at distinct levels of English proficiency

Level of English proficiency	N	Mean (SD) of pretest	Mean (SD) of post-test
High	10	9.90 (4.12)	11.00 (1.63)
Mid	9	10.89 (2.15)	10.67 (1.32)
Low	10	8.80 (1.75)	10.20 (2.44)

graphically in Table 3 and Fig. 4, respectively, and the results of the t-tests are displayed in Table 4.

The results of the t-tests revealed no statistical difference in grammatical comprehension between the pretest and the post-test for the participants at all the three levels of English proficiency in the sense that all the *p*-values were statistically insignificant at a 0.05 level albeit a large effect size for the low proficiency group (Cohen's $d = 1.43$), implying that grammatical comprehension of this group of participants in the pretest and the post-test differed by 1.43 SDs. The students at a lower level of English

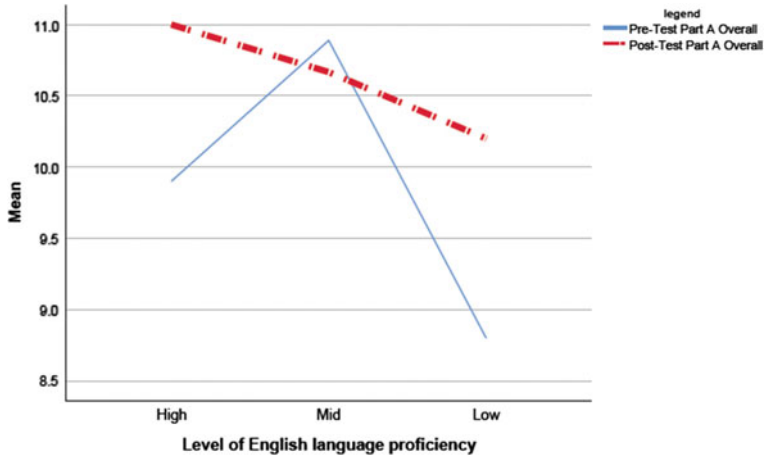


Fig. 4 Descriptive statistics of grammatical comprehension of the participants at distinct levels of English proficiency

Table 4 Paired-samples t-tests of grammatical comprehension of the participants at distinct levels of English proficiency

Level of English language proficiency	Mean difference	df	*t*	*p*	95% BCa CI	*D*
High	1.10	9	0.76	0.47	[−1.50, 4.10]	0.31
Mid	− 0.22	8	− 0.29	0.78	[−1.67, 1.33]	0.19
Low	1.40	9	1.56	0.15	[−0.27, 0.3.14]	1.43**

Note * $p < 0.05$. ** $d > 0.8$

proficiency ameliorated more profoundly in their grammatical comprehension of the English tense system after the instruction; one plausible explication is that less able learners possessed less prior knowledge before instruction. As observed in the following quotes from the focus group interviews, the student in the low proficiency group expressed that he failed to comprehend the target concepts before instruction, so it was difficult for him to complete the truth-value judgement test in the pretest. In contrast, even though the student in the high proficiency group did not encounter those four target concepts either before instruction, he understood the meanings of individual words and could plausibly guess the meanings of those concepts on the basis of the principle of compositionality by combining the meanings of individual words. With less prior knowledge, the participants at a low level of English proficiency learnt more in the instructional sessions. Then they could ameliorate more significantly in terms of understanding of the target concepts in the post-test.

> … those words had not been seen, and more examples are needed.
>
> (Focus Group 1, Student 1, Low-Level)
>
> [They] are something new. [I] understood what each individual word means … but when they were combined … [I] had not seen [them].
>
> (Focus Group 2, Student 5, High-Level)

That said, the mean scores of the high proficiency group in both the pretest and the post-test were higher, though not statistically higher at a 0.05 level. As language comprehension encompasses not only grammar knowledge but also vocabulary knowledge, it is reasonable that the participants in the high proficiency group, who possessed more advanced linguistic knowledge overall, performed better in the comprehension tasks.

6.3 Grammatical Comprehension of the Four Concepts Underlying the English Tense System

Four paired-samples t-tests were conducted to compare the participants' grammatical comprehension of the four concepts in truth-value judgement tests in the pretest and the post-test. With four test items covering each of the four concepts, the total score for each concept was four. Descriptive statistics of the participants' grammatical comprehension of distinct concepts are presented numerically and graphically in Table 5 and Fig. 5, respectively, and the results of the t-tests are displayed in Table 6.

The results of the t-tests and the computation of effect sizes demonstrate that the participants' grammatical comprehension of the concept of temporal non-immediacy regressed statistically ($p = 0.01$, Cohen's $d = 2.00$), whereas that of the concept of virtual immediacy progresses statistically ($p = 0.00$, Cohen's $d = 2.02$).

Table 5 Descriptive statistics of the participants' grammatical comprehension of distinct concepts

Concept	N	Mean (SD) of pretest	Mean (SD) of post-test
Temporal immediacy	29	2.03 (1.12)	2.00 (0.76)
Virtual immediacy	29	2.93 (0.80)	2.28 (1.03)
Temporal non-immediacy	29	2.14 (1.16)	3.48 (0.69)
Virtual non-immediacy	29	2.72 (1.25)	2.86 (1.03)

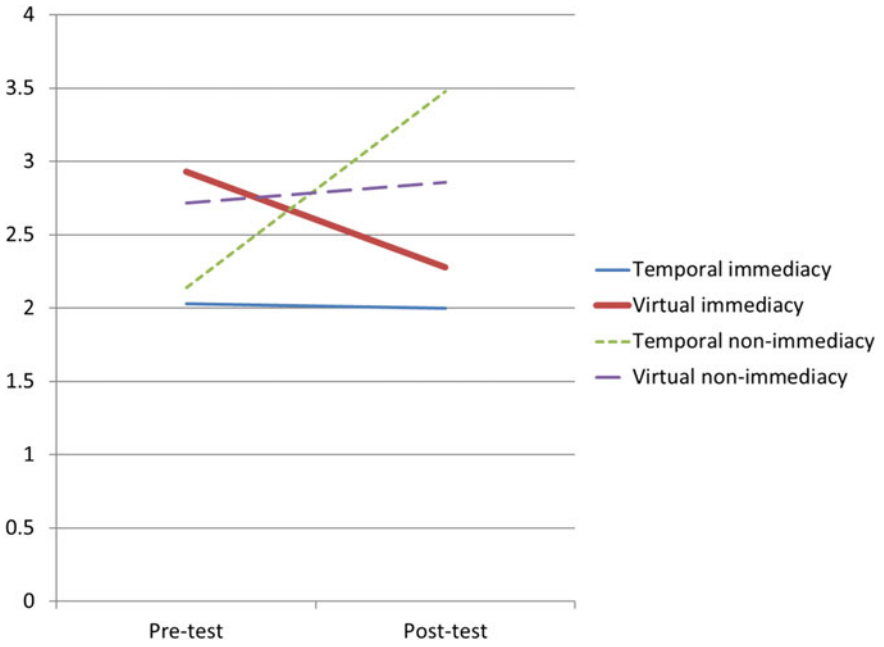


Fig. 5 Descriptive statistics of the participants' grammatical comprehension of distinct concepts

6.3.1 Role of Instructional Order

Statistically, the significant amelioration in the participants' grammatical comprehension of the concept of temporal non-immediacy is plausibly associated with the instructional order. A participant of a focus group interview commented that it was not until the third session when she was clear about the semantic concepts related to epistemic reality taught in the instructional sessions, and therefore, more significant improvement was observed in the participants' grammatical comprehension of the concept of temporal non-immediacy, which was taught in the third instructional session, with a mean difference of + 1.35 and an effect size of $d =$

Table 6 Paired-samples t-tests of the participants' grammatical comprehension of distinct concepts

Concept	Mean difference	df	*t*	*p*	95% BCa CI	*D*
Temporal immediacy	−0.03	28	−0.14	0.89	[−0.52, 0.41]	0.06
Virtual immediacy	−0.66	28	−2.80	0.01*	[−1.10, −0.21]	2.00**
Temporal non-immediacy	1.35	28	6.02	0.00*	[−0.97, 1.80]	2.02**
Virtual non-immediacy	0.14	28	0.53	0.60	[−0.35, 0.62]	0.45

Note * $p < 0.05$. ** $d > 0.8$

2.02, implying that the participants' grammatical comprehension of the concept of temporal non-immediacy in the pretest and the post-test differed by 2.02 SDs.

> (Interviewer: After which lesson did your mind become much clearer?) The second and third lessons.
>
> (Focus Group 3, Student 2, Mid-Level)

6.3.2 Role of Relative Abstractness of Concepts

Relative abstractness of concepts is another relevant factor accounting for disparate impacts of the instruction on grammatical comprehension of distinct concepts. Virtual concepts are much more abstract than temporal concepts as they are more distant from human beings' embodied experience, so comprehension of those concepts requires more of learners' imagination (Langacker, 2011). Taught as an abstract concept in the second instructional session, the concept of virtual immediacy might be incomprehensible to the participants and even confused their understanding, so a decline in the comprehension of such a concept was observed in the post-test.

A combination of the factors of instructional order and relative abstractness of concepts could account for a lack of statistical difference in the learners' grammatical comprehension of the concepts of temporal immediacy and virtual non-immediacy. Even though the concept of temporal immediacy was less abstract and presumed to be more easily comprehended than the two virtual concepts, the concept was taught in the first instructional session when the learners had not yet become familiar with the comprehension of the English tense system from a CG perspective. Therefore, the concept was not comprehended well by the participants given limited consolidation of the concept in the subsequent sessions. On the other hand, being an abstract concept, the concept of virtual non-immediacy posed much challenge to the participants albeit instruction of such a concept in the last instructional session.

The above discussion reveals that instructional order and relative abstractness of concepts considerably influence the pedagogical efficacy of instruction integrating STI with CG in grammatical comprehension of the English tense system. As suggested by the participants' comments in the focus-group interviews, more

time should be allowed to interpret the epistemic model used for materialising the concepts. Not having completely comprehended the epistemic model, the learners found it more difficult to capitalise upon the model to comprehend the concepts taught in the earlier instructional sessions. For such a reason, the pedagogical efficacy of the earlier instructional sessions was lower. Meanwhile, probably because of abstractness of virtual concepts, the learners' comprehension of virtual concepts was worse than that of temporal concepts. Lengthened verbalisation activities with a large amount of primary language data for learners to verbalise the use of tenses with respect to all four target concepts may be required to provide learners with more opportunities and time to internalise those concepts, in particular virtual concepts, so that those concepts can be applied to their grammatical comprehension of the English tense system. After all, time is a determinant of the feasibility of incorporation of the pedagogical grammar method into the existing curriculum. As suggested in the present study, even though the best possible time was provided for instruction under practical constraints, time was still insufficient for the students' internalisation of concepts. For such a reason, unless the total lesson time of the subject of English language can be increased, it is difficult to integrate the pedagogical grammar method under investigation into the local curriculum.

7 Conclusion

This paper aims at investigating impacts of instruction integrating STI with CG on students' grammatical comprehension. No significant impact of the pedagogical grammar method on the participants' grammatical comprehension was observed. Concerning the effectiveness of the pedagogy on grammatical comprehension of the students at different levels of English proficiency, no significant findings were reported either; this was plausibly attributable to the use of the students' daily writing assignments, which were merely rough indicators of language proficiency, for categorisation. Even so, two potential factors limiting the efficacy of such pedagogy were identified: the length of instructional time and instructional order. Such factors ought to be taken into consideration in lesson design so that the pedagogical efficacy of the pedagogical approach can be maximised for learners' sake. The paper possesses two predominant limitations that should be addressed in follow-up studies.

First and foremost, validity of data collection instruments could be further enhanced. Even though truth-value judgement tests have been corroborated to be a valid measurement of grammatical comprehension, the instrument may possess lower face validity than other tests, such as sentential level gap-filling tests, do on account of participants' unfamiliarity (Gass & Mackey, 2007; Mackey & Gass, 2016). Possessing limited knowledge on the format or rubrics of truth-value judgement tests, participants might perform less well in such tests. It is suggested to incorporate a greater variety of assessments of grammatical comprehension with which learners are more familiar, such as matching tasks, discrimination tasks, and noticing

tasks, into the study to enhance the face validity of tests and provide methodological triangulation (Purpura, 2004).

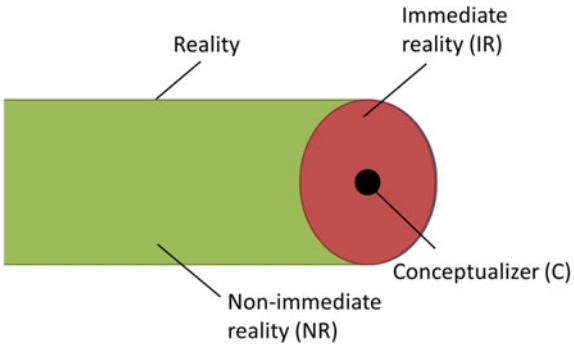
Another limitation of the study is limited instructional time. The amount of instructional time as well as the organisation of instructional sessions was highly restricted by the participating school, so only four instructional sessions, each of which lasted for 25 minutes, were conducted throughout the research period. Sufficient opportunities for mediation are integral to the internalisation of concepts, yet the participants in the current study appeared to experience inadequate mediation owing to limited instructional time. More importantly, segmentation of instruction on the entirety of the English tense system into four instructional sessions, which is an undesirable pedagogical practice in STI, also resulted from limited instructional time. This explains why the participants failed to ameliorate their grammatical comprehension of the English tense system after the instruction. It is thus important to cover the entirety of the English tense system in one instructional session and lengthen the total instructional time so that students can be provided with a coherent learning experience and more opportunities for mediation. Capability to devote sufficient time to instruction of one target structure is a premise for successful implementation of the pedagogy in any L2 classrooms. Participating schools recruited for future studies ought to be willing to fulfil the aforementioned requirements in terms of instructional time and organisation.

Follow-up studies with modified research design, such as provision of untimed verbalisation activities in the instructional sessions to provide sufficient opportunities for internalisation of target concepts, are warranted to further evaluate pedagogical efficacy and appropriateness of an integration of STI and CG on instruction of the English tense system.

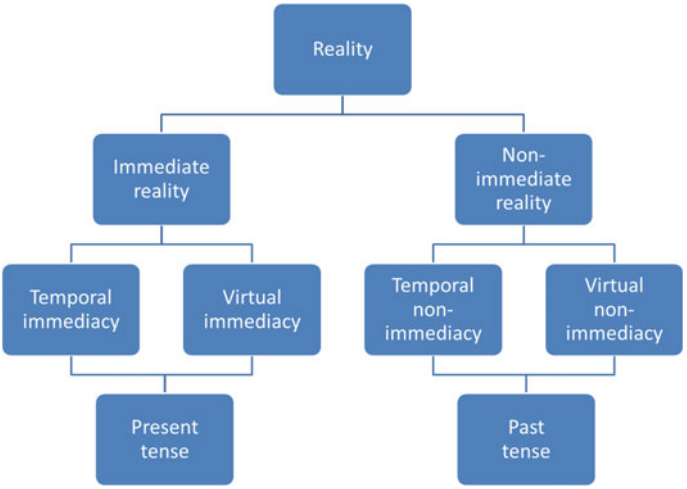
Appendix 1

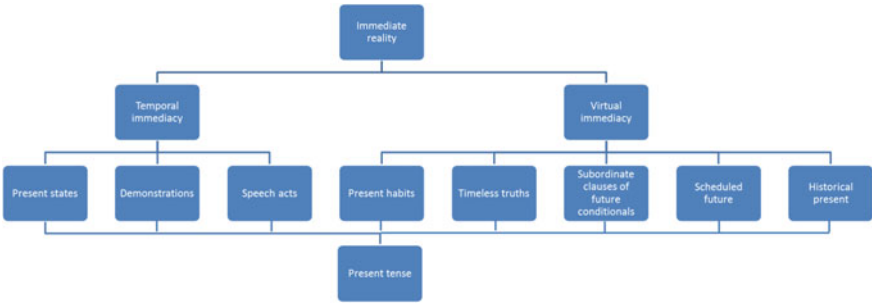
A Scheme of Complete Orienting Basis of Action (SCOBA)

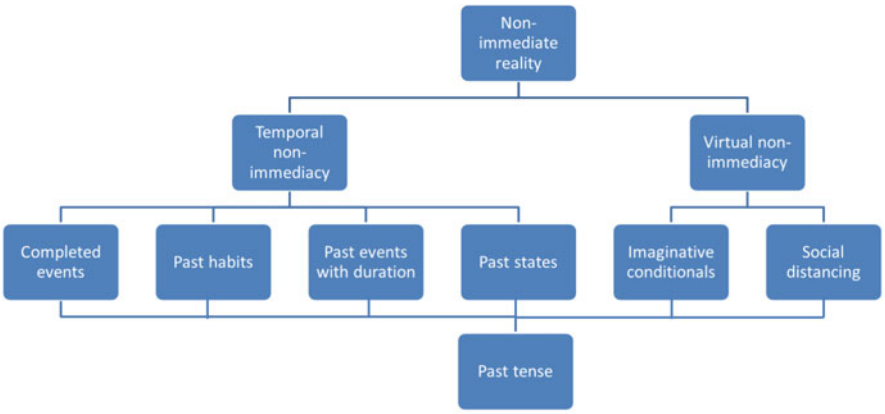
A simplified epistemic model



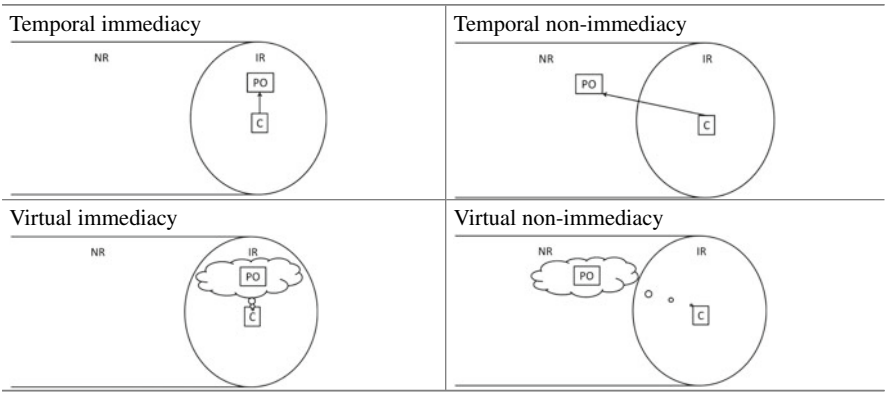
Three didactic charts







Four diagrams



Appendix 2

In-Class Verbalisation Tasks

Explain the tense of the underlined verb in each sentence to your partner using the given charts and diagrams.

Instructional Session 1

1. There *is* a large house on the corner.
2. I *know* Mr. Jackson.
3. Here comes the pitch; Ortiz *swings* and misses.
4. Now I *add* three eggs to the mixture.
5. I *resign* from the commission.

Instructional Session 2

1. He *walks* to school every day.
2. Water *freezes* at 0 degrees centigrade.
3. After he *finishes* work, he will do the errands.
4. I *have* a meeting next Wednesday at that time.
5. He *stands* up in the boat and waves his arms to catch our attention.

Instructional Session 3

1. I *attended* a meeting of that committee last week.
2. It *snowed* almost every weekend last winter.
3. Professor Nelson *taught* at Yale for 30 years.
4. He *appeared* to be a creative genius.
5. He *owed* me a lot of money

Instructional Session 4

1. If he *took* better care of himself, he wouldn't be absent so often.
2. I'd rather you *went* tomorrow.
3. If they *were* alive now they would be horrified.
4. *Did* you want to sit down and stay a while?
5. I *wondered* whether I could see you for a few minutes.

Appendix 3

After-Class Written Verbalisation Tasks

Explain the tense of the underlined verb in each sentence. You may use diagrams if necessary.

Instructional Session 1

1. The car *belongs* to Bill.
2. Now I *understand*.
3. Now I *add* two cups of flour and fold in gently.
4. Here *comes* the bus.
5. I *beg* you not to tell anyone.

Instructional Session 2

1. I *skim* the New York Times at breakfast every morning.
2. Spaniards *eat* dinner late.
3. If Cindy *passes* the bar exam, she'll be able to practice law.
4. When *do* lectures end this year?
5. Probe *clears* Speaker over bike payout.

Instructional Session 3

1. He *owed* me a lot of money.
2. After the War I *moved* to Germany.

3. I *lived* in Berlin for three years and then spent a few months in Cologne.
4. Jill said she *had* too many commitments.
5. She said there *was* plenty left, but there's hardly any.

Instructional Session 4

1. If you *went* tomorrow, you would see Ed.
2. If she *returned* now, we would be in real trouble.
3. If I *walked* home from school, it would take all afternoon.
4. I *hoped* to speak to the Manager. Could you help me?
5. *Did* you want something to eat before the game?

Appendix 4

Primary Language Data

Instructional Session 1

1. I *live* in Berlin.
2. She *has* a headache.
3. Look! Adam *steps* forward, tries to drive, he's bowled!
4. There it *goes.*
5. I *promise* to let you have it back tomorrow.

Instructional Session 2

1. I habitually *do* "The Times" crossword.
2. The sun *rises* in the east.
3. If he *does* not help me, I'll be finished.
4. The new Kevin Costner film *opens* at the Eldorado on Saturday.
5. UN aid *reaches* the stricken Bosnian town of Srebrenica.

Instructional Session 3

1. I *promised* to let you have it back tomorrow.
2. The Boston Red Sox *won* the World Series in 2013.
3. It *rained* every day last week.
4. I *lived* in Hong Kong for 10 years.
5. I *lived* in Berlin.

Instructional Session 4

1. I wish he *was* here.
2. If he *was* here, he would be upstairs.
3. If I *was* rich, I would change the world.
4. I *wanted* to ask for your advice.
5. I *could* offer you some advice.

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The Effect of Lexical Aspect on the Use of English Past Marking by Cantonese ESL Learners and Its Pedagogical Implications

Zoe Pei-sui Luk

Abstract This chapter reports the findings of a study that tested whether lexical aspect of the predicate of a sentence affects the supply of English past marking by native Cantonese-speaking learners of English who had received English education for more than 12 years. The Aspect Hypothesis predicts that past morphology is first used with telic predicates (e.g. accomplishments and achievements), and later spreads to atelic predicates (e.g. activities and statives). The results from a grammaticality judgment task and a cloze test showed that the participants were more likely to use past morphology when the predicate was telic than when it was atelic, suggesting that lexical aspect still affects the supply of English past marking by late-stage learners. These findings deviate from the predictions of the Aspect Hypothesis, suggesting that, even after a long period of English instruction, the effect of lexical aspect is still visible. This chapter also discusses the potential advantages of pedagogical approaches such as Processing Instruction and Cognitive-Grammar-inspired instruction over traditional grammar explanation in mitigating the effect of lexical aspect.

Keywords Cantonese · Lexical aspect · Past tense · Telicity

1 Introduction

Tense–aspect marking is known to be difficult for second language (L2) learners, especially for those whose first language (L1) lacks overt tense morphology. Thus, English learners who speak Cantonese as their L1, which has no overt tense marking, often make tense-related errors. One common type of error is the omission of past markers in obligatory contexts (Darus & Ching, 2009; Yang & Huang, 2004).

Some researchers suggest that the omission of past marking in English is caused by the syntactic and phonological differences between the learner's L1 and L2. Hawkins and Liszka (2003) showed that L1 Chinese-speaking learners are more likely to

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omit past tense markers in their English oral production than native Japanese- and German-speaking learners, whose native languages have past marking. They argued that Chinese learners have difficulty assigning the feature [past] to T(ense), because this feature is not available in Chinese. Goad et al. (2003) discussed the issue from a phonological perspective. They argued that the failure to supply past inflections is related to the properties of L1 prosodic phonology. Because Mandarin Chinese does not allow consonant clusters, native Mandarin Chinese speakers have difficulty producing regular past marking when its attachment to a verb results in a consonant cluster.

This chapter examines the issue from a semantic perspective, with a special focus on the effect of lexical aspect (LA). It reports a study which investigated whether the use of past morphology in English by native Cantonese-speaking learners of English (NCLE) is affected by the LA of the verb, especially when no time adverbials are present in a sentence to indicate a specific time or time frame. While a few studies have looked at the morphological errors made by NCLE, many of these studies do not focus on the effect of LA (e.g. Darus & Ching, 2009; Rezzonico et al., 2017; Yang & Huang, 2004; Yu & Atkinson, 1988). To the author's knowledge, there are only two studies that focus on the effect of LA on the development of tense–aspect morphology by NCLE. One is Tickoo (2001), which examined written narratives by English learners at three different levels. The other study is Hong (2008), which used both a fill-in-the-blank test and written narratives to test the effect of LA. Thus far, no study has used a controlled experiment with university-level learners, who have learned English for at least 12 years and are at their later stages of development. In fact, little research has been dedicated to the effect of LA on late-stage learners. However, this is crucial, as it has been predicted by the Aspect Hypothesis that past morphology does spread to atelic predicates at later stages of development. Hong (2008) did not consider the effect of time adverbials. In her study, time adverbials were provided in the tasks. The effect of the presence of time adverbials is worth considering, because looking for time adverbials in a sentence is often taught to Hong Kong students as a strategy for choosing the right verb form. The current study thus examines whether LA has an influence on the use of past morphology by late-stage native Cantonese learners of English when no time adverbials are used in the test items.

This chapter focuses on past morphology, and it attempts to provide insights as to how the effects brought about by the semantics of a predicate can be mitigated through instruction. Specifically, Processing Instruction and a Cognitive-Grammar-based approach are discussed. The chapter is organised as follows. Section 2 reviews previous studies on L2 acquisition of English past morphology. Section 3 gives a brief review of the tense–aspect system in Cantonese and studies that investigate the learning of English tense–aspect marking by native speakers of Chinese languages. Section 4 states the objective of this study. Section 5 describes the method of this study. The results of the study are reported in Sect. 6. Section 7 discusses the findings and Sect. 8 the pedagogical implications. Section 9 concludes the chapter with a few limitations of the study.

2 Lexical Aspect and Its Effect on the Acquisition of English Past Morphology

One of the most well-researched theories regarding the development of verbal morphology is the Aspect Hypothesis (AH). According to the AH, the learning of tense–aspect marking in a L2 is guided by the LA of the predicate in the earliest stages of acquisition (Andersen, 1991; Andersen & Shirai, 1994). LA concerns the structural properties of an event. The four aspectual classes proposed by Vendler (1957) are states, activities, accomplishments, and achievements. The properties of each of these classes are shown in Table 1. One of the predictions of the AH pertinent to past marking is that learners first use past morphology on achievement and accomplishment verbs, and eventually use it with activity and stative verbs.

Bardovi-Harlig and Comajoan-Colomé (2020) reviewed 29 studies regarding L2 tense–aspect development, and showed that the AH is largely supported in the development of different L2s. In particular, the prediction of the AH regarding past morphology has been borne out in many studies with L2 English learners of different language backgrounds. For example, Bardovi-Harlig (1992) showed that the low-proficiency participants in her study were able to use the English simple past with achievement verbs such as *tell* and *die*, but they had more difficulty using the simple past with stative and activity verbs such as *live* and *work*. Interestingly, Bardovi-Harlig also reported that, even for more proficient participants, the use of the simple past with *live, work*, and *take care of* remained low. Chan, et al. (2012), using data from the European Science Foundation SLA corpus (Perdue, 1993), showed that two native Italian- and two native Punjabi speakers, who were untutored English learners, demonstrated a strong association of past morphology with achievement verbs. Deshors (2018) analysed written essays by upper-intermediate and advanced L1 French learners of English using a collostructional analysis, and found that past morphology was strongly associated with two achievement verbs, *fail* and *forget*. Zhao and Shirai (2018) used a written cloze test and a narrative task to elicit data from native Arabic learners of English. They showed that their low-proficiency learners used past morphology with telic predicates more often than with atelic ones in the narrative task, but such a pattern was not found in the high-proficiency

Table 1 Lexical aspectual classes and their properties

	Dynamic (i.e. requiring energy to sustain the event)	Durative (i.e. having a duration)	Telic (i.e. having an inherent endpoint)	Example
States	No	Yes	No	Love, know
Activities	Yes	Yes	No	Swim, run
Accomplishments	Yes	Yes	Yes	Bake a cake, fix a car
Achievements	Yes	No	Yes	Die, arrive

group, although the interaction between the effect of LA and proficiency was not statistically significant.

Some studies, on the other hand, reported results not conforming to the AH. Many of these studies have shown that English learners use past morphology with statives earlier than predicted. For example, Ayoun and Salaberry (2008) used narrative and cloze tasks with advanced L1 French learners of English, and they found in both tasks, the learners accurately used past morphology with a wide range of stative verbs. Zhao and Shirai (2018), who used the same cloze test in Ayoun and Salaberry (2008), also found that their participants used past morphology frequently with statives in the cloze test.

Some researchers argue for a binary distinction for past morphology development instead of the four-way Vendlerian distinction. For example, Robison (1990) examined the production of verbal morphology in an interview with a native Spanish speaker learning English. He found that the learner tended to use past morphology with punctual (as opposed to durative) verbs. Domínguez et al. (2013), on the other hand, argued that it is dynamicity that affects learners' use of past morphology in L2 Spanish. Specifically, they showed that native English speakers who learned Spanish as an L2 often used the Preterit for events and Imperfect for states. Collins (2002) argued for a telic/atelic distinction. Her L1 French participants used past morphology with accomplishments and achievements equally well, but they were least successful when using the past forms of activities.

To summarise, while there are some exceptions, the literature generally shows some effects of LA on the use of past morphology in English. In particular, beginner learners are more successful when using past markers on achievements and accomplishments than on activities and states. However, there is little empirical evidence that supports the claim that past morphology spreads to atelic predicates as learning progresses. This is in part due to few studies that look at learners at later stages of development.

3 The Cantonese Tense–Aspect Marking System and Studies with Native Speakers of Chinese Languages

Cantonese does not mark tense. Time adverbials are sometimes necessary when the context does not specify the time of an event. As shown in (1), even though the state of being fond of fish was in the past, there is no past marking on the verb.

(1)

我	(以前)	鍾意	食	魚
ngo5	*(ji5cin4)*	*jung1yi3*	*sik6*	*jyu2*
I	before	like	eat	fish

'I used to like fish.'

On the other hand, Cantonese is quite rich in aspect morphology. The most relevant aspect marker is the perfective 咗*zo2*, which is "used to report an event, seen as a whole or as completed" (Matthews & Yip, 1994, p. 204). Matthews and Yip (1994) summarised three typical usages of 咗*zo2* (2).

(2) a. resultative meaning

阿偉	鍾意咗	阿美
A-Wai	*jung1yi3zo2*	*A-Mei*
A-Wai	like.PFV	A-Mei

'A-Wai is in love with A-Mei.' (Not 'A-Wai liked A-Mei')

b. in reporting past events without any such results, which corresponds to the simple past (example adapted from Matthews & Yip, 1994, p. 205).

公司	舊年	賺咗	唔少	錢
Gong1si1	*gau6lin2*	*zaan6zo2*	*m4siu2*	*cin2*
company	last.year	earn.PFV	not.little	money

'The company made a good deal of money last year.'

c. to express a period of time up to and including the present (example adapted from Matthews & Yip, 1994, p. 205).

我	架	車	揸咗	兩	年	幾
Ngo5	*gaa3*	*ce1*	*zaa1zo2*	*loeng5*	*lin4*	*gei2*
I	CL	car	drive.PFV	two	year	some

'I've been driving the car for over two years.'

Although it is not clear how LA affects the use of 咗*zo2*, based on the examples and explanations given in Matthews and Yip (1994), the existence of an inherent endpoint seems to facilitate the use of 咗*zo2*. For example, in (2a), A-Wai was not in love with A-Mei before, but he is now. In other words, the predicate 鍾意咗*jung1yi3zo2 A-Mei* indicates a change of state, instead of being in the state in the past (as in *liked*). In (2c), the event of driving a car for over two years is completed when the car has been driven for over two years. Omitting the time period will result in an ungrammatical sentence. This distinction is similar to that between *run* and *run 10 km*. If this speculation is accurate, 咗*zo2* should be readily used with telic events (i.e. accomplishments and achievements).

One might wonder how this system affects the learning of past morphology in English by NCLE. There are, however, only a handful of studies that examined the development of tense–aspect marking in English by speakers of Chinese languages. Bayley (1994) elicited spoken data from 20 instructed adult Chinese learners of English, most of whom had very limited English exposure outside of the language classroom. He showed that the participants were more likely to associate past marking with perfective situations than with imperfective ones. Qian (2015) also showed that her Mandarin Chinese and Mongolian speakers tended to use past morphology with telic verbs, progressive marking with activity verbs, and present tense with stative

verbs. Her results suggested influence from their L1s as the native Mandarin Chinese speakers were less likely to associate the English past tense with stative verbs than the native speakers of Mongolian, which is a tense-marking language.

The effect of LA on the use of past tense morphology is less robust in other studies involving native speakers of Chinese languages. Klein et al. (2004) investigated whether the AH and the Perceptual Salience Hypothesis affect L2 learners' accuracy in supplying past tense forms. The participants had different first languages, including Cantonese and Mandarin Chinese. In the experiment, the participants were asked to listen to two-sentence stories in which the second sentence was repeated. The participants were then asked to complete the same second sentence in written form by providing the appropriate form of the verb. The results showed that the difference in accuracy of using past forms between telic and atelic verbs was not significant, suggesting that LA does not affect accuracy. Instead, they were significantly more accurate in supplying past tense forms for verbs that require a syllabic inflection (i.e. -ɪd) than those with a non-syllabic inflection (e.g. -d), confirming the Perceptual Salience Hypothesis.

Two studies have examined NCLE. Tickoo (2001) examined written narratives of learners at three proficiency levels, including secondary 3, secondary 6, and university students. Her qualitative analyses suggested that LA did not cause differences in the supply of past morphology in the narratives. Rather, the participants were sensitive to the grounding of an event: they tended to omit past morphology when an event was a backgrounded event. Hong (2008) used a fill-in-the-blank task and a written narrative task to elicit verb forms from secondary school students. Her results suggested that the secondary school students used the simple past significantly more frequently with telic predicates than with atelic ones. She also found that the participants used the simple past more often with states than with activities, deviating from the AH. One important factor that Hong (2008) did not consider was the effect of time adverbials (e.g. *last week*). Time adverbials were given in both tasks (they were given in the prompts in the narrative task). As looking for time adverbials is one of the commonly taught strategies for deciding the proper verb form in a sentence, the performance of the participants might have been boosted due to the presence of these time adverbials.

To summarise, a few studies that examined the learning of English tense–aspect system by native speakers of Chinese languages have reported results that are consistent with the prediction of the AH. The lack of a tense system in learners' L1 could cause a lower rate of past morphology uses with stative verbs. However, few studies have examined whether the strong, exclusive association of past marking with accomplishments and achievements persists. That is, we do not know whether the lower rate of use of past morphology with stative and activity verbs still holds after learning English for many years. The AH predicts that past morphology gradually spreads to atelic predicates, but no experimental study thus far has looked at NCLE who have learned English for many years. To the best of the author's knowledge, only Tickoo (2001) has examined the use of past morphology of university students using written narratives, and there have been no controlled experiments done thus far with this group of learners. The current study did exactly this. The current study is also different from Hong (2008) in which time adverbials were omitted from the target

items of the tasks (details are given in Sect. 5). This study therefore adds to the body of research that looks at the use of English past morphology by NCLE, and by doing so, deepens our understanding of the difficulty of the use of past morphology by these learners and informs language educators of suitable pedagogies.

4 Objectives

Given these backgrounds, this study attempted to address the following research question: Is the accuracy of using past morphology of English by NCLE who are at the later stage of development affected by LA? As the AH predicts that past morphology gradually spreads from telic predicates to atelic ones, these learners should be able to use past morphology with atelic predicates as well as with telic ones after many years of instruction (more than 12 years in the case of the participants in the current study). However, it is equally possible that learners have not improved over time, even after more input has been given. The purpose of this study is thus to test this.

Although there is potential L1 influence from Cantonese, this study was not designed to examine exactly how it influences the acquisition pattern. Instead, this study aims to shed light on how the supply of past morphology is affected by the semantics of a verb or predicate (i.e. LA), so that language teachers know what they should pay attention to when teaching past morphology to native Cantonese speakers. This study adopted written tasks, in which the participants were not required to produce spoken responses. The effect of phonological saliency of the past marker, which was discussed in the previous section, was thus assumed to be minimal.

5 Method

5.1 Participants

Twenty-nine native Cantonese speakers (mean age = 21, SD = 1.44) participated in this study. They were students at the Education University of Hong Kong majoring in programmes of which the focus was not English. They reported to have received instructed English education for 12–20 years. The participants had obtained at least Level 3 at the Hong Kong Diploma of Secondary Education Examination (HKDSE) (i.e. one level above the passing level), suggesting that they were at least intermediate learners of English based on the descriptors provided by the Hong Kong Examination Authority (see Appendix 1 for details). Many of them spoke Mandarin Chinese, and six reported that they had basic to good knowledge of other languages, such as Japanese, Korean, German, and Hakka. They were paid HK$100 (equivalent to US$12.8) each for their participation.

5.2 Materials

A grammaticality judgment task and a cloze test were used. While narrative tasks (written or oral) have been common in previous studies, these two tasks were used for two reasons. First, they have more control over verb types. It can be ensured that there are similar numbers of items for each aspectual type, and that participants work on the same set of verbs. Second, because participants are given as much time as needed to complete the written tasks, errors made by participants are less likely to be performance errors. The reason of adopting a grammaticality judgment task was to test whether learners would direct their attention to morphological marking that is absent in their native language. Psycholinguistic research has shown that Chinese learners of English may not process morphological marking in English (Chan, 2012).

Some might have doubts about the validity of grammaticality judgment tasks. One criticism is that participants' judgment might be affected by obscure or abstract semantic content (Birdsong, 1989). To avoid this problem, it was ensured that the context of each item was related to ordinary, day-to-day activities of a Hong Kong student while designing the items. It was also ensured that the words that made up the test items were readily understood by the participants. The task, therefore, should be valid for testing the learners' receptive knowledge of past morphology (i.e. whether they notice a need for a past tense form), especially when no attention was given to the verb (unlike the cloze test, in which the participants were asked to provide a correct verb form, inevitably drawing the participants' attention to the verb).

The grammaticality judgment task consisted of 48 items, of which 16 were target items and 32 were fillers. Each of these 48 items comprised three sentences forming a short story. For the target items, the last sentence had a predicate that was of one of the four verb types based on Vendler's classification (i.e. stative, activity, accomplishment, and achievement). The classification of aspectual type was done based on the operational test in Shirai (1991), and the four types were equally distributed among the items. The first two sentences in the target items provided a context such that the third sentence also required a past tense form for the main verb. None of the items contained time adverbials, such as *yesterday* and *last month.* This was to avoid giving the participants a direct signal that a sentence required a past tense form. Examples are shown in (3). A full list of all the target items is given in Appendix 2.

a. stative (ungrammatical)
Sally participated in a debating competition. She was so nervous that she stuttered on the stage. She *looks embarrassed* in front of the adjudicators.
b. activity (ungrammatical)
I saw a man singing loudly on the street. A woman told him to shut up but he didn't. Then they *fight*.
c. accomplishment (ungrammatical)
I enrolled in a marathon. Katy followed suit even though she wasn't good at running. Surprisingly, she *runs ten kilometers* in the marathon.
d. achievement (ungrammatical)

Mum panicked because my brother got lost in Ocean Park. Mum requested help from the information center. Thanks to the broadcast, one staff member *finds him* based on Mum's descriptions.

Half of the target items and half of the fillers were grammatical. The ungrammatical target items involved the third sentence using a present form instead of the past form. The filler items were ungrammatical due to non-tense-related reasons. The participants were blind to the objective of the task. There were four items for each verb class (one stative item was later removed because there was a typo in the test administered to the participants which could cause the participants to respond to the item differently). All the ungrammatical items involved an error in the clause describing a foregrounded event in which they formed part of the main storyline. The experiment had a counterbalanced design such that all the verbs used in the target item were used to construct both grammatical and ungrammatical sentences (a participant only saw one of them), and the items were also presented in a pseudo-random order. The participants were asked to indicate whether an item was grammatical or not, and, if not, correct the error.

The cloze test also consisted of 48 items. Each item consisted of three sentences, with the third sentence having a blank, such that the participants were given enough contextual information to decide on the correct verb form. Like the grammaticality judgment task, none of the items contained time adverbials. The target verbs were in the clauses that described foregrounded events which formed part of the main storyline. The participants were asked to supply a correct verb form of the verb given in the third sentence of each item. There were also 16 target items and 32 fillers. The target items were those that required the participants to produce a past tense form. The filler items, on the other hand, required the participants to produce a form other than the past form (e.g. the present form). The four predicate types were distributed evenly across the 16 target items (i.e. each verb type had 4 items). The items were presented in a pseudo-random order. Examples of the target items are shown in (4). A full list of the target items is in Appendix 3.

(3) a. stative
It was the first time I had a family dinner with my step sister. She remained silent throughout the dinner. She _____ (seem) to be dissatisfied with me.
b. activity
The bad weather delayed flight BA345. The airline's crew made an announcement. A number of passengers _____(sit) at the check-in lobby.
c. accomplishment
Ben was a raging alcoholic. He failed to battle his addiction. At his 25th birthday party, he even _____(drink) two liters of red wine.
d. achievement
A child got lost in the forest. The parents called the police. Later, the police _____ (discover) the child's body hidden in thick undergrowth.

5.3 Procedures

The participants completed the two tasks on their computers under distant invigilation of a research assistant using Zoom.[1] The participants were sent a PDF version of the tasks at the beginning of the test session after they had given consent to participate. They were instructed to put down their answers using the comment functions of Adobe Reader and returned the PDF file to the research assistant when they finished. During the administration of the tasks, the research assistant oversaw the whole process, with the participants' cameras on. The participants could take as much time as they needed. This was to ensure that any error that they made was not due to time pressure. Most of the participants completed the tasks in about an hour, with only three who needed an extra 30 minutes.

5.4 Analysis

In the grammaticality judgment task, an item would only be marked correct if the participant accurately identified the target error in an ungrammatical target item. In the cloze test, misspelled answers were marked incorrect (e.g. *drunk* instead of *drank*). While simple past tense forms were the target forms, other verb forms that demonstrated pastness, such as past continuous forms (e.g. *were sitting*) and passive forms that involved the past form of *be* (e.g. *were closed*), were marked correct. Mixed-effects binomial logistic regression models were used to analyse the data: a mixed-effects method was used to take into account the effects of random item and subject effects, and a binomial logistic regression model was used because the response was binary for each item (i.e. past or non-past). LA was the fixed independent variable. The models predict whether a response will be a past or non-past item given the LA of the predicate.

6 Results

6.1 Grammaticality Judgment Task

Only the target items, which were ungrammatical, were analysed. There was no overcorrection to past forms in the grammatical target items. The accuracy rates are summarised in Table 2.

Data were fitted in the mixed-effects binomial logistic regression models using `glmer()` in the R package `lme4` (Bates et al., 2015), with participants and items as random effects, and LA as a fixed effect. The results showed that the fitted model

[1] Face-to-face testing was replaced because of the COVID-19 pandemic.

Table 2 Accuracy rates of identifying the error in the target items in the grammaticality judgment task

Lexical aspect	N	Mean accuracy (SD)
Stative	29	60.3% (43.1%)
Activity	29	50.0% (37.8%)
Accomplishment	29	77.6% (34.3%)
Achievement	29	77.6% (31.6%)

was significantly better than the null model which only has the random effects terms ($\chi^2(1) < 0.01$), indicating that LA was a factor determining whether the participants would use past morphology or not. With accomplishment as the baseline, the model revealed significant differences between accomplishment and activity, and accomplishment and stative, but no significant difference was found between accomplishment and achievement. Because both accomplishment and achievement are telic, the results might suggest a distinction between telic and atelic predicates.

A mixed-effects binomial logistic regression model with telicity as a fixed effect showed a main effect of telicity (estimate = 1.534, $z = 3.480$, $p < 0.001$). As there was no significant difference between this model and the one with LA as the fixed effect ($p = 0.901$), the telicity model, which is a simpler model with fewer levels (i.e. the one with telicity as the fixed effect), was adopted as the final model. Table 3 shows the details of the model.

Table 3 Mixed-effects binomial logistic regression model (grammaticality judgment task)

	Groups	*Name*	*Variance*	*SD*
Random effects	Participants	(Intercept)	1.524	1.235
	Item No	(Intercept)	0.220	0.469
	Estimate	*SE*	*Z value*	*p-value*
Fixed effects				
(Intercept)	0.090	0.373	0.242	0.809
Telicity: telic	1.534	0.442	3.480	0.0005***
Model statistics				*Value*
Number of observations				217
Number of participants				29
Number of items				15
Marginal R-squared				0.105
Conditional R-squared				0.415
AIC				254
BIC				267.5

*** $p < 0.001$

Table 4 Mean number of items in which a past form was supplied

Lexical aspect	N	Mean (SD)
Stative	29	2.690 (1.072)
Activity	29	2.862 (1.026)
Accomplishment	29	3.310 (0.967)
Achievement	29	3.483 (0.950)

6.2 Cloze Test

Only the target items were analysed in this task. Table 4 shows the mean number of items in which the participants supplied a past form. A mixed-effects binomial logistic regression model using `glmer()` in the R package `lme4` (Bates et al., 2015) with LA as the fixed effect and the participants and items as the random effects revealed no effect of LA. The model was not significantly different from the null model with only the random effects ($\chi^2(1) = 0.110$). However, another mixed-effects binomial logistic regression model with telicity as the fixed effect revealed a significant effect of telicity: the use of past marking was significantly more frequent with telic predicates than with atelic ones (estimate = 1.154, $z = 2.538$, $p < 0.05$). This model was significantly different from the null model with only the random effects ($p < 0.05$) (Table 5). The results suggest that it is telicity rather than LA that affects the supply of past forms.

Table 5 Mixed-effects binomial logistic regression model (cloze test)

	Groups	*Name*	*Variance*	*SD*
Random effects	Participants	(intercept)	1.241	1.14
	ItemNo	(Intercept)	0.539	0.734
	Estimate	*SE*	*Z value*	*p-value*
Fixed effects				
(Intercept)	1.049	0.373	2.811	0.005
Telicity: telic	1.154	0.455	2.538	0.011*
Model statistics				*Value*
Number of observations				464
Number of participants				29
Number of items				16
Marginal R-squared				0.062
Conditional R-squared				0.391
AIC				441.6
BIC				458.1

* $p < 0.05$

7 Discussion

This study investigated whether the accuracy of supplying past forms by NCLE of English is affected by the LA of the predicate. The results of the two tasks suggest that the LA does have an effect on the use of past tense forms in English by these learners. However, the effect is not a four-way, Vendlerian distinction, but a binary one, in which the participants did significantly better when the predicate was telic than when it was atelic, suggesting that it is telicity that affects their supply of past forms. The results are interesting because the participants were university students who were late-stage learners of English. The study suggests that the effect of telicity can persist even after years of instruction, inconsistent with the AH. The findings of this study are also inconsistent with Tickoo (2001), who claimed that LA has little influence on the use of past morphology by NCLE. The results echo those of Hong (2008), in which the participants were also better at supplying past forms with accomplishments and achievements, although there was no evidence suggesting a higher use of past morphology with stative than with activity predicates in this study. The absence of time adverbials in this study might have lowered the use of past morphology with stative verbs by the participants.

There are two possible explanations as to why the participants were sensitive to telicity. First, the L2 learners might be misguided by the frequency biases in the input. Wulff et al. (2009), using data in large corpora of English, showed that past tense is distinctively associated with a small number of telic verbs (i.e. show a Zipfian distribution) in naturally occurring English. Learners of English can be influenced by these biases, and associate past morphology with telic verbs. Even though the participants in this study were mostly instructed learners in a non-English-speaking country, they could have been exposed to these biases through teaching materials (e.g. English textbooks) and the media (e.g. social media, movies and songs), which constitute the major sources of English input to foreign language learners.

A second explanation is that it is perhaps cognitively easier to perceive telic events as completed events in the past than atelic events. When there is an inherent endpoint, learners know that something happened and ended in the past and it is no longer true in the present moment (i.e. at Speech Time). Atelic predicates, however, have no inherent endpoints. It is, therefore, not obvious to learners whether the event or state continues until the speech time. Therefore, it might be easier for learners to supply past forms to telic predicates and atelic ones.

Previous research has suggested that L1 influence plays a role. In the case of Cantonese, L1 influence and the predication of the AH might be confounded, in which 咗 *zo2* is strongly associated with telicity. It could be the case that native Cantonese speakers transfer their knowledge of 咗 *zo2* to past morphology in English. Because 咗 *zo2* is biased toward telic predicates, they follow this pattern and use English past morphology the same way. In other words, the effect of LA might be brought about through their L1. Regardless of whether the cause is L1 influence or a direct effect of the universal trend of tense–aspect development, what this study has shown is

a robust effect of telicity, and this is what language educators should tackle when teaching NCLE.

8 Pedagogical Implications

The findings of this study suggest that the difficulty of using past morphology does not necessarily lie in the supply of past morphology, as the participants were capable of supplying past morphology in general. Instead, the results point to a semantic effect of the predicate, suggesting that it might be more difficult for learners to conceptualise pastness for atelic events. Furthermore, this problem persists even for learners who have studied English for a considerable period of time. These participants had at least 12 years of English education and attained a university admission level, and yet their supply of past forms was still influenced by telicity. Therefore, a pedagogy that can facilitate learners' conceptualisation of atelic past events should be helpful in mitigating the effect of LA. This section discusses two pedagogical approaches, Processing Instruction and a Cognitive-Grammar-based pedagogy, which draw learners' attention to both meaning and form.

Processing Instruction (PI) was first proposed by VanPatten and Cadierno (1993), and was derived from the input processing model (VanPatten, 1996). The model predicts that learners tend to pay attention to and thus process meaningful units before those that have little meaning value and are redundant. PI therefore aims to draw learners' attention to the less attended forms and increase learners' intake by requiring them to process the target form with activities designed with structured input. According to Mégharbi (2007), there are three essential stages in PI. In the first stage, learners are given explicit grammar explanation about the target feature or construction. In the second stage, the teacher informs learners of processing strategies that may lead to erroneous interpretations. In the last stage, learners work on structured input activities, which require them to process the target linguistic feature in order to interpret the meaning of the sentence.

PI has been tested in teaching different grammatical items in different languages, such as the future tense in Italian (Benati, 2000), subjunctive in Spanish (Collentine, 1998; Farley, 2001), and directional and locational expressions in Russian (Comer & DeBenedette, 2011). These studies have shown that PI is more effective than more traditional methods, such as drilling, and some output-based methods.

For tense-aspect marking in English, Chan (2019) compared the relative effectiveness of PI, traditional instruction (TI), and implicit instruction (II) for teaching the English past tense to L1 Cantonese primary-school-aged children. In her study, the participants in the PI condition were engaged in structured input activities, and were instructed not to rely on temporal adverbials, but pay attention to verb endings during these activities. The TI participants were given grammar explanation and completed form-focused activities. The II participants were given passages to read, and answered comprehension questions about the passages. Using interpretation and production tasks, Chan showed that the PI participants outperformed the participants

in the other two instruction conditions in the interpretation task. The PI participants also did significantly better than the II participants in the production task, and they were on a par with the TI participants. Her results showed that drawing learners' attention to the inflected verb forms and their meanings helps learners connect the two.

It would be interesting to test whether processing instruction is equally effective with verbs of different aspectual types, and whether it can mitigate the effect of atelicity. This study has shown a strong tendency for NCLE to associate past marking with telic predicates (i.e. accomplishments and achievements), but the association with atelic predicates is much weaker. To the best of the author's knowledge, no studies have systematically addressed the question of whether PI is equally effective with predicates of different aspectual types. Future research may be necessary to investigate whether the effect of lexical aspect can be weakened when processing instruction has been found to be effective in mapping form and meaning in L2 acquisition of the English simple past.

The second approach is a Cognitive-Grammar-based approach. Cognitive Linguistics emerged in the 1970s, and has received much attention since then. This approach to language emphasises that "meaning resides in how we conceptualize the world" (Langacker, 2008b, p. 16), and "grammar is conceptualization" (Croft & Cruse, 2004, p. 1). Cognitive Grammar (Langacker, 2008a), as one of the cognitive approaches, views language as an inventory of linguistic units that can be described in terms of phonological, semantic, and symbolic units, and places a strong emphasis on the semantic descriptions of these units. Langacker (2008) argued that "explicit description of abstract entities like thoughts and concepts" are necessary in linguistic semantics (p. 30). These semantic descriptions (or conceptual characterisations) can make grammar explanations, which otherwise can be rather abstract, more transparent to learners. As the results of the current study showed that the participants had difficulty associating past morphology with atelic events, which might suggest that they were unable to conceptualise a past event that does not inherently end, a pedagogical approach based on Cognitive Grammar could be useful in making learners understand events of different aspectual types and their association with past morphology by helping them conceptualise past atelic events using schematic diagrams.

One of the major differences between Cognitive Grammar and traditional grammar descriptions is the use of schematic diagrams to represent meaning. For example, Langacker (2008a) illustrated the meaning of the verb *enter* using the image schema as shown in Fig. 1. The meaning of the verb comprises an entity (represented by the "object" image schema), a path along which the entity moves (represented by the "source-path-goal" image schema), and a container that serves as the goal of the path (represented by the "container-content" image schema). The schemas help learners understand the essential features of the meaning of the verb.

Traditional instruction of tense often involves explicit instruction on the form (e.g. regular vs. irregular) and meaning (e.g. when past tense forms are used) of past tense. However, previous research has shown that Hong Kong English teachers often lack metalinguistic knowledge to offer grammar explanation (Andrews, 1999, 2001).

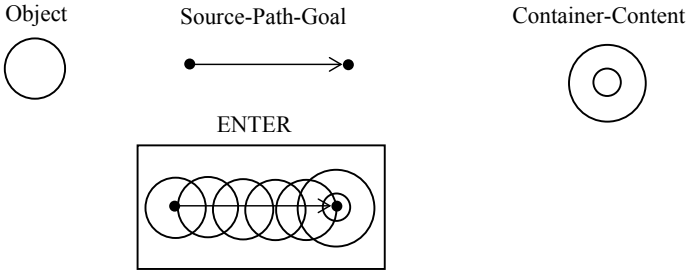

Fig. 1 Image schema of the verb *enter.* 2008a Adapted from Langacker (p. 33)

Even if grammar explanations that involve metalinguistic knowledge are offered, students who have little knowledge of linguistic concepts such as perfective and imperfective are unlikely to understand these explanations. The use of diagrams is therefore beneficial, as it visually demonstrates similarities between different uses of a grammatical feature in different situations. In the case of past morphology and LA, this would mean visually demonstrating the interpretation of past morphology in events of different aspectual types.

Instructions designed on Cognitive Grammar have shown some success in teaching tense–aspect marking to L2 English learners. Bielak and Pawlak (2013) tested whether Cognitive-Grammar-inspired instruction is more effective than traditional instruction for teaching the English present tense to native Polish speakers. The group of learners who received Cognitive-Grammar-inspired instruction (CG group) were given schematic pictorial representations of tense, which was made up of a timeline and an event (or a state), whereas the group of learners who received traditional instruction were given grammar rules. Figure 2 is a simplified adaptation of one of the pictures used in the study. The arrow represents a timeline, the shaded bar is the state of *trusting*, and the rectangle with bold lines represents a keyhole through which the speaker peeps into the past. The participants completed a pre-test, an immediate post-test, and a delayed post-test administered 3 weeks after the immediate post-test, all of which were written tests. Their results showed that although both the CG group and the traditional group improved in the first post-test and there was no significant difference between them, the CG group performed significantly better in the delayed post-test than in the immediate post-test, and was significantly better than the traditional group in the delayed post-test, suggesting that Cognitive-Grammar-inspired instruction enhances retention of the knowledge of tense better than traditional grammar explanation. Kermer (2016) also reported positive results

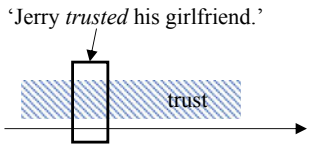

Fig. 2 An example of a schematic pictorial representation. Adapted from Bielak and Pawlak (2013, p. 159)

with the use of Cognitive-Grammar-informed instruction to teach the present perfect and the past tense to native German speakers.

Based on the findings of these studies, a pedagogy designed on Cognitive Grammar is potentially promising for NCLE who have difficulty associating past morphology with atelic events. As tense and aspect are abstract concepts, grammar explanation using metalanguage (e.g. different LA types) might not be the best way to teach. The use of pictorial representations will allow teachers to avoid using metalanguage, which can further confuse learners. Teachers can use these pictorial representations, such as the one in Fig. 2, to demonstrate the differences among different LA types.

9 Conclusion

This chapter discusses how the semantics of the verb/predicate affects the use of past morphology by NCLE. The results showed that these learners were more likely to supply past morphology to telic events than to atelic ones. These findings indicate the necessity to draw learners' attention to the differences among different aspectual types and the meaning of past morphology with atelic events.

In relation to the results, two pedagogical approaches, processing instruction and a Cognitive-Grammar-based pedagogy, were discussed. These two approaches have the common assumption that language consists of a collection of mappings between linguistic forms and meaning. They are, however, different in their teaching focus: processing instruction aims at requiring learners to process linguistic forms through engaging them in activities with structured input, whereas the Cognitive-Grammar-based approach focuses on helping learners conceptualise meaning. Both approaches have shown to be more effective than traditional approaches in teaching some of the grammatical features. How effective each of these approaches can be in mitigating the effects of LA and whether combining the two approaches will produce better learning outcomes would constitute interesting questions for future research.

This study has a few limitations. First, the participants of this study came from one tertiary institution in Hong Kong only, most of whom were intermediate learners. The effect of LA might be different with low-proficiency-level or very advanced learners. Second, the study did not examine the influence of L1. NCLE might experience a longer stagnation in development than English learners with a tense-marking L1 because of the strong association of the perfective marker 咗 *zo2* with telic predicates, which may reinforce their "beliefs" that past morphology should be used with telic predicates. To test this, future studies could compare the use of English past morphology by learners with similar language exposure or proficiency levels but with different L1s, and test whether it will take longer for NCLE to overcome the biased association.

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Appendix 1

Descriptors of English learners achieving Level 3 at HKDSE (Hong Kong Examinations and Assessment Authority, 2014)

Candidates at this level typically

• understand literal spoken English when delivered at moderate speed in familiar accents in familiar situations, and are able to identify views expressed in straightforward texts and the speakers' attitudes and intentions when they are explicitly expressed
• understand simple texts, especially if the topic is familiar, and are able to follow the development of an explicit argument and identify explicit opinions presented within them, make straightforward inferences and work out the meaning of unfamiliar words when a familiar context is given, and respond in part to simple written instructions requiring relevant information from the texts to be used to complete a task
• write in a relevant, organized and creative way when the context is familiar, using some more complex sentence structures and common vocabulary accurately, and adopting the main elements of a style suitable to the purpose
• use a range of simple common expressions with fluency, pronouncing familiar words accurately, and responding to others in a sustained manner

Appendix 2

Ungrammatical target items in the grammatical judgment task

Stative
Sally participated in a debating competition. She was so nervous that she stuttered on the stage. She looks embarrassed in front of the adjudicators.
John and I went wine tasting. He could tell the subtle differences between wine varieties. Rioja, the red wine he tried at the tasting session, tastes a bit sour.
Sam's grandfather die. He used to take care of Sam when Sam was a baby. He loves Sam very much.
I passed by a musical band on the street. The performers lifted the atmosphere very well. Their performance involves interactions with the audience.
Activity
I saw a man singing loudly on the street. A woman told him to shut up but he didn't. Then they fight.
The Lee family had a day off. Each family member agreed to do some housework. They all clean their own rooms.
The science teacher listed the steps of dissecting a frog clearly. We watched him quietly. Although we found it disgusting, we learn the steps by heart.
Jenny's father was terminally ill. Unfortunately, she couldn't afford such a hefty surgery cost. She works several part-time jobs to earn as much money as possible.

(continued)

(continued)

Accomplishment
I invited Alice to perform at my wedding party. She put on a magic show. Then, she sings three songs for the guests.
The Sunshine Sportswear Limited held an interview. The management asked the candidates a few questions. The candidates then present an advertising campaign for the company's new polo shirt.
On Minnie's birthday, her boyfriend, Eddie brought her to Disneyland. There they joined a cookery workshop. Eddie eventually bakes a chocolate cake.
I enrolled in a marathon. Katy followed suit even though she wasn't good at running. Surprisingly, she runs ten kilometers in the marathon.
Achievements
Mum panicked because my brother got lost in Ocean Park. Mum requested help from the information center. Thanks to the broadcast, one staff member finds him based on Mum's descriptions.
Uncle George invited Aunt Daisy to be his dance partner. She hesitated because she didn't dance well. Upon multiple invitations, Aunt Daisy finally accepts it.
Jimmy, a committee member, supervised the funfair. Miss Chan inquired about the funfair. To every question the teacher posed, Jimmy responds "I don't know."
I had my breakfast on a bus to the city center. The driver blamed me for not abiding by the rules. He refuses to give me a ride.

Appendix 3

Target items in the cloze test

Stative
A tsunami struck the city's coastal areas. The waves damaged lots of public infrastructure. In retrospect, the high efficiency of the reconstruction work _____ (deserve) recognition.
It was the first time I had a family dinner with my step sister. She remained silent throughout the dinner. She _____ (seem) to be dissatisfied with me.
Our English teacher warned us not to take the coming exam too lightly. I studied all the notes in great detail. Preparation for the exam _____ (deprive) me of sleep and I fell asleep at the exam.
A car accident involving a taxi and a minibus occurred on Ocean Road. The reporters took some pictures at the scene and wrote an article. The article falsely _____ (imply) that the taxi driver was responsible for the accident.
Activity
The bad weather delayed flight BA345. The airline's crew made an announcement. A number of passengers _____(sit) at the check-in lobby.
Mum and I went on a one-day tour to Sai Kung. We tried a variety of seafood for lunch. After dinner, we _____ (stroll) along the beach to enjoy the night view.
My brother, a stuntman, hurt his leg badly on the set. Mum was so worried that she prayed to God day and night. She _____ (kneel) in front of the altar without eating or drinking.

(continued)

(continued)

David used to be overweight. To lose weight, he tried eating less junk food. He also _____ (exercise) more often.
Accomplishment
Ben was a raging alcoholic. He failed to battle his addiction. At his 25th birthday party, he even _____(drink) two liters of red wine.
In a bakery class, Mr Tong introduced the recipe for Black Forest cakes. He first mixed some eggs into the flour, baking powder, milk and oil. Then, he _____ (melt) some chocolate bars to make the sauce.
The class wanted to win the blackboard design competition at the school's Christmas party. Every class member helped with the decoration work. They _____ (erase) the blackboard after the event.
The staff meeting ended later than the scheduled time. My friend at the cinema phoned me to see where I was. I then _____ (rush) to the cinema to meet her.
Achievements
A child got lost in the forest. The parents called the police. Later, the police _____ (discover) the child's body hidden in thick undergrowth.
I encountered unfair treatment from the management. No colleagues offered me emotional support. Therefore, I _____ (resign) from the company.
While crossing the street, Max dropped his wallet on the zebra crossings. He bent down to pick it up. Not noticing Max, a bus driver _____ (knock) him over.
The global economic situation negatively affected the willingness of spending. Some policies were formulated to stimulate demands for retail goods and services. Nonetheless, thousands of small businesses _____ (close) down due to the poor economy.

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Processing Instruction: Research, Theory and Practical Implications of the Learning and Teaching of English Grammar to Chinese L1 Speakers

Alessandro G. Benati

Abstract In this chapter, the input processing theory is presented and discussed. The two main principles of the theory are examined, and the characteristics of the processing instruction pedagogical intervention will be presented. The main findings of two empirical studies carried out to measure the relative effects (at sentence and discourse level) of processing instruction on the acquisition by Chinese L1 learners of two grammatical features in English (past tense regular forms and English causative forms) are discussed. The two grammatical features were chosen because they are both affected by a combination of processing principles. The results of both studies clearly indicate that processing instruction/structured input affects the way L2 learners process and interpret information by facilitating form-meaning connection and accurate parsing. The pedagogical implications from the empirical work presented in this chapter showed that grammar tasks should be designed for learners to accurately process forms in the input. The findings of the two parallel studies reaffirm the view that input practice should precede output practice. Structured input practice offers the possibility to develop activities that are effective and change processing behaviours facilitating acquisition.

Keywords Processing instruction · Input processing · Structured input · Structured output · Discourse-level tasks

1 The Input Processing Theory and Its Principles

The Input Processing theory (VanPatten, 1996, 2004) is captured as a set of processing strategies that L2 learners use when processing input. This theoretical framework specifically investigates the following:

- The conditions under which L2 learners make form-meaning mappings. Form-meaning connections are the relationship learners make between referential meaning and the way it is encoded linguistically. For example, when learners

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hear the sentence *I talked to my teacher* and understand that *talked* means the action is in the past, a form-meaning connection is made;
- The grammatical roles L2 learners assign to nouns based on their position in an utterance. In the sentence *The police officer was killed by the robber*, learners, in the attempt to make moment-by-moment computation of sentence structure during comprehension, parse the first element they encounter in the sentence as the subject of the sentence. Learners interpret the sentence as if it were the police officer who killed the robber. This causes a delay in interpreting the meaning of the sentence and therefore a subsequent delay in acquisition.

VanPatten (1996, 2004) argued that input processing consists of two sub-processes: making form-meaning connections and parsing. He identified two main processing strategies used by L2 learners to decode input. The two main strategies used by learners when they process input are:

- The Primacy of Meaning Principle: Learners process input for meaning before they process it for form.
- The First Noun Principle (P2): Learners tend to process the first noun or pronoun they encounter in a sentence as the subject/agent.

In the first principle, VanPatten (2004, p. 7) affirmed that during input processing, L2 learners initially direct their attention towards the detection of content words to understand the main meaning of an utterance. Learners tend to focus their attention on content words in order to understand the message of the input they are exposed to. In doing so, they do not process the grammatical form, and consequently fail to make form-meaning connections. The Primacy of Meaning Principle is further subdivided into six sub-principles in order to examine the interplay between various linguistic and cognitive processes during language comprehension.

Lexical preference, redundancy and meaningfulness, resources and location are key elements of VanPatten's sub-principles (e.g. Lexical Preference Principle and Sentence Location Principle).

In the First Noun Principle, VanPatten stated that L2 learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent (VanPatten, 2004, p. 15). This processing strategy could lead L2 learners to misinterpret the meaning of an utterance and cause delay in acquisition. VanPatten's First Noun Principle (2004) has three main associated sub-principles. These sub-principles attempt to identify other factors, which might influence the way L2 learners parse sentences correctly and attenuate their use of the First Noun Principle. Learners do not automatically use the First Noun Principle to assign grammatical and semantic roles. They are sensitive to several factors that attenuate their use of this processing strategy, including lexical semantics, event probabilities and contextual constraints.

VanPatten also pointed out that none of these principles operates in isolation. He argued that sometimes they may act together or one may take precedence over another, and sometimes several "may collude" to delay acquisition.

2 Processing Instruction

Processing instruction is predicated on VanPatten's model of input processing (1996). It is a pedagogical intervention to grammar instruction that uses a particular type of input to push learners away from non-optimal processing strategies so that they are more likely to make correct form-meaning connections or parse sentences (compute basic structure in real time) appropriately during comprehension.

The main goal of processing instruction is to ensure that L2 learners derive "good" intake from input by engaging learners in structured input (practice component). During structured input, practice learners' focal attention is directed towards the relevant grammatical items and not elsewhere in the sentence. The main objective of this practice is to help learners to circumvent the default processing strategies they use when exposed to input language.

The characteristics of processing instruction has been described in detail in previous work (Farley, 2005; Lee & Benati, 2009, 2013; Lee & Van Patten, 2003; Wong, 2004). There are two main components of processing instruction: Component 1: Learners are given information of a processing principle that might negatively affect their processing of a particular form or structure during comprehension. Learners are warned that they might not process a particular feature due to processing constraints (e.g. redundancy, communicative value, location, and word order); Component 2: Learners are pushed to process the target form or structure during structured input activities in which the input is manipulated in particular ways to push learners to become dependent on form to get meaning. After receiving the explicit information about the processing principle affecting that feature, learners are pushed to process the form or structure through structured input activities. In structured input activities the input is manipulated in particular ways to push learners to become dependent on form and structure to get meaning.

Lee and VanPatten (1995, p. 104) produced the following guidelines for structured input activities:

1. Present one thing at a time.
2. Keep meaning in focus.
3. Move from sentences to connected discourse.
4. Use both oral and written input.
5. Have the learner "do something" with the input.
6. Keep the learner's processing strategies in mind.

3 Processing Instruction Research

There is a large research database on Processing Instruction research (Lee, 2015; Lee & Benati, 2009). Research on the relative effects of Processing Instruction has addressed, among other issues, the following questions:

- How does it compare to other types of instructional intervention?

- Can its effects be measured on different processing problems, different languages and among different populations?
- Can secondary effects for PI be measured?
- Does it have long-term effects?
- How can processing instruction be measured?

The last question is relevant to the two empirical studies presented in this chapter.

3.1 How Can Processing Instruction Be Measured?

The positive effects of processing instruction have been found for a variety of romance (e.g. Spanish, French, and Italian) and non-romance languages (e.g. German, English, Arabic, Russian, and Japanese) on a variety of morphological, syntactic and semantic linguistic items and among learners from a different first language (e.g. English, Italian, Korean, Greek, and Japanese). Previous research has affirmed the superiority of processing instruction over other types of output-based instruction (Benati, 2017; Benati & Lee, 2015).

Sentence-level tasks

A number of conclusions can be drawn regarding the type and mode of assessment task in the processing instruction studies conducted so far:

(a) All processing instruction studies have provided evidence that learners who receive this type of instruction perform significantly better on interpretation sentence-level tasks than learners receiving other types of instruction (e.g. traditional instruction and output-based instruction);
(b) All processing instruction studies have provided evidence that processing instruction can cause equal improvement compared to output-based approaches in learners' performance in different sentence-level production tasks (e.g. oral and written modes).

In the last few years two questions have been raised:

(1) Can we further measure the effects of processing instruction on discourse-level production tasks?
(2) Can we measure the effects of processing instruction on discourse-level interpretation tasks?

Discourse-level production tasks

VanPatten and Sanz (1995) set out to investigate whether the effects of processing instruction observed in the sentence-level tasks (i.e. interpretation and production) in two previous studies (Cadierno, 1995; VanPatten & Cadierno, 1993) could be obtained in discourse-level production tasks. The participant pool consisted of four classes of forty-four students of Spanish in their third year of a university programme.

The participants were assigned to two processing instruction groups and two control groups. The focus of instruction was the same as in VanPatten and Cadierno's study (1993): preverbal object pronouns in Spanish. The effects of instruction were measured on three different tasks:

1. the same sentence-level tasks used by Van Patten and Cadierno (1993);
2. a structured question-answer interview;
3. a video narration task.

The data collection procedure was very similar to the other empirical research reviewed in previous studies and consisted of two days of instruction. The findings of VanPatten and Sanz's study showed that processing instruction is still effective even when measured on a less controlled and discourse type of task. Although the results of this study seem to emphasise that altering the processing strategies used by L2 learners when they are processing input leads to a change in knowledge which is available for use in different types and modes of production task, the effects of processing instruction were more significant in more controlled oral tasks (e.g. completion task) rather than less controlled ones (e.g. video narration task). This study provides further evidence on the positive effects of processing instruction in syntax (e.g. object pronouns and word order) and the fact that the effects are observable in more communicative and discourse-oriented types of task rather than only sentence-level tasks.

A second study on production discourse-level tasks is the one carried out by Cheng (2004). Cheng measured the effects of processing instruction on a different kind of linguistic item of the Spanish linguistic system: namely *ser* and *estar*. Her study was conducted to find evidence on the effects of processing instruction on the acquisition of two copular verbs in Spanish (*ser* and *estar*). Processing instruction was related to two of Van Patten's sub-principles of the Primacy of Meaning Principle (1996, p. 14):

(a) Learners process content words in the input before anything else;
(b) Learners prefer processing "more meaningful' morphology before "less" or "non-meaningful morphology".

The second principle was particularly relevant to this study as copular verbs in Spanish are of low communicative value for L2 learners and redundant features of Spanish. The two main research questions addressed by this study were:

1. Do processing instruction and traditional instruction have the same effects on the acquisition of *ser* and *estar*?
2. Are the effects short or long-lasting?

Eighty-eight participants studying Spanish in their third year of a University college level course were involved in this study. Cheng used a very similar research design to that of VanPatten and Cadierno (1993) comparing three groups in a pre-post-test format including three types of task:

1. interpretation

2. sentence completion
3. guided composition

The results of this further study on the effects of processing instruction showed that students receiving processing instruction outperformed those receiving no instruction and traditional instruction. Once more the effects of processing instruction are observable on output tasks at both sentence and discourse levels, whereas the effects of the traditional type of instruction are not observable on interpretation tasks.

Sanz (2004) investigated the effectiveness of processing instruction when implemented with the use of CALL. One of the purposes of this study was to address the role of explicit and implicit feedback in CALL. Twenty-six students enrolled in a Spanish language programme at intermediate level participated in this study. They were assigned to two groups receiving processing instruction via CALL with + and − feedback (the groups received no explicit information). An interpretation task and production tasks at sentence level were used. A production discourse-level task (video retelling) was also used.

The results of this study showed that both groups increased in their ability to comprehend and produce correct Spanish object pronouns. Structured input practice was responsible for the improvements of both groups in all the tasks no matter whether the feedback received was implicit or explicit.

VanPatten and Sanz (1995), Cheng (2004) and Sanz (2004) demonstrated that processing instruction is effective not only at sentence level but also at discourse level (production tasks).

Discourse-level interpretation tasks

Lee (2004) argued that processing instruction has been investigated in various linguistic features affected by one or a combination of processing problems and in different languages. These effects have been measured on interpretation and production sentence-level tasks and production discourse-level tasks. As he suggested (Lee, 2004, p. 319), "because processing instruction affects discourse-level production, I can hypothesise that it will also affect discourse-level interpretation".

Benati et al. (2010) measured the effects of processing instruction on discourse-level interpretation tasks. They measured the relative effects of processing instruction in the acquisition of Japanese passive forms (affected by the First Noun Principle). The participants were native English speakers learning Japanese. The participants pool consisted of twenty-seven learners. A pre-test and post-test procedure was used. The processing instruction packets contained explicit information and structured input practice (referential and affective). The explicit information component provided learners with linguistics information about the target feature and the processing problems learners might encounter when processing this form. The assessment tasks consisted of sentence- and discourse-level interpretation tests and sentence and discourse-level production tests. The sentence-level tasks were very similar to the ones used in previous studies reviewed in this book. The discourse-level interpretation task consisted of a dialogue and seven questions. In the dialogue, two people talked about a TV programme. The participants listened to the dialogue and had to

determine who did what to whom, and then tick the correct answer. If they were not sure they had to choose "I'm not sure". There was no repetition of the dialogue so that the test would measure whether or not the participants comprehend the target form and meaning in natural conversations. The discourse-level production test consisted of creating a story with a sequence of six story pictures. In the discourse-level production test, the participants looked at the sequence of six pictures and had to write a story. The results of this study clearly indicated that the processing instruction group made measurable gains not only in the interpretation sentence-level task but also in the interpretation discourse-level task.

Benati and Lee (2010) examined the acquisition of English, and targeted as its linguistic feature the simple past tense, which is formed by adding the morpheme *–d* to the end of verbs. This linguistic item is affected by the Lexical Preference Principle as learners tend to process lexical items before grammatical items when both encode the same semantic information (VanPatten, 2004). They compared the effects of processing instruction to those of traditional instruction (a control group was used). Three groups of participants, numbering twenty-nine in the final data pool, participated in this study. They were all native speakers of Chinese who were learning English in a Chinese primary school. Both the sentence-level and discourse-level interpretation tasks were included in the final data pool. Pre-tests were administered a few weeks prior to the beginning of the treatment. Two tests were developed for this study: one sentence-level interpretation test and one discourse-level interpretation test. The instructional treatment lasted approximately six hours for the two groups. During the treatment period, feedback on performance was limited to telling the participants whether an answer was right or wrong. The discourse-level interpretation test required the learners to interpret past tense markers for verbs that were embedded in discourse. It consisted of a dialogue, which was spoken at a normal conversational speed by native speakers of English. The dialogue was recorded and played to the learners. No repetition was provided so the test would measure real-time comprehension. The dialogue contained many verbs but 20 were selected for the test. Ten of these were target forms in the past tense. The other ten were in the present tense. Neither set of verbs co-occurred with a temporal adverb or any other reference to time. The learners were asked to decide whether the verb listed referred to present or past events. They were given 1 point for each correct assignment of the ten target forms (past tense markers). The distracters (present markers) were not scored. As in the case of the sentence-level interpretation test, the pre-test and post-test were balanced in terms of difficulty and vocabulary.

The results of the statistical analysis clearly indicated that the processing group improved from pre-test to post-test as measured by the sentence-level interpretation test. The performance of this group was statistically significant and superior to the performance of the traditional and control groups. The processing instruction treatment also made significant improvement from pre-test to post-test as measured by the discourse-level interpretation task. The performance of the processing instruction group was statistically significant and superior to the performance of the traditional and control groups.

Benati and Batziou (2017, 2019) explored the effects of structured input and structured output when delivered in isolation or in combination on the acquisition of the English causative when measured by sentence- and discourse-level tasks. In the first study, fifty-four Chinese university students participated. The participants were randomly assigned to four groups: structured input only group, structured output only group, combined structured input and structured output group, and control group. Interpretation and production tasks were used in a pre-test and post-test design. The design included a delayed post-test battery (3 weeks after instruction). The assessment tasks included an interpretation and production task at sentence level, and an interpretation task at discourse level. The results indicated that the learners who received structured input both in isolation and in combination benefitted more than the learners receiving structured output only. These two groups were able to retain instructional gains three weeks later in all assessment measures.

Despite the positive effects of processing instruction, more research is needed to investigate its effects with other learners of other language backgrounds (e.g. Chinese) acquiring English. In particular, the effects of processing instruction need to be further explored utilising discourse-level tasks.

4 Two Empirical Studies

To measure the relative effects (at sentence and discourse levels) of processing instruction on the acquisition by Chinese L1 learners of two grammatical features in English (past tense regular forms and English causative forms), two parallel studies were carried out. The two linguistic features were chosen because they are both affected by a combination of processing principles.

Study 1

The first study reported in this section was conducted to address the following two questions:

Q1. Would learners receiving processing instruction and traditional instruction improve their ability to interpret English past tense forms presented in sentences?

Q2. Would learners receiving processing instruction and traditional instruction improve their ability to interpret English past tense forms embedded in discourse presented as a dialogue?

Participants

Three groups of participants, numbering forty-nine in the final data pool, participated in this study. They were all native speakers of Chinese who were learning English in a Chinese primary school. To select the population the following set of criteria was used in this study:

(a) all participants have to be native speakers of Chinese;
(b) they all have to be beginning-level learners of English, and;

(c) they have not been taught or exposed to the target linguistic feature (English simple past tense marker *–d*) inside or outside the classroom before.

The initial participant pool of sixty-eight was reduced to forty-nine as only those who scored less than 50% of the maximum score in the pre-tests of both the sentence-level and discourse-level interpretation tasks were included in the final data pool. The pre-test was administered a few weeks prior to the beginning of the treatment. Then, the participants were randomly assigned to one of the following three groups: PI ($n = 20$), TI ($n = 17$), and a control group ($n = 12$). Randomisation should lessen or eliminate any confounding influence of extraneous variables and help promote group comparability across instructional treatment.

Procedures

The study adopted a pre-test/post-test procedure. The first group of participants was taught the English simple past tense marker *–d* using a processing instruction treatment. The goal of processing instruction is to help learners alter their reliance on lexical items (Lexical Preference Principle) so that they process the target verb morpheme accurately and efficiently. The second group was taught the English simple past tense marker *–d* using a traditional instruction treatment. Here, the learners received a paradigmatic explanation of the target feature which was followed by practice in producing the target feature in mechanical and meaningful output activities. The control group did not receive instruction on the target form during the treatment period.

The learners who participated in the study were native speakers of Chinese whose study of English was only in its initial stage. The same instructor delivered both instructional treatments and also acted as facilitator during the treatment phases. To examine the short-term effects of instruction we used a pre-test and an immediate post-test.

Two tests were developed for this study: one sentence-level interpretation test and one discourse-level interpretation test. Pre-testing and post-testing combined lasted approximately 30 minutes. The instructional treatment lasted approximately six hours for the two groups. During the treatment period, feedback on performance was limited to telling the participants whether an answer was right or wrong. No further explanation was offered and the students seemed satisfied with the limited feedback. Limiting the feedback was consistent across the two groups. An immediate post-test was then carried out at the end of the second day of instruction.

One-way analyses of variance (ANOVAs) were conducted on the raw scores for all the pre-tests to assess whether there were any statistically significant differences among the three groups before the beginning of the experimental period. Repeated-measures ANOVAs were used on pre-test/post-test measures to assess whether there were any relevant effects for Treatment (instructional group) and Time (pre-test score vs. post-test score).

Target feature

The English simple past tense marker *–d* was selected for the instructional treatment for two reasons. Firstly, it is affected by the Lexical Preference Principle, which has been investigated in many other PI studies. There is a large database showing that PI is effective in altering learners' attention from a lexical item to a grammatical form and therefore improving learners' performance in interpretation and production tasks. In the following sentence "Yesterday I played tennis with John", both the lexical adverbial/adverbial phrases and the verb morphology convey pastness. According to the Lexical Preference Principle, for an L2 learner, lexical indicators would take precedence over grammatical forms. In addition to that, the past tense marker is a redundant form, made redundant by the adverbial phrase (Yesterday).

Secondly, the English past tense marker was chosen for the specific problems which it seemed to pose to learners in the present study. In the case of the Chinese language, verbs have no tense forms to indicate that something is occurring, has already occurred, or will occur: different devices are used (i.e. time adverbs or particles such as le). Clearly, there is a high possibility that native Chinese speakers who are learning English would find it difficult to encode pastness as they may borrow the concept of past tense in their L1 as the starting point. VanPatten (2004, p. 332) claimed that "we would predict that learners with L1 language like English that marks tense will connect past tense markers (forms) to meaning (pastness) before learners with L1 languages that do not mark tense grammatically (e.g. Chinese)". The main purpose of processing instruction in this study, then, was to push learners to process the past tense marker which otherwise may not be processed as learners do not need to process it to assign pastness to the meaning of the sentence.

Materials

Two separate sets of instructional materials were used. The processing group (PI) received materials that were input-based and processing-oriented. The traditional instruction group (TI) received materials that were output-based and production-oriented. The control group received no instruction on the target feature but was subject to a comparable amount of exposure to the target language during their class time. The two sets of materials were balanced in terms of the number of activities and the size of vocabulary. The activities were constructed using highly frequent lexical items because of the age and beginning-level proficiency of the participants. The TI group received explicit information on the past tense in English. This was a paradigmatic explanation of the target feature. The activities they carried out consisted of a mixture of mechanical and meaningful output practices. These participants produced the target form in each item of each practice activity. The explicit information in the processing group focused on providing the participants with information about the target feature and also about the specific processing problem addressed in this investigation. The practical component of PI consisted of structured input activities, both referential and affective. These activities were constructed following PI guidelines (Farley, 2005; Lee & VanPatten, 2003; Wong, 2004).

The PI materials used in the present study contained six referential activities and four affective ones. It is termed "referential" because there is one correct answer. In this activity the learners must indicate the time frame encoded in each verb form they heard. The answer is right or wrong based on the form of the verb in the sentence. The practice component of TI consisted of output-focused practices, both mechanical and meaningful. The paradigmatic explanation of the target form was followed immediately by activities that required the learners to produce the target form in their output.

Assessment instruments and scoring

To assess the effects of the two instructional treatments, PI and TI, a pre-test and immediate post-test design was used. In order to address the question raised in the present study, the tests consisted of two interpretation tests: sentence-level and discourse -level. Two versions of each test were created. One version was used as the pre-test and the other as the post-test. The interpretation test consisted of 20 items for which the learners indicated temporal reference or were offered the option of not knowing (cannot tell). Ten of the items were distracters in which they used a present tense form for which the correct answer would be "right now". These items were not scored. The ten target items on which the learners were scored contained the targeted linguistic item, past tense *–d*. In the interpretation task, the learners were required to listen to sentences in which there were no temporal adverbs so that the learners could not rely on them to assign tenses. Instead the learners would have to rely on verbal morphology to indicate when the action took place (present or past temporal reference). To the extent possible, the interpretation tasks were designed to tap real-time comprehension. To that end, only a short gap of five seconds between questions for the learners to mark their answers was allowed. For this interpretation measure, raw scores were calculated so that a correct answer would receive 1 point and any incorrect answer would receive 0 point. The maximum score possible would, therefore, be 10 points for the sentence-level interpretation test (either pre-test or post-test).

The discourse-level interpretation test required the learners to interpret past tense markers for verbs that were embedded in discourse. It consisted of a dialogue, which was spoken at a normal conversational speed by native speakers of English. The dialogue was recorded and played to the learners. No repetition was provided so the test would measure real-time comprehension. The dialogue contained many verbs but 20 were selected for the test. Ten of these were target forms in the past tense. The other ten were in the present tense. Neither set of verbs co-occurred with a temporal adverb or any other reference to time. The learners were asked to decide whether the verb listed referred to present or past events. They were given 1 point for each correct assignment of the ten target forms (past tense markers). The distracters (present markers) were not scored. As in the case of the sentence-level interpretation test, the pre-test and post-test were balanced in terms of difficulty and vocabulary. The learners ticked the answer sheet after listening to the whole dialogue.

Results—Sentence-level interpretation data

The pre-tests were administered to the students a few weeks before the beginning of the instructional treatment period. It is important to establish that there were no pre-existing differences between the PI, the TI and the control groups so that we could attribute any post treatment differences to the effects of instruction. The one-way ANOVA conducted in the interpretation pre-test for the simple past tense revealed no significant differences between the groups' mean scores before the treatment period ($F(2, 49) = 0.643$, $p = 0.534$). The means indicate an improvement for the PI group but not for either the traditional instruction group or the control group.

These scores were submitted to a repeated-measures ANOVA for which Instruction (PI, TI and the control group) was the between-subjects factor and Time (pre-test vs. post-test scores) was the within-subjects factor (the repeated measure). The statistical analysis yielded a significant main effect for Instruction ($F(2, 49) = 115.252$, $p = 0.000$), for Time ($F(2, 49) = 88.013$, $p = 0.000$), and a significant interaction between Instruction and Time ($F(1, 49) = 42.418$, $p = 0.000$). A post hoc analysis showed that the PI group performed significantly better in the post-test than the traditional instruction group ($p = 0.000$) and the control group ($p = 0.000$). There was, however, no significant difference between the scores of the traditional instruction group and the control group ($p = 0.625$).

Results—Discourse-level interpretation data

We used a one-way ANOVA on the pre-test scores of the three groups to ensure that there were no pre-existing differences between the groups. The results showed no significant differences between the three groups' mean scores before instruction ($F(2,49) = 3.073$, $p = 0.063$). The groups possessed equivalent knowledge of the English marker *–d* before receiving instruction on the English past tense marker. Any differences found among the post-test scores would be attributed to the effects of instruction. Repeated-measures ANOVA was used to compare the effects of Instruction and Time and the interaction between Instruction and Time. As in the case of the sentence-level interpretation test, the statistical analysis revealed a significant main effect for Instruction ($F(2,49) = 107.734$, $p = 0.000$), a significant main effect for Time ($F(2,49) = 97.290$, $p = 0.000$), and a significant interaction between Time and Instruction ($F(2,49) = 55.751$, $p = 0.000$). The post hoc test carried out on the post-test scores of the three groups revealed that the PI group's performance was statistically higher than that of the traditional instruction group ($p = 0.001$) and the control group ($p = 0.001$). No significant difference was found between the scores of the traditional and control groups ($p = 0.063$).

Discussion and Conclusion

The results provide positive answers for the two questions formulated at the beginning of this study and support the two hypotheses. The first two question of this study were formulated to investigate the effects of PI and TI on the interpretation of sentences containing the target feature (past tense marker *–d*).

Q1. Would learners receiving processing instruction and traditional instruction improve their ability to interpret English past tense forms presented in sentences?

The results of the statistical analysis clearly indicate that the PI group improved from pre-test to post-test in the interpretation sentence-level interpretation test. The performance of the PI group was statistically significant and superior to the performance of the TI and control groups. This result confirms previous findings on the effects of PI on the acquisition of past tense markers (Benati, 2005; Benati et al., 2008). We now have data on the effectiveness of PI with high-school students (Benati, 2005), middle-school students (Benati et al., 2008), and now primary-school students (the present study). The results of the present study lend support to the Age Hypothesis which states that: "PI will be equally effective as an intervention with younger learners as it is with older learners" (Benati & Lee, 2008, p. 174).

The second research question was formulated to investigate the effects of PI on a discourse-level interpretation task.

Q2. Would learners receiving processing instruction and traditional instruction improve their ability to interpret English past tense forms embedded in discourse presented as a dialogue?

The results of the statistical analyses presented in the previous section have clearly shown that the PI treatment made significant improvement from pre-test to post-test as measured by the discourse-level interpretation task. The performance of the PI group was statistically significant and superior to the performance of the traditional and control groups. These results support Lee's (2004) hypothesis that PI would affect discourse-level interpretation.

That we have another set of findings involving native speakers of Chinese lends support to the Target Language Hypothesis that states: "PI will be effective for instilling target-language specific processing strategies, no matter the native language of the learners" (Lee, 2004, p. 322).

One of the limitations of the present study is the small number of participants in each group. Future research should address this limitation. Another area for future research is to examine discourse-level effects over a longer period of time. Are the effects of PI as measured by discourse-level interpretation tests durative and long term?

Study 2

The aim of the second study was twofold:

(a) To compare and contrast three instructional treatments (structured input (SI) only, structured output (SO) only, and a combination of structured input and structured output (SI + SO));
(b) To measure the effects of SI and SO practice on both sentence- and discourse-level interpretation and production tasks.

Two specific questions were formulated:

Q1: What are the immediate and delayed effects of SI, SO and SI + SO on the acquisition of the English causative form as measured with sentence-level interpretation and production tasks?

Q2: What are the immediate and delayed effects of SI, SO and SI + SO on the acquisition of the English causative form as measured with discourse-level interpretation tasks?

Participants

In order to address the questions of this study, two separate experimental classroom studies were carried out. In the first experiment, fifty-four participants (native speakers of Chinese, aged 18–20) were enrolled in an early intermediate English course in a British university (original pool sixty-four subjects). They were randomly assigned to four groups: SI only ($n = 13$); SO only ($n = 15$); SI + SO ($n = 16$); and control group ($n = 10$). The participants were removed from the final data pools if they had contact with English outside class and if they scored over 60% in the pre-tests. Only those participants who had participated in all the phases of the experiment were included in the final data analyses.

Procedures

Instruction lasted for three hours over two consecutive days in a pre-test and post-test design. The control group received no instruction. The regular classroom instructors were trained in the use of the instructional materials.

Target feature

The target grammar feature selected for this study was the passive English causative. It was chosen primarily because it is affected by the First Noun Principle (VanPatten, 1996, 2004). According to this principle, L2 learners tend to assign agent status to the first noun or pronoun they encounter in a sentence. For example, in the sentence *Jane had her dress mended last Monday*, learners would process *Jane* as the person who actually mended the dress. This processing strategy could cause misunderstanding and delay in the acquisition of the target feature and word order pattern. The main goal of SI would be to aid learners in parsing English causative correctly and appropriately.

Materials

Three instructional treatments were used in both experiments. They were balanced in terms of number of target features, duration of activities, vocabulary items (high frequency) and use of visuals. No explicit instruction about the target feature was provided. At no time did the participants receive either explanation or feedback about the target form. The participants in the three groups were only informed whether or not they were right or wrong but no explanation was given.

The SI treatment contained in total six activities developed according to the following guidelines provided by Lee and VanPatten, (1995) and Farley (2005) for developing structured input activities: (1) present one thing at a time; (2) keep meaning in focus; (3) move from sentence to discourse; (4) use both written and oral input; (5) have learners do something with the input; and (6) keep learners' processing strategies in mind. More specifically, it consisted of four referential and two affective activities (both aural and written input). The activities were structured in a way that the learners relied on the causative structure to correctly understand

meaning in the input. They were developed so that they aided learners in circumventing the First Noun processing principle. All the activities were communicative and meaningful and the learners were asked to interpret input correctly. No activities were included where the learners had to produce the target grammar feature.

The SO treatment contained in total six activities developed according to the following guidelines provided by Lee and VanPatten (1995) to develop structured output activities: (1) present one thing at a time; (2) keep meaning in focus; (3) move from sentence to discourse; (4) use both written and oral production; (5) others must respond to the content of the output; and (6) the learners must have some knowledge of form or structure. Each activity contained four steps that pushed the learners to produce both written and oral output. All the activities were meaningful and communicative in nature and no mechanical practice was included. As stated by Lee and VanPatten (1995, p. 121), structured output has two characteristics: "involves the exchange of previously unknown information; requires learners to access a particular form or structure in order to express meaning".

The SI + SO treatment contained in total six activities (three SI and three SO activities) selected from the SI and SO treatments.

Assessment instruments and scoring

A pre-test and post-test split block design was used. The pre-tests were administered to all four groups a week before the beginning of the instructional period. The immediate post-tests and three-week delayed post-tests were administered to all the participants to measure treatments' effects. One sentence-level interpretation, one sentence-level production and one discourse-level interpretation task were used. Three versions of each assessment task were developed and balanced in terms of difficulty and vocabulary.

The sentence-level interpretation tasks consisted of 20 sentences (10 target items and 10 distractors). The participants had to listen to the sentences and decide (interpret) who was the agent of the action. They could choose between the "names" of the person, "someone else", or they could tick the "not sure" option. No repetition was provided so that the test would measure real-time interpretation. The raw scores were calculated as follows: 0 point for an incorrect response; 1 point for a correct response.

The discourse-level interpretation task was developed to measure the ability of the learners to interpret correct English causative forms when these forms are embedded in discourse. The participants had to listen to a story which was divided into three segments with each containing three target items and two distractors. The task had nine target items and six distractors in total. A booklet was constructed for the discourse-level interpretation task. The learners heard the story segment only once, then turned into the appropriate answer sheet (pictures showing two different characters doing the same action), and they had to decide who was performing the action. The participants received 1 point for each correct selection and 0 point for each incorrect one.

The sentence-level production task was developed to measure a learner's ability to produce correct English causative forms at sentence level. It consisted of ten short

sentences (seven target items and three distractors). The participants had to write a sentence using correct target forms. They had five minutes to complete the task. Correct and accurate forms were worth 1 point each, and incorrect ones 0 point.

Results—Sentence-level interpretation data

A one-way ANOVA was conducted on the pre-test scores. The analysis showed no significant differences between the four groups before instruction (F (3,54) = 0.403 $p = 0.239$). Any differences found after instruction would be attributed to the effects of instruction. The descriptive statistics showed the means of the four groups in the sentence-level interpretation task (pre-test, post-test and delayed post-test). The SI group and the SI + SO groups clearly improved from pre-test to post-tests scores. A repeated-measures ANOVA was used on the raw scores of the sentence-level interpretation task. It showed a significant main effect for Treatment (F (3,54) = 286.456, $p < 0.000$); a significant main effect for Time (F (3,54) = 115.111, $p <$ 0.000); and significant interaction between Treatment and Time (F (3,54) = 49.839, $p < 0.001$). Given the significant main effect for instructional treatment, post hoc tests were conducted to compare the group's scores from the pre-test to the post-tests. The post hoc Tukey test showed that the SI group and the SI + SO groups were equal ($p =$ 0.059) and significantly different than the SO group ($p = 0.000$) and Control group ($p = 0.000$). There was no difference between the SO group and Control group ($p =$ 0.107). To investigate possible delayed effects, a second ANOVA was conducted on the raw scores of the two sentence-level interpretation post-tests. The results showed a significant main effect for Treatment (F (3,54) = 311.527, $p < 0.000$). The post hoc Tukey test showed that the SI group and the SI + SO groups were again equal ($p =$ 0.057) and significantly different than the SO group ($p = 0.002$) and Control group ($p = 0.000$). There was no difference between the SO group and Control group ($p =$ 0.636).

The results from the sentence-level interpretation task demonstrated that only the SI and SI + SO groups gained in their ability to interpret English causative forms presented at sentence level. These gains were maintained over a period of three weeks. The SO group and the control group made no significant gains.

Results—Sentence-level production data

A one-way ANOVA was carried out on the pre-test scores. The analysis showed no significant differences between the four groups before instruction (F (3,54) = 0.343 $p = 0.165$). Any differences found after instruction would be attributed to the effects of instruction. The descriptive statistics showed the means of the four groups in the sentence-level production task. The SI group, the SO group and the SI + SO groups clearly improved from pre-test to post-test scores.

A repeated-measures ANOVA was used on the raw scores of the sentence-level production task. The results from the statistical analysis showed a significant main effect for Treatment (F (3,54) = 114.357, $p < 0.000$); a significant main effect for Time (F (3,54) = 66.958, $p < 0.000$; and significant interaction between Treatment and Time (F (3,54) = 51.902, $p < 0.000$). A post hoc Tukey test yielded the following

contrasts: the SI group, the SO group and the SI + SO groups were equal ($p = .205$) and significantly different from the Control group ($p = 0.000$).

To investigate possible delayed effects, a second ANOVA was conducted on the raw scores of the sentence-level production post-tests. The results showed a significant main effect for Treatment (F (3,54) = 115.642, $p < 0.000$). The post hoc Tukey test showed again that the three instructional groups were equal (SI = SO = SI + SO, $p = 0.945$) and significantly different from the Control group ($p = 0.000$).

The results from the sentence-level production task demonstrated that all the instructional treatments (SI, SO and SI + SO) made equal gains in their ability to produce English causative forms at sentence level from pre-test to post-test. These gains were maintained over a period of three weeks.

Results—Discourse-level interpretation data

A one-way ANOVA was conducted on the pre-test scores. The analysis showed no significant differences between the four groups before instruction (F (3,54) = 0.435p = 0.225). Any differences found after instruction would be attributed to the effects of instruction. The descriptive statistics showed the means of the four groups in the discourse-level interpretation task (pre-test, post-test and delayed post-test). The SI group and the SI + SO groups clearly improved from pre-test to post-test scores.

A repeated-measures ANOVA was adopted on the raw scores of the discourse-level interpretation task. It showed a significant main effect for Treatment (F (3,54) = 231.740, $p < 0.000$); a significant main effect for Time (F (3,54) = 118.469, $p < 0.000$); and a significant interaction between Treatment and Time (F (3,54) = 98.525, $p < 0.000$). Given the significant main effect for instructional treatment, post hoc tests were conducted to compare the group's scores from the pre-test to the post-tests. The post hoc Tukey test showed that the SI group and the SI + SO groups were equal ($p = 0.074$) and significantly different than the SO group ($p = 0.000$) and Control group ($p = 0.000$). There was no difference between the SO group and Control group ($p = 0.444$).

To investigate possible delayed effects, a second ANOVA was conducted on the raw scores of the two discourse-level interpretation post-tests. The results showed a significant main effect for Treatment (F (3,54) = 88.469, $p < 0.000$). The post hoc Tukey test showed that the SI group and the SI + SO groups were again equal ($p = 0.237$) and significantly different from the SO group ($p = 0.000$) and Control group ($p = 0.000$). There was no difference between the SO group and Control group ($p = 0.994$).

The results from the discourse-level interpretation task indicated that only the SI and SI + SO groups gained in their ability to interpret English causative forms presented at discourse level. These gains were maintained over a period of three weeks. The SO group and the control group made no significant gains.

Discussion and Conclusion

The first research question was: What are the immediate and delayed effects of SI, SO and SI + SO on the acquisition of the English causative form as measured by sentence-level interpretation and production tasks? The results of interpretation

sentence-level tasks clearly indicated that SI and a combination of SI + SO help learners to process the English causative forms correctly and appropriately. The improvement found for the SI and SI + SO groups was maintained three weeks after instruction. These instructional groups were more effective than the SO and Control groups in interpreting the target form embedded in a sentence. The results of the production sentence-level task indicated that the three instructional groups (SI, SO, and SI + SO) equally improved from pre-tests to post-tests and were statistically better than the Control group. The advantage found for these three groups maintained for a period of three weeks after the end of the instructional treatment.

The second research question was: What are the immediate and delayed effects of SI, SO and SI + SO on the acquisition of the English causative form as measured with discourse-level interpretation tasks? The results of the interpretation discourse-level tasks clearly indicated that SI and a combination of SI + SO are more effective than the SO and control groups in interpreting correct English causative forms at discourse level. The improvement found for the SI and SI + SO groups maintained three weeks after instruction.

The overarching purpose of this study was to measure the relative effects of SI and SO in isolation and in combination using both sentence- and discourse-level interpretation and production tasks. The findings from the interpretation sentence-level task provide further empirical support for the view that SI is better than SO (also used in MOI studies and reviewed earlier in this paper) in altering the way learners process input. SI is a better form of pedagogical intervention than SO in helping learners to process and interpret English causative forms and providing good intake for the developing system. The SI and the SI + SO group shared the SI component, which provides evidence to support the view that SI alone is sufficient to improve learners' performance as SO makes no gains in the interpretation sentence-level task. Similar results were obtained from the interpretation discourse-level task. The SI group and the SI + SO group outperformed the SO group, which provides further evidence for the impact of SI on input processing. The findings from the production sentence-level task showed that the SI group, the SO group and the SI + SO group performed equally. The evidence obtained from the sentence-level production task further suggests that SI not only has an impact on the way learners interpret sentences but also on the way learners produce sentences containing the target form. In the present study, SI clearly altered the way the learners processed input and impacted on their developing system and subsequently on what the learners could access for production. The learners who had received instruction and attempted to alter input processing received a double bonus: better processing of input and knowledge apparently also available for production. Overall, the main findings from this study make a number of theoretical and pedagogical contributions to the ongoing debate on the effects of SI and SO.

Firstly, the results of the two experimental studies confirm the key role of SI as an effective pedagogical intervention designed to alter processing problems such as the First Noun Principle. SO is not successful in bringing about similar effects to those brought about by SI in interpretation tasks at both sentence and discourse levels. The findings from this study reaffirm the importance of input-based practice as a

key pedagogical tool and make a contribution to the view that this practice should precede output practice (structured input activities should precede structured output activities).

Secondly, SI was the causative variable for the change in the performance of the groups. Not only was SI effective in developing the learners' ability to process input (at sentence and discourse levels) but also had an impact on their developing system so that the learners could access a linguistic feature in written production tasks under less controlled situations (discourse-level task). SI alters the way learners process input and assists in developing underlying knowledge.

Thirdly, the results from this study confirm the durative effects of SI over a period of three weeks.

Fourthly, the findings from this study in using native speakers of other languages than English also support the so-called *Native Language Hypothesis* (Benati & Lee, 2008, p. 166) "PI will be effective for instilling target language specific processing strategies, no matter the native language of the learners". The present study contributes to the expanding of the *Native Language Hypothesis* by adding Chinese speakers to the current list of languages on which the effectiveness structured input practice has been observed.

Despite the positive outcomes, there are some limitations of the present study. The small number of participants is something that needs to be addressed in a replication if the findings from this study can be generalised. Although durative effects were measured by using delayed post-tests in the design of this study, further research should investigate long-term effects. This study measured the effects of SI and SO on the interpretation and production discourse-level tasks. Further research would need to continue to measure a variety of instructional interventions in discourse-level tasks and more spontaneous production tasks that include time pressure and do not allow learners to monitor their responses. Further research should also consider the role of structured input and structured output tasks with or without explicit information.

5 Conclusion

The two studies reviewed in this chapter measured the effects of processing instruction on altering two processing principles: The Lexical Preference and The First Noun Principle. The purpose of the two studies was to test the effects of processing instruction on the acquisition English (simple past and causative forms) by L1 Chinese speakers. The effectiveness of this pedagogical treatment was measured through sentence and discourse for interpretation and production. Delayed effects were also measured in the second study.

Overall the findings from these two experimental studies are consistent with the previous research database within this framework. The results provide further evidence for the *Native Language Hypothesis* (Benati & Lee, 2008). Positive effects of processing instruction on sentence and discourse (interpretation and production) are provided. This is a valuable contribution to the PI research agenda by further

offering evidence (immediate and delayed effects) to the effects of processing instruction (and in particular the structured input practice component) on the acquisition of morphology and syntactic structures in English by L1 Chinese speakers.

The implications from this research clearly indicate that processing instruction is an effective pedagogical intervention with certain features as language acquisition is not driven by explicit rules but by interaction with input data and then output data. Grammar tasks should therefore be designed for learners to notice and process forms in the input and eventually make correct form-mapping connections. Structured input is an effective pedagogical intervention designed to alter processing problems and help learners to make accurate and appropriate form-meaning connections. The findings of the two parallel studies reaffirm the importance of this input-based practice as a key pedagogical tool and contribute to the view that this practice should precede output practice. Structured input practice offers the possibility to develop activities that are effective and change processing behaviours facilitating acquisition.

Despite the positive outcomes of the two studies presented in this chapter, there are a number of limitations: limited size of participants; and long-lasting effects of instruction in this study were measured only over a period of three weeks. Further research should address these shortcomings and measure the effects of processing instruction and structured input activities on native Chinese speakers through online tests such as self-paced reading and eye-tracking. The use of online measurements to investigate the effects of processing instruction and/or structured input can offer us the possibility of more detailed information and analysis about moment-by-moment sentence comprehension and a way to measure implicit knowledge (Benati, 2021a, 2021b).

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Not All Unaccusatives Are Acquired Equal: Between-Verb Variations in Chinese Learners' Acquisition of English Alternating Unaccusatives

Junhua Mo and Jinting Cai

Abstract English unaccusatives pose a great challenge to L2 learners. L2 acquisition of these verbs has drawn consistent attention from researchers. However, between-verb variations have been largely neglected by previous studies. This study focuses on the between-verb variations in Chinese learners' acquisition of English alternating unaccusatives. Through a combined use of a written production task and an acceptability judgment task, it was found that there were significant between-verb variations in Chinese learners' acquisition of English alternating unaccusatives. Case studies showed that Chinese learners mainly acquired the transitive use of *break* and the intransitive use of *sink*. Interviews and a textbook corpus survey suggested that the variations between *break* and *sink* were mainly caused by verb semantics and relative frequency. Based on these findings, this study concludes that not all unaccusatives are acquired equal by L2 learners on the grounds that English alternating unaccusatives do not pose the same acquisition problems to L2 learners. It advises L2 researchers to consider the theoretical implications of the between-verb variations in L2 acquisition of English alternating unaccusatives. It also recommends L2 teachers to teach these verbs with an integrated approach of rule-based and item-based methods.

Keywords Chinese learners · Alternating unaccusatives · Between-verb variations · Verb semantics · Frequency

[1] Unaccusatives are also termed as ergatives.

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1 Introduction

The Unaccusative Hypothesis (Burzio, 1986; Perlmutter, 1978) suggests that intransitives are not homogenous, but can be further divided into unaccusatives[1] (e.g. *happen*, *melt*) and unergatives (e.g. *jump*, *sleep*). The only Noun Phrase (NP) of unaccusatives, which appears as the surface subject, plays the semantic role of a theme and therefore is mapped to the object position at the deep structure. In contrast, the sole NP of unergatives, which assumes the agent role at the semantic level, is the subject at both the deep and surface structures. In English, the distinction between unaccusatives and unergatives is morphologically unmarked. In addition, both types of verb are typically used in the active voice. Therefore, the distinction between English unaccusatives and unergatives is not readily observable on the surface, as shown in (1a), (1b) and (1c).

(1)	a	The cat appeared.	(Unaccusative)
	b	The window broke.	(Unaccusative)
	c	The man slept.	(Unergative)

In English, many unaccusatives can be used transitively without undergoing any morphological change. Such unaccusatives are called alternating unaccusatives in (2a) and (2b), while those only used intransitively are called non-alternating unaccusatives in (3a) and (3b).

(2)	a	His hairstyle changed.	(Intransitive/inchoative)
	b	The boy changed his hairstyle.	(Transitive)
(3)	a	The ball disappeared.	(Intransitive)
	b	*The boy disappeared the ball.	(Transitive)

The symbol * stands for an error.

The shift from the intransitive use to the transitive use and vice versa is called the inchoative/causative alternation (Haspelmath, 1993), which is simply referred to as the causative alternation (Pinker, 1989). The fact that alternating unaccusatives can be used transitively while non-alternating ones cannot dictates that the former can be used in the passive voice while the latter cannot, as shown in (4a) and (4b).

(4)	a	His hairstyle was changed.	(Passive)
	b	*The ball was disappeared.	(Passive)

The symbol * stands for an error.

The unique semantic and syntactic properties of English unaccusatives cause considerable difficulties to L2 learners. Researchers have noted that L2 learners with diverse L1 backgrounds all tend to make errors with English unaccusatives (Cai, 2000, 2008; Deguchi & Oshita, 2004; Hirakawa, 2000; Hwang, 1999; Ju, 2000; Mo,

2006, 2011; Yip, 1995; Zobl, 1989). According to Montrul (2005), there are four types of unaccusative errors in L2 English. The first error is passivisation, which refers to L2 learners' production and acceptance of English unaccusatives in the NP-Be-Ven structure (e.g. **An accident was happened* or **The window was broken*). The second error is avoidance, which refers to L2 learners' reluctance to accept English unaccusatives in the NP-V structure in judgment tasks (e.g. *A leaf fell* or *The fish burned in the pan*). The third error is L2 learners' production and acceptance of non-alternating unaccusatives in the There/It/Ø-V-NP structure with or without an expletive (e.g. *There/It/Ø arrived a stranger*). The last error is transitivisation, which refers to L2 learners' production and acceptance of non-alternating unaccusatives in the NP1-V-NP2 structure (e.g. **The magician appeared a bird from his sleeve*). Of these four types of error, passivisation is the most frequently detected. According to Oshita (2000), it is one of the most universal, conspicuous and persistent errors in L2 English. In contrast, avoidance is much less noticeable in that it will not become an issue unless in experimental settings like judgment tasks. Production of the postverbal NP structures for unaccusatives is often limited to L2 learners whose L1s have null expletives. Transitivisation is observable in L2 English, but much less frequently than passivisation.

2 Theoretical Background of Language Acquisition Studies

Among the various linguistic theories fueling language acquisition research, the Universal Grammar (UG) and the usage-based linguistics figure prominently, with the former as a classic and the latter as a revolution. These two approaches to language acquisition are contending with each other in their description and explanation of language acquisition.

2.1 UG-Based Approach to Language Acquisition

Chomsky (1986) suggests that children are born with a language acquisition device (LAD), which underpins and facilitates their language acquisition. Thanks to this innate language faculty, children efficiently develop native language grammar based on limited input. That is, most of the grammar that children learn does not stem from the input they are exposed to, but from an innate Universal Grammar (UG). According to the UG-based approach, language acquisition is a process of setting parameters, which are afforded by the UG but activated by limited language input.

As a supporter of the UG-based approach, Pinker (1989) proposes the Semantic Verb Class Hypothesis. It posits that syntactic representations of verbs are determined by their semantic meanings. Verbs with the same semantics are conflated into the same syntactic class via linking rules and lexical rules. The linking rules are innate, while the lexical rules, consisting of broad-range rules and narrow-range rules, are

to be acquired. The broad-range rules are a necessary condition, while the narrow-range ones are a sufficient condition for the argument structure alternation to take place. Regarding the English causative alternation, its broad-range rule is that the verb should describe a dynamic event, while the narrow-range rule is that the verb, instigated by an external force, undergoes a change of physical state (e.g. *break*, *shrink*) or a change of location (e.g. *drop*, *slide*). To acquire English causative alternation, learners should apply both the broad-range rule and the narrow-range rule after they get a correct understanding of the semantic meaning of a given alternating unaccusative.

2.2 Usage-Based Approach to Language Acquisition

Goldberg (1995) and Tomasello (2003) advocate a usage-based approach that language acquisition is based on sense and experience. According to this approach, children must go through several stages in their language acquisition. That is, they start with formulas, induce low-scope patterns and then establish argument structure constructions, which are abstract and productive. Tomasello (1992) suggests the Verb Island Hypothesis that verbs represented in young children's minds are like islands, quite independent of each other. That is, their knowledge of the verbal argument structures is item-specific or tied to particular verbs. It is after some time that children start to generalise syntactic rules.

In the usage-based approach, frequency of input is crucial to language acquisition (Ellis, 2002). Braine and Brooks (1995) propose the Entrenchment Hypothesis that if a verb is repeatedly presented in a certain structure, it will impress the learners that this verb cannot be used in other structures, thus preventing the learners from associating this verb with other structures. In other words, the higher the frequency at which a structure is presented for a particular verb, the less likely it will be used in other structures. Goldberg (2006) expresses a similar view by pointing out that what impresses the learners is not the frequency of occurrence of a given verb, but the relative frequency at which this verb is chosen in a certain argument structure.

3 Previous Studies of L2 Acquisition of English Unaccusatives

L2 acquisition of English unaccusatives is a hot topic in L2 studies. There are three foci of attention in the studies of this topic. First is the L2 acquisition of the distinction between unaccusatives and unergatives, which is implicit to L2 learners. Researchers found that L2 learners tended to make errors with unaccusatives, but not with unergatives (Deguchi & Oshita, 2004; Hirakawa, 2000; Mo, 2006, 2011; Oshita, 2000, 2001; White, 2003; Zhang, 2009; Zhang & Qiao, 2013; Zobl, 1989). They suggested that

L2 learners were able to detect the thematic and deep-structure differences between these two groups of verbs.

The second research focus is the distinction between L2 acquisition of non-alternating unaccusatives and that of alternating ones. Yip (1995) argues that non-alternating and alternating unaccusatives pose different acquisition problems. To acquire non-alternating unaccusatives, L2 learners need to expunge the ungrammatical passive use of these verbs from their interlanguage grammar. To acquire alternating unaccusatives, they need to functionally distinguish the intransitive use of these verbs from their passive use. Other researchers are concerned with the acquisition order of non-alternating and alternating unaccusatives (J.T. Cai, 2000, 2008; Y. Cai, 2000; Tang & Huang, 2010; Wang & Yu, 2008; Yin & Yang, 2006; Zhang & Shi, 2012; Zhang & Qiao, 2013). They found that L2 learners overcame the passivisation or avoidance of non-alternating unaccusatives before they did with alternating ones. They suggested that L2 learners acquired non-alternating unaccusatives before they did with alternating ones.

The third research focus is the L2 acquisition of causative alternation, which is mainly concerned with alternating unaccusatives. Y. Cai (2000) focused on the acquisition of alternating unaccusatives that denote a change of state. He suggested that L2 learners first acquired the transitive use of alternating unaccusatives and then their intransitive use. His viewpoint was later echoed by J.T. Cai (2000) and Wang (2002). J. T. Cai suggested that the transitive use of alternating unaccusatives was unmarked, while its intransitive use was marked. The unmarked use was supposed to be acquired earlier than the marked use. Wang maintained that the intransitive use of alternating unaccusatives was a weakness in Chinese learners' acquisition of these verbs. He called upon Chinese English teachers and textbook developers to pay more attention to this usage, which, in his opinion, was commonplace in both Chinese and English and therefore was supposed to be acquired by Chinese learners.

Of the above three research foci of L2 acquisition of English unaccusatives, the third one is least investigated as far as Chinese learners of English are concerned. What is more, English alternating unaccusatives are not semantically differentiated, but regarded as a homogeneous group. Only a few studies have been conducted to investigate the potential between-verb variations in Chinese learners' acquisition of English alternating unaccusatives (Ju, 2000; Kang, 2010). Studies of L2 learners of other L1 backgrounds acquiring English alternating unaccusatives are rare, too.

Ju (2000) is the first to note between-verb variations among alternating unaccusatives in L2 English. She investigated the influence of conceptualisable agents in discourse on advanced Chinese English learners' tendency to passivize English unaccusatives, non-alternating and alternating alike. Through a forced-choice judgment task, she found that there were no significant differences among non-alternating unaccusatives in terms of susceptibility to the passivisation error, whereas such differences existed among alternating unaccusatives. She further attributed these between-verb variations in alternating unaccusatives to their varying degrees of external causation, suggesting that the stronger the external cause was, the more likely the alternating unaccusative was to be passivised.

Kang (2010) investigated the effect of verb semantics and frequency on Chinese learners' acquisition of English causative alternation by examining three verb groups: alternating unaccusatives, non-alternating unaccusatives and unergatives. For each group, there were three target verbs: a high-frequency verb, a low-frequency verb and a nonce verb. Through a grammaticality judgment task, she found that advanced Chinese learners could generally distinguish the three verb groups correctly, thus lending support to the Semantic Verb Class Hypothesis and the Entrenchment Hypothesis. However, there were great variations within the alternating unaccusative group, casting doubt on the validity of these two hypotheses. Kang chose *break* as a high-frequency alternating unaccusative, *shrink* a low-frequency one and *bart* a nonce one. If the Semantic Verb Class Hypothesis held true, Chinese learners would have acquired both the intransitive use and the transitive use of *break* and *shrink*, as both are externally caused and describe a change of state. If the Entrenchment Hypothesis were valid, Chinese learners would have acquired the two usages of *break* more successfully than they did with *shrink*. However, Chinese learners mastered the transitive use of *break*, but not its intransitive use. When it comes to *shrink*, however, the opposite is true. Thus, Kang concluded that Chinese learners' acquisition of alternating unaccusatives did not support the Semantic Verb Class Hypothesis or the Entrenchment Hypothesis.

Ju's and Kang's studies have showed that between-verb variations are not only real, but also wide. However, it is not clear what variation patterns alternating unaccusatives may have. And it is not clear what factors may have led to such variations. Therefore, it is necessary to study L2 learners' variable performance on verbs that belong to the same verb group. As Sikorska (2002) notes, "group results are misleading because they hide variability by subject and by lexical items" (p. 204). She recommends researchers to study learners' responses to individual verbs in that "by looking at responses on individual verbs, it can be established whether L2 learners treat verbs of the same class alike, as UG theory would predict" (p. 204).

Recognising the emerging trend of studying between-verb variations in second language acquisition research, this study set out to examine such variations in a more detailed way. In light of the strengths and weaknesses of the previous studies, it tried to make several improvements. First, it employed multiple instruments to elicit more types of learner data in a complementary sense. Second, it re-tested the validity of the Semantic Verb Class Hypothesis by making a finer semantic distinction between alternating unaccusatives. Third, it re-tested the Entrenchment Hypothesis by examining both verb frequency and relative frequency. Finally, it discussed the theoretical and pedagogical implications of the possible between-verb variations among alternating unaccusatives.

4 The Present Study

4.1 Research Questions

This study attempted to answer three research questions.

1. Are there significant between-verb variations in Chinese learners' written production and acceptability judgment of English alternating unaccusatives with respect to the intransitive use, the passive use and the transitive use respectively?
2. If so, what are the greatest between-verb variations among English alternating unaccusatives in these two tasks respectively?
3. Do verb semantics and frequencies contribute to the greatest between-verb variations among English alternating unaccusatives?

4.2 Participants

A total of 184 Chinese English learners participated in this study. They were studying in educational institutions of different levels in Jiangsu Province, People's Republic of China. Among them, 54 were 2nd-year students from a senior high school, 58 3rd-year students from the same school, 43 2nd-year English majors from a university, and 29 1st-year graduate students of English from another university. These students were the same subjects of Mo's (2011) study, which categorised them, according to their school years, as English learners of different proficiencies ranging from low, lower-intermediate, intermediate to advanced. They were so categorised because Mo's study had multiple research purposes, one of which was to track the developmental path of English unaccusatives, non-alternating and alternating alike, in comparison with that of English unergatives, in Chinese learners' acquisition of these intransitive verbs. The influence of L2 proficiency, however, was not a concern of this study, which, under the influence of Kang (2010), preoccupied itself with the effect of verb semantics and frequency. Therefore, this study did not include L2 proficiency as a mediating variable, but took the students as a homogenous whole.

4.3 Target Verbs

This study chose six English alternating unaccusatives as its target verbs. They were *break*, *change*, *improve*, *increase*, *melt* and *sink*.

4.4 Instruments and Data Collection

To address the three research questions, this study devised four instruments. Of them, the first and second instruments were used to answer the first and second research questions while the third and fourth ones were used to answer the third research question.

The first instrument was a controlled written production task (see Appendix A), in which participants were asked to make sentences with a given verb and a given noun phrase. Their sentences were required to contain a given verb and a noun phrase and be grammatically correct. Furthermore, they were encouraged to create as many sentences as possible, as long as the given verb was used differently in different sentences. A sample of the controlled production task is shown in (5).

(5)	Break / the glass cup (玻璃杯)

The second instrument was an acceptability judgment task (see Appendix B). Following Hwang (1999), this task presented each target verb in three syntactic structures: NP-V, NP-Be-Ven and NP1-V-NP2, which correspond to the intransitive use, the passive use and the transitive use respectively. Since this study was concerned with L2 acquisition of English unaccusatives, qualified subjects should, as suggested by Ju (2000), have acquired the rule of English passive voice. Therefore, twelve pseudo-passive sentences (e.g. *His mobile phone lost last week*) were included as distracters. All the test sentences and distracters were mixed and randomised. But sentences with the same target verb were so ordered that they did not appear in adjacency. Participants were asked to rate the acceptability of each sentence on a 5-point scale ranging from −2 to + 2. They were also asked to provide a correct alternative when they assigned a negative score. A sample of the acceptability judgment task is shown in (6).

(6)	**The window broke** when it was hit by a stone.
	−2 −1 0 +1 +2

The third instrument was interviews, which were conducted by the first author with 8 participants after they finished the written production task and the acceptability judgment task. These participants were 3 students with the student numbers of 12, 32 and 52 from the 3rd-year high school group and 5 students with the student numbers of 1, 3, 5, 9 and 21 from the 2nd-year English major group. These participants were chosen for the interviews on a random basis for the purpose of "minimizing any conscious or unconscious biases in the results of the study" (Brown, 2006, p. 22). The purpose of the interviews was to uncover the participants' thinking processes when they were performing on certain target verbs in these two tasks. The participants thus had an opportunity to recall how they dealt with the given language tasks and explain why they did with a particular verb in this way rather than another. For the

sake of smooth communication, the interviews were carried out mostly in Chinese. English was used sporadically when there arose a need to do so. No interviews were conducted with the 2nd-year high school group and the 1st-year English graduate group in that they were not available for immediate follow-up interviews.

The last instrument was a textbook corpus survey. Given that English textbooks constitute the major source of input in L2 settings (Xu, 2012), an English textbook corpus with a total of 600,314 words was constructed by the first author to examine the effect of L2 input on Chinese learners' acquisition of English alternating unaccusatives. It consisted of three series of textbooks developed by Liu (1996a, 1996b), Li (2001) and Zheng (2003) respectively. Liu's textbooks comprise both student books and student workbooks ranging from the first grade in junior high to the third grade in senior high. Li's textbooks are the *New Horizon College English series: Student's Books 1–4*, while Zheng's textbooks are the *Integrated Course of New College English series: Student's Books 1–4*.

It must be pointed out that the four instruments of this study were not designed on an equal footing in that they involved different numbers of participants and different numbers of target words. The first and second instruments (i.e. the production task and the acceptability judgment task) were the major instruments of this study in that they involved all the participants and all the target words. The third instrument (i.e. the interview) was supplementary by nature in that it only investigated a very small sample of participants. The fourth instrument (i.e. the textbook corpus survey) was also supplementary in that it only focused on the target words that constituted the largest variation in each syntactic structure.

4.5 Data Analysis

Data analysis of this study started with the handling of distracters, which were embedded in the judgment task to disqualify participants who had not acquired the English passive rule. This study divided participants into qualified and unqualified by setting a threshold of three for the 12 distracters. Any participant who made three or more wrong judgments on the distracters was disqualified, leading to the deletion of his or her data from the data pool. In the end, 33 out of 54 in the 2nd-year high school student group, 49 out of 58 in the 3rd-year high school student group, 43 out of 54 in the 2nd-year English major group, and 29 out of 29 in the 1st-year English graduate student group were considered as qualified participants. Thus, the total number of qualified participants was 154 and their data were kept for analysis.

When dealing with the production data, this study followed Hirakawa (2000) in identifying three structures in the data: NP-V, NP-Be-Ven and NP1-V-NP2. Five principles were established with reference to the data analysis methods used by the previous studies (Hirakawa, 2000; Oshita, 1997, 2000) and in light of the peculiarities of the data collected by the present study. First, learner sentences must contain the given verbs before they were included for further consideration. Second, only finite uses of the given verbs were included in data analysis. Third, learner sentences of

the same structural pattern were counted only once when they were produced by the same participant for the same verb (e.g. *The sun had melted the snow* and *The sun is melting the snow*). Fourth, learner errors in tense, number and other non-essential aspects were ignored. Finally, indeterminable structures and unintelligible sentences were excluded from data analysis. Guided by these five principles, the production data for each target verb were calculated as the probability at which a given structure was applied to a given target verb. Since each target verb was likely to be associated with three structures, it had three possible production probabilities, all of which fell in the range of 0–1 and were supplied with two decimals. With the use of Statistical Product and Service Solutions (SPSS), a one-way ANOVA test was performed on the production probabilities of all the six target verbs in each structure and paired samples t-tests on the production probabilities of the two target verbs that constituted the greatest variation in each structure.

The judgment data for each target verb was calculated as the participants' acceptance score of a given sentence containing this given verb. It fell in the range of −2 to 2 and was supplied with two decimals. The acceptance scores of all the six target verbs in each structure were first subject to a one-way ANOVA test with SPSS. When the greatest variation in each structure was preliminarily identified, it was put to paired samples t-tests.

The interview data was transcribed into Chinese and then translated into English. The Wordsmith Tools were used to retrieve concordance lines containing the six target verbs in the English textbook corpus. When analysing the textbook data, this study followed Oshita (1997, 2000) by deleting three special usages: (1) unaccusative verbs with propositional complements, namely, raising verbs (e.g. *appear (to be) happy*, *happen to be in the room*); (2) idioms and metaphorical usage of verbs (e.g. *fall in love*, *fall ill*); and (3) nonfinite verbs (e.g. infinitives (with or without *to*), gerunds, and participle constructions). This study made a distinction between verb frequency and relative frequency. The former was defined as the total occurrence of a target verb found in the cleaned data, whereas the latter was the number of times that a structure occurred for the same target verb, divided by the total verb frequency. The verb frequency was a natural figure while the relative frequency was a small figure between 0 and 1 with two decimals.

Since this study attempted to investigate the between-verb variations of six alternating unaccusatives used in three structures in two tasks, it may encounter a plethora of between-verb variations. It would be impossible to finish if every between-verb variation was included for cause analysis. To enhance the feasibility of cause analysis, this study only focused on two verbs constituting the greatest variation in each structure. Given that these two verbs represent the two extremes of the variation range of each structure, this method was named by this study as the Extreme Verb Method.

5 Results

5.1 *Between-Verb Variations in the Written Production Task and the Acceptability Judgment Task*

Statistical results showed that there were significant between-verb variations in both Chinese learners' written production of English alternating unaccusatives and their acceptability judgment of these verbs. Such variations existed in all the three syntactic structures: NP-V, NP-Be-Ven and NP1-V-NP2.

Table 1 shows the results of a one-way ANOVA performed on the six alternating unaccusatives in their respective chance of being used in the NP-V, NP-Be-Ven and NP1-V-NP2 structures in the written production task. As suggested by the *p* values, there are significant differences between these verbs in every given structure. That is to say, there are significant between-verb variations among alternating unaccusatives in the participants' written production data.

Table 2 shows the results of a one-way ANOVA performed on the mean scores of the six alternating unaccusatives in the acceptability judgment task. According to the *p* values, there are significant differences between these verbs in every given structure,

Table 1 Production probabilities of each syntactic structure for each alternating unaccusative in the written production task

Structure		Verb							
		Break	Change	Improve	Increase	Melt	Sink	*F*	*p*
NP-V	M	0.12	0.55	0.31	0.77	0.90	0.97	122.324	0.000
	SD	0.33	0.50	0.46	0.42	0.31	0.16		
NP-Be-Ven	M	0.95	0.60	0.73	0.43	0.19	0.18	84.627	0.000
	SD	0.22	0.49	0.45	0.50	0.38	0.39		
NP1-V-NP2	M	0.88	0.72	0.35	0.31	0.14	0.05	106.582	0.000
	SD	0.33	0.45	0.48	0.46	0.34	0.22		

Table 2 Acceptance scores of each alternating unaccusative in each syntactic structure in the acceptability judgment task

Structure		Verb							
		Break	Change	Improve	Increase	Melt	Sink	*F*	*p*
NP-V	M	−0.29	0.49	0.67	1.22	1.20	1.77	41.225	0.000
	SD	1.69	1.74	1.56	0.87	1.42	0.64		
NP-Be-Ven	M	1.37	1.05	0.84	−0.36	0.30	−1.08	61.390	0.000
	SD	1.27	1.42	1.45	1.56	1.73	1.38		
NP1-V-NP2	M	1.82	1.69	1.22	1.23	0.54	−0.03	68.862	0.000
	SD	0.50	0.68	0.76	1.08	1.37	1.53		

indicating significant between-verb variations among alternating unaccusatives in the acceptability judgment data. This finding lends support to Ju (2000), who found that there are significant between-verb variations in Chinese learners' acceptance of the passivisation of English alternating unaccusatives in the NP-Be-Ven structure.

5.2 *Greatest Between-Verb Variations in the Written Production Task and the Acceptability Judgment Task*

Data analysis based on the Extreme Verb Method showed that of the six alternating unaccusatives, *break* and *sink* constituted the greatest variation in both the written production task and the acceptability judgment task.

Figure 1 displays the probabilities of the NP-V, NP-Be-Ven and NP1-V-NP2 structures for each alternating unaccusative in the written production task. A glimpse of the production probabilities of the six verbs reveals that *sink* and *break* stand at the two extremes in all the three structures. But the pattern in the NP-V structure is opposite to those in the other two structures. In the NP-V structure, the probability of *sink* is the highest while that of *break* the lowest, whereas the probability of *break* is the highest and that of *sink* the lowest in the NP-Be-Ven and NP1-V-NP2 structures. Additional t-tests revealed significant differences in the production probabilities in each of the three structures ($p = 0.000$), verifying that these two verbs always constitute the greatest variations in the three structures, though in two different directions.

Figure 2 shows the mean score for each alternating unaccusative presented in each structure in the acceptability judgment task. It is obvious that *break* and *sink* occupy the two extremes of each zigzagging line, whatever structure it refers to.

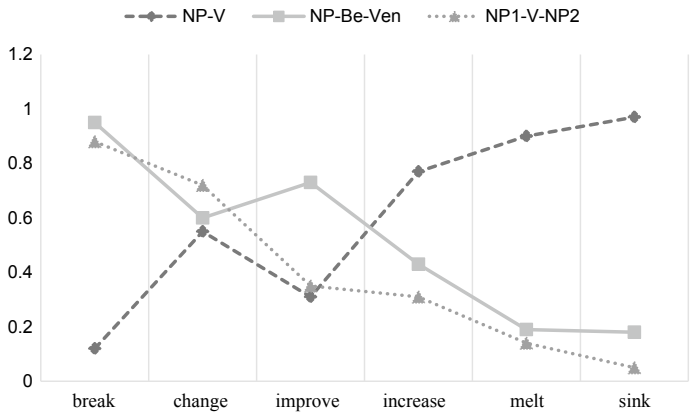

Fig. 1 Production probabilities of each syntactic structure for each alternating unaccusative in the written production task

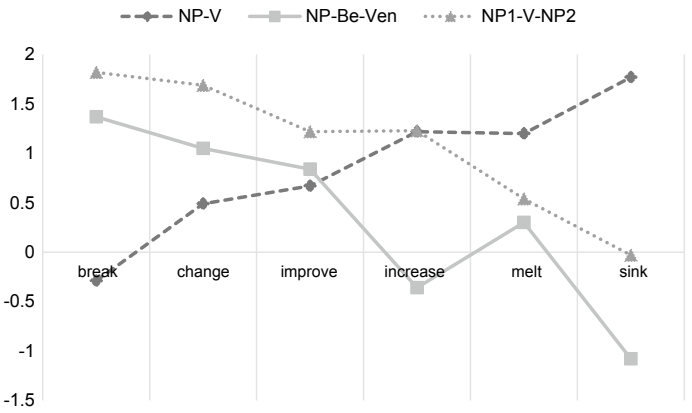

Fig. 2 Acceptance scores of each alternating unaccusative presented in each syntactic structure in the acceptability judgment task

However, the participants' acceptance of these two verbs in the NP-V structure is drastically different in that their acceptance of *break* was the lowest while that of *sink* was the highest. However, this pattern is completely reversed when it comes to the NP-Be-Ven and NP1-V-NP2 structures, both of which manifest the highest acceptance of *break* and the lowest acceptance of *sink*. Results of t-tests revealed that the differences between *break* and *sink* in the NP-V, NP-Be-Ven and NP1-V-NP2 structures were all statistically significant ($p = .000$). Therefore, the variations between *break* and *sink* were the greatest among the six alternating unaccusatives in each structure of the acceptability judgment task.

Table 3 summarises the greatest between-verb variations among the six alternating unaccusatives in the written production task and the acceptability judgment task respectively. It shows that *break* and *sink* form sharp contrasts in all the three structures.

Figure 3 shows that participants produced *break* in the NP-V structure with a ratio less than 0.15, but produced it in the NP-Be-Ven and NP1-V-NP2 structures with high probabilities exceeding 0.85. When it comes to *sink*, however, it is a contrasting

Table 3 Summary of greatest between-verb variations among alternating unaccusatives in the written production task and the acceptability judgment task

Structure	Variation			
	Highest		Lowest	
	Written production task	Acceptability judgment task	Written production task	Acceptability judgment task
NP-V	Sink	Sink	Break	Break
NP-Be-Ven	Break	Break	Sink	Sink
NP1-V-NP2	Break	Break	Sink	Sink

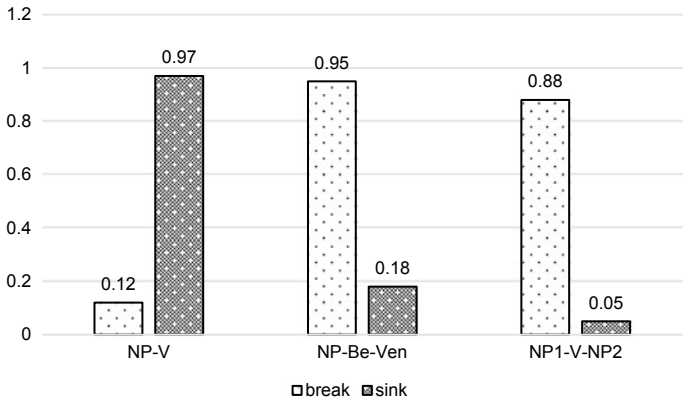

Fig. 3 Production probabilities of break and sink in the written production task

picture. That is, *sink* is produced in the NP-V structure with a probability of more than 0.95, but in the NP-Be-Ven and NP1-V-NP2 structures with probabilities less than 0.20.

Figure 4 shows that participants assigned a negative score to *break* in the NP-V structure, but gave very positive scores to its uses in the NP-Be-Ven and NP1-V-NP2 structures. When it comes to *sink*, however, it is a different picture. That is, *sink* in the NP-V structure was scored very positively, but its uses in the NP-Be-Ven and NP1-V-NP2 structures were both rated negatively.

The above results demonstrated that participants only acquired the transitive use of *break* and the intransitive use of *sink*. This finding echoes Kang (2010), who found that Chinese learners only acquired the transitive use of *break* and the intransitive use of *shrink*. These variations suggest that Chinese learners do not acquire alternating unaccusatives in the same way, despite the fact that they belong to the same group.

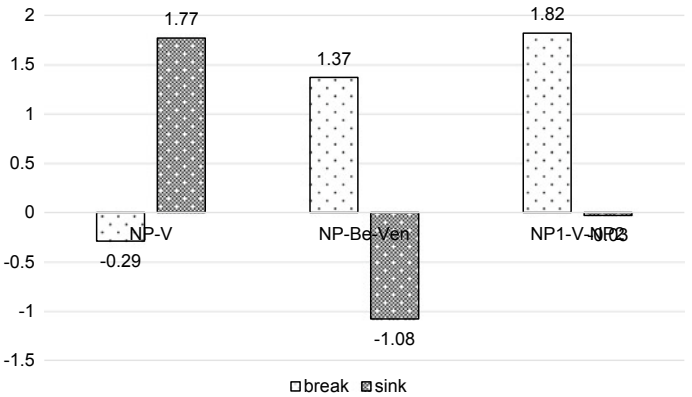

Fig. 4 Acceptance scores of *break* and *sink* in the acceptability judgment task

These variations confirm the Verb Island Hypothesis (Tomasello, 1992) that the initial acquisition of verbs is item-based.

6 Discussion

6.1 Effects of Verb Semantics

In this study *break* and *sink* were found to be both semantically similar and different. They are similar in that they are both externally caused. Their difference is that *break* has a stronger external causation than *sink*. Interview results showed that the semantic difference between *break* and *sink* affected Chinese learners' acquisition of these two verbs.

A participant whose student number was 1 in the 2nd-year English major group produced two sentences for *break*. Sentence One is *The glass cup is broken*, which takes the NP-Be-Ven structure, while Sentence Two is *Who break the glass cup*, whose syntactic structure is NP1-V-NP2. When asked what she meant by her first English sentence *The glass cup is broken*, she answered in Chinese that "玻璃杯破了" (*Bolibei po le*) (The glass cup broke). When asked if there were any other ways to express *Bolibei po le* (the glass cup broke) in English, she said in English that "[T]he glass cup is broken into pieces." When asked what she thought of the given sentence *The glass cup broke when it fell on the floor*, she did not say whether this sentence was correct. She just insisted that "[T]he glass cup is always broken by somebody." This participant's response showed that although she was capable of the intransitive use of "破" (*po*) (break) in Chinese, she had not mastered the intransitive use of *break* in English. She associated the action of breaking with an external force so strongly that in her English mental grammar, *break* was represented as a transitive verb only. A participant with the student number of 9 in the same group not only assigned −2 to the intransitive use of *break* presented in the NP-V structure in the acceptability judgment task, but also changed this sentence into the passive voice by replacing *broke* with *was broken*. She explained that "[T]he breaking of the window did not happen voluntarily. It must be a result of external forces. It must be broken by somebody or something. Therefore, it should use the passive voice." Feedback from these two participants showed that they always associated the verb action of breaking with an external force such as human actions. In other words, they believed that *break* was a verb with a clear and strong external causation, which rendered it difficult for them to acquire the intransitive use of this verb.

A participant with the student number of 52 in the 3rd-year high school group assigned +2 to *sink* in the NP-V structure. When asked why he made such a judgment, he answered the small ship sank on its own. Therefore, it should be used in the active voice, as the given sentence *The small ship sank after it ran into a huge iceberg* did. A participant with the student number of 32 in the same group assigned −2 to *sink* in the NP-Be-Ven structure. When asked why he assigned such a negative score, he

explained "[W]hen I was working on Sentence 20 [The small ship was sunk after it ran into a huge iceberg], I thought that this sentence was saying that the small ship was made to sink after it ran into the iceberg. It emphasised that it [the small ship] was made to sink. However, my view is that the small ship ran into the iceberg and then sank by itself. As far as a ship is concerned, it can do nothing but sink by itself. It is not possible to say that the ship was made to sink." Responses of these participants showed that they did not conceive any external cause for the sinking action of the small ship. Instead, it happened by itself. Therefore, it was easy for them to acquire the intransitive use of *sink*.

The fact that *break* has a stronger external causation than *sink* may have led Chinese learners to establish different mental representations for these two verbs. They may consider *break* as a transitive and *sink* as an intransitive in their interlanguage grammar. The divergent acquisition patterns of *break* and *sink* highlight the role of verb semantics in L2 acquisition. The pivotal role of verb semantics is exactly what the Semantic Verb Class Hypothesis (Pinker, 1989) argues for. Therefore, this study supports the Semantic Verb Class Hypothesis. It is noteworthy, however, that the acquisition difference between *break* and *sink* showed that Chinese learners had not acquired the causative alternation rules specified by this hypothesis, implying that there may be other factors at work.

6.2 *Effects of Relative Frequency*

This study found that verb frequency could not explain the found variations between *break* and *sink*. It was relative frequency that contributed to the sharp variations between these two verbs.

Table 4 shows the verb frequency and relative frequency of *break* and *sink* in the English textbook corpus. It is apparent that the verb frequency of *break* is much higher than that of *sink*. With regard to the relative frequency, however, the story between them is much more complicated. The relative frequency of *break* in the NP-V structure is proportionally lower than that of *sink*, whereas the reverse pattern emerges in the other two structures. The NP-V structure is the syntactic manifestation of the intransitive use of *break* and *sink*, the NP-Be-Ven structure the passive use, and the NP1-V-NP2 structure the transitive use. Given that the passive use is converted from the transitive use, it is in essence a transitive use, too. Therefore, it is possible to

Table 4 Verb frequency and relative frequency of *break* and *sink* in the English textbook corpus

Structure	Frequency			
	Verb frequency	Relative frequency		
		NP-V	NP-Be-Ven	NP1-V-NP2
break	91	0.16	0.44	0.40
sink	19	0.89	0.00	0.11

combine the passive use and the transitive use as a broad transitive use, thus yielding a rule that *break* has a lower relative frequency as an intransitive and a higher relative frequency as a transitive. By contrast, the relative frequency of *sink* as an intransitive is high but its relative frequency as a transitive is low. Interview results showed that the verb frequency difference between *break* and *sink* did not contribute to the variations between *break* and *sink*, because participants did not mention it at all. What impressed them was the distribution of the relative frequency of each verb.

A participant with the student number of 3 in the 2nd-year English major group produced *break* in NP1-V-NP2 and NP-Be-Ven structures. When asked if she had learned other usages of *break*, she answered no. A participant with the student number of 21 in the same group assigned −2 to *break* in the NP-V structure, suggesting that she did not accept the intransitive use of *break* at all. When asked why, she said that "[W]hat I have learned before is that the window and the breaking action formed a passive relationship. Therefore, I changed *break* into *was broken.*" When asked if she ever encountered *break* used in a way like the given sentence *the window broke*, she said no. From the responses of these two participants, it can be seen that they did not have the faintest idea that *break* could be used as an intransitive verb in the NP-V structure. Naturally, they failed to produce or accept *break* in this structure. At the same time, participants were aware that the major relative frequency of *break* was its transitive use. For example, a participant with the student number of 21 from the 2nd-year English major group assigned −2 to *break* in the NP-V structure. When asked why she gave such a negative score, she answered that "[A]s far as I can remember, *break* is always used in the form of somebody breaking something or something being broken by somebody. I have never seen that *break* is used in the active voice when the sentence starts with something." This participant's response indicated that *break* was always used as a transitive. This could help to explain the finding participants produced and judged this verb in the NP1-V-NP2 and the NP-Be-Ven structures at a high rate.

A participant with the student number of 12 from the 3rd-year high school group assigned +2 to *sink* in the NP-V structure. She explained "[T]his is the way that *sink* is used most of the time." On the other hand, a participant from the same group assigned to −2 to *sink* in the NP-Be-Ven structure. When asked whether her negative judgment of this sentence was made for grammatical reasons or for contextual considerations, she said that it was for grammatical reasons. "It [The small ship was sunk after it ran into a huge iceberg] is ungrammatical. I think *sink* is an intransitive verb." A participant with the student number of 5 in the 2nd-year English major group produced two sentences for *sink*, which include *The small boat sank after hitting big stones under the water* and *They made the small boat sinking by holing on it*. When asked why she did not produce a sentence like *they sank the small boat by holing on it*, she answered "I have never used *sink* in a way that puts a noun immediately after it. I remember that that there is such a usage in the later acceptability judgment test. But I myself have never seen such a usage."

The fact that *break* had a high verb frequency did not guarantee that Chinese learners acquired both the transitive use and the intransitive use of this verb as an alternating unaccusative. It was the low relative frequency of *break* presented

in the NP-V structure that rendered it difficult for Chinese learners to acquire the intransitive use of this verb. The effect of relative frequency was also attested by Chinese leaners' acquisition pattern of *sink*. Despite its low verb frequency, *sink* boasted a high relative frequency of being used in the NP-V structure, which made it easy for Chinese learners to acquire its intransitive use. The importance of the relative frequency to Chinese learners' acquisition of alternating unaccusatives verifies the Entrenchment Hypothesis (Braine & Brooks, 1995).

7 Theoretical and Pedagogical Implications

7.1 Advocating a Dual Theoretical Approach to Language Acquisition

The finding of this study on Chinese learners' varied acquisition patterns of *break* and *sink* corroborates both the Semantic Verb Class Hypothesis and the Entrenchment Hypothesis. This is opposite to Kang (2010), whose finding on *break* and *shrink* does not support either of these two hypotheses. This disagreement results from Kang's inappropriate research design and inadequate data interpretation. In Kang's study, *break* and *shrink* are thought to be semantically identical on the grounds that both of them are externally caused to describe a change of state. It is justified in doing so when they are grouped as alternating unaccusatives to contrast with non-alternating unaccusatives or unergatives. However, when efforts are made to make a comparison within the alternating unaccusatives, the semantic difference between *break* and *shrink* cannot be ignored. That is, *break* has a much greater external cause than *shrink*. This semantic difference between *break* and *shrink* contributes to the acquisition difference that Chinese learners have more difficulty acquiring the intransitive use of *break* than that of *shrink*, thus lending support to the Semantic Verb Class Hypothesis. In the same vein, Kang's failure to confirm the Entrenchment Hypothesis is also due to his inadequate handling of the frequency factor. Kang only identified the verb frequency difference between *break* and *shrink*. He did not examine the relative frequency difference between them. If he showed that *break* had a low relative frequency of being used in the NP-V structure while *shrink* had a high relative frequency in the NP-V structure, he would have explained his finding that Chinese learners were not able to acquire the intransitive use of *break*, but were capable of using *shrink* in this way. Therefore, a new interpretation of Kang's finding on *break* and *shrink* is also in favor of the Semantic Verb Class Hypothesis and the Entrenchment Hypothesis.

The finding of this study is similar to some of the L1 studies. Ambridge et al. (2008) detected the effect of both verb semantics and frequency on L1 children's and adults' graded judgments of argument structure overgeneralisation error. Tomasello (2003) found that frequency played a role in the early stage of children's language acquisition, while semantic constraints started to work after the age of four and a

half. Despite the fact that the Semantic Verb Class Hypothesis is proposed from a UG-based approach to language acquisition and the Entrenchment Hypothesis is grounded in a usage-based approach, both of them are supported by this and other studies, L2 and L1 alike. This suggests that these two approaches are not as incompatible as they seem to be. They may be complementary rather than mutually exclusive of each other. Therefore, this study recommends the combined use of the UG-based approach and the usage-based approach to language acquisition studies. A dual approach may be more effective than a single one in revealing the whole picture of language acquisition in case that both innateness and experience may be at work in language acquisition.

7.2 Promoting an Integrated Approach to the Teaching of English Alternating Unaccusatives

There are two misconceptions about the teaching of English alternating unaccusatives. The first is the view of Yip (1995), who suggests the acquisition task of alternating unaccusatives is to functionally distinguish between the intransitive use and the passive use. For alternating unaccusatives that denote a strong external causation (e.g. *break, drop*), the crux of the problem is not that L2 learners are not able to distinguish the two different uses, but that they have great difficulty acquiring the intransitive use in the first place. For alternating unaccusatives that denote a weak external causation (e.g. *sink*, *shrink*), the passive use of these verbs is found by this study to be nearly non-existent in the L2 learners' interlanguage grammar, which does not provide any ground for L2 learners to figure out the functional meaning of their passive use. Therefore, Yip's view on the teaching of English alternating unaccusatives is seriously flawed. It is only applicable to advanced L2 learners who have acquired both the transitive use and intransitive use of English alternating unaccusatives and reached the stage of distinguishing the functional differences of these verbs used in the NP-V and NP-Be-Ven structures respectively.

Compared with Yip's view, the second misconception is more widespread that the teaching task of English alternating unaccusatives is to help L2 learners acquire their intransitive use on the basis of the transitive use (J.T. Cai, 2000; Y. Cai, 2000; Wang, 2002). This view is partially supported by this study, because it only captures half of the teaching story. That is, it is applicable to English alternating unaccusatives that denote a strong external causation (e.g. *break*, *drop*), but not to those that denote a weak external causation (e.g. *sink*, *shrink*). For the latter type of unaccusative, L2 teachers do not need to instruct learners on the intransitive use, but rather remind them of the transitive use.

It is evident that there is no single, uniformed rule of teaching English alternating unaccusatives. Given that not all unaccusatives are acquired equal, L2 teachers should not teach them in an equal way, either. A sensible teaching approach should take into account the between-verb variations of English alternating unaccusatives. It takes at

least two steps to adopt such an approach. First, a subtle semantic distinction must be made among English alternating unaccusatives. Despite the fact that these verbs are all externally caused, the degree of external causation varies from verb to verb. They are not a homogenous group, but form a hierarchy of external causation. On the top of the hierarchy are alternating unaccusatives with a strong external causation (e.g. *break*, *drop*), while on the bottom are those with a weak external causation (e.g. *sink*, *shrink*). Second, a subtle frequency distinction must be made among English alternating unaccusatives. Given that a high verb frequency alone cannot lead to a full, successful acquisition of English alternating unaccusatives, L2 teachers should stay alert, devoting attention not only to low-frequency unaccusatives, but also to high-frequency ones. This is necessary because both low-frequency and high-frequency alternating unaccusatives may have a skewed distribution of relative frequencies. For example, as this study shows, the major relative frequency of *sink* is the intransitive use, while that of *break* the transitive use. Since each alternating unaccusative deserves the teachers' attention, an item-based teaching is called for. Therefore, an effective approach to the teaching of English alternating unaccusatives should integrate both verb semantics and frequencies. It will be an explicit vocabulary teaching method which tells students that some English verbs can be used both intransitively and transitively. These verbs are called alternating unaccusatives. The greater the external cause of an alternating unaccusative is, the more probably it will be used transitively. Even high-frequency alternating unaccusatives deserve students' attention in that students may fail to acquire both the transitive use and intransitive use of these verbs.

8 Conclusion

Through a combined use of a written production task and an acceptability judgment task, this study reported significant between-verb variations among the six alternating unaccusatives in three syntactic patterns in two tasks. By utilising the Extreme Verb Method, this study found that Chinese learners mainly acquired the transitive use of *break* and the intransitive use of *sink*. Interviews and a textbook corpus survey revealed that these acquisition differences between *break* and *sink* were attributable to verb semantics and relative frequency.

By revealing the between-verb variations among alternating unaccusatives, this study provided fresh insights into L2 acquisition. That is, L2 acquisition of the same verb group may be more diverse than what the UG-based or the usage-based approach suggests. Underneath the verb group results, there may exist significant individual verb differences. However, these differences have not received due attention. Thus, it is high time to heed these differences. Only in this way can L2 researchers and teachers arrive at a complete understanding of L2 learning and teaching.

This study has some limitations. First, the number of target words, which is six in this study, may not be adequately large. Second, the Extreme Verb Method used in the

data analysis may have hidden some of the between-verb variations, thus producing an incomplete picture of the acquisition story. Third, the role of English proficiency is not investigated in this study, which has not brought to light the developmental path of L2 acquisition of alternating unaccusatives. Fourth, the influence of pragmatic discourse and the transfer of L1 are not examined in this study, which may also contribute to the between-verb variations of alternating unaccusatives. Fifth, the interview data and the textbook corpus data are not analysed systematically. Future studies are encouraged to overcome these limitations by including more target words, analysing the learner data in a more careful way, tracking the development of L2 acquisition of alternating unaccusatives and considering more contributing factors such as discourse pragmatics and L1 influence.

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Appendixes

Note 1: The two tasks of this paper are part of another study with more research purposes. To keep the two tasks unchanged in the least sense, the full form of the original version is provided as follows.

Note 2: The following two tasks were designed in Chinese. English instructions, directions and reminders were provided when they were included in this book for publication. They are written in the italicised form and brackets for the purpose of differentiation.

(Hello, there.

Thank you very much for participating in this English language survey, which is composed of two tasks. Please proceed with Task 1. When you finish it, you can start doing Task 2.

Before you start, please provide some background information about yourself. Your information and your performance in the two tasks will be used for research purposes only. Please feel safe.

Thank you.)

同学:

您好!

首先, 非常感谢您参与本次的英语能力测试。本测试由两个语言任务组成。请先完成任务1, 再完成任务2。

在开始之前, 请简单说明您的背景信息。您提供的信息和将要完成的两个语言任务, 都会被严格保密, 将只用于研究的目的。敬请放心。

谢谢!

(School: _____ Class: _____ Student number: _____ Chinese name: _____).

学校: _____ 班级: _____.

学号: _____ 姓名: _____.

Appendix A

Written Production Task

(Task 1)

任务**1**

*(**Directions**: Please make sentences with the given verb and noun phrase. You can make whatever sentences you like, as long as your sentences contain the given verb and noun phrase and are grammatically correct. You are encouraged to make as many different sentences as possible, as long as each sentence uses the given verb in a different way.)*

说明: 请用所给的动词和名词短语组合造句。你可以自由地造句, 但你造出来的每一个句子都必须包含所给的动词和名词短语组合, 而且都必须合乎语法。我们希望你能为每个组合造尽可能多的句子 (越多越好), 但是每个句子中动词的用法要各不相同。

*(**Example**: learn / the Chinese language.*

More and more foreigners (外国人) are learning the Chinese language.

The Chinese language is learned by more and more foreigners (外国人).)

例如: learn / the Chinese language.

More and more foreigners (外国人) are learning the Chinese language.

The Chinese language is learned by more and more foreigners (外国人).

(As is shown above, a student makes two sentences with the given verb "learn" and the given noun phrase "the Chinese language." Both sentences are grammatically correct. What's more, they use the given verb "learn" in different ways. One is in the active voice, and the other the passive voice.)

如上所示, 某学生用learn / the Chinese language组合造了两个合乎语法的句子, 而且在这两个句子中动词learn的用法各不相同。一个是主动态的用法, 一个是被动态的用法。

(Reminders: First, although some of the given verbs (e.g. fall, break, change and laugh) can be used as nouns, you are asked to use them not as nouns, but as verbs. Second, if you meet any unknown words, you can ask the survey administrator for help. Third, although there is no time limit on this task, please move on to the next task when you finish it.)

提醒: (1) 虽然有些动词也可以做名词, 比如fall、break、change和laugh等, 但是请你不要把它们用做名词, 而要把它们作为动词来造句。(2) 如果你遇到不认识的单词, 可以提出来。(3) 本任务没有时间限制, 但你做完之后就请开始下一个任务。

Arrive/a strange man (陌生人)

Run/the young athletes (年轻的运动员)

Break/the glass cup (玻璃杯)

Exist/some old customs (旧风俗)

Cry/the little boy (小男孩)

Improve / people's health (人们的健康)

Appear / a new product (新产品)

Sing/the famous singer (著名歌星)

Sink/the small boat (小船)

Remain/only a few things (只有少数几样东西)

Dance/the beautiful girl (美丽的女孩)

Increase/the vegetable prices (蔬菜的价格)

Fall/many leaves (许多树叶)

Laugh/the audience (观众)

Change/her life attitude (她的生活观念)

Happen/a traffic accident (交通事故)

Swim/the little ducks (小鸭子)

Melt/the snow (雪)

_____
_____
_____
_____

(Thank you very much for finishing Task 1. Please move to the next page to start Task 2.)

感谢您完成任务1, 请翻至下一页开始任务2。

Appendix B

Acceptability Judgment Task

(Task 2)

任务**2**

(Directions: Please read each of the following paragraphs and decide on a 5-point scale the acceptance of each underlined part in terms of both grammatical correctness and contextual appropriateness. If you assign a negative score, please identify the error you perceive and correct it.)

说明: 请仔细阅读下面的段落, 然后从语法正确和语境得体两个方面来判断各划线句子的可接受程度, 并根据所给的5分制对其打分。如果你给的是负值, 请指出错误并改正。

−2	−1	0	+1	+2
completely Unacceptable	slightly unacceptable	cannot decide	slightly acceptable	completely acceptable

−2	−1	0	+1	+2
完全不能接受	有点不能接受	无法判断	有点能接受	完全能接受

are

(Example:** Jane has three sisters. **All of them \is\ ∨ college students.)

−2 −1 0 +1 +2

are

例如： Jane has three sisters. **All of them \is\ ∨ college students.**

−2 −1 0 +1 +2

(A student circles -2, because he/she finds the underlined part completely unacceptable. He/she perceives that the subject of the given sentence is given in the plural form and therefore "is" is not acceptable and "are" is needed. So he/she crosses "is" out and provides "are" for it, as shown above.)

某学生选择 -2, 是因为他觉得该划线句子完全不能接受。他发现, 该句子的主语是复数, 所以不能用 is, 而要用 are。因此, 他把 is 划掉, 在其周围写上正确的单词are (如上所示)。

(Reminders: First, please don't worry about whether your performance is correct or wrong in that this task only aims at investigating your language intuition. ***What you are expected to do is to make a quick judgment according to your first response****. Second,* ***please do the judgment according to its natural order. Don't refer back to the previous ones or skip any items****. Third, the part without any underlining is correct.* ***You only need to decide the acceptance of each underlined part****. Fourth, when you meet any unknown word, you can ask for help. Fifth, there is no time limit on this task. But you are expected to submit your test paper as soon as you finish it.)*

提醒: (1)因为本任务的目的是调查你的语感, 所以请不要担心对错。你只需根据自己的第一反应迅速做出判断即可。(2)在做题的过程中,请按照先后顺序依次往下做, 而不要往回翻, 也不要漏题。(3)不划线的部分都是正确的, 你只需判断划线句子的可接受程度。(4)如果你遇到不认识的单词, 可以提出来。(5)本任务没有时间限制, 但你做完之后就请立即交卷。

(1) David had a party last weekend. **Many people invited to his party.**

−2 −1 0 +1 +2

(2) **The birthday cake fell on the floor.**

−2 −1 0 +1 +2

(3) **The window broke** when it was hit by a stone.

−2 −1 0 +1 +2

(4) **The little boy cried** when the nurse was about to (准备) give him an injection (给他打针).

−2 −1 0 +1 +2

(5) **I improved my spoken English (英语口语) a lot** after I went to college (上大学).
−2 −1 0 +1 +2

(6) **The lab assistant (助手) happened an accident** when he mixed (混合) the wrong chemicals (化学药剂) together.
−2 −1 0 +1 +2

(7) **The teacher sang all the students together** as she played the piano (弹钢琴).
−2 −1 0 +1 +2

(8) The famous writer wrote a new novel (小说). **It published a month later.**
−2 −1 0 +1 +2

(9) **That patient (病人) was remained in the hospital for a few more days.**
−2 −1 0 +1 +2

(10) **His lifestyle (生活方式) was completely changed** after he got married (结婚).
−2 −1 0 +1 +2

(11) **Tom is swum for more hours every day** after he got a new coach (教练).
−2 −1 0 +1 +2

(12) Jane wrote a Christmas card (圣诞节贺卡) yesterday. **It mailed out today.**
−2 −1 0 +1 +2

(13) **Gender discrimination (性别歧视) exists in today's job market (人才市场).**
−2 −1 0 +1 +2

(14) In less than a year, **the number of workers in that factory increased from 100 to 500.**
−2 −1 0 +1 +2

(15) **Jack ran faster and faster** when his classmates cheered (为…鼓劲加油) him loudly.
−2 −1 0 +1 +2

(16) **My grandma melted the butter (黄油) quickly** when she put it on the stove (炉子).
−2 −1 0 +1 +2

(17) **The little girl fell the birthday cake on the floor.**
−2 −1 0 +1 +2

(18) **The audience (观众) danced the dancers (舞蹈演员) more enthusiastically (热情地)** when they applauded (鼓掌).
−2 −1 0 +1 +2

(19) **A dove (鸽子) was appeared out of the magician's (魔术师) sleeve (袖子).**
−2 −1 0 +1 +2

(20) **The small ship was sunk** after it ran into (撞上) a huge iceberg (冰山).
−2 −1 0 +1 +2

(21) **The little boy was cried** when the nurse was about to (准备) give him an injection (给他打针).
−2 −1 0 +1 +2

(22) I borrowed a book from the library. **It returned to the library a week later.**
−2 −1 0 +1 +2

(23) **He changed his lifestyle (生活方式) completely** after he got married (结婚).
−2 −1 0 +1 +2

(24) **The postman arrived today's newspaper earlier than usual (比平常早).**
−2 −1 0 +1 +2

(25) **The funny clown (滑稽的小丑) laughed all the people** when he started to perform (开始表演).

−2 −1 0 +1 +2

(26) It is a new bicycle. **It must keep inside the house at night.**

−2 −1 0 +1 +2

(27) **An accident was happened** when the wrong chemicals (化学药剂) were mixed (混合) together.

−2 −1 0 +1 +2

(28) In less than a year, **the number of workers in that factory was increased from 100 to 500.**

−2 −1 0 +1 +2

(29) **Jack was run faster and faster** when his classmates cheered (为…鼓劲加油) him loudly.

−2 −1 0 +1 +2

(30) **That patient (病人) remained in the hospital for a few more days.**

−2 −1 0 +1 +2

(31) **My spoken English (英语口语) improved a lot** after I went to college (上大学).

−2 −1 0 +1 +2

(32) **The dancers (舞蹈演员) danced more enthusiastically (热情地)** when the audience (观众) applauded (鼓掌).

−2 −1 0 +1 +2

(33) My son wanted a new football. **It bought this morning.**

−2 −1 0 +1 +2

(34) **Gender discrimination (性别歧视) is existed in today's job market (人才市场).**

−2 −1 0 +1 +2

(35) **The window was broken** when it was hit by a stone.
−2 −1 0 +1 +2

(36) **All the students were sung together** as their teacher played the piano (弹钢琴).
−2 −1 0 +1 +2

(37) **Today's newspaper arrived earlier than usual (比平常早).**
−2 −1 0 +1 +2

(38) **The small ship sank** after it ran into (撞上) a huge iceberg (冰山).
−2 −1 0 +1 +2

(39) **All the people laughed** when the funny clown (滑稽的小丑) started to perform (开始表演).
−2 −1 0 +1 +2

(40) It rained heavily (下暴雨) for several days. **Many crops destroyed in this heavy rain (暴雨).**
−2 −1 0 +1 +2

(41) **A bad boy broke the window with a stone.**
−2 −1 0 +1 +2

(42) **The doctor remained that patient (病人) in the hospital for a few more days.**
−2 −1 0 +1 +2

(43) **The nurse cried the little boy** when she was about to (准备) give him an injection (给他打针).
−2 −1 0 +1 +2

(44) Helen made an apology (道歉) to her mother. **Her apology accepted quickly.**
−2 −1 0 +1 +2

(45) **The birthday cake was fallen on the floor.**
−2 −1 0 +1 +2

(46) **My spoken English (英语口语) was improved a lot** after I went to college (上大学).
−2 −1 0 +1 +2

(47) **The dancers (舞蹈演员) were danced more enthusiastically (热情地)** when the audience (观众) applauded (鼓掌).

−2 −1 0 +1 +2

(48) Several years passed by. **The details (细节) of the event (事件) forgot.**

−2 −1 0 +1 +2

(49) **An accident happened** when the wrong chemicals (化学药剂) were mixed (混合) together.

−2 −1 0 +1 +2

(50) **His lifestyle (生活方式) completely changed** after he got married (结婚)**.**

−2 −1 0 +1 +2

(51) **Tom swims for more hours every day** after he got a new coach (教练).

−2 −1 0 +1 +2

(52) **The huge iceberg (冰山) sank the small ship.**

−2 −1 0 +1 +2

(53) **The magician (魔术师) appeared a dove (鸽子) out of his sleeve (袖子).**

−2 −1 0 +1 +2

(54) **Jack's classmates ran Jack faster and faster** when they cheered (为…鼓劲加油) him loudly.

−2 −1 0 +1 +2

(55) The left brake (左刹车) of my bike didn't work well. **It repaired immediately.**

−2 −1 0 +1 +2

(56) **Today's newspaper was arrived earlier than usual (比平常早).**

−2 −1 0 +1 +2

(57) **The butter (黄油) was melted quickly** when it was put on the stove (炉子).

−2 −1 0 +1 +2

(58) **All the people were laughed** when the funny clown (滑稽的小丑) started to perform (开始表演).

−2 −1 0 +1 +2

(59) Everyone agreed that something should be done. **A decision made soon.**

−2 −1 0 +1 +2

(60) In less than a year, **the factory owner (工厂的老板) increased the number of workers in that factory from 100 to 500.**

−2 −1 0 +1 +2

(61) **Some employers (雇主) exist gender discrimination (性别歧视) in today's job market (人才市场).** −2 −1 0 +1 +2

(62) **Tom's new coach (教练) swims Tom for more hours every day.**

−2 −1 0 +1 +2

(63) The teacher pointed out the mistakes in the students' homework. **The mistakes corrected immediately.** −2 −1 0 +1 +2

(64) **A dove (鸽子) appeared out of the magician's (魔术师) sleeve (袖子).**

−2 −1 0 +1 +2

(65) **The butter (黄油) melted quickly** when it was put on the stove (炉子).

−2 -1 0 +1 +2

(66) **All the students sang together** as their teacher played the piano (弹钢琴).

−2 −1 0 +1 +2

(Please submit your test paper as soon as you finish it. Thank you very much for your participation and support.)

做完之后, 请立即交卷。谢谢您的参与和支持!

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Acquisition of English Ditransitives by Mandarin Chinese Learners

Hai Xu

Abstract Both English and Chinese ditransitives imply a "transfer", but differ in terms of transfer directions and dativisable verb types. This study investigates (1) the classes of English dativisable verbs that Chinese EFL learners are most likely to produce and (2) the role of L1 in the acquisition of English ditransitives. Concordances of dativisable verbs in the Chinese Learner English Corpus show that the verb classes of "giving" and "communicated message" constitute the largest proportion of the correct usage of ditransitives by Chinese EFL learners. A grammaticality judgement test was administered to a group of postgraduate students ($n = 106$) and a group of undergraduate students ($n = 134$) at two different proficiency levels. Under four different conditions of treatment, they were required to make a judgement of the English translations of four different types of dativisable verb. Results show that L1 transfer facilitates the grammaticality judgement when English dativisable verbs are congruent with their Chinese counterparts and hinders the judgement when there is incongruency between English dativisable verbs and their Chinese equivalents. It was further found that the "top-down" approach of instruction of L2 English ditransitives is more effective than the "bottom-up" approach. This study concludes that the central task challenging Chinese EFL learners is, to a large extent, to reorganise the conceptual structure of ditransitives.

Keywords Ditransitive · Transfer direction · Dativisable verb classes · Top-down approach · Conceptual reorganisation

1 Introduction

The issue of how ditransitives are acquired by L1 speakers and by L2 learners has received considerable attention. Ditransitive (or double-object dative) is one of the earliest functional categories acquired by L1 young children. Based on the CHILDES database, Campbell and Tomasello (2001) reported that L1 children aged between

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1.6 and 2.3 have acquired the double-object dative before either the *to* dative or the *for* dative. The dativisable verbs L1 children use in their utterances are not confined to adult prototypical ones (e.g. *give*, *bring* and *feed*), but also include some less typical ones (e.g. *show*, *send*, *read*, *get* and *make*). This is largely due to "their frequency and saliency in the language children heard" (Campbell & Tomasello, 2001, p. 253). Kiekhoefer (2002) found that L1 English/German children aged between 2 and 3 show the item-based nature and gradual appearance of more abstract conceptual domains while acquiring ditransitives, and there is evidence for very specific metaphoric blends even at this early age.

A number of studies have explored the complexity of L2 acquisition of ditransitives by adopting either the generative grammar or cognitive grammar approach. Following a minimalist framework, Drenhaus (2000) ascribed the process of acquiring ditransitive verb constructions in German to a change in the feature matrix of adverbs and focus particles. Incorporating corpus contrastive interlanguage analysis and usage-based approaches, Xu (2016) focused solely on the learning of *give* ditransitive construction and demonstrated an item-based learning process of *give* ditransitive constructions by Chinese EFL learners. Year and Gordon (2009) considered the roles of dativisable verb prototype, input distribution and frequency in the acquisition of the English ditransitive construction by Korean speakers and suggested that construction learning is superior with a more balanced set of dativisable verbs to a focus on a single prototype.

Using the syntactic priming paradigm, McDonough (2006) examined L2 English speakers' production of dative constructions. She found that during interaction between the L2 English speakers, syntactic priming occurred with prepositional datives only, and there was no evidence of syntactic priming for ditransitives even when the L2 participants only received ditransitive dative primes. McDonough (2006, p. 193) attributed it to "the complex semantic and morphological rules associated with the double-object dative". According to her, the L2 English learners "might not have reached the abstract representation stage, in which case their production of double-object datives would be limited to specific lexical items" (McDonough, 2006, p. 194). In her study, the L2 participants produced 63% of the ditransitive targets with only two verbs *ask* and *teach* and did not produce any ditransitive targets with eight of the given verbs, namely *make*, *bring*, *cut*, *pour*, *cook*, *toss*, *knit* and *pass*. She claimed that the L2 learners' use of the double-object dative form might be item-specific. However, McDonough (2006) might fail to consider the L1 transfer effect. In her two experiments, 72% (36/50) and 59.26% (32/54) of the participants were L1 Chinese speakers, respectively. Those English verbs of creation (viz. *knit*, *cook*, *make* and *pour*) did not occur in the primed production of the ditransitive construction, for their Chinese equivalents are not dativisable. The L1 Chinese speakers seldom produced any ditransitive targets with *toss* because of its nuanced meaning in English. This suggests that we need to consider the effect of L1 transfer in L2 acquisition of English diatransitives.

Previous research has shed light on the roles of grammatical rules and cognitive factors in the L2 acquisition of ditransitives. However, compared with studies of L1 acquisition of ditransitives, there is a surprising paucity of studies investigating the

classes of dativisable verbs L2 learners tend to produce. An examination of prototypical, metaphoric and non-prototypical classes of ditransitives L2 learners have produced is instrumental in our understanding of how L2 learners acquire ditransitives. Another research gap in the literature is that few studies have examined the role of the L1 in the L2 acquisition of ditransitives. It remains unclear whether congruent/incongruent patterns of ditransitive usage between Chinese and English dativisable verbs (see Sect. 2.2) might affect the acquisition of English ditransitives by L2 learners.

2 Theoretical Underpinnings

It is generally assumed that L1 speakers have implicit knowledge of English dativisable verb classes (Goldberg, 1995, pp. 122–129). In other words, L1 speakers may unconsciously choose English dativisable verbs according to some semantic and morphological rules. In addition, to investigate the role of the L1 in the L2 acquisition, we need to compare and contrast English and Chinese ditransitive constructions.

2.1 Classes of English Dativisable Verbs

Pinker (2013, pp. 129–139) proposed a set of narrow-range rules to classify dativisable verbs:

(1) Verbs that inherently signify acts of giving, e.g. *give*, *pass*, *hand*, *sell*, *pay*, *trade*, *lend*, *loan*, *serve* and *feed*;
(2) Verbs of sending, e.g. *send*, *ship* and *mail*;
(3) Verbs of instantaneous causation of ballistic motion, e.g. *throw*, *toss*, *flip*, *slap*, *kick*, *poke*, *fling*, *blast* and *shoot*;
(4) Verbs of continuous causation of accompanied motion in a deictically specified direction: *bring* and *take*;
(5) Verbs of future having (involving a commitment that a person will have something at some later point), e.g. *offer*, *promise*, *bequeath*, *leave*, *refer*, *forward*, *allocate*, *guarantee*, *allot*, *assign*, *advance*, *award*, *reserve* and *grant*;
(6) Verbs of communicated message, e.g. *tell*, *show*, *ask*, *teach*, *pose*, *write*, *spin*, *read*, *quote* and *cite*;
(7) Verbs of instrument of communication, e.g. *radio*, *satellite*, *e-mail*, *telegraph*, *wire*, *telephone*, *netmail* and *fax*;
(8) Verbs of creation, e.g. *bake*, *make*, *build*, *cook*, *sew*, *knit*, *toss* (when a salad results), *fix* (when dinner results) and *pour* (when a drink results);
(9) Verbs of obtaining, e.g. *get*, *buy*, *find*, *steal*, *order*, *win*, *earn* and *grab.*

Goldberg (1995, p. 128) suggested that at least one additional subclass of dativisable verbs should be added to the list:

(10) Verbs of refusal, e.g. *refuse* and *deny*.

Levin (1993, pp. 45–48) proposed some more classes of dativisable verbs:

(11) Slide verbs: *bounce*, *float*, *roll* and *slide*;
(12) Bill verbs: *bet*, *bill*, *charge*, *fine*, *mulct*, *overcharge*, *save*, *spare*, *tax*, *tip*, *undercharge* and *wager*;
(13) Appoint verbs: *acknowledge*, *adopt*, *appoint*, *consider*, *crown*, *deem*, *designate*, *elect*, *esteem*, *imagine*, *mark*, *nominate*, *ordain*, *proclaim*, *rate*, *reckon*, *report* and *want*;
(14) Dub verbs: *anoint*, *baptise*, *brand*, *call*, *christen*, *consecrate*, *crown*, *decree*, *dub*, *label*, *make*, *name*, *nickname*, *pronounce*, *rule*, *stamp*, *style*, *term* and *vote*;
(15) Declare verbs: *adjudge*, *adjudicate*, *assume*, *avow*, *believe*, *confess*, *declare*, *fancy*, *find*, *judge*, *presume*, *profess*, *prove* and *suppose*.

In the above classes, (1), (2) and (4) are considered to be prototypical ones; (3), (6) and (7) are metaphorical ones; and the rest are non-prototypical ones (Campbell & Tomasello, 2001, p. 261; Goldberg, 1995, pp. 31–39).

There are other classes of verbs that are non-dativisable. Pinker (2013, pp. 130–138) listed the following:

(1) Verbs of fulfilling, e.g. **present*, **credit*, **reward*, **entrust*, **honour*, **supply* and **bestow*;
(2) Verbs of continuous causation of accompanied motion in some manner, e.g. **carry*, **pull*, **push*, **schlep*, **lift*, **lower* and **haul*;
(3) Verbs of manner of speaking, e.g. **shout*, **scream*, **murmur*, **whisper*, **shriek*, **yodel*, **yell*, **bellow*, **grunt* and **bark*;
(4) Verbs of proposition and propositional attitudes, e.g. **say*, **assert*, **question*, **claim*, **think* (*aloud/about*) and **doubt*;
(5) Verbs of choosing, e.g. **chose*, **pick*, **select*, **favour*, **indicate*, **prefer* and **designate*.

Goldberg (1995, pp. 128–129) summarised some more morphophonological constraints:

(6) Verbs with particular morphemes, e.g. **per-*, **con-*, **-mil* and *-s*ume*;
(7) Polysyllabic verbs with non-initial stress, e.g. **purchase*, **obtain*, **collect*, **explain*, **report* and **announce*. However, verbs of future having (e.g. *assign*, *allot*, *guarantee* and *bequeath*), verbs of instrument of communication (e.g. *e-mail* and *radio*) and verbs of creation (e.g. *xerox* and *thermofax*) are exceptions to this rule.

The classification of dativisable/non-dativisable verbs highlights the effect of verb types in the L2 acquisition of English ditransitives and offers insights into L2 learners' developmental trajectory.

2.2 English Versus Chinese Ditransitives

Ditransitives in both English and Mandarin Chinese share the typical meaning that "the agent acts to cause transfer of an object (the referent of the direct object) to the recipient (the referent of the indirect object)" (Goldberg, 1995, p. 141; Zhang, 1999, pp. 196–197). Nevertheless, the two languages also distinguish from each other in terms of transfer directions and dativisable verb types. Consider (1a) and (1b).

(1) a. Jack bought Susan a bicycle.
b. 傑克 買了 蘇珊 一輛 自行車。
jiékè mǎile sūshān yīliàng zìxíngchē
Jack buy_PFV Susan one_CL bicycle
"Jack bought Susan's bicycle."

While "the bicycle" in (1a) is transferred from the subject (i.e. "Jack") to the indirect object (i.e. "Susan"), the transfer direction of "the bicycle" in (1b) is diametrically opposite. To put it in another way, some of the dativisable verbs in Mandarin Chinese are unique in that they licence the movement of the patient from the indirect object to the subject (Lin, 2000; Shi, 2004, 2020; Xu, 2007).

Some verbs in Mandarin Chinese are also distinctive in that they can occur in ditransitives with two opposite interpretations. For instance,

(2) 我 上了 她 一節 課。
wǒ shàngle tā yījié kè
I teach/learn_PFV her one_CL lesson
"I offered her a lesson." / "I attended a lesson by her."

Out of context, "上" (shàng) in (2) is ambiguous, for it licences an antonymous pair in ditransitives. Similarly, "借" (jiè), a highly frequent verb, can be subsumed under two opposite meanings of "lend" and "borrow" in Chinese ditransitives (cf. Shi, 2004, 2020).

In addition, some English verbs acquire the meaning of "giving" or "transfer" when they are used in the ditransitive construction, whereas the Chinese counterparts of those English dative verbs are illegal in this construction. Consider (3a) and (3b).

(3) a. Jack baked Susan a cake.
b. *傑克 烤了 蘇珊 一塊 蛋糕。
jiékè kǎole sūshān yīkuài dàngāo
Jack bake_PFV Susan one_CL cake

"Bake" originally does not imply "transfer" and acquires such a meaning only when it is compatible with the English ditransitive construction. By contrast, its corresponding Chinese verb "烤" (kǎo) is not licenced with the ditransitive pattern.

In the current research design, we consider the role of the L1, that is, in what way L1 knowledge of Chinese dativisable verb types facilitates or inhibits the production of L2 English ditransitives.

Specifically, this article addresses the following two research questions:

(1) What classes of English dativisable verbs are Chinese EFL learners most likely to produce?

(2) What is the role of the L1 in the acquisition of English ditransitives by Chinese EFL learners?

We adopted a corpus-based approach to the classes of English dativisable verbs that frequently occur in EFL Chinese learners' production. For the second research question, we conducted a grammaticality judgement test.

3 A Corpus-Based Study

This study was designed to investigate, on the basis of a balanced learner corpus, the main classes of dativisable verbs that Chinese EFL learners are likely to produce.

3.1 Method

The Chinese Learner English Corpus (CLEC), which contains around one million tokens, represents how secondary and college students in mainland China acquire English (Gui & Yang, 2002). Concordances of the CLEC would show how Chinese EFL learners acquire English ditransitives.

Since the CLEC has not been coded with errors of English ditransitives, it is difficult to retrieve those errors using concordance tools. We decided to make an exhaustive list of English dativisable verbs and to concordance them one by one. By referring to Pinker (2013), Levin (1993) and Goldberg (1995), we collected 295 dativisable verbs. After the searches for ditransitives in the CLEC, we categorised them into three groups: prototypical, non-prototypical and metaphorical (c.f. Campbell & Tomasello, 2001, p. 261; Goldberg, 1995, pp. 31–39). As pointed out in Sect. 2.1, GIVE verbs, SEND verbs and BRING and TAKE verbs are of prototypical classes; verbs of instantaneous causation of ballistic motion (e.g. *toss*), verbs of communicated message (e.g. *write*) and verbs of instrument of communication (e.g. *radio*) fall into the category of metaphorical dative verbs; and the remaining are of non-prototypical ones.

3.2 Results

In the CLEC, there are altogether 1941 hits of ditransitive expressions. Out of the 295 dativisable verbs as reported in the literature, only 37 (12.54%) were used. Table 1 lists the classes and occurrences of the 37 dativisable verbs in the CLEC. Of all the ditransitives found in this corpus, the metaphorical classes of dativisable verbs constitute the largest proportion: 802 (41.32%) ditransitives produced with seven dativisable verbs. The prototypical classes of dativisable verbs occupy the second

Table 1 Dativisable verb classes and their occurrences in the CLEC

I. Prototypical classes	
GIVE verbs	*give* (497), *pay* (7), *hand* (3), *feed* (2), *pass* (2), *sell* (2), *lend* (1), *render* (1), *repay* (1)
BRING and TAKE verbs	*bring* (131), *take* (65)
II. Non-prototypical classes	
Verbs of future having	*offer* (40), *leave* (13), *grant* (2), *allow* (1), *allocate* (1), *award* (1), *owe* (1), *promise* (1)
Verbs of creation	*make* (7), *prepare* (1)
Verbs of obtaining	*find* (1)
DUB verbs	*call* (232), *name* (67), *dub* (9), *nickname* (2)
APPOINT verbs	*consider* (8)
Possession-change verbs	*cost* (12), *fine* (1)
LONG verbs	*wish* (27)
III. Metaphorical classes	
SEND verbs	*send* (25)
Verbs of communicated message	*tell* (483), *ask* (145), *teach* (94), *show* (48), *write* (5), *read* (2)

place: 712 (36.68%) ditransitive expressions produced with 11 prototypical dativisable verbs. And only 427 (22%) ditransitive expressions are produced with 19 non-prototypical dativisable verbs. Although the number of prototypical and metaphorical dativisable verbs produced by learners is smaller than that of non-prototypical ones, the frequencies of the former are higher than the latter. In other words, Chinese EFL learners have a tendency to use typical dativisable verbs to produce ditransitives. This suggests that dativisable verbs with the inherent transfer of possession and verbs with the implied meaning of "giving to a direct recipient" are more easily acquired by Chinese EFL learners than those verbs with the implicit meaning of "giving to an intended recipient" (Xu, 2001, pp. 83–85).

As for specific dativisable verb classes, Table 1 shows that most ditransitive expressions were produced with "verbs of communicated message" (*tell* and *ask*, in particular) and "GIVE verbs" (*give*, in particular), whereas there are very few instances of verbs of throwing, verbs of instruments of communication, verbs of future having, verbs of obtaining, SEND verbs, APPOINT verbs, possession-change verbs and verbs of creation. The results are largely consistent with McDonough (2006), in which *ask* and *teach* are the verbs frequently used in the ditransitive construction. Nevertheless, in the CLEC, *give*, *tell*, *call* and *bring* also frequently occur in the ditransitive construction.

A further analysis of concordance lines indicates that the L1 may play a role in the production of English ditransitive expressions. It is noted that 81.5% of the ditransitive expressions were produced with the verbs of *give*, *tell*, *call*, *ask*, *bring* and *teach*. This might be attributed to the fact that their Chinese counterparts 給 (gěi), 告訴 (gào·su), 叫 (jiào), 問 (wèn), 帶給 (dài·gěi) and 教 (jiāo) are typical dativisable

verbs in Chinese. If there are no equivalent Chinese dativisable verbs (e.g. verbs of instruments of communication and verbs of creation), those classes of English dativisable verbs will seldom occur in students' writing. Though they are licenced in both English and Chinese, some classes of English dativisable verbs (e.g. verbs of throwing) were also seldom used. This is because those English dativisable verbs (e.g. *bunt*, *flick* and *toss*) have subtle nuances of meaning.

4 A Grammaticality Judgement Test

A grammaticality judgement (GJ) test was adopted to investigate the role of the L1 in the acquisition of English ditransitives. Despite some criticisms, GJ test is found, to a large extent, to be valid and reliable (Gutierrez, 2013; Mandell, 1999). By comparing GJ test data with dehydrated sentence (DS) test data—an assessment tool commonly used in the L2 classroom, Mandell (1999) reported that GJ test is a reliable measure of L2 learners' linguistic knowledge. Gutierrez (2013, p. 445) further showed that the construct validity of a GJ test hinges "not only on aspects of the instrument […] but also on other aspects such as proficiency of the learners, the length of L2 expossure, and the type of instruction". Following Gutierrez (2013), we designed an untimed GJ test and recruited two groups of participants at different proficiency levels who received different types of written input. Thus, this test involves three independent variables (namely dativisable verb type, written input and L2 proficiency) and one dependent variable (viz. the accuracy rate of judgement).

4.1 Participants

To investigate whether proficiency is a variable affecting the grammaticality judgement of English ditransitives, a cohort of first-year postgraduate students ($n = 106$) of a key national university and a group of second-year undergraduate students ($n = 134$) of a provincial university in Guangzhou, China, were recruited to this grammaticality judgement test. All the students were non-English majors. The two groups of students represented L2 learners at different proficiency levels. In mainland China, postgraduate students are supposed to pass the National College English Test, Band 6 (CET6), and second-year undergraduate students, Band 4 (CET4)—a lower proficiency test.

An abridged version of the Vocabulary Levels Test (Nation, 2013), which consists of the test items from the 3000 and 5000 word levels, was administered to the students. Results showed that the vocabulary size of those postgraduate students was significantly larger than that of undergraduate students: $F(1, 207) = 306.58$, $p < 0.05$. According to Schmitt (2010, p. 4), there are typical high correlations between measures of vocabulary size and various measures of language proficiency. Hence, those postgraduate students can be claimed to be at a higher English proficiency level than second-year undergraduate students.

Using the boxplot, we screened the outliers from the data of this grammaticality judgement test. The valid data of 209 participants, with 95 postgraduate students and 114 undergraduate students, entered into the final analysis.

4.2 Instrument

While English ditransitives can only express a normal single-direction transfer (i.e. the patient is transferred from the subject to the indirect object), the transfers exhibited in Chinese dativisable verbs allow three possibilities: (1) a normal single-direction transfer as in English dativisable verbs; (2) a reverse transfer from the indirect object to the subject, as opposed to English ditransitives; or (3) a bidirectional transfer. Obviously, the last two types of ditransitive are unique in Mandarin Chinese. Due to L1 transfer, Chinese EFL learners may mistakenly think that the English counterparts are applicable to the English ditransitive construction [see (4)], or believe that English and Chinese ditransitives are identical in structure and meaning [see (1) above].

(4) a. 他借走我 一 本 書。
tā jièzǒu wǒ yīběn shū
he borrow me one_CL book
"He borrowed a book from me."
b. *He borrowed me a book.

In addition, verbs of instruments of communication and verbs of creation in Mandarin Chinese are not dativisable, whereas their corresponding English verbs are allowed. Consider (3) and (5). The differences between the two languages explain why Chinese EFL learners often underuse or misuse those two classes of English dativisable verbs.

(5) a. *她 織了 我 一件 毛衣。
tā zhīle wǒ yījiàn máoyī
she knit_PFV me one_CL sweater
b. She knitted me a sweater.

The instrument we designed focuses on four types of dativisable verb: (1) dativisable verbs involving a normal single-direction transfer; (2) Chinese dativisable verbs involving a reverse transfer; (3) Chinese dativisable verbs involving a bidirectional transfer; and (4) dativisable verbs unique in English. For the first type, the following five pairs of typical Chinese and English dativisable verbs were included: 給 (gěi)—*give*, 賣 (mài)—*sell*, 告訴 (gào·su)—*tell*, 付 (fù)—*pay* and 教 (jiāo)—*teach.* All these pairs of verbs share similar ditransitive patterns and meanings. For the second type, the following were selected: 買 (mǎi)—*buy*, 拿 (ná)—*take*, 偷 (tōu)—*steal*, 吃 (chī)—*eat* and 抽(煙) (chōu/yān)—*smoke*. Though the first three pairs of verbs are all dativisable, the transfer directions demonstrated in Chinese and English ditransitives are opposite; as for the last two pairs, 吃 and 抽(煙) are dativisable verbs in Chinese involving a reverse transfer, whereas their English counterparts *eat* and *smoke* are not licensed in the ditransitive pattern. For the third type, the following three pairs of verbs were chosen: 借 (jiè)—*lend/borrow*, 租 (zū)—*rent* and 換 (huàn)—*exchange*,

in which the verbs in Chinese are dativisable involving a bidirectional transfer. For the last type, dativisable verbs unique in English were included: 烤 (kǎo)—*bake*, 織 (zhī)—*knit*, 打電話 (dǎ diànhuà)—*telephone* and 電郵 (diànyóu)—*e-mail*.

This grammaticality judgement test consists of 20 sentences involving the above English and Chinese verbs. The participants were required to judge whether those English translations of Chinese sentences were grammatically acceptable and to correct them if they thought there was an error. It is hypothesised that the participants' judgement of English ditransitives will be interfered by their mother tongue (i.e. Mandarin Chinese).

In this GJ test, we used different types of instruction (cf. Gutierrez, 2013) to tap into the learners' knowledge of English ditransitives. Outside classes, L2 learners in mainland China are most likely to resort to a dictionary and/or a grammar book when they are uncertain about the usage of a grammatical construction. In this GJ test, the materials provided for the participants were similar to a mini dictionary and/or a grammar book. The participants were randomly assigned to any of the following four groups and then took the same grammaticality judgement test (see Appendix A). The students in Group 1 (indicated as I_0), the control group, did not receive any treatment and only took the test. The students in Group 2 (indicated as I_1) were given a booklet of dativisable verb entries (see Appendix B), similar to some pages of a mini dictionary. The students in Group 3 (indicated as I_2) were provided with a usage note (See Appendix C), which expounded on the usage of English and Chinese ditransitives. The students in Group 4 (indicated as I_3) were equipped with both a booklet of verb entries and a usage note.

4.3 Scoring and Data Analysis

One point was awarded if the participants made a correct judgement of English translations. For example, the following test item should be judged "incorrect", for *steal* is not dativisable in English; and it should be changed into "He stole a mobile phone from me".

(6) 他偷了我一部手機。= He stole me a mobile phone. ()

The maximum score for this test was 20 points. Using SPSS 26.0, we ran a 2 × 4 × 4 three-factor mixed ANOVA to test the effects of L2 proficiency of dativisable verb type and written input, respectively, as well as their interaction effects.

4.4 Results

L2 proficiency was found not to significantly affect the participants' grammaticality judgement of English ditransitives: $F(1, 201) = 1.238, p = 0.267, \eta^2 = 0.006$. Thus, it can be claimed that L2 learners' vocabulary size does not correlate to their knowledge of English ditransitives.

Table 2 lists the descriptive statistics of this test, including the means and standard deviations of dativisable verb types and different written inputs on the grammaticality judgement. The lowest scores were those dativisable verbs unique in English, and the treatment groups generally achieved higher scores than the control group in terms of Chinese dativisable verbs involving a reverse-direction transfer and those involving a bidirectional transfer.

As for the effect of dativisable verb types, the results of the three-factor mixed ANOVA show that this variable significantly affected the grammaticality judgement of English ditransitives: $F(2.432, 488.869) = 238.303$, $p < 0.01$, $\eta^2 = 0.542$. As Table 2 indicates, dativisable verbs involving a bidirectional transfer as well as those dativisable verbs involving a normal single-direction transfer earned the highest scores, whereas dativisable verbs unique in English achieved the lowest. The results of a post hoc analysis using a Bonferroni adjusted level of 0.05 further showed that there were no significant differences between dativisable verbs of a normal single-direction transfer and dativisable verbs of bidirectional transfers, and that the differences between other dativisable verb types were statistically significant. This suggests that the Chinese EFL learners had difficulty in judging the dativisability of

Table 2 Mean and standard deviations of dativisable verb types and written input on the dependent measures

Dativisable verb type	Written input	Mean	Standard deviation	N
Involving a normal single-direction transfer	I_0	4.64	0.62	42
	I_1	4.48	0.70	61
	I_2	4.58	0.59	64
	I_3	5.00	0.00	42
	Subtotal	4.65	0.60	209
Involving a reverse transfer	I_0	3.93	1.42	42
	I_1	4.28	0.66	61
	I_2	4.44	0.66	64
	I_3	4.43	0.70	42
	Subtotal	4.29	0.89	209
Involving a bidirectional transfer	I_0	4.55	0.67	42
	I_1	4.70	0.84	61
	I_2	4.70	0.77	64
	I_3	4.69	0.81	42
	Subtotal	4.67	0.78	209
Dativisable verbs unique in English	I_0	2.76	1.16	42
	I_1	2.67	0.96	61
	I_2	2.80	1.16	64
	I_3	2.79	1.12	42
	Subtotal	2.75	1.09	209

English verbs whose Chinese counterparts are dativisable verbs involving a reverse transfer, and that they had scant knowledge of those dativisable verbs unique in English.

As far as the variable of written input is concerned, it also exerts a statistically significant effect on the grammaticality judgement: $F(3, 201) = 2.15$, $p < 0.05$, $\eta^2 = 0.037$. The results of a post hoc analysis using a Bonferroni adjusted level of 0.05 demonstrate that there are significant differences between I_3 and I_0 and between I_3 and I_1. Hence, it is inadequate if learners only look up a traditional dictionary entry. They need a more detailed usage note of a grammatical construction.

The three variables did not show any interaction effect: (1) dativisable verb type versus written input: $F(7.297, 488.869) = 1.573$, $p = 0.138$, $\eta^2 = 0.023$; (2) dativisable verb type versus L2 proficiency: $F(2.432, 488.869) = 0.459$, $p = 0.670$, $\eta^2 = 0.002$; (3) written input versus L2 proficiency: $F(3, 201) = 0.632$, $p = 0.595$, $\eta^2 = 0.009$; and (4) dativisable verb type versus written input versus L2 proficiency: $F(7.297, 488.869) = 0.876$, $p = 0.529$, $\eta^2 = 0.013$.

5 Discussion

5.1 The Role of the L1

In this study, it was found that the Chinese EFL learners tended to produce more metaphorical and prototypical dativisable verbs than non-prototypical ones, that they often misused English verbs whose Chinese counterparts are the dativisable type involving a reverse transfer from the indirect object to the subject, and that they had limited knowledge of English dativisable verbs whose Chinese counterparts are not applicable to ditransitives. All the findings lend support to the claim that L1 transfer plays a role in the acquisition of English ditransitives by Chinese EFL learners. This is partly consistent with Yuan and Lin (2019), which found that in terms of dative constructions, L1 transfer takes place in Chinese-speaking learners' L2 English discourse but does not in English-speaking learners' L2 Chinese discourse. Nevertheless, Yuan and Lin (2019) did not determine the magnitude of dativisable verb type and written input in the acquisition of English ditransitives.

This study demonstrates both the promotive and inhibitory roles of the L1. Since the Chinese ditransitive construction shares a similar pattern and meaning with that of English, positive L1 transfer promotes the production of a large number of prototypical English ditransitives. On the other hand, negative L1 transfer was found to come into play. Most of the participants in the current research were at the L1 lemma mediation stage, in which "the lemma information of the L1 counterpart is copied into the L2 lexical entry and mediates L2 word use" (Jiang, 2000, p. 47). In Mandarin Chinese, verbs of instruments of communication and verbs of creation are not dativisable, whereas their English counterparts are. Learners might copy this semantic and syntactic information of Chinese lemma into corresponding L2 English lexical entry

and mediate L2 use. That can explain the underuse of English dativisable verbs of this type and the lowest scores in judging the grammaticality of those English verbs. In the same vein, the Chinese grammar licences some dativisable verbs which transfer the patient from the indirect object to the subject, whereas corresponding English verbs are not allowed. This results in the second lowest scores in the grammaticality judgement of English verbs of this type.

Underlying negative L1 transfer is the mechanism of language learning. According to the Compensation Hypothesis of L2 learning (Wang, 2003), L1 negative transfer will occur if learners lack authentic contexts compatible with L2 expressions. "By way of compensating this lack, L1 contextual knowledge comes in, thus activating those L1 forms which go with it, and resulting in L1 transfer" (Wang, 2003, p. 112). As far as English ditransitive is concerned, the linguistic and contextual knowledge might not be properly welded and thus is mediated and effected by L1 contextual knowledge. Learners will then unconsciously activate their knowledge of Chinese ditransitives. Therefore, to mitigate negative L1 transfer, learners need to develop semiotic competence and to interconnect verbal fluency with conceptual fluency (Danesi, 2000). More importantly, they need to be aware of the conceptual underlying structure: English dative verbs only involve a single normal transfer from the subject to the indirect object.

While teaching L2 learners how English ditransitives are used, English instructors often resort to an authoritative English grammar book and seldom introduce to students the similarities and differences between the usage of English and Chinese ditransitives. *Longman Grammar of Spoken and Written English* (Biber et al., 1999, pp. 388–392), for instance, only contains three short subsections introducing the semantics and grammatical pattern of ditransitives in relation to intransitive and monotransitive patterns. As the current study shows, a top-down approach, such as a usage note which compares and contrasts English and Chinese ditransitives, would be more beneficial to L2 learners. For the ease of understanding by L2 learners, a usage note can be written in their L1.

5.2 Top-Down Approach Versus Bottom-Up Approach

As the results of the grammaticality judgement test indicate, different types of written input affect the accurate judgement of English ditransitives. I_3, the integrated model, was found to be more effective than I_1, the traditional dictionary entry model. The integrated model is actually linked with the top-down approach of instruction, and the traditional dictionary entry model is linked with the bottom-up approach.

The main reason why the bottom-up approach of instruction is less effective is that this type of written input does not expound on the patterns and rules of a linguistic unit as well as its constraints. Learners will find it difficult if they have to make inferences from the entries by themselves. As the Compensation Hypothesis of L2 learning (Wang, 2003) predicts, the correct usage of an L2 lexical or syntactic unit is contingent upon the linking between authentic contextual knowledge and linguistic

form. This requires that a linguistic unit be explicitly explained. Although definitions and illustrative examples in a dictionary may provide useful information, learners' skill of using a dictionary is generally low, and it is not easy for them to retrieve the information that is crammed in dictionary entries. To complement definitions and illustrative examples, a usage note (e.g. Appendix C) can provide explicit information that facilitates the decoding and encoding of a linguistic unit.

With respect to the written input of the usage of English ditransitives, it would be helpful if both a dictionary entry and a usage note were provided. In such entries as *give* and *bake*, definitions and illustrative examples can show the semantic and syntactic information of those dativisable verbs. Moreover, those entries can be cross-referenced to the usage note of "English versus Chinese Ditransitives". This usage note is intended to explicate the conceptual underlying structures of English and Chinese ditransitives: the fundamental difference between English and Chinese ditransitives lies in the transfer direction of the patient. In English, the patient only undergoes a transfer from the subject to the indirect object ($S \rightarrow O_i$), whereas Chinese ditransitives allow three possible transfer directions: (i) a transfer from the subject to the indirect object ($S \rightarrow O_i$), (ii) a transfer from the indirect object to the subject ($S \leftarrow O_i$) and (iii) a transfer bidirectionally, ($S \leftrightarrow O_i$) (cf. Shi, 2020). Such schematised information needs to be accompanied with some specific examples so as to be informative and user-friendly. To summarise, the top-down approach of instruction is effective in that it is compatible with one of the claims of second language acquisition: the primary task facing EFL learners is that of conceptual reorganisation (Danesi, 2000, pp. 70, 158). The top-down approach of instruction is beneficial in helping L2 learners to "reorganize conceptually what they know already in new culturally-appropriate ways" (Danesi, 2000, p. 39). In the case of English ditransitives, Chinese EFL learners do not have to learn this construction, but rather reorganise its underlying conceptual structure: English ditranstives only allow the transfer from the subject to the patient.

The findings have pedagogical implications. Teachers need to make L2 learners aware of the similarities and differences between English and Chinese ditransitives. However, simply focusing on the surface differences between Chinese and English ditransitives is inadequate. During teaching, more emphasis should be placed on the differences in the conceptual underlying structures between L1 and L2, for "surface differences between languages are caused by differences in conceptualisation" (Danesi, 2000, p. 80). As there is a weak correlation between L2 proficiency and knowledge of English ditransitives, the top-down approach of instruction is applicable to L2 learners at any proficiency level. In our study, the learners above the upper-intermediate level still found it difficult to judge the correctness of English ditransitives and needed to be informed of the conceptual underlying structures of English and Chinese ditransitives. The implication for textbook designers is that they should spell out, in a usage note, the underlying differences in ditransitive patterns between Chinese and English. The explanation of the usage should be accompanied with specific examples and exercises. In brief, the primary teaching goal is to help L2 learners to entrench a new way of conceptualising English ditransitives.

6 Conclusion

This study shows that Chinese EFL learners tend to produce ditransitives with some prototypical and metaphorical classes of English dativisable verbs. It further demonstrates that L1 Chinese transfer plays a key role in the acquisition of English ditransitives. If the usage of an English dativisable verb is congruent with its Chinese counterpart, positive L1 transfer will occur. If the usage of an English dativisable verb does not correspond with its Chinese equivalent, negative L1 transfer will come into play. Based on the results of this study, there is an advantage of the top-down approach of instruction over the bottom-up approach. In the grammaticality judgement test, the former was found to be more effective than the latter. During L2 acquisition, the central task facing L2 learners is that of conceptual reorganisation. Hence, to promote Chinese EFL learners' acquisition of English ditransitives, instructors should provide L2 learners with substantial input of the conceptual underlying structure of English ditransitives.

This study was mainly based on an English learner corpus to examine Chinese-speaking learners' patterns of acquiring English ditranstives, and used a grammaticality judgement test to investigate the effect of L1 transfer on L2 acquisition. In future studies, researchers can collect more developmental data from students' written and spoken output to pursue the trajectory of L2 acquisition of English ditransitives, and consider adopting alternative approaches, such as the syntactic priming paradigm in McDonough (2006) and Kaan and Chun (2018), to triangulate the results concerning the role of L1 in the L2 acquisition of ditransitives. L2 instructors can further test whether the top-down approach of instruction is applicable in a more natural classroom setting.

Appendix A

Grammaticality judgement test

下列英文翻譯是否正確?正確的請打√; 有誤的打 × , 並請改正。

(Are the following English translations grammatically acceptable? If yes, please tick √. If you think it is inappropriate, please tick × , and correct it.)

(1) 他借 (給) 我一本書。
= He lent me a book. ( )

(2) 他借 (走) 我一本書。
= He borrowed me a book. ( )
(3) 我買了王教授一本書。
= I bought Prof. Wang a book. ( )
(4) 他賣我一輛自行車。
= He sold me a bicycle. ( )
(5) 我吃小王一個桃兒。
= I ate Little Wang a peach. ( )
(6) 他給我一支鉛筆。
= He gave me a pencil. ( )
(7) 他偷了我一部手機。
= He stole me a mobile phone. ( )
(8) 你能告訴我往火車站的路怎麼走嗎?
= Can you tell me the way to the railway station? ( )
(9) 我們付他100塊錢。
= We paid him 100 *yuan*. ( )
(10) 約翰拿了瑪麗一本書。
=John took Mary a book. ( )
(11) 她教我們英語。
= She teaches us English. ( )
(12) 我抽了他一支煙。
= I smoked him a cigarette. ( )
(13) 我租他一間房。(= 我從他那兒租了一間房。)
= I rented him a room. ( )
(14) 我租他一間房。(= 我租給他一間房。)
= I rented him a room. ( )
(15) 她烤了一塊生日蛋糕給我。
= She baked me a birthday cake. ( )
(16) 我打電話告訴她這則消息。
= I telephoned her the news. ( )
(17) 她換我一件新衣服。(= 她換給我一件新衣服。)
= She exchanged me a new dress. ( )
(18) 她換我一件新衣服。(= 她從我這兒換了一件新衣服。)
= She exchanged me a new dress. ( )
(19) 他有沒有將那份地址電郵給你?
= Has he emailed you that list of addresses yet? ( )
(20) 她給我織了一件毛衣。
= She knitted me a sweater. ( )

Appendix B

A booklet of dativisable verb entries

請先閱讀下面的動詞詞條解釋, 之後做題; 做題汉有把握時, 請再參照這些詞條。
(Please read the following verb entries before you take the test. You can refer to these entries again when you encounter difficulties in taking the test.)

bake /beɪk/ *verb* **1** [I or T] to cook inside a cooker, without using added liquid or fat 烘, 烤, 焙 (麵包、蛋糕等) : *Grandma always baked on Saturday.* 奶奶總是在星期六烤麵包。| **bake sth (for sb) / bake (sb) sth** *I'm baking a birthday cake for Alex. / I'm baking Alex a cake.* 我在給亞曆克斯烤一塊生日蛋糕。

borrow / ˈbɒrəʊ/ *verb* **1** [T] to use something that belongs to someone else and that you must give back to them later 借入, 借來: *Can I borrow your calculator?* 我能借用你的計算器嗎?| **borrow sth from sb/sth** *I borrowed a camera from Tom.* 我向湯姆借了架照相機。

buy /baɪ/ *verb* [I or T] (**bought, bought**) to obtain something by paying money for it 買, 購買: *Eventually she had saved enough money to buy a small car.* 最終她存了足夠的錢, 可以買一輛小汽車了。| **buy sb sth** *He's always buying me presents.* 他總是給我買禮物。

eat /iːt/ *verb* [I or T] (**ate, eaten**) to put or take food into the mouth, chew it, and swallow it 吃: *Do you eat meat?* 你吃肉嗎?| *When I've got a cold, I don't feel like eating.* 我感冒時候不想吃東西。

exchange / ɪksˈtʃeɪndʒ/ *verb* [T] **1** to give something to someone and receive something from them 交換; 互換: We exchanged addresses and promised to write to one another. 我們交換了地址, 答應要給彼此寫信。| **exchange sth for sth** *The tokens can be exchanged for goods in any of our shops.* 禮券可在我們的任何一家店兌換商品。

give /gɪv/*verb* (**gave, given**) **1** [I or T] to offer something to someone, or to provide them with it 給, 交給: **give sb sth** *Give your mother the letter.* 把信給你母親。

knit /nɪt/ *verb* (**knitting, knitted** or **knit, knitted** or **knit) 1** [I or T] to make clothes, etc. by using two long needles to connect wool or another type of thread into joined rows 編織; 針織: *She reads and knits to pass the time.* 她以閱讀和織毛衣來打發時間。| **knit sb sth** *I'm knitting him a sweater for Christmas.* 我在織一件耶誕節時送給他的毛衣。| **knit sth for sb** *She knitted a blanket for the baby.* 她在給那嬰兒織了條毯子。

lend /lend/ *verb* (**lent, lent**) **1**[T] to give something to someone for a short period of time, expecting it to be given back 借給, 借出: *I've lent the car to a friend.* 我把車借給了一位朋友。| **lend sb sth** *She lent me her very expensive coat*. 她把她那件極昂貴的外套借給了我。

mail (mainly US) /meɪl/ *verb* [T] (mainly UK **post**) to send a letter or parcel or email something 郵寄: *She mailed it last week but it still hasn't arrived.*她是上星期寄的, 但現在還未到。| **mail sb sth / mail sth to sb.** *I promised to mail him the article / mail the article **to** him.* 我答應給他寄這篇文章。

pay /peɪ/ *verb* [I or T] (**paid, paid**) **1** to give money to someone for something you want to buy or for services provided 支付; 付: *Ill pay for the tickets.* 我來買票。| **pay sb sth** *I paid him $5 to cut the grass.* 我付了他五美元除草。

rent /rent/ *verb* [T] to pay or receive a fixed amount of money for the use of a room, house, car, television, etc 租用; 出租: *How long have you been renting this place?* 你租用這個地方多長時間呢?| *He rents rooms in his house to students.* 他把家中的房間租給學生。| **rent sb sth** *The old lady rented us her spare bedroom for £5 a week.* 這位老太太以一周5英鎊的租金租給我們她空閒的臥室。

sell /sel/ *verb* [I or T] (**sold, sold**) to give something to someone else in return for money 賣; 出售: *He regrets selling all his old records.* 他後悔賣掉了所有的舊唱片。| **sell sb sth** *I sold him my car/I sold my car to him for £600.* 我以600英鎊的價錢把我的車賣給了他。

smoke /sməʊk/ *verb* [I or T] **1** to breathe smoke into the mouth and usually lungs from a cigarette, pipe, etc 抽 (香煙、煙斗等) ; 吸煙: *Do you mind if I smoke?* 你介意我抽煙嗎? | *I used to smoke a packet of cigarettes a day.* 過去, 我常一天抽一包煙。

steal /stiːl/ *verb* [I or T] (**stole, stolen**) **1** to take something without the permission or knowledge of the owner and keep it 偷: **+ from** *Johnny was accused of stealing from the shop.* 約翰尼被控在商店行竊。| **steal sth from sth/sb** *She admitted stealing the money **from** her employers.* 她承認她從雇主那兒偷了錢。

take /teɪk/ *verb* [T] (**took, taken**) **1** to move something or someone from one place to another 攜帶; 拿走; 取走; 運走: I forgot to take my bag with me when I got off the bus. 我下公共汽車時忘了拿包。| **take sb. sth**. *I have to take Steve the money tonight.*今晚我必須給史蒂夫帶去錢。

teach /tiːtʃ/ *verb* [I or T] (**taught, taugh**t) **1** to give someone knowledge or to instruct or train someone 教; 講授: *She taught English to foreign students.*她曾經教過外國學生英語。| **teach sb sth** *His mother had taught him some words in Spanish.* 他母親教了他一些西班牙語單詞。

telephone /ˈteləfəʊn/*verb* [I or T] to use a phone打電話 (給) *: I'll telephone my lawyer to arrange an appointment.* 我會給律師打電話安排會面事宜的。

tell /tel/ *verb* [I or T] (**told, told**) **1** to say something to someone, often giving them information or instructions 告訴; 告知: If you see anything suspicious, tell the police. 如果發現有可疑的情況, 要通知員警。| **tell sb sth** *Tell me your phone number again.* 請再告訴我你的電話號碼。

Appendix C

The usage note "English versus Chinese ditransitives"

請先閱讀下面有關英、漢雙賓結構對比的說明, 之後做題; 做題沒有把握時, 請再參照這一說明。

(Please read the following usage note of English versus Chinese ditransitives before you take the test. You can refer to this usage note again when you encounter difficulties in taking the test.)

雙賓結構是指謂語動詞後面接兩個賓語的結構, 即$S + V + N_1 + N_2$ (主語 + 謂語動詞 + 賓語$_1$ + 賓語$_2$), 例如, ***He gave me a letter.*** (他給我一封信)。英、漢語中典型的雙賓動詞是***give*** ("給 (予)")。

英、漢雙賓結構語法意義的本質差別是客體轉移的方向。英語雙賓結構中的物體只能從主語 (S) 向間接賓語 (N_1) 轉移, 即右向: $S \rightarrow N_1$。上一例句中, ***letter***從***he*** (主語) 右向轉移至***me*** (間接賓語) 手中。英語雙賓動詞只能是右向動詞。

漢語雙賓結構的客體轉移方向不僅允許1) 右向: $S \rightarrow N_1$, 還允許2)左向: $S \leftarrow N_1$和3)左右向: $S \leftrightarrow N_1$。

漢語的給予類 (如 "給"、 "送"、 "賣"、 "付 (錢)"、 "扔") 和教類 (如 "教") 的雙賓動詞是右向動詞, 與相應的英語動詞 (如***give***, ***send***, ***sell***, ***pay, throw***, ***teach***) 無區別。例如, 漢語可說, "他教我們化學。", 英語也有對應的說法: ***He teaches us chemistry.***

漢語的取得類動詞 (如 "買"、 "拿"、 "偷"、) 屬左向, 與英語取得類動詞 (如***buy***, ***take***, ***steal***) 表達的意思相反。例如, 漢語說 "張三買了李四一輛自行車。", 主語 "張三"最終擁有了自行車; 英語***John bought Mary a bicycle***, 不是表示 "約翰買了瑪麗一輛自行車", 而是表示 "約翰買給瑪麗一輛自行車"。另外, 漢語一些左向的消耗類動詞 (如 "吃"、 "抽 (煙)") 可出現在雙賓結構中, 但對應的英語動詞 (如***eat***, ***smoke***) 不行。例如, 漢語可說, "他吃了我一個蘋果。", 但英語不能說****He ate me an apple.***

漢語的借類動詞 (如 "借"、 "租"、 "換") 為左右向動詞, 而英語雙賓結構只准許右向的借類 (如***lend, rent (out)***) 動詞。例如, 漢語 "我借他一輛自行車。"是一個歧義句, 可表示 "我從他那兒借了一輛自行車", 也可表示 "我借給他一輛自行車"; 而英語能用雙賓結構表達的, 只能是***I lent him a bicycle*** (右向), 不能說****I borrowed him a bicycle*** (左向)。

英語還允許一些製作類動詞 (如***bake***, ***build***, ***knit***, ***make***) 和通訊工具類動詞 (如***radio***, ***e-mail***, ***telephone***) 出現在雙賓結構中, 而漢語沒有相應的雙賓結構。例如, 英語可說, ***She knitted him 10 pairs of socks to take with him***, 但漢語不可說 "*她織他十雙襪子讓他帶去"。

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The Tendencies of Overpassivisation and Overuse of *Be* Verbs in the Writing of Chinese Learners of English and Applications for Practice

Hye K. Pae, Jing Sun, and Detong Xia

Abstract This chapter examines how Chinese learners of English formulate verbal phrases in expository writing using a learner corpus. Among 1,541 extracted overpassivised cases, the misuse of unaccusative verbs accounted for 45%, followed by transitive verbs (24%) and copular *be* verbs (19%), all of which were higher than that of unergative verbs (10%). The distribution of errors in unaccusative verbs remained consistent in beginners and intermediate groups, indicating that the overpassivisation tendency is persistent in the course of mastery of English. The most conspicuous error in transitive verbs was found in object relative clauses. The most common error in the copular *be* verb was made in object complements and in the past tense. Based on these findings, a hands-on activity is provided to collectively address different verbal types used in various sentence structures as pedagogical effort.

Keywords Overpassivisation · Unaccusative verbs · Transitive verbs · Copular *be* verbs · Chinese learners of English

1 Introduction

Among the various linguistic features of English, the verb is one of the most complicated and difficult grammar points for learners of English to master (Cowan, 2009). The difficulty has to do with multiple layers, irregular inflections, aspect, and tense associated with the verb. Each component of these features entails its unique intricacies. Given the complexities of the verb, the purpose of this chapter is to address the use of verbs by classifying error-prone verb forms for Chinese learners of English as a second language (L2[1]) based on a learner corpus. Of particular interest is the

[1] In this chapter, an L2 refers to both a foreign language and an L2.

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tendency to overpassivise unaccusative verbs by Chinese learners, as it is the unaccusative verb that is inconsistent in the form-meaning correspondence in a sentence and that is found to cause persistent errors made across different proficiency levels (Choi, 2019; Oshita, 2000; Yip, 1995). We first survey the types of verb and learners' tendency to passivise unaccusative verbs as well as theoretical considerations and existing studies. We then present the focus of this chapter, a corpus-based empirical study of overpassivisation. We finally provide pedagogical recommendations based on the findings of this study.

1.1 The Types of Verb and the Overpassivisation of Unaccusative Verbs

1.1.1 Types of Verb in English

Intricacies surrounding the verb in English involve various types, including copula verbs, auxiliary verbs, transitive verbs, and intransitive verbs. Figure 1 displays the types of English verb at a glance. This cline of various verb types in English is hardly found in other languages, especially in Chinese.

First, the copula verb is a group of verbs that connect the subject of the sentence to a subject complement for linking purposes and existential expressions. Of copula verbs, *be* verbs are the most prominent, appearing in both main and subordinate clauses in eight different forms (i.e. *am, are, is, was, were, be, being,* and *been*). There is also a cluster of verbs that function as copula verbs, such as *become, feel, get, look, smell,* and *seem,* that describe the subject of the sentence along with a subject complement. Since the main function of these words is linking the subject to a subject complement, they are called *linking verbs.* Copular *be* verbs can also be

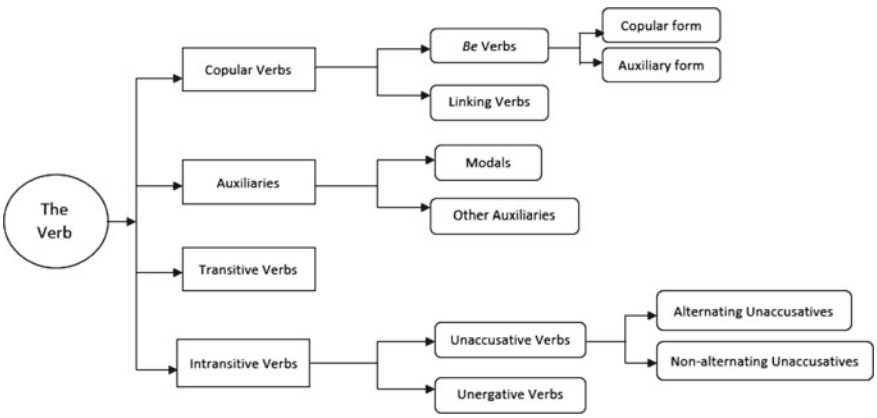

Fig. 1 Classification of the verb in English

used as auxiliary verbs (helping verbs) in the passive voice with past participles or in progressive aspect with present participles (e.g. *the cat was hit by the car,* and *he is eating*, respectively). The equivalent copular *be* in Mandarin is *shi* (是), whose function is narrower than that in English. Regarding functionality, the Mandarin *shi* is used only as a copular but does not function as a helping verb to voice and tense/aspect construction. As for co-occurrence in a sentence, the Mandarin *shi* collocates with a noun phrase but does not go with predicative adjectives or prepositional phrases, which is different from English (Lee & Huang, 2004).

Second, auxiliary verbs precede main verbs in verb phrases and provide additional information. They include modal verbs, the auxiliary *be* verb (e.g. *they are watching the game*), the auxiliary *do* verb (e.g. *I do not have it*), and the auxiliary *have* verb in perfect expressions (e.g. *I have been to Paris*). Modal verbs express special meanings, such as ability, necessity, permission, and possibility (e.g. *can, could, should, must, may*). *Be* verbs are also used for different linguistic functions such that they are used in forming questions, progressive forms, passive constructions, phrasal modals (by combining with modal verbs; e.g. *be able to, be supposed to, be about to, be going to*), and tag questions. *Tense* and *aspect* also add another level of complexities to the multifaceted system of the verb describing the time of the action that the verb expresses as well as the speaker's view of a given action in time, respectively.

Third, transitive verbs require one or two objects to complete the meaning of a sentence. Without an object, a group of transitive verbs, such as *enjoy, say, like,* and *love*, cannot fulfil the requirement of a sentence syntactically and semantically.

Last, intransitive verbs do not require objects to complete the intended meaning of a sentence. Intransitive verbs have subcategories, including unaccusative verbs and unergative verbs, which are called *split intransitivity*. Unaccusative verbs are a subgroup of intransitive verbs that semantically do not deliver the subject's action but rather are semantically the patient (i.e. a person or thing who/which undergoes a change) of the action that the verb expresses because the subject is not responsible for the verb's action (e.g. *appear, disappear, emerge, thaw*). In contrast, unergative verbs express volitional actions and are syntactically and semantically represented (e.g. *run, walk, drive,* and *swim*).

Unaccusative verbs have several characteristics that separate them from unergative verbs. There are various criteria used to differentiate unaccusative verbs from unergative verbs, apart from the fact that unaccusative verbs can take either animate or non-animate subjects. Table 1 synopsises differences between unaccusative verbs and unergative verbs[2] based on unaccusativity diagnostics (Newson et al., 2006; Van Valin, 1990). None of the features are mutually exclusive, but some cases straddle more than one category, depending on the criterion used.

[2] *Middles* are not considered in this classification. *Middles* are a subtype of intransitive verb that functions similarly to alternating unaccusative verbs. However, specific uses in sentences are different (e.g. no progressive form or no complements of sense verbs due to always being *stative* verbs).

Table 1 Differences in semantic roles between unaccusative and unergative verbs with examples

	Unaccusative verb	Unergative verb
Volition	Involuntary (*emerge, fall, melt, rise*)	Voluntary (*dance*, *laugh, play, talk*)
The subject's role	Theme/patient (*burn, melt, sink, dry*)	Agent (*drive, run, swim, walk*)
There sentence	*There subject (There arrived a letter; There spread a disease)*	Not applicable
Manner of motion	*Roll* verbs (change of position) (*roll, bounce, drop, move*)	*Run* verbs (*drive, run, swim, walk*)
Change of state	Result in change in state (*break, close, melt, open*)	Not applicable
Telicity	Telic (except existence verbs; mostly, change of state) Change of state (*break, melt, open*) Directed motion (*break, melt, open*) (*break, open, melt*)	Atelic Agentive activity verbs (*work, swim. dance*) (*run, drive, swim*)
Existence of state	Existence of an entity (*exist, remain, stay, dwell*)	Not applicable
Locative inversion	Plausible (*Against the wall sits the table; down the wall ran the water*)	Implausible
Directed motion	Changes in motion or location (*arrive, ascend, come, exit*)	Not applicable
Appearance	Appearance of an entity on the scene (*appear, arise, emerge, develop*)	Not applicable
Spatial configuration	Specific spatial configuration (*sit, lie, stand, lean, hang*)	Not applicable
Resultative†	Plausible (*The river froze solid; Her hair grew long*)	Not applicable
Durativity	Durative (*last, remain, stay*)	Not applicable
Nominal modifier	Plausible (*fallen tree, frozen juice, melted ice; rolling rock, bouncing ball*)	Not applicable
Cognate object	Not applicable	Can have a related object (*She smiled a guilty smile*)

Note †Resultative expressions can also be found, but they appear with transitive verbs, as in *She wiped the table clean* and *He drank the glass empty*.

Some verbs have both transitive and unaccusative counterparts, based on the presence or absence of *transitivity alternation.* These unaccusative verbs are subcategorised into (a) alternating unaccusatives[3] that are paired with corresponding transitive verbs (e.g. *break, change, burn, open,* and *survive*) and (b) non-alternating unaccusatives that have no corresponding transitive counterparts [e.g. *appear, vanish, happen, occur, and remain* (Levin & Rappaport Hovav, 1995)]. For example the unaccusative verb *break* can be used for either *the window broke* (unaccusative) or *the boy broke the window* (transitive). However, the unaccusative verb *occur* as in *the crash occurred* does not have a transitive counterpart as in[4]**the boy occurred the crash.*

The Chinese language has alternating and non-alternating unaccusative verbs (Mo, 2014) but lacks other features found in English. Below is an example that shows the different functions of the verb *break* in Mandarin.

(1) a. 男孩打破了窗户。< literally, *The boy hit broken the window* >
b. 窗户破了。<literally, *The window (is) broken*>

In (1a), 打(hit) is a transitive verb and 破(broken) expresses a consequence of the verb action as a resultative verb complement. In (1b), however, the same character 破(broken) expresses the state of *being broken* with no acting verb in the sentence for the standard of English. Note that there is no copular verb used in (1b). This is one example that shows the difference between Mandarin and English. This will be revisited in the section of theoretical explanations and previous research.

1.1.2 Overpassivisation of Unaccusative Verbs

Consider the following sentences:

(2) a. She danced. [S + V; unergative]
b. She disappeared. [S+V; unaccusative]
(3) a. *She was danced.
b. *She was disappeared.

In English, the surface forms of unergative and unaccusative sentences are identical, as shown in (2), in which the subjects of the two sentences are placed in the pre-verbal position. Non-native speakers of English rarely compose the sentence **she was danced*, but they tend to compose the sentence **she was disappeared*, as shown in (3b). The stark difference between the two sentences above lies in the semantic intricacies of the unaccusative verb with the thematic role of the subject. Specifically, in (2a), the subject is an *agent* who plays a role in causing the event described in the sentence. In (2b), however, the subject fills the role of *theme* or *patient* of the action of the verb and is affected by the event expressed by the sentence.

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[3] Since the subject of the unaccusative version is construed the same way as the object of the transitive version, these verbs are also called *ergative* verbs (Newson et al., 2006). Most researchers have regarded the verbs as alternating unaccusative verbs, however. Hence, we follow the majority and classify them as alternating unaccusatives.

[4] The sign (*) placed in front of the sentence indicates an ungrammatical sentence.

Another explanation of passivised errors made in English by Mandarin speakers involves the influence of the first language (L1). In the sentence 兔子消失了 < The rabbit disappeared >, the intransitive verb 消失 meaning *disappear* functions as a resultative predicate. Since the verb 消失 describes the state of the subject 兔子(the rabbit) *being disappeared*, it functions as a subject complement similar to a proxy of an adjective, and therefore, the expression of **the rabbit was disappeared* seems to be logical for Mandarin speakers, when it is translated into English.

Relatedly, Chan (2008) pointed out Cantonese speakers' tendency of omission, overgeneralisation, and substitution of *be* verbs in L2 English production. Lee and Huang (2004) also reported Chinese learners' tendency of overgeneralisation of *be* verbs. They viewed errors below as overgeneralisation produced when "a learner fails to observe the boundaries of a rule" (p. 218).

(4) a. *The queen is walked into her bedroom.
b. *They were came back.
c. *I am can make one clothes.
d. *He is open the door (Lee & Huang, 2004, p. 218).

Although the error shown above can be viewed as the examples of overgeneralisation, another explanation is possible. The error in (4a) can be interpreted as an unaccusative verb's passivisation indicating telicity (see below for Van Valin's (1990) explanation) rather than overgeneralisation. In addition, (4b) expresses the change of location, and therefore, it can be viewed as the overpassivisation of an unaccusative verb *come* (see Table 1). Although Lee and Huang's (2004) explanation "[a]ll overgeneralized uses of *be* in [(4)] are [attributable] to the overuse of *be* with a main verb" (p. 218) can be valid, a further explanation is also possible for (4c) and (4d). The *be* verb in sentence (4c) is used with a modal verb, not with the main verb. Sentence (4d) seems to be along the lines of the verb expressing a resultative state, 佢開咗門 in Cantonese (literally, *he open* [past tense marker 咗, equivalent to 了 in Mandarin] *door*), wherein the verb *open* 開 is used to express the status of *being open* 開 咗; hence, *is open* is produced erroneously in English, but it makes (perfect) sense in Cantonese (and Mandarin). This will be revisited in the discussion section.

1.2 Theoretical Explanations and Previous Studies

Previous research has attempted to identify the root causes of overpassivisation errors produced by East Asian learners of English. Among various factors, conspicuous factors converge on the explanations of English-specific syntactic complexity (Choi, 2019; Park & Lakshmanan, 2007; Yip, 1995), the semantic construal of unaccusative verbs (Kim, 2007), the inanimacy of subjects (Oh, 2014; Owada, 2017; Pae et al., 2014), L1 transfer (Hwang, 2006; No & Chung, 2006), and confusion between alternating and non-alternating unaccusative verbs (Mo, 2014).

1.2.1 Syntactic Explanation

The *unaccusative hypothesis* was formulated from a syntactic perspective under the universal alignment hypothesis (Perlmutter, 1978). The *unaccusative hypothesis* addresses the fundamental relationship between syntax and semantics, given that the subject described in an unaccusative verb at the surface level (i.e. agent) refers to an object in its underlying semantic representation (i.e. theme or patient), but it maintains the view of a syntactic phenomenon. Although the distinction between unaccusative and unergative verbs is primarily a syntactic representation in relation to the semantic elements of agenthood versus patienthood, this hypothesis does not attempt to characterise split intransitivity semantically, largely ignoring the mismatch between syntax and semantics of the verb. Another syntactic explanation involves L2 English learners' tendency to treat unaccusative verbs as transitive verbs that could be in passive forms. Yip (1995) explained this phenomenon as the *transivisation hypothesis*. These syntactic approaches to split intransitivity have been challenged because the mapping of syntax and semantics is not always consistent and there is no consistent semantic basis for split intransivity.

Regarding empirical research, Park and Lakshmanan (2007) used English resultative phrases as the syntactic diagnostic for the unaccusative-unergative division in English. They found no significant difference between transitive verbs and alternating unaccusative verbs for Korean speakers, indicating that Korean learners tend to treat these two types of verb similarly in relation to resultative expressions. The results also showed a significant difference between alternating unaccusatives and unergatives. Park and Lakshmanan (2007) also reported that although advanced learners performed slightly better than intermediate counterparts, their performance was not significantly different, indicating that learners "do not go through developmental stages by proficiency level in acquiring the classification of the two subtypes of intransitive verbs in English resultatives" (p. 337). This means that the confusion of unaccusative and unergative verbs remains persistent to advanced L2 learners. Mo (2014) also examined how Chinese learners would acquire alternating and non-alternating unaccusative verbs to find that these two types of the verb were different from each other in the sequence of learning in that non-alternating unaccusative verbs were acquired before the other. He also noted that the two verb types' developmental patterns were partly different from each other.

1.2.2 Semantic Construal

Another interpretation underscores the interface of the representation of both syntax and semantics, focusing on the nature of mismatch between syntax and semantics. From this view, unaccusativity is syntactically represented in an NP+V form but semantically determined. Van Valin (1990) elucidated split intransitivity from a semantic perspective using the *role and reference grammar theory* to explain the system of verbal classifications and semantic representations with respect to semantic roles, grammatical relations, and voice. He argued that the inherent lexical aspect and agentivity embedded in unaccusative verbs are underlying factors behind split intransitivity, which is associated with telicity. Unaccusative verbs are in general telic and

refer to *accomplishments* or are bounded by an endpoint or resulting state, whereas unergative verbs are typically atelic and are focused on *activities.* The following sentences show the interface between syntactic forms and semantically determined thematic roles.

(4) a. John walked in the park (*atelic or activity; unergative*).
b. John walked in the park for an hour.
c. *John walked in the park in an hour.

(5) a. John walked to the park (telic or accomplishment; unaccusative).
b. John walked to the park in an hour.
c. *John walked to the park for an hour.
(Van Valin, 1990, p. 236)

In the NP+V sentence *John walked*, the verb expresses the subject *John's* volition of the verb action *walk*, which qualifies an unergative verb. However, the addition of the preposition phrase *in the park* or *to the park* makes the meaning of the sentence different. The prepositional phrase *to the park* focuses on an *accomplishment* with the expression of a goal, which is telic, while the phrase *in the park* focuses on an *activity,* which is atelic. Since *walk* in (5a) expresses a telic and resulting state rather than an activity, it is possible that English learners passivise the sentence into **John was walked to the park,* as in **The queen is walked into her bedroom* (Lee & Huang, 2004, p. 218). The Mandarin example 窗户破了 < literally, *The window (is) broken* > also involves telicity as an expression of the change of state or an end result. Therefore, it is likely that Mandarin (and Cantonese) learners avoid using *the window broke* but compose **the window is broken* by taking the verb *break* for a resulting state of *being broken*, although they use it as an intransitive verb in the sentence.

Choi (2019) reported participants' narratives of rationale for overpassivisation in verbatim in a mixed-method study of learners of English, as in "I think the windows or the house cannot be broken or burned by itself," "How can the lake freeze itself? I think it can only be frozen by the cold weather," "… most of the verbs related to the body parts must be in the passive voice. This is because they are all controlled by the brain," and "… Can it arrive in the shops by itself? No, I don't think so" (p. 423). All these excerpts converge on whether the semantically expressed volitional agentivity is involved in the action described by the verb or not. The criterion as to whether a sentence should be in passive voice or not is summarised well in another quote "When I judged the sentence whether it must be in the passive voice or not, I just cared about whether the subject is being done by someone or something" (Choi, 2019, p. 424). These explanations of English learners illustrate that their judgment of sentence structures in general is grounded in the semantics of a given sentence.

1.2.3 Subject Characteristics

Since unaccusative verbs express non-volitional actions in the sentence, the role of the subject is also considered in terms of the animacy/inanimacy of the subject (Choi, 2019; No & Chung, 2006; Pae et al., 2014). Choi (2019) attempted to find the locus of overpassivisation produced by Korean learners of English using a grammaticality judgment test. Results showed that the overpassivisation tendency was

closely related to proficiency levels, verb types, and the presence of corresponding passive morphemes in L1 Korean. Choi (2019) identified the conceptual presence of external causers, subjects' inanimacy, and the knowledge of lexical items as learners' underlying mechanisms for overpassivisation. A participant's narrative illustrated the importance of the subject's animate or inanimate nature, as in "The subject in this sentence is not a person, so I think the verb must be in the passive" (Choi, 2019, p. 425).

1.2.4 Multiple-factor Explanations

The specificity of the English language associated with unaccusative verbs can be attributable to the confusion that learners of English encounter. Choi (2019) examined overpassivisation patterns by subcategories based on the presence or absence of paired transitive counterparts and the presence or absence of L1 passive morphemes. Results showed that the participants had the most difficulties with unaccusative verbs that had both paired transitive verbs and L1 passive morphemes, compared to those with no paired transitives and no L1 morphemes (39% vs. 75% accuracy, respectively, see Table 2). This pattern was consistently found in No and Chung's (2006) study (36% vs. 64%, respectively). Significant proficiency effects were also found. From subsequent interview data, Choi (2019) further identified the causes of overpassivisation as the conceptual presence of external causers, the inanimacy of the subject, and the knowledge of lexical items. There seems to be multiple factors which exert significant effects according to the internalised external causes of the verb's action, the subject's characteristics (animate vs. inanimate), and the presence of passive morphemes in L1 Korean, since unaccusative verbs themselves have multiple layers. No and Chung (2006) also summarised the causes of Koreans' overpassivisation errors as English's inherent factors, L1 influence, and morphological factors.

Tense might also affect the overpassivisation tendency. Mortazavi (2012) attempted to explain the locus of overpassivisation from tense and the auxiliary verb *have* by using sentences in present, past, perfect, and passive forms in a forced-choice task. Results showed that both higher intermediate and lower intermediate groups of Indian students were likely to accept incorrectly passivised forms in the past tense (e.g. *died* vs. *was died*) than in the present tense (e.g. *die* vs. *is died*). However, a significant overpassivisation tendency was not observed in the perfect form (i.e. *have* + *past participle*).

Shan and Yuan (2008) looked at unaccusative verb use from the opposite direction by investigating English-speaking learners of Chinese as an L2. The English speakers did not overpassivise Chinese and tended to treat Chinese change-of-state verbs as causatives due to L1 transfer. They concluded that overpassivisation was not L2 learning-universal but was an English-specific tendency produced by learners of English.

1.3 The Current Study

Compared to the studies of overpassivisation in other languages, there is a relative lack of empirical studies in Chinese learners of English. To address this gap, we aimed to identify native Chinese speakers' error production associated with the *be* + *past participle* construction in their writing and to catalogue error patterns in order to integrate them into L2 English pedagogy. Two research questions guided this study.

1. How systematically do Chinese learners of English make overpassivisation errors according to verb types?
2. What are the relationships between error patterns and proficiency and between error patterns and the quality of writing?

The first research question was examined by looking at the distributions of passivised errors produced by Chinese learners of English in syntactic categories. The second research question was analysed by looking at correlation patterns and variances explained in proficiency and the quality of writing by predictors of error patterns.

2 Method

2.1 Data Sources

This study relied on an open access corpus of the English First Cambridge Open Language Database (EFCAMDAT; Huang et al., 2017), which comprised writings of non-native speakers of English worldwide who participated in the online learning platform provided by Education First (Huang et al., 2017). Chinese speakers' writing accounted for the second largest subcorpus among 198 nationalities in the

Table 2 Top ten writing prompts

Writing prompt	Error frequency	%
Filling out an insurance claim form	256	16.6
Writing a movie plot	102	6.6
Writing a letter of complaint	70	4.5
Summarising a story	61	4.0
Writing an autobiography	56	3.6
Writing about a memorable experience	54	3.5
Giving instructions to play a game	39	2.5
Writing a party invitation	39	2.5
Labelling photographs from a safari	31	2.0
Planning for the future	31	2.0

EFCAMDAT, after Brazilians. The Chinese subcorpus consisted of 165,162 student essays and 11,909,869 words (Huang et al., 2017). The corpus included a wide range of essay topics at different proficiency levels.

Table 2 shows top ten writing prompts in which the writers showed error production. Writing for *filling out an insurance claim form* comprised the largest overpassivised form, accounting for 17% of errors, followed by *writing a movie plot*. The prompt of *filling out an insurance claim form* depicted a hypothetical scenario, including a character who found the door to his apartment broken and missing items.

2.2 Variables

The EFCAMDAT provided proficiency levels which were aligned with international language assessments, such as TOEFL and IELTS, as well as the Common European Framework of Reference for languages. The proficiency levels were classified into beginners, intermediate, and advanced groups for this study, which were directly derived from the corpus manual. The corpus comprised 16 skill levels, which were classified into basic, independent, and advanced/proficient levels, based on a concordance table provided by the EFCAMDAT. The independent level was equivalent to TOEF iBT 57–109 and the advanced/proficient level to 110–120. The basic level did not have a corresponding equivalency provided in the corpus manual. The corpus also provided a variable of grade, which was marked by the teacher of Education First.

2.3 Coding

We first extracted the *be* + *past participle* form from the Chinese learner subcorpus resulting in 15,133 cases. Based on the extracted corpus data, we identified errorneous *be* + *past participle* form, yielding 1,541 cases, and then classified them into five verb types, including unaccusative verbs, unergative verbs, transitive verbs, *be* verbs, and auxiliary verbs. Each incorrectly produced case was assigned to one of the five verb types. For example **It is finally arrived*! was coded as an unaccusative; **We were walked in the park* was coded as unergative because it indicated an activity, as indicated by Van Valin (1990); and **I was very enjoyed myself in Japan* was coded as a transitive; when *be* verbs were added redundantly as in **Yesterday, I was been robbed*, it was categorised into the *be* category. As *be, do,* and *have* can be auxiliary verbs as well as main verbs, when a *be* verb was used as a substitution for *have*, as in **I was worked as a marketing assistant for five years*, it was coded as the auxiliary verb type. Following Newson and colleagues' recommendation, we treated the verb *live* differently from the criterion for the subject's volition for unergative verbs. Specifically, as in *she lived in Paris*, when the word *live* has "the meaning *reside* … this is precisely the meaning it has as an unaccusative" (Newson et al.,

2006, p. 158). Hence, we coded the verb *live* as an unaccusative verb, as in the sentences **When I was young, I was lived in Xi'an* and **My parents are both live in JinHua.*

One coder completed the first round of coding in its entirety to identify misuse cases in passive voice expressions. A second coder completed 25% of coded cases to find only 3% discrepancies. After resolving the discrepancies, the agreement reached 100%.

2.4 Data Analysis

Since the identification of the patterns of misuse occurrences in relation to over-passivisation is one of the objectives of this chapter, we examined the distributions of variables under examination. To answer the three research questions, we used descriptive statistics, correlation matrix, and multiple regression techniques.

3 Results

Chinese students' written essays extracted from the EFCAMDAT corpus exhibited a wide range of misused passive-form expressions, as shown in (6). They constructed the passive forms with unaccusative, unergative, transitive, and copular *be* verbs.

(6) a. Dear mom and dad, *I am already arrived at Santa Monica, California. *I was listened to the radio and it's said that today *it will be rain all afternoon. [unaccusative and unergative]

b. *We are appreciated your passion. [transitive]

c. *That's is viewed as inappropriate. [additional *be* verb]

d. *Although some of illness is not be cured, it's can be helpful. [substitution for modal verb *can*; additional *be* verb]

3.1 Research Question 1: Systematic Overpassivisation Patterns

In order to inspect the distribution of overpassivisation across the verb types, descriptive statistics were obtained. Table 3 shows the occurrences and percentages of misuse cases by verb type. Of 1,541 identified cases, the misuse of unaccusative verbs accounted for 45%, which was more than four times as many as its unergative counterparts. This was consistent with the findings of previous studies (Choi, 2019; Oshita, 2000; Park & Lakshmanan, 2007; Yip, 1995). The number of overpassivised transitive verbs was higher than that of overpassivised unergative verbs, accounting

Table 3 Frequency and percentage of misuse cases by verb type

Verb type	Frequency	Per cent
Unaccusative	685	44.5
Unergative	166	10.8
Transitive	370	24
Copular *be*	299	19.4
Auxiliary	21	1.4
Total	1,541	100

for 24%. Examples that showed errorneous passive forms with transitive verbs are as follows:

(6) *She was liked little animals. She was liked to travel.
*I was met my husband.
*I was staying at home for rest, then the thief was broken my window.
*I was called police at once.
*I was studied Taxation.
*Finally, I will be opened my own company.

We identified top ten words that were most incorrectly produced by each verb type. Table 4 shows words and the corresponding frequency in number and percentage by each type of verb. Regarding the number of words used in each verb type, the unaccusative verbs had 73 different overpassivised words, the unergative verbs 64, and the transitive verbs 120. The error cases involved with copular *be* verbs had 20 different base words, while those of auxiliary words had 17 different base words.

Table 4 Top ten base words associated with overpassivisation by verb type

Copular *be* ($n = 299$)			Unaccusative ($n = 685$)			Unergative ($n = 166$)			Transitive ($n = 370$)		
Word	#	%	Word	#	%	Word	#	%	Word	#	%
Break	178	59.5	Graduate*	72	10.5	Work	51	30.7	Promise	51	13.8
Be	73	24.4	Happen	64	9.3	Run	7	4.2	Say	16	4.3
Open	13	4.3	Die	55	8.0	Move	6	3.6	Appreciate	14	3.8
Get	12	4.0	Come	43	6.3	Wake	5	3.0	Take	11	3.0
Steal	5	1.7	Break	36	5.3	Walk	4	2.4	Like	9	2.4
Have	3	1.0	Change	34	5.0	Centre	4	2.4	Make	9	2.4
Give	2	0.7	Live*	33	4.8	Sit	4	2.4	Know	8	2.2
Fill	1	0.3	Become	24	3.5	Study	4	2.4	Change	8	2.2
Look	1	0.3	Disappear	22	3.2	Turn	4	2.4	Enjoy	7	1.9
Use	1	0.3	Fall	19	2.8	Listen	3	1.8	Show	7	1.9

Note *The word *graduate* was classified as an unaccusative verb based on the criterion of the change of the state; the word *live* was classified as an unaccusative verb, meaning *residing* (Newson et al., 2006)

The frequency of unaccusative verbs gradually decreased from the highest number. The word that showed the most overpassivised cases was *graduate*. Although it can be questionable,[5] we classified the word *graduate* as an unaccusative verb based on the unaccusative diagnostic criterion of the *change of the state*. Examples that showed misuse of the word *graduate* are as follows:

(7) a. *I got my certificate when I was graduated from Yale.
b. *I worked in a government department after I was graduated from Taiyuan Technical College.

The second most frequently produced base word in the unaccusative verbs was *happen* ($n = 64$). Unlike other studies, overpassivised cases with the synonym *occur* were not found. The third most frequently misused base word was *die* ($n = 55$). Examples are shown below. Van Valin (1990) pointed out that although the word *die* could be classified as an unergative verb in other languages, that classification could be misleading and questionable (see pp. 253–254).

(8) a. A good thing has been happened in my family.
b. The earthquake was happened in the evening.
(9) a. Finally, he was died in his house.
b. Unfortunately his parents are died.

The unergative verbs had a dominantly concentrated case. The verb *work* accounted for 31%, followed by significantly less dominant second *run* (4%). It was interesting to find that the word *work* tended to be passivised across all proficiency levels, as in (10). It is possible that the Chinese speakers were confused about the use of present perfect progressive (i.e. *have been working*). However, since the same error was found at intermediate and advanced levels, the error suggests something beyond mere confusion of present perfect progressive forms. Another explanation is that they might have treated the perfect tense of *work* as an expression of continuous *state of working*, which is consistent with one of the elements described in Table 1.

(10) a. *We have been worked for the same company. [Beginner]
b. *I have been worked for fifteen years. [Intermediate]
c. *I have been worked at the Student Council for two years. [Advanced]

The transitive verb also had one noticeable word. The word *promise* accounted for 14% with 51 cases, as in * *Please be promised that you will keep the secret for me*. Another example was involved in the object relative clause, as in **we didn't see most of animals [that] you were promised*, in which *animals* in the main clause is the object of the verb *promised* in the subordinate relative clause.

[5] We encourage other researchers to take another perspective/interpretation and to conduct a follow-up study on this matter.

3.2 *Research Question 2: Relationship Between Error Patterns and Proficiency/Quality of Writing*

Since written narratives and grammatical knowledge are sensitive to the writer's language proficiency level, we looked at error patterns by English proficiency. Figure 2 displays the distribution of misuse cases by verb type and proficiency level. When occurrences were split by proficiency level, the distribution of misuse of unaccusative verbs did not make a drastic difference between the beginners and intermediate groups. This is consistent with the findings of previous studies that indicated that the misuse of unaccusative verbs tended to be found in high intermediate learners of English (Choi, 2019; Chung, 2014; Mortazavi, 2012; Pae et al., 2014). Overall, the error rates decreased significantly when it came to the advanced group. In particular, the misuse of *be* verbs significantly dropped as the proficiency level increased (255 for the beginners vs. 45 for the intermediate vs. 1 for the advanced). Another notable pattern found between the beginners and intermediate groups was the misuse cases of transitive verbs. The intermediate group showed more errors in transitive verbs than the beginners group. As indicated earlier, the most conspicuous overpassivised transitive verb for the intermediate group was *promise*, as in **we didn't see most of animals you were promised*. Other examples are shown in (11).

(11) a. Beginners: *You are needed to fill in [an] arrival card.
*In the afternoon, he was read emails.
b. Intermediate: * I will be appreciated [it] if you'd like to allow me to go.
* He is changed my life!

We also identified the most frequently passivised words without considering verb types (i.e. collapsing unaccusative, unergative, *be*, and transitive verbs) by proficiency level. Table 5 exhibits the base words that tend to be overpassivised by proficiency.

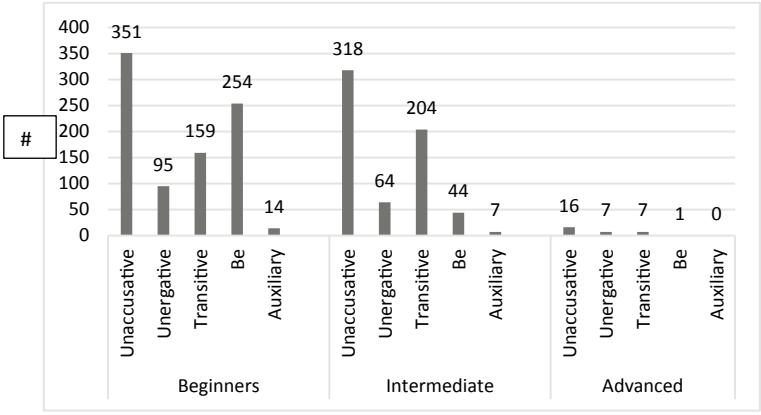

Fig. 2 Distribution of misuses by verb type and proficiency level

Table 5 Most frequently overpassivised words by proficiency level

Beginners ($n = 873$)			Intermediate ($n = 637$)			Advanced ($n = 31$)		
Word	#	%	Word	#	%	Word	#	%
Break	197	22.6	Promise	51	8.0	Centre	4	12.9
Die	49	5.6	Happen	44	6.9	Change	2	6.5
Graduate	39	4.5	Graduate	32	5.0	Happen	2	6.5
Work	33	3.8	Change	29	4.6	Suffer	2	6.5
Live	25	2.9	Be	29	4.6	Work	2	6.5

Next, we were interested in knowing the correlations of overpassivisation patterns with proficiency and the quality of writings as indexed by grades that were provided by the EFCAMDA. We used dummy codes for the four verb types using 0 or 1, that is the presence or absence of each verb type examined in this study. Table 6 displays a correlation matrix including the four verb types, proficiency, and individual grades. Errors in unaccusative verbs and transitive verbs were positively correlated with proficiency. This demonstrated that the error production of unaccusative verbs did not decrease as proficiency increased. As indicated earlier, the pattern of transitive verbs might have to do with the errors produced in the object relative clause. However, the error production of *be* verbs was negatively correlated with proficiency, indicating that as proficiency increased, *be* verb errors decreased. The correlation patterns between proficiency and unaccusative and between proficiency and transitive verbs were different from that of between proficiency and *be* verbs. Interestingly, the error production in each verb type was not correlated with the quality of essays. In order to examine whether the overuse of *be* verbs was related to tense and aspect, we analysed the frequency of overused *be* verbs in context. The majority of misuse was found in the past tense (84%), followed by the present tense (14%), the future tense (1%), and the present perfect (1%).

Using the dummy codes, a multiple regression technique was also performed using dummy variables for the four verb types as predictor variables and the quality of essay as measured by the graded mark and proficiency as dependent variables. Since we were not interested in testing theories, a stepwise entry method was used. When the graded mark was entered as a dependent variable, no predictor explained

Table 6 Correlation matrix

	1	2	3	4	5	6
1. Unaccusative	1					
2. Unergative	−0.31**	1				
3. Copular *be*	−0.44**	−0.17**	1			
4. Transitive	−0.50**	−0.19**	−0.28**	1		
5. Proficiency	0.10**	0.01	−0.27**	0.14**	1	
6. Grade	−0.01	0.02	0.04	−0.04	−0.01	1

significant variance in the quality of the essay. When the proficiency was entered, only the copular *be* verb and the transitive verb were significant predictors ($R = 0.28$, $R^2 = 0.08$; $\beta = -0.253$, $t = -9.95$, $p = 0.000$ for the copular *be* verb; $\beta = 0.072$, $t = 2.83$, $p = 0.005$ for the transitive verb).

4 Discussion

In English, the form-meaning correspondence is unclear in unaccusative verbs, as surface subjects that are syntactically represented in sentences are semantically interpreted. This mismatch in the form and meaning is likely to impose challenges on learners of English. To address this matter, this chapter examines how native Chinese speakers formulated their writing by focusing on the use of unaccusative verbs in particular and on verb usage in general. Since intransitive verbs do not take objects, unaccusative and unergative verbs cannot be constructed in the passive voice. However, research has shown that unaccusative verbs are likely to be constructed in the passive voice more often than unergative verbs by learners of English (Choi, 2019; Oshita, 2000; Yip, 1995). We identified overpassivised patterns, base words associated with errors, and their relationships with proficiency and the quality of writing. Although this study did not indicate whether errors made in writing by Chinese learners are occasional mistakes or persistent errors, systematic deviations indicated that the patterns might be beyond occasional mistakes made by learners of English.

The learner corpus dataset showed a high level of overpassivisation tendencies with unaccusative verbs, compared to unergative verbs, which was consistent with the findings of previous studies. This study found that the native Chinese speakers produced passive forms with unaccusative verbs four times more frequently than unergative verbs. The findings can be summarised in four related ways. First, given the predominant misuse of unaccusative verbs by the Chinese learners of English, as found in learners of different L1 backgrounds, such as Japanese and Koreans (Choi, 2019; Chung, 2014; Chung, 2014; Oshita, 2001; Pae et al., 2014), the complexity rests on the English language in which the verb has multiple layers and intricacies. In addition, Shan and Yuan (2008) reported that English-speaking learners of Chinese as an L2 did not show the overpassivisation pattern in L2 Chinese, suggesting that overpassivisation was English-specific expressions by learners of English. Regarding unergative verbs, the Chinese learners constructed the word *work* in passive forms, accounting for about one-third of the misuse cases. It may be possible that the Chinese leaners treated *work* not as a volitional intransitive verb but focused on the description of the *state of working* when they constructed a sentence **We have <u>been</u> worked for the same company.*

Unexpectedly, the Chinese learners errorneously passivised transitive verbs in the active voice. Most cases were associated with the word *promise* that was used in the object relative clause, as in **We didn't see the animals [that] they <u>were</u> promised*. Other transitive verbs that were used in passive forms in the active voice included

say and *appreciate*, as in **He is really said [that] we should appreciate the more natural, older things before those things are taken away,* and **I am appreciated your kindly help*, respectively. The Chinese learners seemed to have confusions about the properties of transitive verbs, which might have resulted from incomplete learning or insufficient mastery of the difference between transitive and intransitive verbs. Further studies on this point are needed.

The Chinese learners also showed the overuse of *be* verbs, as in **Cotton tops and denim jeans are also be allowed*. Lee and Huang (2004) interpreted the overuse of *be* verbs in **I am can make one clothes* and **He is open the door* (p. 218) as overgeneralisation of *be* verbs. It is unclear what was overgeneralised in these examples (i.e. the concept of the object of overgeneralisation and the way in which overgeneralisation occurs are unclear) in Lee and Huang's (2004) explanation. It may be plausible that the native Chinese speakers used the *be* verb as a default entry after the subject (further research is warranted to investigate this). It is also possible that the learners tended to use *be* verbs to indicate tense or aspect when they had not yet mastered the correct usage (Chan, 2008; Lee & Huang, 2004). Since the examples above did not have nuances of tense or aspect, this explanation does not seem to apply to this particular *be* verb overuse case. A study also showed that Spanish-speaking learners of English were inclined to produce incorrect sentences by adding an unnecessary *be* verb to the main verb (e.g. **It is rained hard* for *It rained hard*; **Who is won the game*? for *Who won the game*?) (Pae et al., 2017). The overuse of *be* verbs warrants further research on overpassivisation with other L1 groups.

Second, the misuse of unaccusative verbs seems to be persistent from the beginners to the intermediate level of English proficiency. For the beginners level, 40% of the misuse cases were associated with unaccusative verbs. And for the intermediate level, 45% of misuse was related to the same type of verbs. Given that misuse of other types of verb gradually decreases as proficiency increases, this deviation from the progression of proficiency suggests that the locus of errorneous passivisation linked to unaccusative verbs is deeply rooted in the linguistic properties of the English language. Another possibility has to do with a definition of the intermediate level adopted in this study. According to the proficiency demarcation provided by the EFCAMDAT (Huang et al., 2017), the intermediate group had a wide range of English skills, ranging from about the 11th percentile to about the 92nd percentile and the advanced group was almost native-like. Since we relied on the proficiency level as provided by the corpus data holder, there was no way to know whether the reclassification of proficiency levels would make different results. Given the authority of the corpus data holder, we leave our interpretation at this.

Third, the correlation coefficients showed that unaccusative verbs were negatively related to unergatives, copula *be* and transitive verbs, and positively related to proficiency. Transitive verbs were also negatively related to unergative, *be* verbs and proficiency levels. Although proficiency levels were positively correlated with unaccusative and unergative verbs and negatively with *be* verbs, the quality of the writing (i.e. graded marks provided by the data holder) was not related to any of the variables. Given that proficiency was positively related to unergative and transitive verbs (i.e. as proficiency increased, the error on those two verbs increased), the

misuse of unergative and transitive verbs persistently remained in the higher level of English proficiency. This suggests that direct and explicit instruction on unergative verbs be implemented in L2 English lessons. The most disproportional misuse of transitive verbs was found in the object relative clause as shown earlier. The misuse of other types of transitive verb showed a relatively proportional distribution. Transitive verbs in relative clauses, especially object relative clauses, may also need to be taught explicitly to learners of English.

Last, the multiple regression analyses showed that *be* verbs and transitive verbs were significant predictors of proficiency. This indicated that the use of unaccusative and unergative verbs was not significantly associated with proficiency levels. This finding is consistent with those of descriptive statistics and correlation coefficients, suggesting that the problem with overpassivisation of intransitive verbs, unaccusative verbs in particular, is persistent across beginners and intermediate levels of English proficiency. This is also consistent with the findings of previous studies (Choi, 2019; Mortazavi, 2012).

4.1 Pedagogical Recommendations

The results of this study not only showed the consistent findings with previous studies regarding passivisation errors associated with intransitive verbs (i.e. unaccusative verbs), but also showed unexpected findings (i.e. notable errors in transitive verbs). Based on these findings, a class activity that covers both intransitive verbs and transitive verbs concurrently may be useful. Although communicative teaching and implicit teaching ushered in over the past decades, direct and explicit instruction needs to be employed to tackle verb intricacies because advanced learners still demonstrate overpassivisation errors (Choi, 2019; Chung, 2014). Based on the findings of this study, we provide an instructional tip, consolidating various verb types in one classroom activity.[6] The guiding principles of this activity are based upon the premise that writing is social and rhetorical. It is social due to being dependent upon situations, contexts, and audiences. It is rhetorical in that cultural nuances and linguistic assets are brought into writing. The given activity opens up multiliteracies for writers and, at the same time, places constraints on the choice of a particular verb type in a specific context.

[6] This activity was developed by the first author and has been used in a TESOL class over a decade with decent feedback with respect to consolidation of multiple aspects of linguistic components within one activity.

4.1.1 Exercise: Writing a Short Story Using Basic Sentence Structures for Intermediate and Advanced Learners

Based on the verb used in a sentence, sentences can be classified into five structures. The verb in each structure requires different sentential ingredients, such as objects or complements. Table 7 shows different sentence structures based on verb types and corresponding examples, under which a list of verbs used for each sentence type is shown. All the five sentence structures are to be explained hand in hand with verb types using a compare and contrast method.

The activity of writing a short story in groups (or individually if appropriate) can be used in classrooms for English learners. There are two objectives in this activity: (1) effectively teach the sentence structures by focusing on the verb and (2) effectively combine pedagogy with creative teamwork by creating a semi-natural context. To effectively address the intricacy of verbs through the five sentence structures, there are several ways to introduce the function of verbs in sentences. One way is to introduce different structures deductively in which the instructor explicitly explains the verb type as well as the structure of each sentence type, and then moves onto examples. Another way is using tree diagrams with explicit explanations. Tree diagrams can be used as a part of a deductive lesson. Although it is a useful way to present structural relationships within a sentence, a tree diagram does not explain whether an object or a complement is needed to complete a sentence. To overcome this shortcoming, an activity that combines teachable concepts and something creative can be employed as a mixture of deductive and inductive ways, along with direct explanations of verb and sentence types. A short-story project addressing sentence structures as teamwork serves its purpose in this regard and is briefly described below.

Table 7 Verb types, sentence types, and examples

Structure	Verb type	Sentence structure	Example
1	Intransitive (unergative)	S + V	A girl smiled.
	Intransitive (unaccusative)	S + V	A letter arrived.
2	Imperfect intransitive	S + V + C	The girl is active.
3	Perfect transitive	S + V + O	The girl likes apples.
4	Ditransitive	S + V + IO + DO	The boy bought me a book.
5	Imperfect transitive	S + V + O + OC	The boy makes me happy.

Note S = subject; V = verb; C = complement; O = object; IO = indirect object; DO = direct object

Structure 1: Perfect Intransitive

(1) Unergative verbs: *run, walk, smile, stand, move*, etc.
(2) Unaccusative verbs: *appear, disappear, emerge, melt, happen*, etc.

Structure 2: Imperfect Intransitive (a.k.a. *linking verbs*)

(1) *Be* verbs: all *be* verbs, *continue, hold, remain, stay, lie*, etc.
(2) Change of status: *become, get, go, come, fall, grow, turn*, etc.
(3) Sense verbs: *feel, smell, sound, taste*, etc.
(4) Appearance-related verbs: *appear, look, seem*, etc.

Structure 3: Transitive: *eat, tell, build, dig, open, like, love*, etc.
Structure 4: Ditransitive

(1) Dative verbs: *give, send, tell, throw, hand, bring*, etc.
(2) Benefactive verbs: *make, bake, buy, build, cook*, etc.

Structure 5: Imperfect Transitive

(1) Causative verbs: *get, cause, call, elect, appoint, choose, make, have, let*, etc.
(2) Sense verbs: *see, watch, hear, smell*, etc.

As shown in Table 7, the verb used in Structure 1 (i.e. intransitive V) is different from that used in Structure 3 (i.e. transitive V). The complement used in sentence Structure 2 (i.e. subject complement) behaves differently from that in Structure 5 (i.e. object complement). Specifically, Structure 1 verbs are self-sufficient as perfect intransitive verbs because no other element is required to express the subject's status or volitional action. Verbs used in Structure 2 are called imperfect intransitive verbs because a complement that additionally explains the subject's status, emotion, or appearance is required to convey the intended meaning of a sentence. Below is a brief description of a suggested activity.

This activity builds upon Dewey's maxim "learning by doing". The following is required: (1) a group of students (3–4 students in a group work being the best size) and (2) a wiki workspace.[7] There are freely available wiki platforms for group work, such as pbworks.com. A wiki is a useful online learning environment that allows effective teamwork in the workspace with comment functions. While students work in a group, the instructor can provide feedback directly or indirectly. Once a final story is produced, the instructor is to provide direct feedback on deviations made in a paragraph, if any, and student inquiry and learning in general. An example of a final product is provided in the appendix.

This activity is purposeful and meaningful to students in that they actively build a story using specific sentence structures. As the activity requires a full command of syntactic functions of verbs (i.e. which type of verb is to be used in which paragraph while keeping a storyline interesting) in order to accomplish the goal of the assignment, it fulfils the objectives of learning the intricacies of the verb and actively engaging in a creative student-centred activity. Upon completion of this project, a

[7] This can be individual work, but the author has found that it works better in groups. Google Doc can be used, but a wiki workspace allows the instructor to monitor the development of a story better than Google Doc.

class discussion can include micro-level grammatical constraints in sentences as well as social and interactional implications of syntax related to a linguistic tool that mediates activities, relationships, and discussions. This also leads to a concept of *metalanguage*, which is an analysis of language, and can serve as a catalyst for empowering students to use syntax as they write their own stories.

After each group produces a final product, each short story can be analysed as a whole group in many different ways. One way to expand the project to English Language Arts is to analyse it with students with respect to the Speaker (the voice that tells the story), Occasion (the time and place of the story), Audience (the reader to which the story is directed), Purpose (the aim that the author tries to achieve or the reason behind the story), Subject (the moral of the story or topic of the story), Tone (the author's attitude towards a given subject) and Style (what linguistic devices are used)—this approach to literary analysis is called a SOAPSTone strategy. Many other ways to expand on this activity are also possible. This activity can serve as an integrated model (i.e. evidence-based plus creative classroom praxis) for English instruction in that the creative portion of a short story is associated with meaning-making through the network of interrelated systems of linguistic form and meaning.

5 Conclusion

This study identified error production of passive forms by Chinese learners of English. Consistent with previous studies, overpassivisation of unaccusative verbs was salient, compared to that of unergative verbs. Additional use of *be* verbs was also observed, as in the study of Lee and Huang (2004). Misuses of transitive verbs, especially in the relative pronoun clauses, were also observed. As an effective pedagogical example, a short-story writing lesson is recommended, which encompasses essential verb types, such as copula *be* verbs, intransitive verbs (unaccusative and unergative verbs), transitive verbs, and ditransitive verbs within five essential sentential structures, as a way of mastering the multifaceted verb characteristics in a semi-natural setting. Since the understanding of the role of L1 in L2 learning is important, it will be more effective if the instruction adds an activity to compare learners' L1 verbal features and the five verbal types in English. This will make the activity a more conducive model than traditional instruction, which incorporates L1 features into L2 learning for teaching the verb to learners of English.

5.1 Limitations and Future Directions

Several limitations are noted, which are closely related to future directions. First, since it is a cross-sectional study, we still do not know the learning trajectory involved in syntactic verbal characteristics and sentential use by learners of English. Future

studies that investigate learners' mastery trajectories will provide a better understanding of L2 learning. Second, given the overuse of *be* verbs, a comprehensive study dealing with misuse and overuse of *be* verbs at different proficiency levels in relation to tense and aspect would facilitate an understanding of learners' usage patterns of *be* verbs. This line of studies will allow for unpacking multiple layers of overgeneralisation of *be* verbs, which is beyond the scope of this study. Next, this study used only Chinese learners' overpassivisation patterns. A direct comparison of learner groups with diverse L1s will allow for identifying relevant linguistic features yielding trans-linguistic effects, such as cross-language transfer or cross-linguistic influences on L2 English. Since previous research has dealt with L1 groups independently, comparative studies are needed. Last, this study is largely descriptive, and the effectiveness of the proposed instructional activity is still unknown. Since there is a paucity of studies on intervention effectiveness of pedagogical methods, follow-up studies that examine the efficacy of instructional strategies are warranted.

Appendix

An example of a short story produced by a group of students

Pop Quiz!

The teacher smiles. The door opens. The bell rings. Students arrive. Chairs squeak. Fans blow. Papers rustle. Pages turn. The teacher speaks. The students groan

The kids seem worried. Last night was busy. The dance was fly! Their notebooks are empty. Their homework looks unfinished. Their guilt is real. The teacher feels smug. He is not happy. The homework seems to be difficult. The quiz will be worse

The teacher distributes the papers. He slowly shakes his head. This quiz will hurt their grades. He considers a different assignment. He contemplates a group quiz. The students voice their complaints. They annoy the teacher. He ignores them. The students missed their chance! The teacher demands silence

The teacher gives Jimmy a quiz. Jimmy gives the teacher a look. The teacher asks Jimmy a question. Jimmy doesn't give him an answer. The class gives Jimmy encouragement. The teacher gives Jimmy a detention. Next, the teacher hands Sandy a quiz. Sandy shows the teacher her best smile. Sandy gives the teacher a reason to hope. The class sends Sandy negative thoughts

The whole exercise makes the teacher sad. The class calls the teacher mean. Eventually, their pleading makes him weak. Most days, Jimmy's jokes make the teacher happy. Most days, Sandy's simpering drives him crazy. As a student, pop quizzes made him angry. Finally, he finds the group's arguments

convincing. The teacher considers the battle lost. The teacher declares the quiz cancelled. The class considers the teacher heroic

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Cantonese English as a Second Language (ESL) Learners' and Local English Teachers' Perceived Difficulties of English Article Use and Pedagogical Implications

Mable Chan

Abstract This study involved in total 247 participants, 109 of whom were Cantonese English as a Second Language (ESL) learners covering primary, secondary and college students, and 138 teachers of primary (1st–5th grades) and secondary schools (6th–12th grades) in Hong Kong. They were asked to take part in an opinion survey about their understanding of English article use, difficulties (students) encountered and possible solutions to the problems. Results reveal that Cantonese ESL learners understand the important roles played by English articles, though advanced/very advanced learners seem to be more able to articulate the specific roles, functions and usages of English articles. There are difficulties which are common to all learners of different proficiency levels, which may be related to their lack of a clear understanding of the major uses of English articles involving linguistic concepts such as generality, referentiality, specificity, and noun countability. The role of teachers' own understanding of English article use is also found to be significant. The pertinent concepts central to one's understanding of English articles should be introduced, and this should also be done collaboratively among junior and senior form teachers.

Keywords Commission errors · Omission errors · Generality · Referentiality · Specificity · Noun countability

1 Introduction

Articles, one of the most common grammatical forms second language learners have to deal with in acquiring English, do not exist in Cantonese, which brings substantial challenges and difficulties to Cantonese ESL learners. Two main problems reported in the literature are: commission errors (i.e. the use of *the* in contexts where *a/an* is required or vice versa) and omission errors. For commission errors, Ionin et al. (2004) put forward the Fluctuation Hypothesis and suggested that L2 learners of English whose first language (L1) lacks articles fluctuate between the two settings

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of the Article Choice Parameter (i.e. definiteness and specificity), overusing definite articles in specific contexts, and indefinite articles in non-specific contexts. For omission errors, Robertson (2000), White (2003) and Lardiere (2004, 2005) argued for the relevance of the Missing Surface Inflection Hypothesis (MSIH): highly proficient learners have the underlying syntactic representation of definiteness, but have a persistent mapping problem.

While past studies mainly focused on how English articles are represented in the interlanguage grammar of L2 learners of different L1 backgrounds, this study aims to examine the issue from the perspective of students and teachers. Through understanding how students and teachers perceive English article use and how articles are learned and taught, we can have a better understanding of the learning and teaching of English articles in the classroom.

2 Literature Review

2.1 Definiteness and Indefiniteness in English and Cantonese

Three important semantic functions that a language must be able to realise are:

(a) reference to whole classes of entities of the same type (generic reference), e.g.

1. *Lions* (generic) are dangerous animals.

(b) reference to individuals within a class of entities that are known to the recipient of the message (definiteness) and reference to individuals not known to the recipient (indefiniteness), e.g.

2. A: I saw *a lion* (indefinite) today.
   B: Did you?
   A: Yes, at the zoo. *The lion* (definite) was lying in the sun.

(c) reference to individuals within a class of entities that have a "noteworthy property" (specific reference) (Ionin et al., 2004) and reference to individuals that have no noteworthy property (non-specific reference), e.g.

3. a. I want to see *a lion.* He's called Zimba.
   (specific reference—noteworthy property is his name)
   b. I want to see *a lion.* I've never seen one before.
   (non-specific reference)

Languages vary in how they realise these three semantic functions. English uses overt morphological forms, as illustrated above: the articles *the* and *a(n)*/Ø, and the plural marker (usually *–s*). Mandarin and Cantonese use word order, the numeral *one*, demonstratives, and extra-linguistic context.

Chinese is a topic-prominent language; indefinite NPs cannot occupy the pre-verbal topic position, and therefore NPs placed in the pre-verbal topic position are marked as definite, as shown in the following examples (examples in Mandarin cited from Li & Thompson, 1981, p. 120, with the Cantonese sentences expressed in Romanisation in brackets):

Transcript 1

1a) 人 來 了。
rén lái le (Cantonese: **yàhn** làih la)
'The person(s) has/have come.'
1b) 來了 人 了。
láile **rén** le (Cantonese: làih la **yàhn** la)
'Some person(s) has/have come.'

In 1a, *yàhn* (the person) which occupies the topic position is regarded as definite, whereas it is interpreted as indefinite in 1b as it occurs after the verb.

The same rule applies to object NPs. The unmarked position for object NPs is after the verb (as in 2a), but we can also use *béi* with object NPs placed before the verb to convey definiteness (as in 2b) (examples in Mandarin cited in Li & Thompson, 1981, p. 120, with the Cantonese sentences expressed in Romanisation in brackets):

Transcript 2

2a) 我 在 買 書 了。 我 買 緊 書。
wǒ zài mǎi **shū** le (Cantonese: ngóh máaih gán **syū**)
'I am buying a book.'
2b) 我 把 書 買 了。 本書 畀 我 買 咗。
wǒ **bǎ** shū mǎi le (Cantonese: bún syū **béi** ngóh máaih Jó)
'I bought the book.'

There are other ways in Cantonese to mark definiteness and indefiniteness. The numeral *yāt* "one" can be used like an indefinite article referring to an indefinite NP, and it is optional:

Transcript 3

3a)	有	一架	飛機	跌咗落嚟!
	yáuh	yāt **ga**	**fèigèi**	ditjólohklàih
	have	one CL	plane	fall-SPF….

'A plane fell down'.

(Cheung, 2007, p. 107)

3b)	阿英	要	搵	(一)個	律師。
	a-yīng	yiu	wán	(yāt) **go**	**leuhtsī**
	a-yīng	need	find	(one) CL	lawyer

'Ying has to find a lawyer.'

(Yip & Matthews, 1999, p. 89)

According to Yip and Matthews (1999, p. 89), it is the presence of the classifiers (CL) that "perform the functions of the English articles in individuating entities". When the NP is a subject or a topicalised object, the classifier is used to denote definiteness, as shown in the following example:

Transcript 4

4)	架 車	阻住	個	出口。
	ga chē	jó-jyuh	go	chēut-háu
	CL car	block-CONT	CL	exit-mouth

'The car is blocking the exit.' (Not 'A car is blocking the exit')

However, if the NP follows the verb, it can be interpreted as either definite or indefinite, as shown in the following example:

Transcript 5

5)	我	聽日	會	搵	個	律師。
	ngóh	tīngyaht	wúih	wán	**go**	**leuhtsī**
	I	tomorrow	will	contact	CL	lawyer

'I'll contact a/the lawyer tomorrow.'

(Yip & Matthews, 1999, p. 89)

Demonstratives like *nī* (this) and *gó* (that), together with classifiers, can also be used to express definiteness such as *nī bún syū* (this book) and *gó go yàhn* (that person). In English, demonstratives, whose primary function is that of deixis used to "locate and identify entities with reference to their distance in relation to the speech participants in the spatio-temporal space of discourse" (Chen, 2004, p. 1145), are different from definite articles, which are deictically neutral. In Cantonese, however,

demonstratives can be used in contexts where demonstratives in English are not allowed but definite articles, including anaphoric uses as shown in the following example (example in Mandarin cited from Chen (2004, p. 1153), with the Cantonese sentences expressed in Romanisation in parentheses):

Transcript 6

6) Anaphoric (non-contrastive)

有	一個	獵人…	養 著	一只	狗。	這	只	狗	很	懂事。
you	yi ge	lierne…	yang zhe	yi zhi	gou	**zhe**	**zhi**	**gou**	hen	dongshi
(yáuh	yāt go	lip yàhn…	yeung-jo	yāt jek	gáu	**nī**	**zek**	**gáu**	hóu	lēk)

'There was a hunter who had a dog. The dog was very intelligent.'

As seen from the above example, the demonstrative *nī zek* is used in Cantonese whereas it is the definite article *the* in English. The extension of the uses of demonstratives in Chinese serving some of the functions of the definite article in English leads Chen to conclude that Chinese demonstratives "have started on the path of grammaticalisation into definite articles" (Chen, 2004, p. 1154).

2.2 L2 Acquisition of Articles

In the 1970s, there were many studies of the acquisition of grammatical morphemes by L2 speakers based on L1 studies of the same type which examined the acquisition order of grammatical morphemes including articles (Andersen, 1978; Bailey et al., 1974; Hakuta, 1976; Krashen, 1977; Larsen-Freeman, 1975). The purpose of these studies was to examine if a common acquisition order could be found and whether L1 and L2 acquisition would be the same. The first published study on the acquisition of eight grammatical morphemes by L2 learners was conducted by Dulay and Burt (1973, 1974). The following eight morphemes are arranged in ascending order of relative difficulty: plural *s*, progressive *ing*, copular *be*, auxiliary *be*, articles (*a, the*), irregular past, third person singular *s*, possessive *s*.

Earlier studies of article acquisition mainly examined the presence or absence of articles in obligatory contexts. Something of a breakthrough occurred when Huebner (1983) used Bickerton's (1981) model to examine not only the presence or absence of articles, but two more significant issues: articles used with each semantic type of NP; and development of L2 learners' mastery of the article + NP function relationship. In this way, Huebner was able to ascertain L2 learners' use of articles in different semantic contexts. Since then, a number of studies have used or adapted Huebner's method in investigating L2 learners' use of articles. Robertson (2000) focused on variability in the use of English articles using Hawkins' (1978) taxonomy. Results from the 18 Chinese ESL learners indicated that there was an overall rate of 78%

accurate suppliance of articles, and the Chinese ESL learners used different strategies in the remaining 22% of contexts where articles were not supplied. Robertson concluded that learners have difficulty mapping forms and functions (i.e. surface forms and abstract features of number and definiteness). Using Liu and Gleason's (2002) classification of the four non-generic uses of *the*, Wong and Quek (2007) studied Chinese and Malay ESL learners of different proficient levels with three measures (SOC: Supplied in Obligatory Contexts[1]; TLU: Target-Like Use[2]; and UOC: Used in Obligatory Contexts[3]). Results reveal that the four non-generic uses of the article *the* pose different levels of difficulty; the acquisition order of the four non-generic uses is independent of ESL learners' first languages, and the accuracy rate increases with L2 learners' proficiency level.

Interest in the L2 acquisition of articles has grown since the studies of Ionin and her colleagues in the early 2000s (Ionin, 2003; Ionin et al., 2003, 2004, 2008) which systematically examined four contexts of English article use: [+def, +spec], [+def, −spec], [−def, +spec] and [−def, −spec], and the knowledge of these contexts of use by L1 speakers of Russian and Korean (neither language has articles). Findings reported that both groups of speakers overgeneralised the use of *the* in [−def, + spec] contexts, and overgeneralised the use of *a* in [+def, −spec] contexts. This led to the idea that there is an article choice parameter (in languages that have articles they either encode definiteness or specificity, not both) and that speakers of L1s that lack articles learning an L2 with articles will fluctuate between the two values of the parameter as they learn English, as the Fluctuation Hypothesis (FH) suggests.

According to the FH, Chinese ESL learners should fluctuate between definiteness and specificity as Chinese is [-ART]. Yet this does not seem to be the case from the results of Snape et al. (2006). The Chinese intermediate learners in the study did not fluctuate between definiteness and specificity contexts and they performed better than the Japanese speakers though both Japanese and Chinese lack articles. Snape et al., (2006, p. 138) suggested this might be because "Mandarin Chinese is (well) ahead of Japanese in the process of grammaticalisation of the universal cognitive category of identifiability and in the development of definiteness as a grammaticality category, which may be true given the recent argument regarding the grammaticalisation of classifiers into indefinite articles (e.g. Liu, 2010) and that of demonstratives into definite articles" (e.g. Chen, 2004; Huang, 1999).

While there have been studies revealing L2 learners' problems in acquiring English articles, few examined the reasons underlying learners' article choices that may result in significant pedagogical decisions. One study (Butler, 2002) involved 80 Japanese ESL learners and found that they made incorrect hypotheses showing sensitivity to wrong contexts, developing inappropriate word-article collocational

[1] SOC: The number of correct suppliances in obligatory contexts divided by the number of obligatory contexts.

[2] TLU: The number of correct suppliances in obligatory contexts divided by the sum of the number of obligatory contexts and that of suppliances in non-obligatory contexts.

[3] UOC: The total number of suppliances in obligatory and non-obligatory contexts divided by the number of obligatory contexts.

rules that limited certain words to collocate with a certain article, and relying much on structural cues in article choices. Recent ones (Chan, 2016, 2017) involved only 33 Cantonese ESL learners of English from a local university examining their explicit knowledge about English articles. Findings show that most participants were confident of using English articles but they did not seem to find articles important/useful for speaking, reading, writing and listening. They failed to account for the roles/functions of English articles using the metalanguage required. There were also misconceptions about the English article system that might have led to their correct and incorrect uses of English articles. To further understand how Cantonese ESL learners' English article choice and how this is possibly related to the input they received, this study involved both students of different proficiency levels and English teachers to examine how articles are learned and taught. The research questions are shown as follows:

1. What is Cantonese ESL learners' explicit knowledge of English articles? How does this vary according to their proficiency levels?
2. What are the difficulties Cantonese ESL learners encounter when acquiring English articles as perceived by teachers? How do teachers believe the problems can be addressed?

3 Methodology

In order to examine English students' and teachers' perception of L2 acquisition of English articles, a questionnaire survey was developed. The questionnaire aims to examine the perceived problems or difficulties of English article use, the role of instruction and textbooks, and possible solutions to the problems.

3.1 Procedures

The experimental group consisted of both Cantonese ESL learners and local English teachers in Hong Kong.

3.1.1 Cantonese ESL Students

There were 109 Cantonese ESL learners who were Hong Kong primary 5 (30 students); secondary 4 (31) and tertiary students (48) with the age range from 10 to 21. They spent about 45 minutes on the opinion survey. The purpose of the opinion survey was to allow the participants to illuminate in detail their understanding of English article use; their difficulties encountered and the possible solutions to the problems. There were a total of 8 questions concerning the participants' perception of the functions/role of English articles; their usage of definite/indefinite and

zero articles; concepts of definiteness and specificity; their difficulties in acquiring English articles and the possible solutions to them. The specific questions are:

1. Why do you think articles are needed in English? What is the function?
2. Is it important to learn articles well? How is it important?
3. How do you use indefinite (*a*/*an*) and definite (*the*) articles? Please list the contexts.
4. Do you know the differences between definiteness and specificity?
5. What challenges or difficulties do you have when using *a*/*an*/*the*?
6. How do you learn English articles in the classroom?
7. What is missing in textbooks or in the classroom that you want to add so that you can learn English articles more effectively?
8. Do you have any suggestions about improving article use?

3.1.2 Local English Teachers

138 English teachers taught in primary (63) and secondary (75) schools in Hong Kong. The primary teachers were aged from 20 to 60 with most of them falling in the age group of 36–40. The age of the secondary teachers who participated in this study ranged from 20 to 50 with most of them falling in the age group of 31–35. Their teaching experience ranged from 1 to 35 years, and most had 11 years of teaching experience. 95% of the teachers possessed teaching qualifications of PGDE (73%), ESL (11%) or TESOL (11%).

Data were collected from different sources: emails sent to (a) the principals of all primary and secondary schools in Hong Kong; (b) part-time postgraduate students studying in the Department of English of The Hong Kong Polytechnic University who are in-service English teachers; (c) teachers who were involved in the author's previous research projects concerning L2 acquisition of tense. A total of 138 teachers filled in a google form consisting of 5 questions:

1. Based on your teaching experience, what are students' difficulties in English article use?
2. How do you teach English articles? Please describe the approach(es) adopted, and why you think it/they can address students' problems/difficulties?
3. What do you tell students about using English articles?
4. What do textbooks tell students about English article use?
5. What else do you suggest to make teaching and learning of English articles more effective? You can discuss this from different perspectives (role of the school; teachers; students; parents; publishers; Education Bureau (EDB)/government; etc.).

The qualitative data were coded using independent parallel coding (Saldaña, 2015; Thomas, 2006). Both the research personnel of this project and the Principal Investigator coded and categorised the data. The codes were then cross-checked by two linguists invited to scrutinise the categorisation and accuracy of data analysis.

4 Results

The following presents the results concerning the perception of both Cantonese ESL learners and local English teachers in Hong Kong.

4.1 Cantonese ESL Learners

4.1.1 Primary Students

There were 30 primary 5 students involved. They were first asked about the need for English articles. When they were asked if articles are important, 83.3% (25 students out of 30) suggested they are important in the following areas: (a) to denote quantity of nouns; (b) to denote definiteness; (c) related to the general role of articles (e.g. S6/8/12/13/14/22/23/25/28/29) (Please refer to Table 1 for details); (d) to indicate the use of *an* before vowels like *aeiou*; and (e) to learn English better. The students' perception of the importance of English articles is also related to how they regard the role/function of articles. Specifically, the primary 5 students suggested the following roles of articles: (a) to denote quantity, and determine whether the nouns are singular or plural (46.5%); (b) to denote definiteness (16.6%); (c) for emphatic purposes (13.3%); (d) to connect sentences (3.3%); (e) for communication/application in daily life (3.3%); and (f) others (e.g. they are adverbs/adjectives/adding description to a sentence; seems odd without adding articles) (17%).

The students were also asked specifically how they use indefinite *a/an* and definite *the*. Generally speaking, *a* and *an* are used by the students to denote quantity (for singular nouns only) and indefiniteness. They use *an* before words starting with *aeiou*. *The* is used to denote uniqueness (e.g. *the earth*); before nouns about nature (e.g. *the sun*) and when the noun is being referred to for the second time in the discourse.

Table 1 General role of articles as perceived by primary 5 students

S6: Yes, they are important because they are frequently used in English **to express different meanings**.
S8: Yes because **we add further description to sentences** after using articles.
S12: I find articles important. **Without learning articles, we fail to understand the meaning of sentences**.
S13: I think it is important. Without articles, we don't know the quantity. Articles are also used to **express our emotion**.
S14: Important as we **fail to express what we want to convey without articles**.
S22: Important because **we can express sentence meaning very clearly**.
S23: Important as articles **can 配合 (collocate) some words**.
S25: Important as articles can **help us describe that thing**.
S28: Important as we fail to **represent some words** without articles.
S29: Important as **we can't form complete sentences without articles**.

When asked if they know what it means by specificity and definiteness, the majority of them claimed that they did not know.

Another part of the opinion survey was about how the students learn English articles in the classroom; their difficulties or challenges encountered, and how they think the problems can be addressed. Regarding classroom learning of English articles, the students tended to rely on the teacher. 40% (12 out of 30 students) of the primary 5 students said that they learned English articles by listening to teachers without specifying how, while about 4/12 (33.3%) of them specified that they learned through the examples given by teachers and having conversations with them; and they also learned how to use articles through doing exercises given by teachers. Other activities included for example doing supplementary exercises; homework; reading books and textbooks and drawing pictures. There were also 6 of the students (20%) claiming that they did not know or they learned nothing in class about English articles.

Their difficulties of article use are categorised as follows: (a) not clear about when to use *a/an/the*; (b) not sure about when definite and when indefinite; (c) need to note *aeiou* when using *an*/difference between *a* and *an*; (d) not sure about the quantity/number when using *a/an*; (e) there may be difficult words/vocabulary affecting their use; (f) position of the articles, specifically if *the* should be used at the beginning of sentences; and (g) not sure what words should go with *the*. For the possible solutions, the top three recommendations are: (a) practice in the form of exercises/e-learning and games (33.3%); (b) exposure (e.g. reading/watching movies/listening) (30%); and (c) teachers' role (e.g. clearer explanation; proactive help; explanation in Chinese) (10%). Specifically, when the students were asked about what is missing in textbooks or in the classroom that they want to add so that they can learn more effectively, a few students believed that there is no problem (36.6%); 23.3% of the students suggested that the description and explanation provided by the teacher is not adequate; some (6.66%) indicated that they did not have the opportunity to apply/use and some even reported that the topic was not covered in class (6.66%).

4.1.2 Secondary Students

31 secondary 4 students participated in this study. Compared with the primary 5 students, more secondary 4 students find English articles important (90.3%, 28 out of 31 students). The reasons given are similar: (a) to denote quantity of nouns; (b) to denote definiteness; (c) related to the general role of articles; (d) to indicate the use of *an* before vowels like *aeiou*; and (e) to learn English better. An additional reason given is related to examination. 3 students suggested that mastering English articles is important for examination purposes. The secondary 4 students suggested the following specific roles of articles: (a) to denote definiteness (29%); (b) to denote quantity (22.6%); (c) to make sentences more fluent (22.6%) which was not mentioned by the primary 5 students; (d) to denote uniqueness which was not mentioned by the primary students (19.35%); (e) to connect sentences/link other vocabulary (12.9%); (f) for emphatic purposes (6.45%); and (g) others (e.g. to

make essays clearer; to meet the length limit of essays; to make the hearer/audience understand better what we mean; similar to demonstratives in Chinese) (16.1%).

When asked specifically how they use indefinite *a/an* and definite *the*, *a* and *an* are used generally by both primary and secondary students to denote quantity (for singular nouns only) and indefiniteness. They use *an* before words starting with *aeiou*. *The* is used to denote uniqueness (e.g. *the* earth); before nouns about nature (e.g. *the* sun) and when the noun is being referred to for the second time in the discourse. Null articles are used before plural nouns and names of countries. When asked if they know what it means by specificity and definiteness, again, over half of them indicated that they do not know.

For classroom learning of English articles, there were quite a number of secondary 4 students (41.9%, 13 out of 31 students) who reported that they learned from teachers; while most did not tell specifically how, 5 of these 13 students specified that they learned from teachers' examples and through having conversations with them. The two other most common learning activities in class were writing/compositions (19.35%) and doing exercises (16.1%).

Their difficulties of article use are very similar to those reported by the primary 5 students: (a) not clear about when to use *a/an/the*; (b) not sure about when definite and when indefinite; (c) need to note *aeiou* when using *an*/difference between *a* and *an*; (d) not sure about the quantity/number when using *a/an*; and (e) there may be difficult words/vocabulary affecting their use. There were 2 categories not found in secondary 4 data, including the difficulty concerning (1) position of the articles, specifically if *the* should be used at the beginning of sentences; and (2) the words which should go with *the*. For the possible solutions, the top four recommendations are: (a) exposure (e.g. reading/watching movies/listening more) (22.6%); (b) practice in the form of mainly doing exercises (no games and electronic means as suggested by the primary 5 students) (19.35%); (c) teachers' role (e.g. giving clearer explanation; one-to-one teaching) (6.45%); and (d) a table listing clearly the usage of English articles (6.54%).

When asked about what is missing in textbooks or in the classroom that they want to add so that they can learn English articles more effectively, only 25.8% of the secondary 4 students were satisfied that there is no problem (compared with 36.6% of primary 5 students). The major problems reported are: (a) not enough coverage in class/textbooks (19.35%) and (b) inadequate description/explanation (e.g. not detailed enough; inadequate examples) (16.1%).

4.1.3 Tertiary Students

48 year 4 students were involved in this study and they found English articles important (83.3%, 40 out of 48 students). The reasons given are more or less the same: (a) to denote quantity of nouns; (b) to denote definiteness; and (c) for clearer communication and to avoid confusion. The year 4 students suggested the following specific roles of articles and none of them expressed that they did not know: (a) to denote definiteness (66.6%); (b) to denote quantity (39.5%); (c) to denote uniqueness (4.16%);

(d) to indicate something mentioned the second time in the discourse (2.08%); and (e) more generally about articles being able to facilitate communication (12.5%).

The three groups of participants seem to use indefinite *a/an* and definite *the* in similar ways. The tertiary group uses *a* and *an* to (a) denote quantity; (b) introduce singular entities; (c) indicate something mentioned for the first time; and (d) indicate entities that are general and "non-specific". They also use *an* before words starting with *aeiou. The* is used by the tertiary group to denote uniqueness (e.g. *the* sun); definiteness (but they used the word "specific") and when the noun is being referred to for the second time in the discourse. They also suggested that null articles are used for proper nouns, country names and plural nouns. Like the primary and secondary groups, the tertiary students failed to understand the difference between definiteness and specificity.

For classroom learning of English articles, while most of the primary and secondary students reported that they learned from teachers, most tertiary students reported that they learned English articles through reading grammar books or textbooks (25%), followed by doing exercises/worksheets (25%), and from teachers in the classroom (e.g. lecturing; simulation) (14.5%). There were also 2 students (4.16%) indicating that they did not formally learn English articles in the classroom.

The tertiary group seems to be more confident in using English articles. Their difficulties can be categorised as follows: (a) not sure why we still use *a* before words starting with *aeiou*; (b) overusing *the* sometimes; (c) not sure if we need to use *the* before certain proper nouns; and (d) when to use or not to use *the.* Unlike the other two groups, they do not seem to have many suggestions to address the problems. Most of them did not give any. 5 of them (10.4%) suggested having more exposure through reading and listening and 3 others (6.25%) suggested using examples and 2 (4.16%) suggested doing exercises.

When asked about what is missing in textbooks or in the classroom that they want to add so that they can learn English articles more effectively, most claimed that there is no problem. The main problems reported are: (a) lack of authenticity (e.g. examples and usage) (18.75%); (b) inadequate examples (6.25%); and (c) lack of rules/theories accounting for the usage of English articles (6.25%).

4.2 Local English Teachers

4.2.1 What Teachers Perceive Students' Difficulties Are in Acquiring English Articles

There were in total 138 English teachers filling in the questionnaire, generating a total of 171 responses (as teachers are free to express what they think about the topics in the questionnaire and some produced more than 1 response). The first question in the questionnaire concerns teachers' perception of the difficulties Cantonese ESL learners encounter when acquiring English articles. The top four problems teachers believe students have when acquiring English articles include: (1) commission errors

(i.e. the use of *the* in contexts where *a/an* is required or vice versa) (27.2%); (2) omission errors (12.3%); (3) lack of this article concept in the L1 (15.8%); and (4) noun countability (10.5%). Other difficulties involve pronunciation (9.6%); difficulty in using *the* (7.9%); numerous exceptions to remember (7.9%); students having difficulty in using articles but no problem in doing exercises/drilling (3.5%); difficulty in memorising the rules (1.75%), and not understanding the importance of using articles (1.75%). There is also an *Others* category and the comments are outlined below (1.75%):

- students' lack of reading in general leading to the problem
- students having no problem with articles and they are just careless.

For commission errors, the teachers found students having difficulty distinguishing definite articles from indefinite articles. For omission errors, two of the teachers believed students "forget" about using English articles. A number of teachers also expressed that this is related to the L1 because the concept of article use does not exist in Cantonese. Noun countability refers to whether nouns are countable or not. The teachers explained that students have difficulty in using indefinite articles when they have no idea whether nouns are countable or not. The pronunciation of nouns is related to the choice of *a* or *an* in using indefinite articles. *An* is used before nouns starting with vowels while there are also teachers claiming that one of the difficulties of English article use is that students need to remember many exceptions referring to the use of *a* before nouns like *university* or *an* before nouns like *hour*.

4.2.2 Pedagogical Approach

There were 126 answers produced concerning pedagogical approaches the teachers used to teach articles. The top 4 pedagogical approaches adopted are: (1) explanation of rules (22.6%); (2) teaching use of articles in context (using examples) (16.7%); (3) through drilling/exercises/proofreading exercises (15.4%); and (4) deductive approach (11.9%). Teachers also used the implicit approach (reading) (7%); inductive approach; (6%); consciousness raising activities (6%); and examinations/tests (6%). Three least mentioned approaches are (1) games/songs/YouTube/interactive activities (3.6%); (2) translation approach (2.4%); and (3) the use of grammar books (2.4%).

The teachers found the explanation of rules important; they believed the "mistakes" are made because students "break the rules", and it is easier for students to "remember" the rules by learning them at a younger age. In an "examination-oriented learning environment", the teachers believed this is the "faster and most direct way" to help students. Some others found it more important to teach article use in context: "students can learn better when they can see how articles are used in real situations" and "contextualised materials are practical and realistic". Doing exercises is another preferred approach of the teachers. Different language drills were reported by the teachers. They included grammar exercises, gap-filling ones, proofreading exercises, and multiple-choice questions, prepared by the teachers or from grammar books.

A deductive approach (Decoo, 1996; Gollin, 1998; Richards & Rodgers, 2014; Thornbury, 1999) involves learners being given a general rule, which is then applied to specific language examples and honed through practice. A number of teachers reported that they used the approach of PPP, standing for presentation, practice and production:

- "We teach English articles with the "PPP" (presentation, practice, production) approach and with meaningful context. First, we introduce some grammar rules about articles in class. When students have an idea about articles, we give them a scenario like "going to a supermarket". Students need to explain what they bought or what they saw in the supermarket in class. Hence, they have chances to practice using articles. Other students need to check if they have used articles in an appropriate way. Finally, we will also give them follow-up exercises to see if they can master the rules of articles."
- "Four steps of deduction:

  1. Students look at examples and tell the rules of using "a", "an" and "the".
  2. Comparison of use of articles and "zero articles" will be shown and explained.
  3. Exception will be shown and explained.
  4. Practice: exercises like cloze passage and proofreading to be given to students to check their usage."

- "I use the deductive approach; I would present the rules of when to use *a*, and tell the students, *an* should be used if the sound of the word is a vowel, after students understand, exercises would be followed."

Compared with the deductive approach (Thornbury, 1999; Norris & Ortega, 2000; cited in Erlam, 2003; Wong et al., 2011), fewer teachers use the inductive one which involves learners in noticing or identifying patterns and working out a "rule" before practicing the language:

- "Usually I adopt an 'inductive approach' when teaching grammar items, and articles is no exception. I'll provide them with a contextualised passage with lots of examples and guide them to explore the rules while highlighting 'exceptional' or 'tricky' examples."
- "I usually adopt an inductive approach if the English proficiency of the students is higher."

4.2.3 Input Students Received from Teachers and Textbooks

There were 132 responses generated from the question about what teachers tell students about English article use. Some responses are general and some more specific. The top three responses are: (1) the rules of article use/form/functions (22.7%); (2) definiteness/indefiniteness/generality (19.3%); and (3) the role of articles which are used to show quantity (15.9%). Other teachers' input includes: the difference between *a* and *an* (vowels, pronunciation, exception) (9%); the overall usefulness and necessity of articles (8%); the role of articles being used to modify

nouns (5.7%); asking students not to rely on the L1 (3.4%); asking students to read (2.3%); asking them to pay attention to context (2.3%) and the *Others* category (11.4%) consisting of the following:

- "They are little words but can affect the meanings and sometimes very greatly."
- "Tell people something"
- "Skip this grammar item in junior form"
- "I would share with them it's a bit similar to a Chinese word "一個" [*jat*^{1} *go*^{3}]"
- "I also reinforce students to put aside the rules and patterns of their own native languages."
- "Teach according to textbook."
- "It is important to convey accurate messages to the audience."
- "Express ideas on a topic."
- "Articles look simple but the usage could be complicated. For some special cases, they have to memorise."

When the teachers were asked to report what textbooks tell students about English article use, 100 responses were obtained. The top three responses are: (1) the rules of using articles/form/functions (29.2%); (2) definiteness/indefiniteness/generality (13.8%); and (3) not much coverage in textbooks (10.8%). Other responses include: the role of articles being used to show quantity (7.7%); examples of article use (7.7%); rules plus examples (6.2%); the difference between *a* and *an* (vowels, pronunciation, exception) (6.2%); articles being used to modify nouns (6.2%); exercises (4.6%) and *Others* category (4.6%). There were also teachers expressing that they do not use textbooks (3%).

4.2.4 Ways to Make Teaching and Learning of English Articles Effective

110 suggestions were given by both primary and secondary teachers involved in this study. The suggestions were provided for different stakeholders: (1) teachers (64%); (2) publishers/textbooks (12%); (3) Education Bureau (9%); (4) students (11%); (5) researchers/scholars (1%); (6) school management (2%); and (7) parents (1%).

Most of the suggestions were given to teachers. There were 3 main categories of suggestions: (1) teaching materials; (2) teaching approaches; and (3) others. For teaching materials, most teachers suggested using authentic materials in teaching English articles, followed by videos/games and examples. For teaching approaches, a communicative approach seems to be the most preferred, followed by direct explanation. In the *Others* category, there were some general suggestions given concerning what teachers should and should not do:

- "Teachers should apply the most suitable pedagogy."
- "Teachers need to be consistent in rolling out the use of articles throughout all year grades rather than just in P1 where they easily forget."

- "Teachers also need to be aware of the different reasons why students tend to misuse articles. In other words I think teachers should maintain a healthy communication with their students as well as colleagues."
- "Teachers should communicate and exchange thoughts more interactively and 'learn' from each other and give feedback but not teaching/learning a rule dully."
- "The teaching of articles should not just be limited to teaching from word level only."
- "Teachers should not only teach articles/grammar/code of writing."
- "More input is needed instead of simply doing exercises and tests."

Regarding textbooks, some suggestions were general and some others more specific. There were 4 teachers commenting on the coverage of the topic in textbooks: "there requires a specific topic in textbooks"; "the explanation in textbooks should be more detailed"; "they do not have specific chapters explaining the use of articles"; "they do not explain when to use *a* and *an*". One teacher suggested that "publishers of textbooks should listen to feedback of teachers to adjust the content". Specifically, there were suggestions about using a communicative approach in presenting the topic in textbooks; listing what proper nouns are; and illustrating silent sounds using examples and tables.

In Hong Kong, the Education Bureau (EDB) aims to provide quality education for students and promote excellence in school education. There were some general suggestions asking the EDB to "take into consideration the contents of a textbook and what students actually need"; and to "amend its curriculum about learning grammar in school" while "training teachers to make classes more fun". Specific suggestions included development of ETV on teaching grammatical items; e-learning materials; resources packs and training kits for teachers. There was also one point asking the EDB not to focus on accuracy but students' fluency in communication.

All the suggestions given to students point to the need to read, which can allow students to have more exposure to English use. Teachers suggested that researchers "should investigate effective pedagogy of English articles, conduct empirical research to prove efficacy of such pedagogy, and share such effective pedagogy with pre-service teachers in teacher training programmes". Middle leaders in local schools were also expected to explore effective pedagogy, and encourage English teachers to try. They should also support the use of contextualised grammar teaching to consolidate the grammar knowledge students have learned. Parents are expected to change their perception about doing grammar exercises and understand the differences between learning in context and out of context. There were 3 teachers claiming that it is not important to teach English articles.

5 Discussion and Conclusion

This study is significant in examining the perception of both students and teachers towards L2 acquisition of English articles. Without being limited by an article test

requiring the participants to explain their choice of English articles as in past studies (e.g. Butler, 2002; Chan, 2016, 2017), the open questions used in this questionnaire survey allowed the learners to report what comes to their mind concerning article use; what is the most salient is probably in the forefront of their minds.

5.1 Students' (Mis)understanding of the Roles of English Articles

All the three groups of participants tend to agree that English articles are important (more than 80% for both primary and tertiary groups, and 90% for the secondary group). This seems to be different from what was reported in Chan (2016) which found that the 33 Cantonese ESL learners majoring in English did not find articles very important for speaking, listening, reading and writing. A more representative sampling covering primary, secondary and tertiary students in this study seems to reveal that this is not really the case.

The two major roles of English articles perceived by all the three groups of student participants are: (a) to denote definiteness; and (b) to denote quantity. A total of 46 participants out of 109 (42.2%) believed that articles are used to denote definiteness, and 40 of them (36.7%) claimed that they are used to denote quantity. Though number is one of the considerations when using indefinite articles, English articles are not used to denote quantity as believed by most beginners/elementary learners of English (46.6% primary students, 22.6% secondary and 39.5% tertiary). The idea of using articles to denote uniqueness seems to be more firmly developed after primary education as both secondary and tertiary groups mentioned uniqueness which was not identified by the primary group (19.35% and 4.16% for secondary and tertiary groups respectively). Only the tertiary group identified the role of English articles as to denote the second mention of a noun (2.08%). Few individual students in the primary and secondary groups indicated the use of *the* for uniqueness and second mention when they were asked to tell how *a/an/the* are used in different contexts in question 3 of the survey.

The primary and secondary groups also indicated other roles of English articles that may reflect their vague idea/concept of English articles. According to the primary group, English articles are also used (1) for emphatic purposes (13.3%); (2) to connect sentences (3.3%); (3) for communication/application in daily life (3.3%); and (4) others (e.g. they are adverbs/adjectives/adding description to a sentence; seems odd without adding articles) (20%). For the secondary group, English articles can be used (1) to connect sentences/link other vocabulary (12.9%); (2) for emphatic purposes (6.45%); and (3) others (e.g. to make essays clearer; to meet the length limit of essays; to make the hearer/audience understand better what we mean; similar to demonstratives in Chinese) (16.1%). One additional role identified by the tertiary group which is quite general is that articles can be used to facilitate communication (12.5%). Such understanding of English article use is highly related to the input the

learners received from teachers and textbooks. As reflected from the percentages reported, the learners do not seem to have received consistently effective input from both sources concerning the role of English articles, which resulted in their confusion.

5.2 Common Difficulties Involved

Based on the findings concerning the difficulties and challenges in acquiring English articles as reported by the 3 groups of participants, the major problem is about whether using articles or not (i.e. to use or not to use). The key seems to be related to one's understanding of the notion of definiteness. The student participants seem to be more confident in using indefinite *a/an* and the major problems concern whether the nouns are countable or not, and the use of *an* before *aeiou.* Perhaps due to the limited understanding of English article use in the initial state, the primary students also wonder if *the* should be used at the beginning of sentences, and what kinds of word that should go with it. It seems worrying that even up to the advanced level, the participants still have difficulty in deciding whether to use *a* or *an* before nouns. 9 out of 48 students expressed that they do not know why sometimes *a* is used before words starting with *u* for example.

When asked what definiteness and specificity are and how they are different, all the three groups of student participants indicated that they do not know. Even if some of them tried to define them and tell the differences, much misunderstanding was revealed. The following are some of the extracts produced by the three groups of participants:

Primary: (19 out of 30 participants (63.3%) reported that they do not know the difference between definiteness and specificity).

1. "*the* meaning definiteness and *a/an* meaning specificity."
2. "*a/an* meaning definiteness and *the* specificity."
3. "definiteness: what you don't know; specificity: what you know."

Secondary: (17 out of 31 participants (54.8%) indicated that they do not know).

1. "Definiteness is something appeared in the first time. Specificity is something appeared in the story before and there is just only one in the story."
2. "Definite: *the* referring to one; specificity referring to *a/an* (i.e. one which is more unique among the few)."
3. "Specificity: to refer to singular or plural definite nouns. Definiteness: to refer to which ones."

Tertiary: (34 out of 48 participants (70.8%) expressed that they do not know).

1. "Definiteness means something that goes on without limitations such as time/numbers; specificity means specification of something."
2. "Definiteness: 100% on something; specificity: indicate something's uniqueness/specific features."

3. "Definiteness refers to the only possible quality of a thing; specificity refers to the degree of specificity."

An examination of the extracts reveals that the student participants representing different English proficiency levels up to very advanced do not seem to have much clue of what definiteness and specificity are and how they are different. Similar hypotheses were borne out by the Japanese counterparts of these Cantonese ESL learners as reported in Butler (2002) focusing on definiteness but not specificity (though this term is used instead to refer to definiteness). Such a limited understanding of the use of English articles seems to be universal, which may be related to how the "rules" of use are presented in textbooks and by teachers. There is thus an imminent need for students to understand the nature and functions of English articles and then the associated linguistic concepts involved.

5.3 Pedagogical Implications

When asked about what can be done to help facilitate learning of English articles in terms of classroom teaching and textbook design, more suggestions were given by the primary and secondary groups. The top three recommendations given by the primary group are: (1) practice in the form of exercises/e-learning and games (33.3%); (2) exposure (e.g. reading/watching movies/listening) (30%); and (3) teachers' role (e.g. clearer explanation; proactive help; explanation in Chinese) (10%). The top four recommendations are: (1) exposure (e.g. reading/watching movies/listening more) (22.6%); (2) practice in the form of mainly doing exercises (no games and electronic means as suggested by the primary 5 students) (19.35%); (3) teachers' role (e.g. giving clearer explanation; one-to-one teaching) (6.45%); and (4) a table listing clearly the usage of English articles (6.54%). Not many tertiary students produced suggestions. 5 of them (10.4%) suggested having more exposure through reading and listening, 3 others (6.25%) suggested using examples, and 2 (4.16%) suggested doing exercises. It seems that all the three groups of participants find exposure, exercises and teachers' input important in helping them learn English articles. This is also consistent with the students' expectations of what else should be offered in an English lesson or by an English textbook to facilitate teaching and learning of English articles. All the three groups expect more coverage (in terms of description and examples) in English lessons and textbooks so that they know how to use and apply English articles. The tertiary group is also aware of the need for authenticity and rules/principles about using English articles. Given students' reliance on teachers and perhaps textbooks in the initial state of language acquisition, explicit instruction in the form of rules and contexts of English article use, together with its role and functions, should first be provided.

Given the important role played by teachers in students' acquisition of English articles, as reflected from the most suggestions given to teachers to address students'

difficulties/challenges (question 5), and the significant role of rule explanation (question 2 about pedagogical approaches), teachers' understanding of English article use seems to be a prerequisite for effective instruction to take place. Teachers should introduce the concepts involved like generics; specificity and definiteness before students can understand how these concepts give rise to major article uses. Based on the four non-generic types of reference (Ionin & Montrul, 2009) and two types of generic-creating predicate (Mari et al., 2012), Table 2 is developed.

As seen from Table 2, types 1 and 2 are generics which can be realised by *a*, *the* or zero articles. Generic reference in English is realised when an NP is modified by two kinds of predicate: characterising predicates (Type 1) and kind-referring predicates (Type 2). A characterising predicate says something about every individual member of class referred to by the NP. For example, *be a dangerous animal* is a characterising predicate (lions are characteristically dangerous). All three articles, *a/the/Ø* can be used with generic reference with characterising predicates. A kind-referring predicate says something about the class referred to by an NP as a whole. For example, *be extinct* refers to the class as a whole, rather than individuals within the class. In this case the indefinite article cannot be used with generic reference, while the other two can. While using *a* or zero articles for generality is known to the teachers, they do not seem to be familiar with using *the* as generic nouns. This does not seem to have been

Table 2 Four non-generic types of reference and two types of generic-creating predicate

Features	Articles	Examples
Type 1 Generic nouns (NPs modified by characterising predicates)	*a, the, 0*	*A lion* is a dangerous animal. *The lion* is a dangerous animal. *0 Lions* are dangerous animals.
Type 2 Generic nouns (NPs modified by kind-referring predicates)	*the, 0*	#A woolly mammoth is extinct (this is not ungrammatical, but it is semantically odd). *The woolly mammoth* is extinct. *0 Woolly mammoths* are extinct.
Type 3 [+def, +spec]	*the*	Pass me *the pen.* *The idea* of coming to the US was… I found a book. *The book* was… *The first person* to walk on *the moon*… *The sun* rises up earlier in summer. *The air* in this city is not very clean.
Type 4 [−def, +spec]	*a, 0*	Chris approached me carrying *a dog*. I keep sending *0 messages* to him.
Type 5 [−def, spec]	*a, 0*	Alice is *an accountant*. I guess I should buy a *new car*. *0 Foreigners* would come up with a better solution.
Type 6 [+def, −spec]	*The*	She will present the prize to *the winner* of the race, when it finishes. *The captain* always leads the team out onto the field.

mentioned by both the primary and secondary teachers involved in this study. Type 3 is marked with *the*. Most teachers know that *the* is a definite article but they do not seem to have a clear idea of specificity and how it is different from definiteness. *The* is actually used to refer to something definite and specific. For [+definite], "the speaker and hearer presuppose the existence of a unique individual in the set denoted by the NP"; for [+specific], "the speaker intends to refer to a unique individual in the set denoted by the NP and considers the individual to possess some noteworthy property" (Ionin et al., 2004, p. 5). For example: A: I have finished reading some English books. B: What are they about? A: *The* books are about love. In other words, even though something is mentioned for the first time, if the speaker believes that the referent is known to the hearer in a particular context, and if a modifier is used for the speaker to identify the referent, *the* can also be used. Types 4 and 5 are indefinites whose referent of a noun is only known to the speaker including first mention nouns. This concept is not new at all, but the concept of countability needs to be introduced so that students know when to add *a/an* and when plural (i.e. zero articles). Students should also be reminded not to rely on word spelling but pronunciation to determine the use of *an*. Type 6 [+def, −spec] is also needed. For example: *She will present the prize to the winner of the race, when it finishes.* "The winner" is definite, but has no specific reference until the race is complete. Another example is: *The captain always leads the team out onto the field.* (*The captain* can be non-specific. It is a role that can be taken by different, specific individuals).

Before using communicative activities or the communicative approach as suggested by teachers to reinforce students' understanding of English articles, the major uses of English articles involving linguistic concepts such as generality, definiteness and specificity should be presented to students in a step-by-step manner. Oversimplifying the uses or highlighting only some of them for students does not seem to be effective. English teachers of primary students, secondary students and even tertiary ones may need to work together so that the topic will be covered comprehensively in stages instead of possibly being ignored, believing that it has already been covered in primary schools.

A comparison of students' and teachers' views develops insights into the teaching and learning of English articles. Data collected from the students reveal common difficulties and problems which may be related to their lack of understanding of the major uses of English articles involving linguistic concepts like generality, referentiality, specificity and nouns countability. The teachers' data also show that the teachers' understanding of the major uses of English articles is instrumental. Though teachers can decide if technical terms should be explicitly introduced to students, the nature and functions of English articles, and how these concepts give rise to the major uses should be covered. The effectiveness of explicit instruction outlining the major uses of English articles as suggested in this chapter can be the focus of future studies.

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Frequency Effects in Chinese Learners' Acquisition of the English Article Construction

Helen Zhao and Yasuhiro Shirai

Abstract The current study, built on the usage-based approach to language, investigated frequency effects in Chinese learners' acquisition of English articles. We carried out type and token frequency analysis of article usages in academic written essays sourced from a written English corpus of Chinese learners. We adopted an existing usage-based article cue coding scheme, which allowed us to implement a refined frequency analysis of all form-function mappings in learner texts. Our findings suggested that learners' article usage follows the Zipfian distribution in terms of token frequency. Learners show a heavier reliance on a very limited number of high-frequency cues than native speakers. Non-definites (indefinite article and zero article) outnumber definite articles in terms of token and type frequency in learner texts. Yet definite articles show a significantly higher type/token ratio than non-definites, suggesting that learners develop a more complex and heterogeneous profile of definite article usage. We argue for more research and pedagogical attention to frequency and complexity effects in the acquisition of articles.

Keywords Usage-based · Construction learning · Frequency · English articles

1 Introduction

Despite the high input frequency, English articles (*a/an*, *the* and the zero article Ø) remain a feature generally acknowledged to be difficult for learners of English who come from an article-less background such as Chinese, Japanese, Korean and Slavic languages (Celce-Murcia & Larsen-Freeman, 1999). Teachers of English as a second language (L2) often find it difficult to understand how or why their students choose to use English articles the way they do. As a result, acquiring the article system remains

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an elusive goal. In the current study, we focused on Chinese learners who have been extensively studied for the stages of their English article acquisition (Crosthwaite, 2016; Diez-Bedmar & Papp, 2008; Robertson, 2000; Thomas, 1989). We adopted the usage-based approach to language acquisition and investigated how frequency affected Chinese learners' acquisition of articles.

2 Adult Second Language Article Acquisition

The framework most widely adopted for analysing English articles in previous L2 article acquisition studies is Bickerton's (1981) semantic wheel framework. This model has two defining features: specific reference (SR) and hearer knowledge (HK). SR means whether the speaker refers to a specific referent, whereas HK means whether the hearer of an utterance has, or is assumed by the speaker to have, shared knowledge about the referent. Based on the two features, Bickerton specified four semantic types. Type 1 [-SR, +HK] is the generics category. The function of genericity can be expressed by the definite article (e.g. ***The*** *elephant is the largest land animal*), the indefinite article (e.g. ***An*** *elephant never forgets*) or the zero article (e.g. **Ø** *Elephants are the largest land animals*). The speaker does not refer to a specific object, while the hearer is assumed to have knowledge of the generic category. Type 2 [+SR, +HK] includes all the referential definites such as previous mentions (e.g. *I know* ***the*** *girl*), anaphoric referents (e.g. ***the*** *Harvard faculty*), uniqueness in all contexts (e.g. ***the*** *Sun*) and uniqueness in a given speech context (e.g. *Pass me* ***the*** *salt*). The referent is uniquely identifiable by both the speaker and the hearer. All the definite article usages, except for generics and some conventional uses, belong to this type. Type 3 [+SR, −HK] is the referential indefinite. These are the first mentions and can take both the indefinite article (e.g. *I repaired* ***a*** *car*) and the zero article (e.g. *I have been repairing* **Ø** *cars all day*). Only the speaker knows which specific object(s) is or are being referred to, while the hearer does not share the knowledge. Type 4 [−SR, −HK] includes all the non-referential nouns and is used with the indefinite article (e.g. *I need* ***a*** *car*) and the zero article (e.g. *I need* **Ø** *cars*). Neither the speaker nor the hearer presumably cares which specific object is being referred to.

The Bickerton model has motivated a strong body of research that has investigated the sequence of acquiring articles. Adult L2 learners have been observed to first associate specificity [+SR] with the definite article (Huebner, 1983; Thomas, 1989). First marking for specificity leads to learners using *the* for all Type 2 and Type 3 noun phrases. This can result in an overuse of *the* in Type 3 contexts where the hearer does not share the knowledge of the specific referent and, as such, *a* should be used, as in "Tom is visiting *a* boy from his class" (Butler, 2002; Ionin et al., 2008; Parrish, 1987). In contrast, learners are slower to account for the hearer's knowledge [±HK] (Butler, 2002; Ionin et al., 2008; Thomas, 1989).

The Bickerton model has also been applied to research that has a contrastive linguistic focus. Diez-Bedmar and Papp (2008) and Crosthwaite (2016) were both learner corpus studies that compared the sequences of article acquisition by learners of different L1s, but the two studies obtained very different results. Diez-Bedmar and Papp (2008) found that college-level Chinese learners of English (proficiency unspecified) showed significantly lower accuracy of article use than Spanish learners in written essays. Also, they concluded the hierarchy of accuracy for Chinese learners was Ø > *a* > *the*. In contrast, Spanish learners showed an overall significantly higher accuracy than Chinese learners and followed the acquisition sequence of *a* > *the* and Ø.

Crosthwaite (2016) reported much higher accuracy rates for Chinese learners' written performance in another learner corpus. He concluded that Chinese learners of low-intermediate to upper-intermediate proficiency in his sample had little trouble with article use and had equally good performance on definite, indefinite and zero articles. Korean and Thai learners who also come from article-less L1 backgrounds produced more errors and resembled the performance of the Chinese learners in Diez-Bedmar and Papp (2008).

Bickerton's semantic wheel was an effective model in guiding linguistic research of article analysis and acquisition. But the model also created issues for researchers to address. First, the four semantic types in the model are balanced in terms of the number of features [±SR, ±HK], but are not balanced in terms of the number of functions. Type 1 has only one function (generics), whereas Type 2 has many more functions. The elicited number of tokens in the four types also differs to a great extent (see Crosthwaite, 2016; Diez-Bedmar & Papp, 2008; Thomas, 1989). The imbalance creates problems for meeting statistical assumptions. Second, the model explains the use of many high-frequency usages but gives up a large number of idiosyncratic functions that reflect idiomatic and conventional article use in English (e.g. **Ø** *hand in* **Ø** *hand*, *in* ***the*** *1990s*, ***the*** *Mississippi River*, **Ø** *Michigan Lake*). Though these functions may seem peripheral, they constitute an indispensable part of the English article system and pose a serious challenge for L2 learners.

3 Usage-Based Approach to Language Acquisition

Almost none of the previous research works investigated frequency effects in article acquisition. Previous researchers have been primarily concerned with learners' accuracy of article use and have largely ignored learners' frequency of exposure to article use and their frequency of using article forms and functions. But frequency is found to be one of the most important predictors of language acquisition in the literature that follows the usage-based approach to language and language acquisition. Frequency effects in language use are typically shown in a Zipfian distribution (Zipf, 1935): Frequency is inversely proportional to its rank in the frequency table. The most frequent usages account for the majority of occurrences in a given category.

The Zipf's law has been consistently shown to be applied to linguistic constructions such as verb argument constructions (Ellis et al., 2016).

Frequency effects in language learning refer to the acquisition of linguistic knowledge based on cumulative experiences with language (Crossley et al., 2019; Ellis, 2002, 2006). Frequency of exposure from the input forms memory and interacts with the form-function associative learning mechanism in learner cognition. Form-function mappings are strengthened and consolidated with increased frequency in learners' input and interactional usage. High-frequency form-function mappings have the advantage of being acquired earlier than low-frequency constructions (Ellis & Ferreira-Junior, 2009). As L2 competence increases, learners gradually expand their use of L2 constructions to incorporate functions that are less prototypical and less frequent (Eskildsen, 2015; Eskildsen & Kasper, 2019).

Among other determinants of language acquisition under the usage-based framework, L1 transfer is another factor that is closely related to L2 article acquisition. As Ellis (2006) noted, "The L2 learners' neocortex has already been tuned to the L1, incremental learning has slowly committed it to a particular configuration, and it has reached a point at which the network can no longer revert to its original plasticity" (p. 184). The reduced plasticity of the brain interferes with the functioning of the associative learning mechanism, making it harder for adult learners to develop sensitivity to distributional probabilities of form-function mappings to the native level (Tachihara & Goldberg, 2020).

In the context of the current study, Mandarin Chinese does not have a system of articles that exists in English (Li & Thompson, 1981). Yet there is a widespread use of determiners which function in part to signify definiteness and indefiniteness. Robertson (2000) found that two distinct features in Mandarin were related to transfer phenomena that he observed in Chinese learners' use of English articles. First, the distal demonstrative *nà-* "that" and the unstressed numeral *yi* "one" begin to take on some of the functions of the definite and indefinite articles *the* and *a* in English, respectively (Huang, 1999; Li & Thompson, 1981):

1) 你 認識 不 認識 那個 人
nǐ rènshi bu rènshi **nèi**-ge rén?
You know no know that-classifier person
'Do you know the/that person?'

2) 他/她 買了 一個 帽子
tā mǎi-le **yi**-ge màozi
3sg buy-perfective one-classifier hat
'S/he bought a/one hat.'

(Robertson, 2000, p. 144)

Another productive structure in the grammar of Mandarin noun phrases (NP) is the "NP-*de*-NP" structure. Two NPs are chained by the particle -*de* which indicates associative relationship (especially possession) (Li & Thompson, 1981). The first NP is often a personal pronoun as in (3). It can also be an animate (3) or inanimate entity (4).

3) 我的 襯衫
wǒ-**de** chènshān
I-particle shirt
'my shirt'

4) 那個 飯店的 菜
nèi-ge fàndiàn-**de** cài
that-classifier restaurant-particle food
'the food of that restaurant'
(Robertson, 2000, p. 144)

Robertson (2000) proposed that Chinese learners had the tendency to transfer the two constructions to English productive use. He reported that some Chinese learners used the English demonstrative *this* and the numeral *one* as the definite and indefinite markers, respectively. He did not make specific observations about whether and how transfer might have been related to the "NP-*de*-NP" structure.

4 Frequency Analysis of English Articles

Master (2013) was one of the very few studies that examined frequency in English article usage. Master focused on the genre of research articles in science and technology. He analysed the token frequencies of the definite article *the*, the indefinite article (*a, an*) and the zero article (Ø) in a self-composed database of research articles published by native English-speaking authors. He found that the articles (*the*, *a/an*, Ø) accounted for the majority of determiners by a very large margin (90.3%). Of the articles, the most frequently occurring form in his database is the zero article Ø (51.2%), followed by the definite article *the* (37.8%) and the indefinite article *a(n)* (11.0%). He concluded that although *the* is the most frequent word, the zero article is in fact the most frequent free morpheme in the English language.

Master (2013) also analysed the frequencies of other types of determiners. Determiners are obligatory prehead structures in English noun phrases that generally serve the function that indicates a specification of definiteness and indefiniteness (Huddleston & Pullman, 2002). Determiners include articles, demonstratives (e.g. *this, those*), possessives (e.g. *our, my*), quantifiers (e.g. *all*, *many*), cardinal numerals

(e.g. *one, two*), assertives/nonassertives (e.g. *some*, *either*) and negatives (e.g. *no*). Non-article determiners are strong competitors to articles because these forms can also serve similar functions as articles. Many of them add a more refined semantic specification to definiteness and indefiniteness and thus are semantically "heavier" than articles. So far very few studies have compared usage-based properties (e.g. frequency of usage) of articles with other determiner types. Master's (2013) study made a valuable contribution to this research gap by investigating the frequency of distribution of various types of determiners in texts produced by native-speaking English expert writers. We used his findings of the distributional frequency as the L1 norm to compare with the L2 learner data in our study.

Zhao and MacWhinney (2018) was the only study that has applied the usage-based approach to a comprehensive investigation of English articles. In their analytical framework (MacWhinney, 2012), forms (e.g. *the*, *a*) compete for mapping onto functions (e.g. second mention). The winner forms in the competition (e.g. *the*) serve as *cues* for the activation of functions (e.g. second mention). For convenient naming of the form-function mappings, Zhao and MacWhinney (2018) called them article cues (e.g. cue "second mention|*the*", symbolising the conditional probability that a second mention interpretation will occur given the formal cue *the*).

Unlike many previous article acquisition studies (Butler, 2002; Huebner, 1983; Thomas, 1989) that adopted Bickerton's (1981) semantic wheel framework (±SR, ±HK) which treated the four semantic categories on an equal footing, Zhao and MacWhinney (2018) emphasised the importance of carrying out a more refined analysis of the form-function mappings in the English article system. From a usage-based perspective, they pointed out the inherent differences in the four semantic categories. For example, the generics category (−SR, +HK) has low token frequency and type frequency in English language usage, but has complex form-function mappings (i.e. the function of genericity mapped onto three forms *the, a, Ø*). The referential indefinites (+SR, −HK) and the non-referentials (−SR, −HK), in contrast, have very high token frequency, as these two meanings represent the most frequent article usages in English, but have low type frequency since these are mostly the few first mention cues that take either the indefinite article or the zero article depending on the countability of the head noun. The referential definites (+SR, +HK) have high token frequency and high type frequency because this category covers all definite article usages in English (except the generic *the*). There was an attempt, though not widely adopted, to extend the four-category framework by adding the fifth category which would include idioms and all idiosyncratic usages (Diez-Bedmar & Papp, 2008; Ekiert, 2004). This fifth category has relatively low token frequency but high type frequency as it contains a large number of context-specific form-function mappings. The semantic wheel framework has been very useful and powerful in accounting for some commonly observed learner errors while considering crosslinguistic influence on L2 acquisition. However, the four semantic categories represent four distinct usage-based profiles which make them not entirely comparable. The usage-based approach to article analysis advocated by Zhao and MacWhinney (2018) broke the categorical restriction of the semantic wheel and treated each form-function mapping

in the article system as an analytical unit. This approach greatly facilitates the identification and analysis of native speakers' and L2 learners' article usages, making it easier to predict and explain learners' specific difficulties in article acquisition.

Zhao and MacWhinney (2018) identified a full range of 86 article cues in the English language and did an L1 corpus analysis of written text (26,468 words) sampled from ten common genres (academic, encyclopaedia, magazine, newspaper, novel, drama, children's story, recipe, etc.) on a wide range of topic areas (politics, economy and finance, education, history, geography, technology, entertainment, sports, travel, food, etc.). Meanwhile, they computed the frequencies and reliabilities of the identified article cues following the corpus count method specified by the theoretical framework of the Competition Model (McDonald & MacWhinney, 1989). They found that native English speakers' use of article cues obeyed the Zipf's law (Zipf, 1935). The top ten cues with the highest token frequencies accounted for 76.3% of all the article tokens in their corpus sample.

5 The Present Study

In the current study, we adopted Zhao and MacWhinney's (2018) analytical framework of English articles and applied it to the investigation of frequency effects in second language learning. In line with the previous literature, we expect to observe frequency effects in L2 acquisition of the English article construction. We assume that the article cues that are used in learner production have emerged in their interlanguage system and have become available to them. Furthermore, we predict that learners should demonstrate increased knowledge of infrequent article cues as their L2 competence increases.

We adopted the corpus-based approach and analysed the L2 learner data from the written section in the Spoken and Written English Corpus of Chinese Learners (Version 2.0) (SWECCL) (Wen et al., 2008). SWECCL is one of the largest corpora for Chinese-L1 learners learning English as a foreign language (EFL). Learners' written texts in this corpus are collected from Chinese-speaking college students in 34 universities in mainland China. The sampling of the universities has a good coverage of geographic areas and of different rankings.

Same as most learner corpora, SWECCL does not offer quantitative data that can be used to indicate learners' L2 proficiency. However, it includes written data obtained from both English majors and non-English majors, both of which are included in the analysis of the current study. Although it is not necessarily the case that an English-major learner will have higher L2 competence than a non-English major, it is fair to assume that in the EFL context English majors have more exposure to the target language and more opportunities of producing the L2 than non-English majors. English majors in Chinese universities take skill-based and content-based courses with input materials and the medium of instruction all in English. They primarily produce written English essays for coursework. Non-English majors, on the other hand, have relatively limited exposure and use of English in college education. With

the above consideration, the current study assumes an overall higher L2 competence among English-major learners than non-English-major learners. Specifically, we aim at investigating the following research questions:

1. What is the frequency distribution of learners' usage of English determiners?
2. What is the frequency distribution of learners' usage of English articles? Specifically,
   (a) What article cues are used by learners?
   (b) Does learners' use of the article cues follow the Zipfian distribution?
3. Do English-major learners show more nativelike usage of articles than non-English-major learners? Specifically,
   (a) Do English-major learners use more infrequent article cues than non-English-major learners?
   (b) What are the type and token frequencies of English majors' and non-English majors' usage of the definite (*the*) and the indefinites (*a/an/*Ø)?

6 Methods

The majority of the written texts in the SWECCL corpus were argumentative essays based on prompts. The essay prompts are available in the Appendix. The corpus includes two types of text, timed and untimed, depending on whether students were given time restriction for the written task. Texts were initially collected from learners' handwritten documents and then were manually typed into digital form.

We included both English majors and non-English majors in our analysis. In the corpus, English majors' texts were available from students in Year 1 to Year 4 at college, whereas non-English majors' texts were only available from students in Year 1 and Year 2. For a fair comparison, we only analysed Year 1 and Year 2 essays from both majors. We randomly sampled approximately 20 texts from the timed essays in the four subgroups (English-major Year-1, English-major Year-2, Non-English-major Year-1 and Non-English-major Year-2). Timed measurements tend to elicit learners' implicit knowledge (Ellis et al., 2009) and are more likely to better reflect the status quo of learners' interlanguage development than untimed measurements. We only selected essays with more than 150 words. Many essays shorter than 150 words are found to be incomplete and lack a clear essay structure.

Four samples with a sum of 16,989 words were generated based on the above criteria (Table 1): English-major Year-1 (4707 words), English-major Year-2 (5858 words), Non-English-major Year-1 (3683 words) and Non-English-major Year-2 (2741 words). We adopted Parrish's (1987) and Tarone and Parrish's (1988) methods of coding all types of noun phrases (NPs) including articles, quantifiers, possessives and demonstratives. A total of 3004 noun phrases were identified as obligatory contexts for the use of all types of determiner, including articles and other non-article

Table 1 SWECCL data sample

	English majors		Non-English majors	
	Year 1	Year 2	Year 1	Year 2
Texts	18	21	19	17
Words	4707	5858	3683	2741
Words per text	261.50	278.95	193.84	161.24
NPs with all determiners	847	1085	626	446
NPs with all determiners per text	47.06	51.67	32.95	26.24
Quantifiers per text	4.50	5.14	2.58	2.12
Possessives per text	4.94	6.57	5.42	4.18
Demonstratives per text	2.06	1.76	1.05	0.82
Obligatory NPs for article use (token)	640	801	454	315
Obligatory NPs for article use per text (token)	35.56	38.14	23.89	18.53
Obligatory NPs for article use (type)	200	234	168	149
Obligatory NPs for article use per text (type)	11.11	11.14	8.84	8.76

determiners (quantifiers, possessives and demonstratives). 2210 tokens of article use (*the*, *a*, *an*, Ø) were identified.

The first author of the current article and a native English speaking research assistant manually coded all article tokens for (a) cue type and for (b) accuracy of usage in obligatory contexts (SOC). The two coders reached an interrater reliability of 0.86 after discussion and resolution of disagreements. We will only report frequency results in this article. The accuracy data is reported in a parallel study (Zhao & Fan, 2021).

Cue types were coded with a coding scheme consisting of 86 article cues developed by Zhao and MacWhinney (2018), which were extracted from descriptive grammar books (Celce-Murcia & Larsen-Freeman, 1999; Huddleston & Pullum, 2002; Quirk et al., 1985; and an ESL textbook focusing on articles, Cole, 2000). To illustrate the current coding, for the sentence "*So **the** children must learn how to compete to protect themselves*", the use of the definite article *the* is an error since the author intends it to be a general category of children rather than refers to a specific group of children. Here, *the* was coded as an error token of the cue "*plural*\Ø" in the coding scheme (Use Ø with plural nouns unless they are uniquely identifiable). More examples of article cues will be discussed below; see especially Table 3.

Certain forms were excluded from analysis. When there are two parallel NPs, both of them are coded when there is no involvement of non-article premodifiers such as possessives or quantifiers. For example, in the phrase "a lot of troubles to **college** and **society**", both "college" and "society" were coded. Both of them are considered as obligatory contexts for article use. But in the phrase "for **your commanders** or **commercial partners**", only the first NP "commanders" was coded for possessive use. The second NP "commercial partners" was excluded from our coding, since we

cannot judge whether the zero article was used due to the use of the possessive (*your*) or due to the cue *plural*\Ø.

We also excluded the erroneous forms that invite ambiguous interpretations. For example, the NP "*foreigner"* in the sentence "I think communicating with **foreigner** is the thing you really want to do" was excluded since it is most appropriate to interpret this error as a morphological error due to the omission of the plural marker *-s*. However, the error could also be interpreted as an omission error of the indefinite article *a*. Such NPs were excluded to avoid ambiguous interpretations in coding. The errors related to misuses of parts of speech were also excluded from coding. For instance, the NP "*independence*" in the sentence "We can learn to be **independence** in universities" was a grammatical error since an adjective (*independent*) rather than a noun was required in the slot. Similarly, we also excluded coding on the adjective "*healthy*" in the sentence "The good **healthy** for them are very important." Gerunds were also excluded from coding.

We distinguished between *tokens* of article cues, counting all the tokens of an article cue, and *types* of article cue, counting only one instance of each article cue which occurred in the text. That is, when multiple forms of the same article cue (e.g. *plural*\Ø) occurred in a text, such as *children*, *schools* and *companies*, we counted the token frequency as 3 and the type frequency as 1.

We grouped the analysis of the indefinite article (*a*, *an*) and the zero article (Ø) as one category of non-definite articles. Only three indefinite article cues were identified in the learner texts: "*singular countable**a/an*" (Use *a/an* when the singular countable noun is not made concrete or instantiated by any modifier); "*positive 'few' or 'little'**a/an*" (Use *a* with words "few" or "little" expressing a positive meaning); and "*a XX of**a/an*" (Use *a/an* with structures like "a number of", "a handful of" and "a pair of"). Only the cue "*singular countable**a/an*" had a reasonable size of coded tokens. The other two *a/an* cues had a very small token size. It is not fair to statistically contrast the indefinite article (*a/an*) cues with the cues of the definite article and of the zero article in terms of token and type frequency. Therefore, we grouped the indefinite article cues with the zero article cues as the non-definite article cues (*a/an/*Ø).

When analysing results, we compared learners' frequency patterns to native speaker patterns. For the comparison of frequency distribution of determiner use, we compared the learner results to the native speaker data reported in Master (2013) since this is the only study that has provided the most comprehensive examination of determiner use frequency in English academic texts. Regarding article cue distribution, we compared our learner results to the native speaker pattern reported in Zhao and MacWhinney (2018).

7 Results

7.1 Frequency Distribution of the Determiners

Table 1 presents the overall determiner usage (including articles) in the learner essays. The average percentage of determiners per number of words was 17.7. This percentage is comparable to 18.3 for the published research articles written by native English speakers reported in Master (2013). The articles *the*, *a(n)* and Ø in the learner production accounted for the majority of determiner use (73.6%), though this proportion is much smaller compared to 90.3% reported in Master (2013). The reduced slice for article tokens in our sample was taken by other determiners including possessives (13.3%), quantifiers (9.1%) and demonstratives (3.6%).

Possessives had a surprisingly high frequency in the learner corpus. Possessives accounted for only 2.4% of determiner use in Master's (2013) analysis in which *their* was reported as the most frequently used possessive determiner in published academic texts (47% of total possessive use). The most frequently used possessives in our data were *our*, *their*, *my* and *your*. We analysed the percentage of each possessive out of the total number of possessive use in each learner group and obtained the following patterns of results (Table 2). *Our* accounted for the majority of possessives by a large margin among both Year 1 and Year 2 groups of non-English majors. Non-English majors heavily relied on first person possessives (*our*, *my*) in their argumentative essays. English majors used the plural form of third person possessive (*their*) much more frequently than non-English majors. English majors also used a higher percentage of *your* in the writing.

The second largest category of non-article determiners in our data is quantifiers which account for 9.1% of determiner use. Similar to the case of possessives, the proportion of quantifiers in our data was drastically higher than its proportion in the published research articles (2.06%) reported by Master (2013). In our data, *some* was found to be the most frequently used quantifier. Master (2013) differentiated two forms of *some* as a determiner: an unstressed form (e.g. *Medical care is worse in some poor villages*) that indicates an indeterminate amount, and a stressed form (e.g. *Some people think …; but in my opinion…*) meaning "certain unidentified" referent (Greenbaum & Quirk, 1990, p. 74). Both forms of *some* appeared in our data, with the unstressed form being the more frequently used form of *some*. *Many* was the second most frequently used quantifier in our data, though it was not reported in Master's (2013) analysis of published research articles.

Demonstratives occupied 3.6% of determiner use in our data, which is slightly lower than the proportion (4.5%) reported in Master (2013). *This* was reported as the most frequently used demonstrative in Master's analysis. In our data, *this* was also the most frequently used demonstrative. But there was not a clear pattern of results regarding the frequency distribution of demonstrative use in the learner groups. This was due to the limited number of demonstrative tokens (see Table 1) that appeared in the learner's essays.

Table 2 Percentages of possessives, demonstratives and quantifiers by learner group

Learner group	Percentages of possessives
English-majors year-1	*Their* (30.7%) *our* (29.5%) *my* (12.5%) *your* (11.4%)
English-majors year-2	*Their* (37.7%) *our* (25.4%) *my* (10.1%) *your* (8.7%)
Non-English-majors year-1	*Our* (58.3%) *my* (19.4%) *their* (4.9%) *your* (1%)
Non-English-majors year-2	*Our* (46.5%) *my* (15.5%) *their* (12.7%) *your* (5.6%)
Master (2013) native data	*Their* (47%) *its* (35.1%) *our* (15.1%) *his* (1.6%)
	Percentages of quantifiers
English-majors year-1	*Some* (28.4%) *many* (21.0%) *other* (11.1%) *every* (4.9%)
English-majors year-2	*Some* (33.0%) *many* (16.5%) *every* (8.3%) *no* (6.4%)
Non-English-majors year-1	*Many* (32.0%) *some* (20.0%) *all* (12.0%) *one* (10%)
Non-English-majors year-2	*Some* (38.9%) *one* (13.9%) *many* (11.1%) *another* (5.6%)
	Percentages of demonstratives
English-majors year-1	*This* (62.5%) *those* (16.7%) *these* (12.5%) *that* (8.3%)
English-majors year-2	*Those* (45.2%) *these* (25.8%) *that* (16.1%) *this* (12.9%)
Non-English-majors year-1	*This* (69.2%) *these* (23.1%) *those* (7.7%)
Non-English-majors year-2	*This* (44.4%) *that* (22.2%) *those* (33.3%)

7.2 Frequency Distribution of Article Cues

Out of the total number of 86 article cues in the coding scheme (Zhao & MacWhinney, 2018), 42 article cues were observed in the learner essays. Despite the fact that half of the L1 cues did not appear in the L2 texts, the frequency distribution of L2 article cues is Zipfian, similar to the Zipfian distribution of L1 article cues. The most frequent article cues overall accounted for the majority of all the tokens. Figure 1 plots the token frequency distribution of all the 42 article cues identified in the learner texts as cue frequency (Y axis) against frequency rank (X axis). Since the frequency ranks in different learner groups varied, we used the rank in the Year-1 English-majors group as the benchmark to plot Fig. 1. The Year-2 English majors have the sharpest Zipfian pattern of distribution compared to the other three groups.

The overall trend of all the learner groups is that the cues with high L1 frequency also have high L2 frequency. Table 3 lists the token frequency of all the article cues

Table 3 Number of tokens for article cues in learner groups

L1 rank	Cue	Example	English-major year 1	English-major year 2	Non-English-major year 1	Non-English-major year 2
1	*Plural\Ø*	**Ø** students	152	210	67	42
2	*Non–countable\Ø*	**Ø** water	136	158	139	92
3	*Singular countable with post-modifiers\the*	**the** man she is dating	19	29	13	13
4	*Singular countable\a/an*	**a** Shakespearean drama	80	97	78	67
5	*Preposition-modifier non-uniqueness\a/an/Ø*	I need **a** translator with more experience.	17	21	19	19
6	*Plural with post-modifiers\Ø*	**the** letters I received today	9	9	4	5
7	*Part of\the*	I'm returning this coat for a refund. **The** zipper broke.	23	15	16	3
8	*Second mention with variation\the*	I saw a peacock at the zoo. **The** bird was beautiful.	9	13	2	4
9	*Clause-modifier non-uniqueness\a/an/Ø*	Help me find **a** word that fits in this sentence.	17	14	3	3
10	*Second mention\the*	I saw a peacock. **The** peacock was beautiful.	17	36	9	5
11	*Names of countries, cities or states\Ø*	**Ø** Australia	11	7	0	1
12	*Non-countable with post-modifiers\the*	**the** wealth of her parents	20	37	12	10

(continued)

Table 3 (continued)

L1 rank	Cue	Example	English-major year 1	English-major year 2	Non-English-major year 1	Non-English-major year 2
13	*Ranking words|the*	**the** first, **the** beginning	6	12	9	4
14	*Superlative|the*	**the** best	11	7	8	5
15	*Uniqueness|the*	**the** Sun, **the** Moon	9	5	16	7
17	*Anaphoric reference in phrase|the*	**the** Black Sea Coast, **the** Harvard faculty	4	8	4	1
20	*Specific collectives of people|the*	**the** Republican Party	1	13	0	0
21	*Habitual location|Ø*	go to **Ø** school	35	7	14	24
22	*Time of the day/week/season|the*	in **the** morning, in **the** summer	1	1	0	0
24	*Historic periods|the*	**the** 1990s	0	1	1	1
25	*Obvious physical place|the*	**the** airport, **the** beach	1	2	0	1
26	*Political and military institution used alone|the*	**the** air force, **the** Department of Commerce	1	7	0	0
29	*Disease name|Ø*	**Ø** cancer	0	2	0	0
30	*Ranking words for time|Ø*	**Ø** next month	1	0	1	0
31	*Comparative | Ø*	**Ø** more years	18	14	6	5
32	*Positive "few" or "little"|a/an*	**a** few friends, **a** little time	0	1	1	4
33	*A XX of|a/an*	**a** handful of	5	9	7	1

(continued)

Table 3 (continued)

L1 rank	Cue	Example	English-major year 1	English-major year 2	Non-English-major year 1	Non-English-major year 2
34	*Generic animals|the*	**the** elephant	0	0	0	2
40	*Company names used alone|Ø*	**Ø** Microsoft	1	0	0	0
41	*Language, religion|Ø*	**Ø** English, **Ø** Buddhism	0	12	2	2
42	*Xx university|ø*	**Ø** Yale University	4	0	0	0
43	*Situational uniqueness|the*	Jimmy, get your feet off **the** table!	3	2	4	0
48	*Generic inventions|the*	**the** computer	2	15	5	2
52	*Abstract adjectives for people|the*	**the** poor, **the** disadvantaged	1	6	1	1
57	*Same|the*	**the** same song	5	3	2	1
59	*Past, future|the*	**the** past, **the** future	6	3	7	1
61	*Negative "few" or "little"|Ø*	**Ø** few choices, **Ø** little doubt	0	0	0	1
62	*Body parts|the*	He got hit in **the** eye	0	0	0	2
63	*Modifying words in phrase|the*	in **the** year 2018	1	1	1	1
67	*Double comparative|the*	**the** more, **the** better	0	0	0	2
82	*Ranking words for prizes|Ø*	**Ø** first prize	0	1	0	0
85	*Singled out words|Ø*	How do you spell **Ø** "cat"?	0	1	0	0

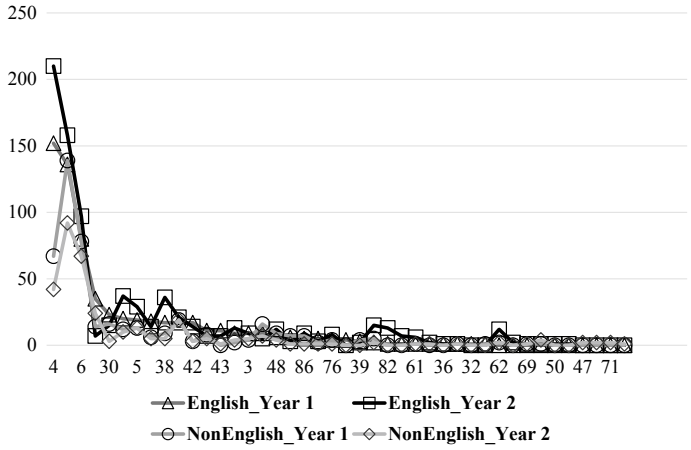

Fig. 1 Frequency distribution of article cues in learner groups

identified in the learner essays. To facilitate comparison across groups, the cues are ranked according to their L1 frequency ranks (Zhao & MacWhinney, 2018).

The three cues with the highest L2 token frequency in Table 3 are *plural\Ø*, *non-countable\Ø* and *singular countable\a/an*, ranking 1, 2 and 4 in L1 frequency. The English majors followed the L1 frequency rank (1 > 2 > 4), whereas the non-English majors deviated from the L1 rank (2 > 4 > 1) (see Table 3). The non-English majors in both years produced more non-countable nouns (or mass nouns) in the essays than plural nouns. For example, non-English majors used a large number of abstract nouns in their essays (e.g. *knowledge*, *education*, *environment* and *success*), which require the zero article cue *non-countable\Ø*.

Among the top 10 article cues in the L1 frequency rank (Table 3), there are two cues that do not rank as high in the L2 frequency rank: *part of\the* and *second mention\the*. The partonomy cue (*part of\the*) describes bridging relations between new entities and a previously mentioned entity in the discourse. The two entities can be linked via lexical relation through synonymy, hyponymy, meronymy, or thematic roles and through the interlocutors' shared pragmatic and world knowledge. For example, in the sentence "*I bought a car, but* ***the handle*** *is broken*", the new entity "*handle*" (i.e. steering wheel) is a constituent part of the old entity "*a car*" and is therefore registered for its unique identifiability in the discourse. This partonomy cue ranks sixth in the L1 frequency ranking but is used relatively less frequently in our L2 data. Similarly, the second mention cue (*second mention\the*) was also pushed out of the top 10 in the L2 frequency ranking.

Idiosyncratic cues, despite its overall low L1 token frequency, were extensively tallied for the various types in L1 data in Zhao and MacWhinney (2018). However, they were rarely found in our L2 data. Even some of the relatively more frequently used idiosyncratic cues were rarely used or did not appear in the L2 texts. These cues include "*collective group names\Ø*" (e.g. *The Republican Party*); "*profession as*

identifier|Ø" (e.g. *Actor Brad Pitt*); "*historic periods|the*" (e.g. *the 1990s*); "*time of the day/week/season|the*" (e.g. *in the morning/summer*); "*directional terms → the*" (e.g. *to the north*). This is partially due to the nature of argumentative writing as the genre of the current L2 learner data. Zhao and MacWhinney's (2018) L1 frequency analysis of article cues was based on samples of ten written genres on a variety of topic areas. It could be that the above idiosyncratic cues might have very low L1 frequency when the genre of academic writing was singled out from their L1 text analysis. If this is true, the weak presence of idiosyncratic cues in L1 English academic texts would likely pose a challenge for L2 learners to acquire this category of article usage, as L1 English academic genre may well constitute a major source of input to learners. Another likely account of restricted idiosyncratic cue use in the learner data is that the limited discourse boundary set by the essay topics (Appendix) fails to create semantic needs for learners to produce some of the above idiosyncratic cues.

7.3 Frequency Effects in Learner Groups

We expected to find frequency effects in construction learning to be applied to L2 article acquisition. We hypothesised that the English-major learners would demonstrate stronger knowledge of infrequent article cues than the non-English-major learners. The pattern of our results was in compliance with this prediction. The English majors produced a larger variety of article cues than the non-English majors (see Table 3). The numbers of cue types produced by the learner groups were: Year-1 English majors (32 types), Year-2 English majors (35 types), Year-1 non-English majors (28 types) and Year-2 non-English majors (32 types).

The Year-2 English majors, in particular, used the largest amount of infrequent article cues among the four learner groups. They produced quite a number of tokens for three cues ("*language, religion|Ø*", "*generic inventions|the*" and "*abstract adjectives for people|the*") that rank low in the L1 frequency ranking (ranked 41st, 48th and 52nd, respectively, see Table 3). They were the only group that used the cues "*ranking words for prizes|Ø*" and "*singled out words|Ø*" which are rarely observed in L1 texts (ranked 82nd and 85th, respectively). They produced an observable number of tokens for the cues "*specific collectives of people|the*" and "*political and military institution used alone the*", which ranked 20th and 26th in the L1 frequency ranking but were barely used by the other three learner groups. In contrast, the Year-1 non-English majors produced the smallest amount of cue types and used very few infrequent cues.

In short, there is evidence suggesting that the English majors demonstrated increased knowledge of infrequent article cues than the non-English majors. Based on this finding, we infer that the overall stronger L2 competence allowed the English majors to expand their article usage from the more frequent cues to the less frequent ones. Meanwhile, regardless of majors, the Year-2 students produced more cue types

than the Year-1 students. But this contrast was not as clear as the contrast between the two majors.

7.4 *Definite Article and Non-definite Article Cues Used by Learner Groups*

Among the 2210 article tokens in our sample, we identified 558 *the* tokens (25.2% of the total number of tokens) and 1652 *a/an/Ø* tokens (74.8% of the total number of tokens). These two proportions were somewhat comparable to the proportions reported in Master's (2013) analysis of published research articles: *the* (37.8%) and *a/an/Ø* (62.2%). Note that the higher percentage of non-definite article tokens in our data was not due to omission or erroneous use of the definite article in obligatory contexts. Unsupplied or inaccurate *the* tokens were coded into *the* cues in our coding method.

In terms of token versus type frequency, we observe very different patterns in the distributions of *the* and *a/an/Ø* cues (see Figs. 2 and 3). *A/an/Ø* cues had significantly higher token frequency than *the* cues by a large margin. The contrast was much smaller when considering type frequency. We treated each learner text as one participant and ran three separate 2 Form (*the* vs. *a/an/Ø*) × 2 Major (English vs. Non-English) × 2 Year (one vs. two) repeated measures ANOVA with token frequency, type frequency and type/token ratio as dependent variables.

The ANOVA on token frequency yielded the main effects of article form [$F(1, 71) = 191.84$, $p < 0.0001$, $\eta^2 = 0.73$] and major [$F(1, 71) = 62.24$, $p < 0.0001$, $\eta^2 = 0.47$]. The form × major interaction was also significant, $F(1, 71) = 9.05$, $p = 0.004$, $\eta^2 = 0.11$. The mean token frequency of *a/an/Ø* cues (mean = 21.91) was significantly higher than that of *the* cues (mean = 7.39); the English majors produced significantly more article tokens per text (mean = 18.47) than the non-English majors (mean = 10.82). The form × major interaction was due to the larger contrast between

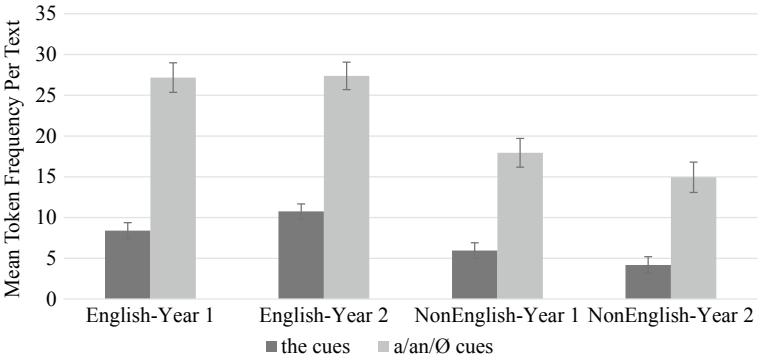

Fig. 2 Mean token frequency of the and a/an/ø cues per learner text

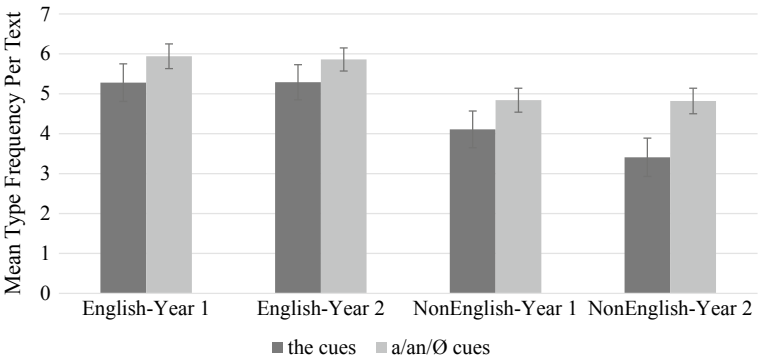

Fig. 3 Mean type frequency of the and a/an/ø cues per learner text

English majors and non-English majors in the production of *a/an/Ø* tokens than in *the* tokens.

The analysis on type frequency only revealed a main effect of article form, $F(1, 71) = 10.12$, $p = 0.002$, $\eta^2 = 0.13$, and no other main effects or interactions. The mean type frequency of *a/an/Ø* cues (mean = 5.37) was still significantly higher than that of *the* cues (mean = 4.53), though with a much smaller effect size than that of token frequency.

The type/token ratio analysis showed a main effect of article form, $F(1, 71) = 189.54$, $p < 0.0001$, $\eta^2 = 0.78$, and no other significant results. The mean type/token ratio for *the* cues (mean = 0.69, standard error = 0.03) was significantly larger than that of *a/an/Ø* cues (mean = 0.28, standard error = 0.01). None of the above analyses indicated a significant effect of the year of study in college.

8 Discussions

8.1 Evidence for Avoidance and Transfer?

Compared to the percentage of article tokens in the overall determiner use (90.3%) in Master (2013), the percentages of article tokens in the learner essays in the current study (73.6%) are much lower. The learners used a significantly higher proportion of other types of determiner (possessives 13.3%; quantifiers 9.1%; demonstratives 3.6%) as premodifiers for noun phrases. This contrast has to be carefully interpreted since the L1 texts that Master analysed are science and technology related research articles, whereas the L2 texts in our analysis are argumentative essays about general societal issues and topics. Nevertheless, what we observed is that the Chinese EFL learners used less amounts of articles for referentiality in written essays than the amount used by L1 expert academic writers. Does this finding constitute evidence

for learners' avoidance of using articles? Our interpretation is that the Chinese EFL participants made use of a variety of referential resources to compensate for their insufficient knowledge about articles. Some of their heavier reliances on non-article determiners can be evidence of L1 transfer.

Robertson (2000) argued for L1 transfer based on his findings that Chinese learners used demonstratives (particularly *this*) to replace the definite article and used the numeral *one* as the replacement for the indefinite article. But Robertson's transfer argument was made based on his observation of samples in his qualitative data. He did not report the actual frequency of occurrences of the argued substitutions (*this* for *the*; *one* for *a/an*). In our results, all the demonstratives accounted for 3.6% of all determiner use, which is comparable to the proportion of non-article determiners in L1 research articles in Master (2013). Similarly, we did not observe an obvious overuse of the quantifier *one* in our sample, contrary to Robertson (2000). As a result, we did not find robust quantitative evidence in support of lexical transfer that Robertson argued for in his study.

Instead, what may be regarded as stronger evidence of transfer in our findings is the high proportion of possessives in the overall distribution of determiners. This transfer can be traced to the very productive use of the particle *-de* in Mandarin noun phrases. This frame of "NP-*de*-NP" in Mandarin could be easily transformed into the "possessive NP" structure in English, thus enabling learners to transfer a productive L1 constructional frame. Luk and Shirai (2009) argued that because of the similarity between L1 and L2, possessive *–s* is acquired earlier than predicted by Krashen's Natural Order by Chinese, Korean and Japanese learners of English. This is consistent with the present findings.

It is noteworthy that the non-English majors in our sample primarily relied on first person possessive pronouns (particularly *our*) for determiner use, whereas the English majors used the third person possessive pronoun (*their*) more frequently. At some point, the English majors were more proficient at projecting a more objective voice by distancing themselves from the topics under discussion. The non-English majors (particularly in Year 1) seemed to be heavily influenced by a Chinese discursive pattern that emphasises the collective "we" that engenders solidarity (Diani & Bison, 2004). Such collective discourse centres on the value of family and self while emphasising the differentiation between *us* and *them* as the two opposite ends of a dichotomy (Zhou & Yang, 2018). The following excerpt comes from an essay written with high-frequency use of the possessive *our* typical of the Year 1 non-English majors. The collective voice in discourse *demands* high use of the possessive and consequently fewer uses of articles.

> *Firstly, universities offer us more stages to show* ***our*** *talents, which will add* ***our*** *self-confidence. Thirdly, we can broad* ***our*** *eyes on evreything, such as making friends, adapting to changeble environment and so on. Forthly, we can improve* ***our*** *abilities through studing in universities, because we will meet with a lot of problems in* ***our*** *studies and lives, we must solve them by ourslves.* (Note: The excerpt is selected from the original learner data and contains grammatical and spelling errors.)

8.2 Definite Article and Non-definite Articles

The non-definite article cues outnumbered the definite article cues in terms of token frequency and type frequency. The contrast was significantly larger for token frequency. This was within expectation. The top two most frequent cues in the English language are zero article cues (Zhao & MacWhinney, 2018): *plural*|Ø and *non-countable*|Ø, and jointly account for 27% of the entire article tokens in the L1 texts analysed therein. The Zipf's law seems to be magnified in the learners' article use. The two cues mentioned accounted for 43.3% of all the article tokens in our data. The learners heavily relied on the most frequent cues for their own usage. This pattern is roughly the same in each of the four learner groups. In fact, the Year-2 English majors showed the sharpest Zipfian pattern of distribution compared to the other three groups and used the two most frequent cues that accounted for 45.2% of all their article tokens.

The definite article cues outnumbered the non-definite article cues in terms of type/token ratio. Given the same amounts of tokens, the participants used significantly more types of *the* cues than types of *a/an/*Ø cues. What contributed to this result was that a very small number of *a/an/*Ø cues (the top three) accounted for almost all the tokens of the non-definite cue category and the rest of the *a/an/*Ø cues had very few tokens. But no definite article cues accounted for the majority of tokens in the definite cue category. The token numbers were relatively more widely spread out among *the* cues. In other words, the learners constructed a more distributed, heterogeneous and "adventurous" profile in their definite article usage. Among the infrequent cues that the learners produced (see Table 3), the majority of them were *the* cues. The learners took more risks of trying out infrequent *the* cues in their written output.

8.3 Language Competence and Frequency Effects

The L2 learner sample in the current study, English majors and non-English majors alike, showed a Zipfian frequency distribution in their L2 article usage, similar to the distributional pattern in L1 article usage (Zhao & MacWhinney, 2018). The finding confirms that L2 production frequency is intimately tuned to input frequency (Ellis & Ferreira-Junior, 2009). Zhao and Fan (2021), which is a parallel study to the current one, adopted the analytical method of structural equation modelling and further corroborated this finding.

The English majors in our sample showed an overall stronger level of written performance than that of the non-English majors. In a timed test situation, the English majors produced significantly longer written texts with a much denser use of noun phrases that take articles or other types of determiners. The English majors also produced a larger variety of article cues than the non-English majors. The English majors demonstrated a stronger capacity to expand article usage from more frequent types to less frequent ones, which aligns with previous empirical findings of the

usage-based approach to L2 acquisition (Eskildsen, 2015; Eskildsen & Kasper, 2019). The usage-based approach assumes a bottom-up exemplar-based learning process in which high-frequency exemplars that have a strong association with the target construction play a decisive role in helping learners identify structural regularities in construction use and formulate functional understanding of the construction (Ellis, 2002). High-frequency exemplars allow learners to learn faster and build up an abstract prototype of the construction so that they can generalise the schemata of the construction use and extend it to non-prototypical exemplars or novel uses at the later stage of construction learning (Goldberg, 1995, 2006; Sung & Kim, 2020).

Zhao (2020) reported that higher proficiency Chinese EFL learners demonstrated a stronger competence to differentiate form-function mappings in the English article construction than the lower proficiency learners at college level. The Michigan Test of English Language Proficiency (MTELP) was used to differentiate proficiency levels. Given the very complex form-function mappings in the article system (4 forms and at least 86 functions according to Zhao & MacWhinney, 2018), the task of learning the English article construction includes schemata development based on high-frequency prototypes and more importantly a refined analysis of the distributional characteristics of language input. In this process, learners analysed cue distinctions and drew analogies among form-function mappings based on semantic and structural similarities (and distinctions) observed from the cues in the input. Meanwhile, learners developed contextualised constructional knowledge (i.e. they learned that functional meanings such as definiteness or countability are in fact context dependent). They needed to look for other distributional features in discourse in order to generate a more accurate analysis of form-function mapping. Therefore, the process of moving from prototypical cue use to less frequent cue use is all part of this process of association, generalisation, analysis, differentiation and category formation.

Finally, in contrast with the observed distinction between the two majors, the year of study did not yield a significant difference in terms of frequency effects. It is not surprising to have this finding for the non-English majors. Because the amount of English exposure is rather limited for non-English majors in Chinese universities. Many of these students rely on their College English classes as the main source of English exposure. Year-2 non-English majors do not necessarily receive more hours of college English training than Year-1 non-English majors. In comparison, we did expect a significant effect of the year of study among the English majors, but the results suggested otherwise. Our speculation was that many programmes for English majors in Chinese universities would be arranged in the first two years of undergraduate studies for English language skills and in the final two years for the more advanced translation and interpretation skills and discipline-specific knowledge (literature, cultural studies, linguistics, translation, etc.). The respective curriculum arrangements for Year-1 and Year-2 English majors, which would indicate the amount of input exposure to students, may not be significantly different.

9 Conclusion

To our knowledge, this is the first study that has investigated frequency effects in L2 acquisition of English articles. Our findings suggest that both frequency and L1 transfer play important roles in influencing learners' article use. Chinese learners "avoid" using articles to a certain extent, which is suggested by a denser use of possessives and quantifiers compared to that of native English academic writers. Their use of possessives and quantifiers suggests traces of lexical and discursive transfer from the L1 discursive convention. Regarding article use, we identified 42 form-function mappings (i.e. cues) in our sample of Chinese learners' college essays. The use of the 42 cues follows the Zipfian distribution, with a heavier proportion of tokens accounted for by few top-ranking cues in the frequency rank. The English majors demonstrated increased knowledge of infrequent article cues than the non-English majors. We conclude that more exposure to English and more opportunities to use the target language allow the English majors to extend their article usage from more prototypical cues to less frequent ones.

The study generates important pedagogical implications for article learning. First, only 42 article cues out of 86 were observed in the learner essays. What about the other half set of cues? A large number of unused cues were low-frequency cues including idiosyncratic and conventional usages of articles (e.g. *geographic features\the*; *political/military institution\the*; *construction names\the*) that may not frequently appear in the genre of academic essays unless they are for specific topics such as politics and geography. Meanwhile, learners may not be exposed to such cues that often, apart from not having enough chances to produce these cues. Nonetheless, these low-frequency cues are an indispensable part of the English article system and will become more important for learners to acquire at an advanced stage of construction learning. It seems clear that the current academic writing practices for English education at college in the Chinese EFL context have not provided a sufficient ground for usage and feedback on these low-frequency cues, thus hindering the ultimate attainment of the English article construction. Instruction can aim to increase students' exposure to these cues in authentic language input of diverse genres and topic areas and create more opportunities for them to extract structural regularities and make generalisations.

Second, there appear to be apparent gaps between non-English majors and English majors, as well as between L2 learners and native speakers with regard to certain high-frequency article usages. For example, non-English majors find the cue of "*plural\Ø*" more difficult to apply compared with English-majors and native speakers, while L2 learners in general find it harder to apply the cue of "partonomy" than native speakers. These are high-frequency cues and should have been well-acquired after years of L2 learning. More explicit types of instruction on these cues are necessary since it may be difficult for learners to acquire them from input exposure. Learners can be encouraged to use the computer-based article tutoring system developed by Zhao and MacWhinney (2018) to compensate for the lack of individualised explicit instruction in language classrooms. A demo version of the tutor is available via the link (http://sla.talkbank.org/English/demo). The tutor has been designed with the usage-based

assumption about construction learning as well as support from instructed second language acquisition theory. Such research is still at the emerging stage. There is great demand for more future research on the usage-based approach to the acquisition and instruction of the English article construction.

Appendix

Essay Topics in the Learner Corpus Sample

No	Topics
1	Does modern technology make life more convenient, or was life better when technology was simpler? Write an essay to state your own opinion.
2	Education is expensive, but the consequences of a failure to educate, especially in an increasingly globalized world, are even more expensive. Write an essay to state your own opinion.
3	Some people think that famous people are treated unfairly by the media, and they should be given more privacy, while some others think that this is the price of their fame.
4	Some people say the government shouldn't put money on building theatres and sports stadiums; they should spend more money on medical care and education. Do you agree or disagree? State the reasons for your view.
5	Some people think that university education is to prepare students for employment. Others think that it has other functions. Discuss and say what other functions you think it should have.
6	Which skill of English is more important for Chinese learners? Some people think that we should give priority to reading in English, while others think speaking is more important. Write an essay to state your own opinion.
7	Some people think that children should learn to compete, but others think that children should be taught to cooperate. Express some reasons of both views and give your own opinion.
8	Will modern technology, such as the internet ever replace the book or the written word as the main source of information? Write an essay to state your opinion.
9	Nowadays, more and more college students rent apartments and live outside campus. Is it appropriate? State your opinion about this.

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Mandarin Speakers' Acquisition of English Articles: Investigating Article Use in Mandarin and Its Influence on L2-English

Elaine Lopez, Yuhuan An, and Heather Marsden

Abstract Mandarin Chinese has no obligatory article system. However, research on the acquisition of English articles suggests Chinese learners behave differently to speakers of other article-less languages (Lopez, 2019; Snape et al., 2006) and this is discussed in relation to the grammaticalisation of determiners in Mandarin (Li & Thompson, 1981). The novel study reported here examines whether use of determiners in L1-Mandarin influences use of the definite and indefinite articles in L2-English. Thirty-three L1-Mandarin advanced-level learners of English completed a forced-choice task to measure L1 use of *zhei/nei* and *yi* in Mandarin and L2 use of the English definite and indefinite articles. Participants were highly accurate in their suppliance of obligatory English definite and indefinite articles. The L1 data show a strong association between *yi* + classifier and indefiniteness, meaning participants use *yi* where they would use *a*. The same was not found with regard to *zhei/nei* as distribution of demonstratives and the bare NP varied across definite contexts. While results show no evidence that L2 participants' use of English articles is influenced by their knowledge of articles in Mandarin, proficiency and task type may account for this finding. Theoretical and pedagogical implications are discussed.

1 Introduction

Acquisition of the English article system is notoriously difficult for second language (L2) learners. Even when the learner's first language (L1) has an article system

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that shares similarities with English, acquisition is not always straightforward, as research on English articles by L1-Spanish speakers attests (Ionin & Montrul, 2010; Ionin et al., 2013). For speakers of an L1 that lacks an article system, the task appears all the harder. Mandarin Chinese is typically considered to be a language that does not have an article system (e.g. Norman, 1988; Snape, 2009), and there is already a body of research that documents a range of challenges for L1-speakers of Mandarin in the acquisition of English articles (e.g. Crosthwaite, 2014; Lardiere, 1998, 2004; Lopez, 2019; Robertson, 2000; Snape, 2009; Tryzna, 2009). However, it is an over-simplification to state that Mandarin entirely lacks articles. For several decades, linguists have been documenting the grammaticalisation of the numeral *yi* 'one' as it takes on the function of an (optional) indefinite article in certain contexts, and of the demonstratives, such as *zhei* "this", *nei* "that" and *nage* "that/those", as they come to be used as definite articles (Chen, 2004; Huang, 1999; Li & Thompson, 1981; among others). Assuming that transfer from the L1 grammar can influence the L2,[1] this optional incipient system of articles (borrowing Lyons' (1999, p. 132) description) must also be available to influence the L2-English of L1-Mandarin speakers. To date, there has been little experimental investigation into Mandarin speakers' use of *yi* 'one', *zhei* 'this', *nei* 'that' and *nage* 'that/those' as determiners and how this might transfer to L2 learners' use of English articles, although a study by Crosthwaite (2014) is a notable exception. Crosthwaite investigated determiner use in contexts known as bridging descriptions (see details in Sect. 2) in Mandarin and the L2-English of Mandarin speakers (and also Korean and L1-Korean L2-English), using an oral production task. A key finding for L1-Mandarin speakers of English was that a pattern of use of *yi* as an indefinite article versus bare nouns in Mandarin appears to be reflected in the use of English articles in bridging descriptions, by a different group of L1-Mandarin speakers. However, questions remain as to whether Mandarin determiners influence L2-English article use in other contexts via using different tasks. The present chapter aims to shed light on these questions through a new investigation into grammaticalised articles in Mandarin and their effect on L2-English by Mandarin speakers. The task comprises English and Mandarin versions of a written article selection task (adapted from Ionin et al., 2004) with contexts for articles defined in terms of specificity and definiteness. Both versions are completed by one group of advanced L2-English speakers whose L1 is Mandarin, with the aim of providing further evidence of the extent to which article choices (definite article, indefinite article, or no article) are related to L2-English and L1-Mandarin.

The chapter is organised as follows. First, a more detailed overview of previous research on the L2 acquisition of English articles is provided. Following this, we present brief details of the emerging articles in Mandarin. The experimental study follows, and the chapter concludes with a discussion of the results, including reflection on how information about grammaticalised articles in Mandarin could be exploited in English language classrooms, where Mandarin is the common language.

[1] This is an uncontroversial assumption in that it is fundamental to a range of theoretically diverse approaches to L2 grammar acquisition, including Ellis (1994), Lardiere (2008), and Schwartz & Sprouse (1996).

2 L2 Acquisition of English Articles

The large body of research on L2 acquisition of English articles has yielded not only some broad trends, but also a rather varied set of results. As a broad trend, there is evidence that the definite article, *the,* tends to be acquired earlier than the indefinite *a*. This has been reported for speakers of a variety of L1s and in studies using different methods. For example, Parrish (1987) used an oral narrative task in a longitudinal study of a Japanese beginner learner of English. By the end of the four-month study, the speaker had attained accuracy rates of 84% for *the* and 50% for *a*. In a completely different kind of study that used a forced-choice elicitation task in which learners had to select *the*, *a* or no determiner to fill in blanks in sentences (following Ionin et al., 2004), García Mayo (2009) reported that low intermediate-level L1-Spanish learners of English were more accurate at supplying *the* in definite contexts than *a* in indefinite contexts, although overall accuracy was high (>93%) for both determiners. Turning to Mandarin speakers of English, Snape (2009) reports that in an elicited picture description task, Mandarin speakers were significantly more accurate in their suppliance of English definite articles than of indefinite articles, although the same speakers showed no difference between definites and indefinites (81–83% accuracy) in a version of Ionin et al's (2004) forced-choice elicitation task. Other studies that have found greater accuracy on definite articles than indefinite include Morales' (2011) investigation of L1-Spanish L2-English children, Zdorenko and Paradis' (2008) investigation of child L2-English learners with various different L1s that included both languages with and languages without an article system, Lardiere's (2008) case study of the end state grammar of an adult Chinese speaker of English and White's (2003) case study of an adult Turkish speaker of English.

Zdorenko and Paradis (2008) proposed that the apparent greater difficulty of indefinite articles could arise from their more complex semantics, including the requirement to take plurality and the mass/count distinction into account. Compare (1) and (2).

1. Anna ate the sandwich/the strawberries/the ice cream.
2. Anna ate a sandwich/some strawberries/some ice cream.

In (1), the form of the definite article does not change, whether the noun is a singular count noun (*sandwich*), a plural count noun (*strawberries*) or a mass noun (*ice cream*). However, in indefinite contexts, the form changes depending on whether the noun is a singular count noun (*a/an*), a plural count noun or singular mass noun (*some*). Thus, accurate use of the indefinite article requires computation of the number and mass/count properties of the noun in addition to other aspects of the semantics of determiners. This greater processing requirement for indefinites could lead to greater inaccuracy, which could manifest itself as article omission or overuse of *the* in contexts that require an indefinite.

However, these broad patterns mask a variety of more subtle effects that arise when details of the semantic and discourse properties of articles are taken into account. While it is clear that English *the* is definite and English *a* is indefinite, the combination of discourse properties that determine the requirement for a definite or indefinite

article is complex. Bickerton (1981) proposed a role for universal semantic properties which make a distinction between specific reference and whether a referent is known/unknown to the listener. Specific reference involves whether or not the noun in question refers to a specific instance of that noun or to its general concept. For example, in *my cat is black,* a specific cat is referred to, but *cats have claws* does not refer to a specific cat but rather to cats generally. Specific reference affects article choice, but both definite and indefinite nouns can have either specific or non-specific reference, as detailed further below. Whether a referent is known or unknown relates to the knowledge a listener is expected to have of a given noun. So if a speaker says, *I'm going to the concert now*, she expects the listener to already know about the concert she is referring to, whereas *I'm going to* ***a*** *concert now* assumes that the listener does not already know about the concert. In the first case, the fact of there being a concert relevant to the event of the speaker going out is old information, whereas in the second it is new information. This distinction means that, when a noun is first introduced, the indefinite *a* is usually the right choice, whereas when the noun is already known in the discourse, the definite *the* is usually right. But some discourse-new nouns can be inferred from their context. For example, in the context of a book, the existence of an author of that book can be inferred. Thus in (3), *author* is preceded by *the*, even if this is the first mention of *author* in the discourse.

3. I bought a book yesterday. The author grew up in the same town as me.

Such references, where the identity of a discourse-new referent is inferable, are termed "bridging descriptions" (Clark, 1975; Clark & Haviland, 1977).

It is clear that article choice in English minimally requires computation not only of the number and mass/count properties of the noun, but also of specificity, whether the noun is new or old information, and, if it is new, whether it is in a bridging context. Many L2 acquisition studies of articles focus on one or more particular discourse conditions that determine the choice of article. A seminal study in this vein is that of Ionin et al. (2004) on which the new research presented in this chapter is based. Ionin et al. investigated the interaction of definiteness and specificity in article choices made by L1-Russian and L1-Korean speakers of English. Definiteness relates to the knowledge shared by both the speaker and the listener, whereas specificity only relates to the knowledge of the speaker. As stated above, both definite and indefinite nouns can have either specific or non-specific reference, as exemplified in (4–7) from Lyons (1999, p.167).

4. Joan wants to present the prize to the winner—but he doesn't want to receive it from her. [+definite, +specific]
5. Joan wants to present the prize to the winner—so she'll have to wait around until the race finishes. [+definite, −specific]
6. Peter intends to marry a merchant banker—even though he doesn't get on with her at all. [−definite, + specific]
7. Peter intends to marry a merchant banker—even though he hasn't met one yet. [−definite, −specific]

Ionin et al. asked participants to complete a fill-the-blank task using short dialogues which included sentences like those in (4–7). The relevant articles had been replaced by blanks, and participants were instructed to insert *a/an*, *the* or *X* to indicate "no article". They found that Russian and Korean learners of English overused both definite and indefinite articles and that these effects related to specificity. In other words, learners overused the definite article in specific contexts and the indefinite article in non-specific contexts, so they demonstrated lower accuracy in the contexts exemplified in (5) and (6) above.

Snape (2009) expanded Ionin et al.'s examination of definiteness and specificity to intermediate-level Mandarin speakers, resident in Canada at the time of data collection. At group level, his results mirror those of Ionin et al. in that the learners seemed to select *the* and *a* as specific and non-specific markers, respectively. The L1-Mandarin speakers in Snape's study also showed significant effects of definiteness, meaning they are able to distinguish between definite and indefinite articles. However, not all patterns in the individual results could be explained. Snape (2009) concludes that the L1-Mandarin learners of English can partially acquire L2 articles, but the lack of an L1 article system to transfer makes full acquisition of English articles difficult. He also accounts for individual differences between participants with reference to the development of interlanguage grammars, which may develop at different rates between individuals despite relatively uniform input.

A teaching intervention study conducted by Lopez (2015, 2019) assessed whether instruction on specificity would improve article accuracy among elementary and pre-intermediate-level Mandarin-speaking learners of English. Part of her data were collected using a task from Ionin et al. (2009), which is itself a version of the task from Ionin et al. (2004) used by Snape (2009). Thus, Lopez's pretest results (before the participants received the teaching intervention) can be compared directly with those of Snape and others. However, in contrast to Snape's (2009) and Ionin et al.'s (2004) participants, the 50 participants in Lopez (2015, 2019) showed no effect of specificity in the pretest: their overall accuracy on all four conditions (represented above in 4–7) was similar, ranging from 66 to 77%. This means that there was no consistent pattern of Mandarin speakers of English overusing the definite article in specific contexts or the indefinite article in non-specific contexts, or indeed being overall more accurate with *the* than *a/an* or vice versa. The disparity with previous studies is not discussed by Lopez, although it is possible that the lower proficiency of these learners played a part.

The performance of the Mandarin speakers of English in Snape's study is very similar to that of the Korean speakers in Ionin et al. (2004), while both groups are less target like than the Spanish speakers of English on the same task in García Mayo (2009). Lopez's (2019) Mandarin speakers of English are similarly less accurate than García Mayo's L1-Spanish speakers. This points to a broad transfer effect, whereby speakers of 'article less' languages experience greater challenge than those of languages with an article system. However, a study by Snape et al. (2006) suggests that the effects of L1 transfer could be more nuanced than this.

Snape et al. (2006) review two small-scale studies which involve Japanese, Chinese and Spanish learners of English. Participant numbers were small: 14 L1-Japanese speakers of English, eight L1-Chinese speakers of English and 14 L1-Spanish speakers of English in total, across the two studies. Consequently, the results must be interpreted with caution. The data collection instrument was the same forced-choice elicitation task from Ionin et al. (2004). Snape et al. found that L1-Spanish speakers were the most accurate with English articles, while the L1-Chinese speakers were more accurate than the L1-Japanese speakers. They explain this finding with reference to Li and Thompson's (1981) account of the grammaticalisation of definiteness in Mandarin. Snape et al. propose that, unlike the Japanese speakers, the Chinese speakers may have been able to transfer a morpho-syntactic definiteness feature from their L1 due to the emergence of articles in Mandarin. This could have led to their greater accuracy than the Japanese speakers.

Robertson (2000) also appealed to transfer of emergent articles in Chinese to account for aspects of English article use in an oral production task that he conducted with 18 Mandarin speakers of English. In this task, accurate suppliance of articles occurred in around three quarters of contexts (78%) and Robertson offered a principled explanation for many of the instances, where articles were omitted. One of these principles explains a pattern in the data of overuse of the numeral *one* and the determiner *this* in contexts, where the indefinite *a* and definite *the*, respectively, would be more natural. To account for this phenomenon, Robertson draws on Li and Thompson (1981) and suggests that this is evidence of lexical transfer of the developing Mandarin articles *yi* "one" and *zhei* "this". However, other studies of oral production of L2-English by L1-Mandarin speakers have not found similar overuse of *one* and *this* (Lardiere, 2008; Snape, 2009).

The first (and only, to our knowledge) systematic investigation of article use in both native Mandarin and L2-English by Mandarin speakers with the goal of identifying possible effects of transfer is Crosthwaite (2014). He focuses on bridging descriptions, which he terms 'inferable' nouns, in a picture-based oral narrative task. For example, in the context of a school depicted in the picture cues, a teacher is inferable, a soldier is not inferable, and a boy is "neutral". He found that, as expected, native English speakers tended to use the indefinite *a* to introduce neutral and non-inferable nouns in the story (*a boy, a soldier*) while they used the definite article *the* to introduce inferable nouns (*the teacher*). A similar distinction was made in Mandarin, with *yi* (followed by a classifier—glossed as "CL" in the examples that follow) used to introduce neutral and non-inferable nouns (*yi-ge xiaopengyou* "one-CL little child", *yi-ge shibing* "one-CL soldier"), while inferable nouns were left bare (*lao shi* "teacher"). This contrasts with the pattern produced by native Korean speakers on a Korean version of the task, where bare nouns were used in all three environments. This finding testifies to a preference for use of *yi* as an indefinite article in Mandarin and the absence of such an article in Korean. With regard to Crosthwaite's L2-English data, he found that Mandarin speakers had acquired the use of the target definite article for inferable nouns at lower proficiency levels than the Korean speakers. He argues that Mandarin speakers' earlier acquisition could be attributed to facilitation of the mapping between the morpho-syntactic form of articles

to the appropriate pragmatic functions, due to Mandarin having a similar system in place, though the use of *yi* in neutral or non-inferable contexts is a preference rather than a syntactic necessity.

To summarise, previous research has shown that characteristics of article use in the L2-English of L1-Mandarin speakers include not only article omission and possibly the overuse of definite *the*, but also, in some cases, greater target-like use compared with learners whose L1 entirely lacks an article system. This suggests that the developing article grammar in Mandarin may transfer to L2-English and serve as a facilitating factor in English article acquisition. The next section examines the development of articles in Mandarin in more detail.

3 Language Change in Mandarin: The Development of Articles

As already indicated above, Mandarin has often been characterised as a language that does not have an article system (e.g. Norman, 1988) in contrast to English. Behind this characterisation lies the fact that nouns in Mandarin can often be bare, as in (8–9) (adapted from Hickmann et al., 1996, p. 595),[2] whereas singular nouns in English require an article (so *person has come* would be ungrammatical in English).

8. Lai le ren le
   come PFV person SFP
   "A/some person(s) has/have come."

9. Ren lai le
   person come PFV
   "The person(s) has/have come."

In addition to illustrating use of bare nouns, examples (8–9) show how word order can be used in Mandarin to provide discourse information, with discourse-new nouns often (but not obligatorily) occurring post-verbally (8) and discourse-old, pre-verbally (9). However, word order is not the only means by which Mandarin can express the definiteness contrast indicated by the English articles in the translations in (8–9). It has been observed since at least Li and Thompson (1976) that the numeral *yi* 'one' and demonstratives including *nei* "that", *zhei/zhe* "this" and *nage* "that/those" are increasingly used with grammatical functions similar to English *a* and *the*, respectively. Both forms are illustrated in example (10), from Chen (2004, p. 1153):

[2] The following abbreviations are used in the glosses of Mandarin examples: CL = classifier; DUR = durative aspect marker; PFV = perfective aspect marker; SFP = sentence final particle.

10. You **yi** **ge** lieren … yang zhe **yi** **zhi** gou. **Zhe** zhi gou hen dongshi.
have one CL hunter keep DUR one CL dog. This CL dog very intelligent
'There was a hunter who had a dog. The dog was very intelligent.'

As indicated in the translation of (10), neither the numerical meaning of *yi* "one" nor the demonstrative meaning of *zhe* "this" contributes to the intended meaning of the sentence. Rather, these forms are bleached of their lexical meaning, and they serve a grammatical function similar to English *a* and *the*. *Yi* in (10) is used to indicate discourse-new nouns, and *zhe* is used to indicate a previously mentioned noun.

Evidence testifying to these grammaticalised uses of *yi* and demonstratives comes from a variety of sources including spoken corpora (Huang, 1999), written corpora (Chen, 2004), and Crosthwaite's (2014) experimental data. All of these sources also testify to degrees of optionality within Mandarin use of *yi* and the different demonstratives as articles. Bare nouns continue to be in frequent use, alongside nouns preceded by the emerging articles, with different factors affecting whether an article is used or a noun remains bare. For example, when a discourse-new noun is inferable (such as "teacher" in the context of a school), it is more likely to be bare, whereas when it is not inferable it is more likely to be preceded by *yi*-CL (Crosthwaite, 2014; Liu, 2010). In definite contexts, when a noun refers to a specific, discourse-old referent, Huang (1999) found that subjecthood affected article use, with *nage* "that/those" being used as a definite article predominantly with nouns in non-subject positions, but also to a lesser extent with subjects. Chen (2004, p. 1178) argues that the ongoing optionality between article use and bare noun use (among other properties of articles in Mandarin) means that "definiteness as a grammatical category defined in the narrow sense has not been fully developed in Chinese", and, as such, there is no grammaticalised article paradigm equivalent to the English article system. Nonetheless, it is clear that Mandarin has forms that can be used with the purely grammatical functions of definite and indefinite articles. Consequently, it is reasonable to consider whether the (unconscious) L1 knowledge of these forms could play a role in the L2 acquisition of articles in English. The study outlined in the next section aims to address this question.

4 The Study

The current study explores the acquisition of the English article system by advanced proficiency Mandarin-speaking learners of English.[3] In addition, it aims to investigate whether the Mandarin demonstratives *zhei* and *nei* and numeral *yi* + classifier might

[3] The experiment reported here is part of a master's dissertation project completed by An (2017). While inclusion of more than one proficiency level would have been ideal (see further discussion of this in Sect. 5), advanced L2 English participants were chosen because article omission is known to persist even among highly proficient learners (Master, 1997).

influence learners' acquisition and use of English articles. We address the following research question:

> Does the optional use of determiners in Mandarin by L1-Mandarin speakers of L2 English influence their use of the definite and indefinite articles in English?

Specifically, we are testing whether learners' use of English articles is more accurate in contexts where they would use a definite demonstrative or numeral in Mandarin.

4.1 Tasks

Data were collected using English and Mandarin versions of a forced-choice elicitation task. The task used was adapted from Ionin et al. (2004). Each test item was presented as a dialogue that contained a blank space. Participants were asked to fill in the blank by choosing *a/an*, *the* or *X* if no article was required. There were 36 test items, comprising six tokens with each consisting of the following six conditions: [+definite, +specific], [+definite, −specific], [previous-mention definite], [−definite, +specific], [−definite, − specific] and [partitive indefinite]. The four [±definite, ±specific] conditions were illustrated in (4–7) above. The remaining two conditions, previous-mention definite and partitive indefinite, are illustrated in (11–12), respectively. These examples also illustrate the use of dialogues in the task.

11. Barbara: Did Betty get anything at the bookstore yesterday?
    Rick: Yes – she bought a novel and a magazine. She read _____ magazine first.

12. Mother: What did you and Kenny do yesterday, when I wasn't here?
    Father: Well, we went shopping. Kenny needed something to write with. We went to a store that had lots of pencils, pens, and markers. I told Kenny he could buy just one thing. So he bought_____ pen.

As Ionin et al (2004) point out, the use of a set of options for filling the blank, rather than allowing participants to insert any word, removes the possibility of participants using demonstratives, numerals or other words that could be semantically appropriate but would be less informative about knowledge of articles. In all items, the noun that followed the blank was singular and in object position. The only adaptation was to change some vocabulary items to words more familiar to British English speakers, following feedback during piloting in the UK, where data collection was planned to take place.

The Mandarin version of the task was created by the second author, who translated the English task into Mandarin (his native language). The translation was checked by three Chinese-English translator/interpreter majors at a UK university, who were all native speakers of Mandarin of advanced English level (an IELTS average score

of 7.5, with a minimum of 7 in each skill). The options for filling the blanks in the Mandarin version were the numeral *yi* (plus classifier), the demonstratives *nei* / *zhei* (one choice, participants were not required to specify) or no word, which resulted in a bare NP.

4.2 Participants

The participants were 33 learners of English whose L1 was Mandarin. Twenty-nine were university students in an English-speaking country at the time of data collection (28 UK, 1 Canada), and four participants were resident in China but had previously studied in the UK. English is a compulsory subject in the Chinese education system, and most of the participants had started to learn English from age nine, with four exceptions who started learning English at age six or seven. By the requirements of the English Syllabus for Full-Time Senior Secondary Schools (Initial Edition) made by the Ministry of Education in China, all students study English grammar as part of their high school education. This includes instruction on the use of English articles. As current or former university students in English-speaking countries, all had received English-medium education and had been expected to speak English in lectures and seminars. Most participants were completing their master's degree at the time of data collection and so were also expected to read extensively and write extended assignments in English. Participants' proficiency was measured via IELTS test scores, as all participants had completed the test prior to moving to English-speaking countries to study. All participants fell between B2 and C1 levels of the Common European Framework (IELTS 5.5–8) (British Council, 2019). Participant details are summarised in Table 1. None of the participants received special training on the use of English articles immediately before the test.

Table 1 Participant details ($n = 33$)

	Mean	Range
Age (years)	26	19–36
IELTS score	6.8	5.5–8
Length of time in English-speaking country (months)	15	9–96

4.3 Procedure

Most participants completed the tasks on paper, but participants not resident in the UK ($n = 5$) answered by typing into an electronic document which they had received by email. They completed the Mandarin version and then the English version. They were asked to complete the items in order and to refrain from going back or changing any earlier answers. Following Ionin et al. (2004), the task was untimed, and participants

could complete it at their own pace. Simple written instructions were given in English, and participants were allowed to ask or email questions before beginning the task.

4.4 Results

The data were analysed by first counting the frequency of suppliance of the different response options in the Mandarin and English versions of the task and then converting these to percentages, for ease of interpretation. Figures 1 and 2 show the percentage of each response option for the six conditions, in the Mandarin version and then the English version, respectively.

In the Mandarin results, there is a clear difference between the definite and indefinite conditions. In the definites, only the previous-mention condition yields a clear preference (81.82%) for inclusion of *nei/zhei* as an article. In the other two definite conditions—definite specific and definite non-specific—a bare NP is preferred in at least 71% of responses. By contrast, in all three indefinite conditions, there is a clear preference for inclusion of *yi* + CL, which is selected at least 74% of the time.

In the English task, where omission of *the* in the definite conditions and *a/an* in the indefinite conditions would lead to ungrammaticality, the participants were highly accurate in their suppliance of both definite and indefinite articles. In the definite conditions, there was over 85% suppliance of *the*, and for the indefinite conditions

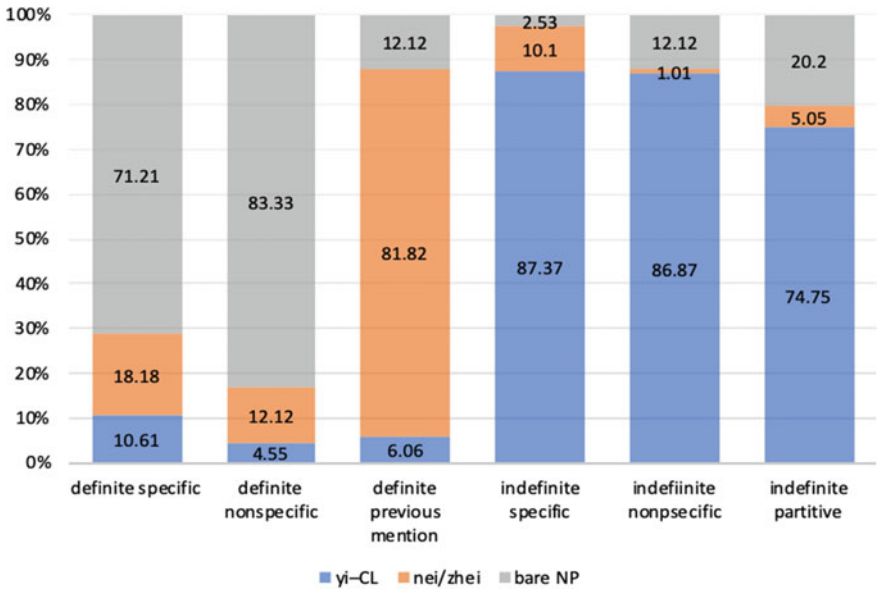

Fig. 1 Percentage selection of each response option, by condition, in the Mandarin (L1) version of the elicited production task

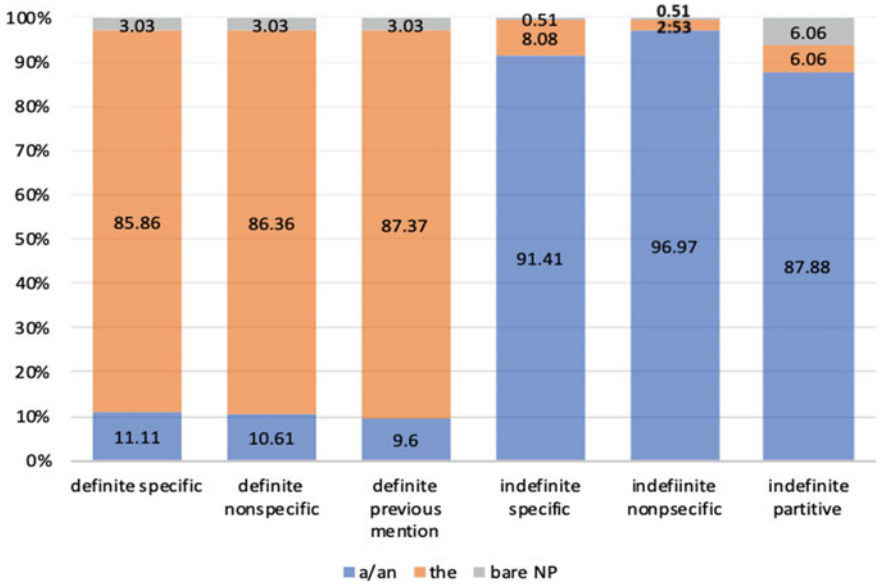

Fig. 2 Percentage selection of each response option, by condition, in the English (L2) version of the elicited production task

it was even higher, with two out of the three indefinite conditions having over 90% accurate suppliance of *a/an*. Despite the slightly higher accuracy on indefinites, a Wilcoxon test that compared accuracy on all the definites with all the indefinites (ignoring condition) showed the difference was not significant ($V = 67.5$, p-value $= 0.99$).

Since the goal of this study is to identify any effect of L1 use of articles in L2 article use, we must compare the distributions of response types in Figs. 1 and 2. If the L1-Mandarin L2-English speakers are affected by their Mandarin use of articles, we would expect to see similar distribution patterns for *the* in English and *nei/zhei* in Mandarin and for *a/an* in English and *yi* + CL in Mandarin. In the indefinite conditions, this is indeed attested: there is a high rate of suppliance of an indefinite article across all three conditions in both Mandarin and English. However, for the definite conditions, whereas the participants prefer bare NPs in Mandarin in the [+definite, +specific] and[+definite, −specific] conditions, there is no such preference in English: there is a high percentage of use of *the* in all three definite conditions, with use of bare NPs accounting for only 3% of the responses. Consequently, there is no evidence that the L2 participants' use of English articles is influenced by their knowledge of articles in Mandarin.

5 Discussion

Our discussion focuses on three areas. We consider in further detail the potential for transfer of knowledge of articles in the L1-Mandarin to the L2-English grammar; the contribution of our findings about article choice in Mandarin to understanding of the status of articles in Mandarin; and possible applications of the findings for classroom instruction.

Focusing first on transfer, our research question asked:

> Does the optional use of determiners in Mandarin by L1-Mandarin speakers of L2 English influence their use of the definite and indefinite articles in English?

As already pointed out above, based on the present set of results for advanced L2 learners, we must answer this question with a no. The participants' high accuracy in suppliance of English articles for the indefinite conditions and the definite previous-mention condition is compatible with an account that proposes influence from the L1, because the Mandarin results show high percentages of use of articles in these conditions. However, the contrast between the Mandarin results and the English results for the two [+definite ± specific] conditions means that a transfer-based account cannot be maintained for this group of participants. If transfer from the L1 played a key role in the participants' L2-English results, then we would expect to see considerable use of bare nouns in these two conditions in the English version and not the high rates (>85%) of suppliance of *the* that are shown in Fig. 2. The absence of use of bare nouns in the [+definite ± specific] conditions could be construed as evidence against accounts of L2 acquisition that propose that when the L1 and L2 differ with regard to the manifestation of a given property, acquisition of that property in the L2 will be impeded (such as Lardiere's (2008) Feature Reassembly Hypothesis). However, it would be premature to take this finding as evidence against a role for transfer from Mandarin in English article acquisition. Recall that the participants in the current study had C1-level high proficiency in English. It could be the case that at lower levels of proficiency, learners may be more strongly influenced by their L1, but at advanced levels, acquisition beyond the influence of the L1 grammar has taken place, so that transfer effects in the conditions investigated here are not detectable. This could be tested by running the same experiment with L1-Mandarin speakers with a lower proficiency level in English, and we recommend this as a potential area for future research. Alternatively, it could be the case that performance in a less controlled task, such as spontaneous oral production, may be more susceptible to L1 influence than the very controlled forced-choice elicitation task used here. Recall that Snape (2009) found task-related differences in his participants' behaviour, whereby L1-Mandarin speakers were significantly more accurate with English definite articles than indefinite articles in an oral production task, but this difference disappeared in a forced-choice elicitation task. Also Crosthwaite's (2014) evidence for a facilitative effect of L1-Mandarin article use on L2-English articles in bridging constructions came from an oral production task. Further research using an oral production task could help to ascertain whether or not the absence of evidence for L1 transfer in the current study is linked to the type of task.

With regard to the contribution of our findings about article choice in Mandarin to understanding of the status of Mandarin articles, the results of the Mandarin version of the forced-choice elicitation task provide the first experimental data, to our knowledge, about article use in the three definite contexts in this experiment ([+definite, +specific] and [+definite, −specific] and [previous-mention definite]). As outlined above, Crosthwaite's (2014) experimental study on Mandarin article use during a picture-based story-telling task focused on indefinites and definites in bridging contexts. The results from the present study for indefinites are very similar to Crosthwaite's: both studies have rates of use of Mandarin *yi* + CL before indefinite nouns that are only slightly lower than use of the English *a/an* in the same contexts (>74% in Mandarin v. > 87% in English in the present study; >71% in Mandarin v. > 73% in English in Crosthwaite, 2014). Together, these findings provide quantitative support for Chen's (2004, p. 1177) assertion that "*yi* 'one' has arguably reached the endpoint of grammaticalisation into an indefinite article".

As for definites, the present study's findings show that use of a demonstrative as a determiner varies depending on the context. Specifically, in previous-mention contexts, insertion of a demonstrative *nei/zhei* as a definite article is frequent (81% of cases), but in the [+definite, +specific] and [+definite, −specific] contexts, bare nouns were preferred in at least 71% of cases. Thus, for contexts such as the Mandarin version of (12) in which the exact same noun is repeated [*magazine*, in (12)], the Mandarin results showed that speakers preferred to insert *nei/zhei* before the second, discourse-old mention of the noun. However, in definite contexts where the definite noun has not previously been mentioned, such as the Mandarin version of (4), Mandarin speakers prefer to leave the noun bare rather than insert a demonstrative. For completeness, the full dialogue for the test item corresponding to (4) is given in (13):

13. *At the end of a running race*

Laura: Are you ready to leave?

Betsy: No, not yet. First, I need to talk to _____ winner of this race —he is my good friend, and I want to congratulate him.

Unlike in Mandarin, a definite article is obligatory in the gap in (13), in English. Our Mandarin findings for the definite conditions provide quantitative evidence of Chen's (2004, p. 1177) observation that Mandarin does not have a "simple, fully grammaticalised marker of definiteness". This in turn lends support to Chen's position that Mandarin does not have a grammaticalised definiteness feature and that the grammar of Mandarin and the grammar of English are different in this regard.

Both Chen's research on determiners in Mandarin Chinese and the L2 research by Ionin et al (2004) that inspired the present study come from a theory-driven approach to linguistics, rather than from a language teaching perspective. However, following the recent initiative to recognise the broad shared interest of formal linguistic research and language teaching research and to seek areas where these two endeavours can inform each other (Marsden, 2018; Marsden & Slabakova, 2019; Whong et al., 2013; and, specifically relating to articles, Lopez & Sabir, 2019), we turn our attention now to possible applications of the findings of the present study for classroom instruction.

The key application that we envisage draws on insights from a teaching intervention study by McManus and Marsden (2017). McManus and Marsden investigated whether increasing learner awareness of how a target grammar property functions in both the L1 and the L2 could benefit acquisition of that property in the L2. The L1 in McManus and Marsden's study was English, the L2 was French, and the target French property was the imperfect tense. One group of participants received explicit instruction about the rules for forming the imperfect tense in both English and French and then completed practice activities that required application of the rules given in the instruction. Practice activities covered both languages (i.e. the learners' L1-English and their L2-French), and they were spread over three weeks, following the instruction. A comparison group received the instruction and practice activities only in French. In post-intervention tests conducted the week after the practice and then again six weeks later, the group that had received practice and instruction in both languages showed improved performance in their L2-French compared with before the intervention, and they retained this gain at the six-week test. The group that had received instruction and practice only in French made some improvements, but these were not as comprehensive as in the both languages group and they were not retained at the six-week test.

Like articles in Mandarin and English, the L1 and L2 in McManus and Marsden's study also behave differently from each other with regard to the imperfect tense. This means that article acquisition by Mandarin speakers of English could be a good candidate for a similar intervention. Our proposal is that teachers of English whose students are predominantly speakers of Mandarin could follow McManus and Marsden's method and develop instruction and practice about the function of *nei/zhei* and *yi* + CL as articles in Mandarin to use alongside instruction and practice of English *the* and *a/an*. The findings from the Mandarin version of the forced-choice elicitation task about the distribution of the Mandarin determiners could be incorporated in two ways. First, for indefinites, the near identical distribution of *yi* + CL and *a/an* suggests that introducing the indefinite article first (before the definite) could provide simple access to the concept of determiners in English. Most standard instruction on English articles introduces the indefinite article before the definite article (Lopez & Sabir, 2019), and it appears that such instruction could benefit Mandarin-speaking learners. Second, the different distributions of *nei/zhei* and *the* can be used to pinpoint different types of context in which English uses a definite article but Mandarin does not. We suggest that such instruction could be used with lower proficiency learners, since our results show that at advanced level, high levels of accuracy on articles are attainable by Mandarin speakers of English, at least in the controlled task that we used. Such instruction is likely to be innovative. According to an informal survey conducted by the first author with 50 L1-Mandarin speakers of English, instruction or exercises that draw parallels between Mandarin and English in relation to determiners are not used in English-teaching materials currently. Only one survey respondent reported that their English teacher had highlighted similarities between *yi* + CL and *a/an*. Given McManus and Marsden's promising findings for the acquisition of the French imperfect being facilitated by concurrent instruction on the English imperfect, incorporation of instruction on Mandarin articles could be effective in facilitating acquisition of English article use.

6 Conclusion

This chapter has reported on an experimental investigation of whether article choice (definite article, indefinite article or no article) in L1-Mandarin influences article choice in high proficiency L2-English, using Mandarin and English versions of a forced-choice elicitation task. The results showed that, in English, the participants were highly accurate in their suppliance of obligatory definite and indefinite articles. In Mandarin, the results showed high rates of use of *yi* + CL which were similar to the rates of use of *a/an* in English, but a mixed distribution of *nei/zhei* and bare NPs in definite contexts, with the demonstratives *nei/zhei* being selected mainly in previous-mention contexts. There was no evidence that the absence of a grammaticalised definiteness feature in Mandarin influences the participants' L2-English, as suppliance of *the* was high in all three definite contexts.

Two key theoretical implications arise from this research. First, the native Mandarin data provide important new quantitative evidence on the distribution of articles in Mandarin, which can inform theoretical linguistic research into the grammaticalisation of determiners in Mandarin. As argued above, the findings lend quantitative support to Chen's (2004) proposal that definiteness as a grammatical category remains undeveloped in Mandarin. Second, building on this finding, the experimental results for Mandarin strengthen the basis for a testable prediction about L1 transfer in the acquisition of English articles by L1-Mandarin speakers. The Mandarin results confirm that the proposed contrast in grammaticalisation between indefiniteness and definiteness can be measured in an experimental setting. Moreover, they show that bare nouns, rather than a definite article, are most likely to be used in [+definite ± specific] contexts, in Mandarin. This motivates an L1 transfer-based prediction that L2 acquisition of English indefinite articles is predicted to be facilitated relative to acquisition of definite articles, and, particularly, that acquisition of the requirement for a definite article in [+definite ± specific] contexts will be delayed. Although this prediction was not supported by the results from high proficiency L2-English speakers in the present study, further research with lower proficiency L2-English speakers is warranted.

This proposal for further research is the key methodological implication of the study. It is linked to two limitations of the current study, namely that it collected data from participants with advanced proficiency in L2-English, and it used only one, very controlled, data collection method, namely forced-choice elicitation (though the use of Ionin et al.'s (2004) task is also a methodological strength in that it makes the results directly comparable with previous studies that also used this task, e.g. García Mayo (2009) and Snape (2009), among others). Although the results showed that high proficiency Mandarin speakers of English are not influenced by their L1 article use in their L2-English, a question remains as to whether the absence of grammaticalised definiteness in Mandarin could lead to delayed acquisition of English definite articles compared with indefinite articles at a lower English proficiency level. A second unanswered question concerns the possibility of a task effect. As discussed above, evidence of transfer in L2-English article use in previous studies came from

less controlled, spontaneous production tasks. In such tasks, speakers may be more susceptible to transfer effects due to the increased processing burden of the less constrained task. Thus, we propose that further research with less advanced learners, and including an additional, less constrained production task, could provide a more complete picture of potential transfer effects in the development of English article use by L2-Mandarin speakers.

Finally, we have proposed a pedagogical implication for the findings about Mandarin articles. Specifically, the evidence showing the differing distributions of indefinite articles in Mandarin (*yi* + CL) and the emerging definite articles (*nei/zhei)* could be used to inform teaching materials that raise awareness of similarities and differences between Mandarin and English in terms of article use. Such materials have been shown in previous research, on different linguistic properties, to facilitate acquisition of the L2 property in classrooms where the students share the same L1. Application of this method to the teaching of English articles in classrooms where Mandarin is spoken presents a promising direction for classroom-based research.

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Suppliance of Functional Morphology by L1 Chinese L2 English Speakers: The Prosodic Transfer Hypothesis and Pedagogical Implications

Neal Snape

Abstract In the current study, L1 Chinese L2 (English as a foreign language = EFL) learners in China are compared with L1 Chinese L2 (English as a second language = ESL) learners in Canada on their productions of articles in an elicited picture description task. The aim of the study is to find out whether both groups of learners delete articles or they are able to supply them in obligatory contexts. There may be a difference between EFL and ESL learners' productions due to ESL learners' ongoing lengthy exposure to English unstressed articles. The goal is to then examine any suppliance of articles using phonetic analysis software Praat to see if suppliance is target-like, i.e. unstressed, by both the EFL and ESL learners. The analysis reveals that despite high suppliance of articles in obligatory contexts, suppliance is far from target-like. We argue that even though the findings show a pattern of suppliance unlike native speakers, the L2 learners may continue to have full access to Universal Grammar post-critical period as further restructuring of prosodic structures is still possible. We end with possible suggestions for classroom instruction which would help L2 learners become more target-like with articles.

Keywords Prosodic transfer hypothesis · Prosodic structures · Articles · Production

1 Introduction

Suppliance of morphology in L2 acquisition is a topic that has been investigated intensely by many scholars (e.g. Lardiere, 2005; Larsen-Freeman, 1975; Prévost & White, 2000), and over the years, there have been different accounts for the reasons why L2 learners fail to supply morphology in obligatory contexts. In the early years of second language acquisition, there was a great deal of focus on the acquisition order of morphemes. The idea was to determine whether L2 learners acquire certain morphemes before others. For instance, is plural *-s* acquired before or after third

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person singular -*s*? (Bailey et al., 1974). Many subsequent studies focused on omission of morphology, rather than the order in which it was acquired by L2 learners, and whether adult L2 learners have full access to Universal Grammar (UG) post-critical period. Prévost and White (2000) provided an account that argued for missing surface inflection whereby underlying features failed to get mapped onto the phonology, and as a result, L2 learners omit functional morphology in obligatory contexts. However, the Missing Surface Inflection Hypothesis (MSIH) (Prévost & White, 2000) does not hypothesise exactly when this mapping process is likely to break down and, by extension, cannot predict *when* functional morphology is omitted.

Notwithstanding omission, Prévost and White argued that the MSIH and findings from their study support the Full Transfer/Full Access (FT/FA) Hypothesis (Schwartz & Sprouse, 1996). Alternatively, one way to try and pinpoint when L2 learners may not supply functional morphology is related to prosodic differences between the first and second languages. Goad et al. (2003) first proposed the idea of the Prosodic Transfer Hypothesis (henceforth, PTH) where "failure to supply overt morphology is related, at least in part, to properties of the L1 prosodic phonology which are transferred into the interlanguage (IL) grammar" (p. 244). In the initial inception of the PTH, Goad et al. (2003) argued for a Full Transfer/Partial Access theory of acquisition, meaning that certain prosodic representations in the L2 may never be adapted or restructured to accommodate L2 morphology. However, further studies that have tested the PTH have shown that Goad et al.'s (2003) original position in respect to access to UG may have been too strong. Goad and White (2008) have since argued that for a minority of adult L2 learners, building the appropriate structures for L2 morphology is possible, and as a result, the PTH was modified as certain findings were consistent with the FT/FA view of L2 acquisition (Goad & White, 2019). One advantage the PTH has over other hypotheses such as the MSIH is that it is possible to make concrete predictions about when functional morphology is likely to be omitted and when it is supplied. In the case of the current study, the data set collected is of speech production by L1 Chinese L2 English learners of English. Since there are prosodic differences between Mandarin Chinese and English, it is useful to test the PTH to see whether these differences are related to prosody. What we may expect to find is that the L2 learners omit functional morphology or supply non-target-like forms because of the prosodic differences between the L1 and L2. In fact, what we do find is across-the-board non-target-like suppliance of definite (the) and indefinite (a) articles. Despite non-target-like suppliance, we argue that the findings are consistent with the FT/FA hypothesis.

This paper first provides details of previous studies that have looked at the acquisition of articles in L2 English since the focus of the current study is on whether Mandarin Chinese L2 learners of English can supply articles in spoken production. Section 3 gives the reader an overview of the Prosodic Transfer Hypothesis by providing an analysis of English prosodic structures and Mandarin prosodic structures. Section 4 explains the current study and the results. Section 5 is a detailed discussion of the findings, pedagogical implications and concludes the paper.

2 Article (Non-)Production by L2 English Speakers

2.1 Omission and Deletion

Many previous studies have tended to document omission in spoken production (see Parrish, 1987; Robertson, 2000). Omission is the usual term used to describe failure to supply functional morphology in an obligatory context. Deletion is used specially in relation to the PTH as functional morphology is deleted because it cannot be represented within a phonological structure. Here, we use the terms *omission* and *deletion* to refer to how L2 learners fail to supply the morphemes *the* and *a*.

Omission of morphology in obligatory contexts is frequently found in L2 studies which use an oral production task. One question that L2 researchers try to address is "Why does omission occur and when does it occur?". One way to explain why omission happens is described by Prévost and White (2000) who appeal to a distributed morphology (DM) model (Halle & Marantz, 1993). Under a DM model, lexical insertion takes place, but crucially, all the features of the vocabulary item must be consistent with the features of where insertion into the syntax takes place, the terminal node. Some features of the lexical item may be underspecified in which case they will not match the terminal node. Not all features have to match the terminal node, but a sufficient number of them should in order to win out the competition between other lexical items that could equally match the features of the terminal node. What this means for L2 speakers is that sometimes due to communication pressure or processing issues, a feature may be missing as the feature failed to get mapped from the morphological component to the phonological component, and this is captured under the MSIH.

We now try to answer the question of *when* does omission happen. The term *deletion* comes from the work by Goad and White (2004, 2006, 2008; henceforth G&W) in looking at oral production data. Goad and White (2004) examined data of an advanced English speaker named SD whose L1 is Turkish (as first reported in White, 2003). SD was unable to produce articles one hundred per cent of the time in elicited production. The analysis G&W (2004) offered of Turkish left edge prosodic structures for demonstratives and numerals compared with English prosodic structures is clearly different. Since Turkish lacks definite articles or any unstressed elements that occur at the left prosodic edge, the free clitic structure outlined in Sect. 3 in Fig. 1a is absent. This is extended to prosodic structures where an adjective intervenes between the article and the noun, as in Fig. 1b. Again, Turkish lacks the free clitic structure where an article attaches directly to the phonological phrase. The only structures available to SD are those prosodic structures that can be adapted to accommodate *L2* articles in the IL grammar. To test the PTH, G&W (2004) explored some of the data sets for suppliance and omission of articles in art + n configurations and art + adj + n configurations. What the results of their analysis showed was that SD substituted articles for demonstrative *this* and numeral *one*, but rarely; it was far more likely that SD would omit articles in both types of configuration. Part of the inaccurate use of articles was due to fossilisation in SD's IL grammar, as Lardiere

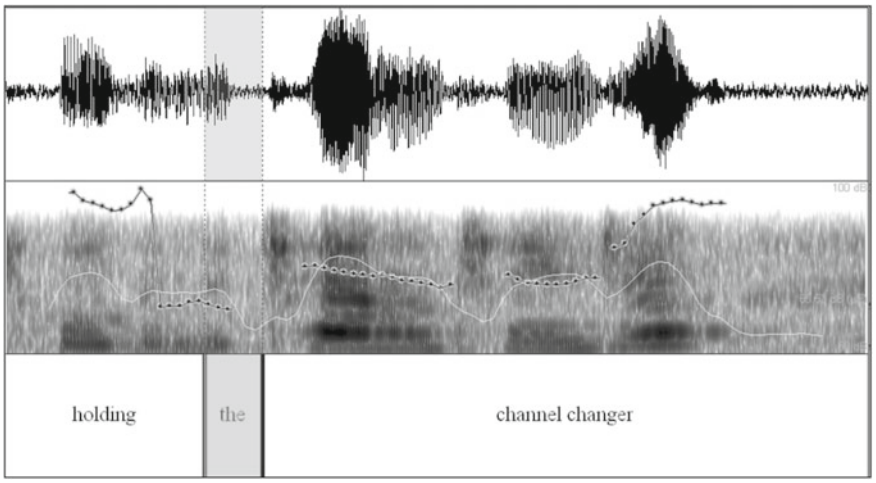

Fig. 1 Visualisation of a definite article with a textgrid in Praat

(2008) had found in her well-known study of Patty, a Mandarin speaker of English. What SD and Patty have in common is that they are both adult *L2* learners, but despite having lived and worked in an English-speaking environment for many years, they still are unable to produce functional morphology, e.g. past tense *-ed*, articles, like a native English speaker does. This led G&W (2004) to argue that perhaps some of the deleted morphology could be accounted for by examining the prosodic differences between L1 Turkish and L2 English. G&W (2004) further claimed that omissions by SD in regard to optionality in suppliance of articles is also likely related to L1 prosodic transfer, though instead of the right edge where agreement and tense morphology occurs, the left edge prosodic structure differs between Turkish and English. G&W (2004) argued that the inability for SD to build new structures or adapt existing L1 structures is the result of partial access to UG. SD has already reached a steady state in her IL grammar and is unlikely to develop further.

Turkish is not the only language that lacks articles.[1] Japanese is another articleless language, but there are prosodic structures in Japanese that can be adapted to represent articles in L2 English. Snape (2007) conducted a study that examined whether intermediate and advanced Japanese L2 learners of English could successfully supply articles in a spoken production task. The task was a story recall task where participants listened to 13 separate stories. Each story was played twice, and then a number of key words (nouns and adjectives) were presented on a computer screen for participants to recall the stories. Participants listened to each story and then recalled each one before continuing onto the next story. The results showed that despite no free clitic structure available in Japanese at the left prosodic edge, Japanese

[1] See Trenkic (2007) for a study that included L1 Serbian L2 English speakers. Trenkic (2007) argues that the PTH cannot account for the findings in her study and provides an alternate account for the omission of articles in spoken production.

L2 learners were able to adapt existing structures to accommodate L2 articles in their IL grammars as articles were used in art + n and art + adj + n configurations. Snape (2007) claimed that the results were consistent with a partial access view to UG because the adult L2 learners were still deleting articles at advanced levels of proficiency, though less so compared to intermediate-level learners. In order to provide a more persuasive argument for partial access, Snape (2007) stated that it would be important to analyse the individual results to see whether some of the advanced learners could achieve native-like suppliance. The suppliance of articles was only predicted if learners could adapt L1 structures, but suppliance does not mean that it is necessarily target-like, as we discuss below in Sect. 12.2.

2.2 Suppliance

As suppliance was found in Snape (2007), the question is whether any suppliance of articles is target-like as unstressed forms. Unfortunately, Snape (2007) offered no phonetic analysis of the suppliance of articles by the Japanese L2 learners, and thus it is not possible to determine whether Japanese speakers produced unstressed articles. Typically, in the studies by G&W, they trained native English speakers to identify whether suppliance was target-like or not. Three or more raters would then be able to compare their judgements to determine what they thought as target-like or non-target-like. But suppliance can also refer to other determiners. G&W (2006) compared a small group of Mandarin Chinese speakers with a small group of Turkish speakers to examine the suppliance of articles by intermediate-level proficiency learners in L2 English. Even though Mandarin Chinese and Turkish do not have formal article systems like English, as discussed above, Turkish does differ from Mandarin Chinese in two key respects, and that is (1) Turkish lacks a definite article but has a quasi-indefinite article[2]; and (2) Turkish has a prosodic structure that can be adapted to accommodate articles in art + n configurations. G&W (2006) put forward a number of predictions with regard to suppliance, listed from 1 to 3 below:

1. Appropriate use of determiners other than articles (e.g. demonstratives and possessives) since these are represented as independent PWds in all three languages.
2. Substitution of other determiners in place of articles, e.g. *one* for *a* and demonstratives or possessives.
3. Adoption of various strategies which allow articles (or article-like elements) to be supplied while bypassing the free clitic structure in Fig. 2, including: (i) stressing of articles; (ii) insertion of fillers or pauses after articles; and (iii) use of fillers in place of articles.

   (adapted from Goad & White, 2006)

[2] Turkish has a quasi-indefinite article *bir* according to Lyons (1999).

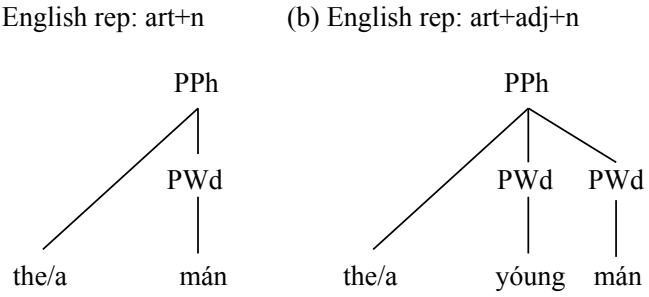

Fig. 2 Prosodic structures for English articles in art + n and art + adj + n configurations

The task was an elicited picture description task. Participants were instructed to describe what they saw in the pictures and create a story. The task was designed to elicit art + n and art + adj + n configurations so that the researchers could examine the pattern of suppliance, be that of articles, demonstratives, numerals, possessives or a mix of determiners. The results show that all L2 learners from both groups supplied articles and did not use substitutions for articles, as outlined in 2 above. In fact, G&W (2006) found very little deletion of articles across the two L2 groups. However, individual results from the Turkish and Mandarin Chinese speakers showed that suppliance was not always target-like. The lower intermediate proficiency learners tended to delete more articles and supply non-target-like articles. Some of these non-target productions are termed as strategies by G&W (2006) such as substitution of other (i.e. stressed) determiners for articles, stressing of articles, articles followed by a pause or fillers and production of fillers in place of articles.

Snape and Kupisch (2010) conducted an analysis of suppliance by the Turkish speaker, SD, specifically focusing on the suppliance of articles rather than the suppliance of other determiners. Though trained raters were used in the previous studies to determine whether suppliance of *the* and *a* was target-like or not, or whether they were appropriate suppliance, Snape and Kupisch (2010) employed Praat software to provide a detailed analysis of the prosodic shape of articles. To determine if suppliance was target-like, Snape and Kupisch used duration, pitch and intensity as parameters (see Sect. 4 for discussion). The data analysed came from the final interview with SD. In order to analyse the supplied articles, the researchers identified all uses of articles in the interview and spliced them from the main WAV audio file to save them as separate individual WAV audio files. The researchers were then able to create textgrids for each WAV audio file in order to enter text under the audio, represented as a spectrogram and waveform in Fig. 1.

Surprisingly, the analysis revealed that a number of articles produced by SD were non-target-like. In other words, some of the articles had a longer duration, 70 ms or above, which meant that they received stress where native English speaker controls produced significantly shorter durations, e.g. 30 ms or less, indicating that the articles were unstressed. Therefore, even when there is suppliance, it may turn out to be very different to how a native speaker produces articles.

3 The Prosodic Transfer Hypothesis: English and Chinese

3.1 English Prosodic Structures

One approach to variability in L2 production is related to prosodic differences between the L1 and L2. The PTH asserts that L2 learners' omission of inflectional morphology can be traced to a lack of corresponding L2 structures. G&W (2004, 2006, 2008) have made predictions about free forms, such as the prosodic structure of determiners. If the L1 is an article-less language, it is possible to make predictions about the suppliance of articles in the L2 if the L1 lacks or has different corresponding prosodic structures. In English, articles are represented in the phonology as free clitics (Selkirk, 1996). Representations of free clitics for article + noun (art + n) and article + adjective + noun (art + adj + n) configurations are illustrated in Fig. 2.

In Figs. 2a and b, both articles can attach directly to the phonological phrase (PPh) followed by prosodic words (PWd) *man* (noun) in 2a and *young man* (adjective and noun) in 2b. These prosodic structures are the typical structures employed by native speakers of English. In contrast, the prosodic representations for demonstrative *this* and numeral *one* are provided in Fig. 3.

The crucial difference between Figs. 2 and 3 is that articles can attach directly to the PPh, but this is not possible for demonstratives (this/that) and numerals (one, two, etc.) because demonstratives and numerals receive stress and therefore form independent PWds (Goad & White, 2008). In other words, the prosodic structures employed to represent demonstratives and numerals are very different. Importantly, it is of course equally possible that articles can be stressed like demonstratives and numerals, but stressed articles are far less common unless a native speaker of English is trying to make a direct contrast, such as (1), though it is not necessary to stress both article and noun in order to successfully make the contrast between the two coloured pens.

(1) Please pass me the blúe pén, not the réd pén.

The difference between unstressed and stressed articles is that "unstressed [ðə] and [ə] are segmentally and moraically distinct from their stressed counterparts [ði:] and

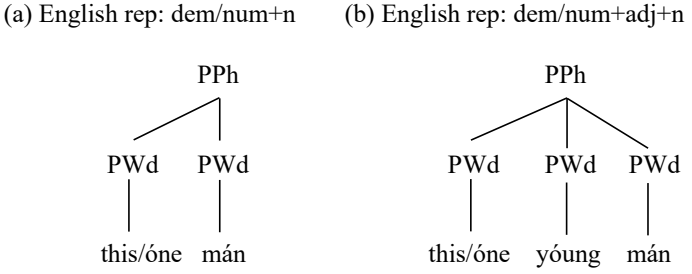

Fig. 3 Prosodic structures for English demonstratives in art + n and art + adj + n configurations

[e:]" (Goad & White, 2004, p. 137). Even though stressed articles are less likely to be produced by native speakers of English, it does not mean that L2 learners follow a similar pattern of production, especially if equivalent L1 prosodic structures are different or absent. In fact, for some L2 learners, the only way to supply functional morphology like articles may be to stress them (see Snape & Kupisch, 2010).

3.2 Mandarin Chinese Prosodic Structures

G&W (2006) had assumed that the free clitic prosodic structure available to native English speakers was absent in Mandarin Chinese. However, G&W (2008) offered a revised analysis of prosodic structures in Mandarin Chinese based on Huang's (1999) work which examined the emergence of *nage* (that) as a definite article in Taiwanese. The free clitic representation is available for *nei* + n configurations in Mandarin (see Fig. 3a) even though there is no formal article system present, so in short, Mandarin speakers of English should be able to represent articles in a target-like fashion in art + n configurations. Conversely, the prosodic representation for an adjective in Fig. 3b is not licenced in Mandarin Chinese because affixal clitics must be prefixed onto the constituent which they modify. Adjectives are positioned between classifier and noun in (2) in Mandarin.

(2)	ta1	mai3-le	nei-ge	da4	mao4zi
	3sg	buy-PERF	the-CL	big	hat
	'S/he bought the big hat.'				

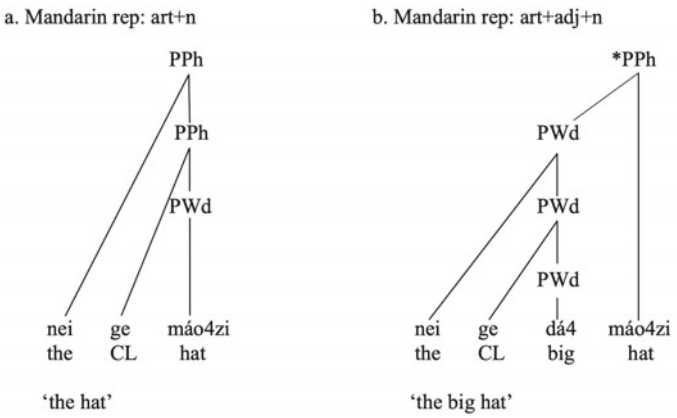

Fig. 4 Possible prosodic structures for Mandarin in art + n and art + adj + n configurations (taken from Goad & White, 2008, p. 585)

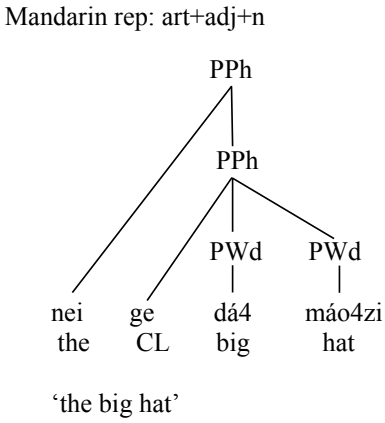

Fig. 5 Prosodic structure for Mandarin in art + adj + n configuration (adapted from Goad & White, 2008)

This means that the adjectival structure in Fig. 4b is ungrammatical as *ge* classifier (CL) cannot prefix onto the head noun *máo4zi* (hat) as there is an intervening adjective *dá4* (big).

It is more likely that the correct prosodic structure for *nei* + adj + n is represented in Fig. 5 where *nei* is a free clitic much like the free clitic structure for English art + adj + n configurations.

Given that Mandarin Chinese seems to have prosodic structures that are equivalent to English prosodic structures despite not having a fully developed article system, we consider what this means for the representation of articles in Mandarin speakers L2 IL grammars. In particular, rather than focusing on deletion of prosodic material (or omission), we examine the type of suppliance provided to see if there is substitution for articles with other determiners. Critically, for the current study, we want to find out if suppliance of articles means accurate target-like suppliance or suppliance of the kind SD produced. We set out to answer the following research questions.

(R1)	Do Mandarin Chinese ESL learners transfer existing L1 prosodic structures to their L2 IL grammars?
(R2)	Do Mandarin Chinese EFL learners transfer existing L1 prosodic structures to their L2 IL grammars?
(R3)	Do both Mandarin Chinese ESL and EFL intermediate learners perform similarly in that they delete articles across-the-board in art + n and art + adj + n configurations?
(R4)	Do Mandarin Chinese ESL learners outperform their EFL counterparts due to greater exposure to L2 English?
(R5)	Based on the ESL and EFL learners' performance on the task, do the findings support an FT/FA access view to UG?

We included EFL and ESL learners because the two groups differ in terms of the L2 acquisition process. The main difference between the two groups is that one group is based in an EFL context whilst the other group is based in an ESL setting. ESL learners who are sensitive to unstressed forms in speech may in turn be able

to produce target-like unstressed forms. The ESL learners may be more target-like in their productions of articles due to opportunities to listen to and speak in English in Canada (e.g. host family, study at university, interactions with English speakers at stores), whereas the EFL learners may only have a limited number of chances to speak in English inside and outside of the classroom since they were all living in China at the time of testing.[3] The research questions address each learner group and compare the two groups to see whether there are differences in suppliance of articles. The main aim of the research questions is to find out if there are differences in performance on the elicited picture description task and if there are, what does this mean in terms of pedagogical implications? The final research question explores whether the findings, in general, support the PTH and an FT/FA view to UG.

4 Empirical Study

4.1 Participants

In total, there were 59 L1 Chinese L2 English learners who participated in the study. In addition, three native English speaker controls were included. Thirty participants were in China attending regular English language classes (EFL) whilst 29 were studying English in Canada (ESL) at the time of testing. Due to the coronavirus pandemic, there was less time during busy semesters to look at the complete data set. Therefore, it was not possible to include all the participants' productions of DPs. Instead, five advanced and five intermediate EFL learners (n = 10) plus seven advanced and 13 intermediate[4] ESL learners (n = 20) were randomly selected from the two groups (China and Canada) of learners in order to obtain a number of the art + n and art + adj + n configurations for analysis. The participants were asked to complete an elicited picture description task and the Oxford Quick Placement Test (OQPT) (Syndicate, 2001) in order to assess the proficiency level of each participant. The elicited picture description task was administered before the proficiency test. The maximum score one can achieve on the test is 60. Table 1 provides the averages for the EFL and ESL learners' OQPT scores. Based on the scores, the learners are divided into intermediate and advanced groups, according to the OQPT criteria.

[3] Since the background questionnaire only asked general questions about the participants' English proficiency, it is only speculative as to how much English is spoken by both groups of learners. It is equally possible that some EFL participants have many chances to speak in English with friends, colleagues, just as it is equally possible that the ESL participants prefer to speak in Mandarin with other Mandarin speakers within a Chinese-speaking community.

[4] Some ESL learners produced very few art + adj + n configurations. More intermediate learners were included in order to have an equal number of art + adj + n configurations to compare with the EFL intermediate learners.

Table 1 Chinese EFL and ESL learners' OQPT scores

		OQPT
EFL learners (China)	Intermediate	42.8
	Advanced	49.6
ESL learners (Canada)	Intermediate	34.5
	Advanced	51.1

4.2 The Elicited Picture Description Task

The elicited picture description task consisted of a series of pictures, which are based around one female character. The task was originally designed to elicit vocabulary items of different prosodic shapes (Goad & White, 2019). However, since the goal was to elicit singular count nouns headed by either a definite or indefinite article, the elicited picture description task was adequate. Each participant was instructed to create a story about the main character's day using each of the pictures (see Goad & White, 2008, for further discussion). Each participant produced a number of DPs requiring articles in singular contexts. Some of the DPs included art + adj + n configurations, e.g. a/the red jacket.

4.3 Coding Procedure

The native speakers' productions of articles in both art + n and art + adj + n configurations in the current study came from the interviewer present in the interviews with SD and two native speakers who were originally recorded in a study by Snape (2009). The participants had to describe what was happening in the pictures in their own words. They were recorded using an Apple iPod fifth generation fitted with a Belkin TuneTalk recorder. The data created by the recorder were mp3 audio files that were later converted into WAV audio files using Audacity software so they could be loaded into Praat and analysed. Praat was used so a closer analysis of each article could be performed. In Snape (2009), the audio files were transcribed using Express Scribe software. All DPs were coded into definite/indefinite, and whether or not the article was supplied or omitted in an obligatory context. The transcriptions allowed the researcher to identify where in the recordings the participants produced art + n and art + adj + n configurations. Once identified, the researcher could then locate and splice art + n and art + adj + n configurations from each recording in order to analyse the prosodic shape of the articles. No substitutions of demonstratives or numerals for articles were made by the native speakers. Partially incomprehensible DPs (e.g. cases with too much background noise) and DPs with hesitations before the article were excluded. There are three possible measures which can be used to establish whether a particular morpheme receives stress, duration, pitch and intensity (Fry, 1955; Ladefoged, 2003). For our analysis of the data set, we used duration to

determine if each article was unstressed or stressed, following the analysis used by Adams and Munro (1978).

4.4 Group Results of the Elicited Picture Description Task

The objective was to see whether the Chinese speakers could supply articles in obligatory art + n and art + adj + n configurations. Substitution errors may have arisen as a result of the task used. As both the researcher (hearer) and the participant (speaker) could see the pictures, they have a shared knowledge of what exists so if the participant said in the first mention use "#the girl is walking along the street" instead of the indefinite "a girl is walking along the street" it was still counted as suppliance as the goal here is to see whether articles are supplied, regardless of pragmatic appropriateness. Examples of suppliance of *the* and *a* are shown in the following examples in (3).

(3)

(a) put it in an envelope
(b) look at the recipe
(c) she went to a museum

(taken from Snape, 2009, p. 44).

Tables 2 and 3 show that the native speakers supplied articles in art + n and art + adj + n configurations 100% of the time.

Examples of deletion of *the* and *a* are in (4).

Table 2 Articles produced by native speakers in art + n configurations (taken from Snape & Kupisch, 2010, p. 541)

	Definite articles		Indefinite articles	
	Unstressed	Stressed	Unstressed	Stressed
Total number	16/18	2/18	16/16	0/16
	(88.9%)	(11.1%)	(100%)	(0%)
Average duration (ms)	79	140	74	–

Table 3 Articles produced by native speakers in art + adj + n configurations (taken from Snape & Kupisch, 2010, p. 541)

	Definite articles		Indefinite articles	
	Unstressed	Stressed	Unstressed	Stressed
Total number	21/23	2/23	26/26	0/26
	(91.3%)	(8.7%)	(100%)	(0%)
Average duration (ms)	78	185	64	125

(4)

(a) in front of—computer
(b) send—letter is better
(c) he walked by—restaurant

(taken from Snape, 2009, p. 44).

Table 4 provides the results of the Chinese L2 learners' deletions of articles.

The results of Table 4 are interesting because there is relatively little deletion of articles. Tables 5 and 6 provide the detailed measurements of average article duration

Table 4 Deletion of articles in art + n and art + adj + n configurations

		Total deletions in art + n configurations	Total deletions in art + adj + n configurations
EFL learners (China)			
	Intermediate (n = 5)	1	11
	Advanced (n = 5)	2	6
ESL learners (Canada)			
	Intermediate (n = 13)	12	16
	Advanced (n = 7)	6	2

Table 5 Articles produced by L1 Chinese L2 English learners (in China) in art + n configurations

		Definite articles	Indefinite articles	Total
Intermediate (n = 5)	Total number	26/26	6/6	32
		(100%)	(100%)	
	Average duration (ms)	149	168	
Advanced (n = 5)	Total number	25/25	7/7	32
		(100%)	(100%)	
	Average duration (ms)	157	149	
		Yates $\chi^2 = 0.99$, $p = 0.319$		

Table 6 Articles produced by L1 Chinese L2 English learners (in Canada) in art + n configurations

		Definite articles	Indefinite articles	Total
Intermediate (n = 13)	Total number	11/11	21/21	33
		(100%)	(100%)	
	Average duration (ms)	171	161	
Advanced (n = 7)	Total number	15/15	17/17	32
		(100%)	(100%)	
	Average duration (ms)	85	125	
		Yates $\chi^2 = 5.84$, $p = 0.0156$		

for the definite and indefinite articles in art + n configurations. The results of the China EFL and Canada ESL groups are divided into the two proficiency groups in art + n configurations.

The results from chi-square tests show that there are no significant differences within the EFL group in proficiency ($p = 0.319$), but this differs from the results of the ESL group ($p = 0.0156$), where the advanced speakers are significantly better than the intermediate speakers. One way to interpret these results is to argue that these learners have been able to adapt L1 prosodic structures to represent the L2 morphology, in which case there would be more suppliance. However, our analysis of suppliance in Tables 5 and 6 revealed complete non-target-like suppliance by intermediate and advanced L2 speakers in China (EFL group) and Canada (ESL group). Figure 6 illustrates the suppliance of articles and the measurements in milliseconds for both Chinese groups and both proficiency groups.

Tables 7 and 8 provide the detailed measurements of average article duration for the definite and indefinite articles in art + adj + n configurations. The results of the China EFL and Canada ESL groups are divided again into the two proficiency groups.

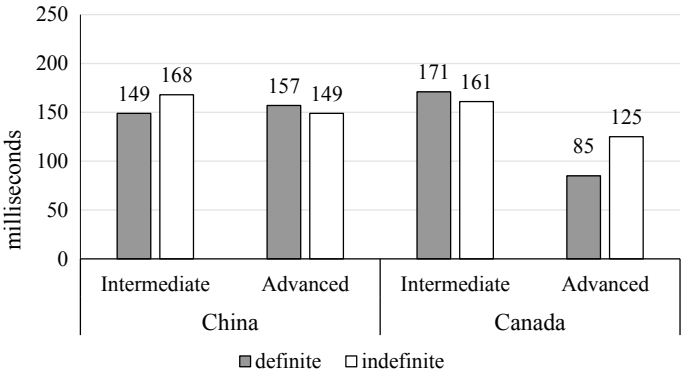

Fig. 6 Articles produced by L1 Chinese L2 English learners in art + n configurations

Table 7 Articles produced by L1 Chinese L2 English learners (in China) in art + adj + n configurations

		Definite articles	Indefinite articles	Total
Intermediate (n = 5)	Total number	15/15	12/12	27
		(100%)	(100%)	
	Average duration (ms)	182	230	
Advanced (n = 5)	Total number	22/22	11/11	33
		(100%)	(100%)	
	Average duration (ms)	186	177	
		Yates $\chi^2 = 3.58$, $p = 0.0584$		

Table 8 Articles produced by L1 Chinese L2 English learners (in Canada) in art + adj + n configurations

		Definite articles	Indefinite articles	Total
Intermediate (n = 13)	Total number	19/19	13/13	32
		(100%)	(100%)	
	Average duration (milliseconds)	174	157	
Advanced (n = 7)	Total number	16/16	15/15	31
		(100%)	(100%)	
	Average duration (milliseconds)	211	216	
		Yates $\chi^2 = 0.62$, $p = 0.431$		

Figure 7 illustrates the suppliance of articles and the measurements in milliseconds for both Chinese groups and both proficiency groups in art + adj + n configurations.

Table 9 reports the results of separate chi-square tests for the EFL group and the ESL group between proficiency levels on the suppliance of articles in art + n and art + adj + n configurations.

The results of Table 9 show that there is no significant difference between art + n and art + adj + n configurations for the China EFL group ($p = 0.350$), but there is a

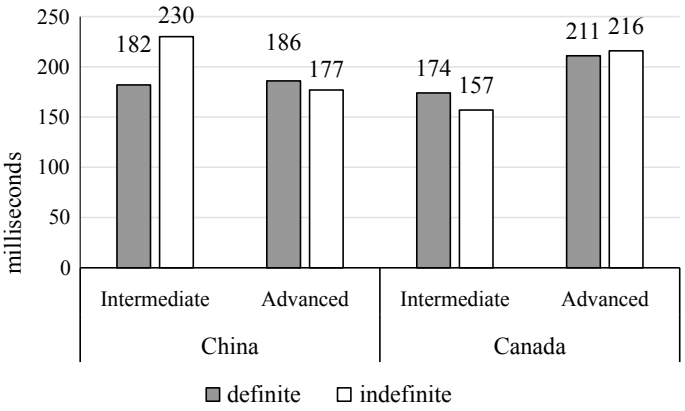

Fig. 7 Articles produced by L1 Chinese L2 English learners in art + adj + n configurations

Table 9 Total number of articles (definite and indefinite) average duration within China and Canada groups

	China (intermediate and advanced)	Canada (intermediate and advanced)
art + n versus art + adj + n	Yates $\chi^2 = 0.87$, $p = 0.350$	Yates $\chi^2 = 17.15$, $p = 0.0001$

Table 10 Total number of articles (definite and indefinite) average duration between China and Canada groups

	Intermediate	Advanced
art + n	Yates $\chi^2 = 1.14$, $p = 0.285$	Yates $\chi^2 = 5.44$, $p = 0.0196$
art + adj + n	Yates $\chi^2 = 4.85$, $p = 0.0276$	Yates $\chi^2 = 0.19$, $p = 0.662$

significant difference between art + n and art + adj + n configurations for the Canada ESL group ($p = 0.0001$). To break down the results further, we ran chi-square tests for each group independently with proficiency and type of configuration as separate independent variables. The results are given in Table 10.

Table 10 shows there is a significant difference between the advanced China EFL group and the Canada ESL group in the average duration of articles in the art + n configuration ($p = 0.0196$). No difference was found between the groups in the art + adj + n configuration. There was a significant difference between the intermediate China EFL group and the Canada ESL group in the average duration of articles in the art + adj + n configuration ($p = 0.0276$).

5 Discussion and Conclusion

In this study, we examined EFL and ESL Chinese L2 learners' production of articles using an elicited picture description task. The main focus of the study was upon suppliance rather than omission/deletion of articles as all the L2 speakers successfully supplied articles in obligatory contexts albeit non-target-like suppliance. To show whether suppliance was target-like, we used Praat to measure the duration of individual articles in art + n and art + adj + n configurations. The overall findings from our analysis show that both the EFL and ESL learners predominately produce articles much longer than their native speaker counterparts. Instead, it seems that the learners adopted some of the strategies as outlined above in G&W (2006) such as inserting a pause or filler after the article or stressing the article. Thus, article suppliance is far greater than article deletion in the Chinese speakers' IL grammars, but even at advanced levels of proficiency, there continues to be non-target-like suppliance. The main difference between the EFL and ESL groups was that the advanced ESL learners were significantly better than the intermediate ESL learners: this difference was not observed between the two proficiency levels in the EFL group. The ESL group provided significantly shorter definite articles in art + n configurations compared with the EFL group (see Fig. 6). There was a difference between the two groups in art + adj + n configurations when the definite article and indefinite article were grouped together; the ESL intermediate group provided shorter articles than the EFL intermediate group. Individual results show that no learner from either the EFL group or the ESL group was able to produce unstressed articles.

The findings are somewhat surprising because most studies that include spoken production data typically demonstrate omissions as high and suppliance as low, compared with native speakers. Our study has shown that despite having an L1 background with no formal article system, the Chinese speakers at intermediate and advanced levels of proficiency were able to produce articles at a high rate. We argue that the results support the strong version of the PTH as the Chinese speakers seem to have failed to build new structures. Instead, they have managed to adapt existing L1 structures to accommodate articles. The very fact that all the L2 learners are able to supply articles in art + adj + n configurations with relatively few deletions (see Table 4) supports the idea that restructuring of L1 prosodic structures has taken place. What may be unclear is whether these L2 learners have full access or partial access to UG with regard to representing articles in a target-like manner, i.e. unstressed. Of course, we cannot rule out the fact that further restructuring and building of new L2 structures may occur in the learners' IL grammars. We believe that the non-target-like suppliance exhibited in the current study by the EFL and ESL learners is consistent with the FT/FA account. It is still possible that learners can reach a very advanced stage in IL development where article suppliance and representation become more target-like. Advanced proficiency alone may lead to more target-like suppliance of articles. More opportunities to speak with native speakers of English may lead to greater accuracy in suppliance of articles and an increase in their perceptual ability to perceive articles. Some suggestions are provided below.

So far, we have outlined the differences found in our study between Chinese speakers and native English speakers in article suppliance. Here, we briefly explore a couple of ways to assist ESL and EFL learners to become more target-like in the representation of articles. Snape and Kupisch (2016) suggest some useful activities instructors or learners themselves could try out. Firstly, there should be an emphasis on training L2 learners to perceive articles in English, as perception has been shown to play a large role in acquisition (e.g. Pierce & Ionin, 2011). One of the reasons for this is because articles are very short in length and in regular speech L2 learners may find that they are difficult to perceive. Instructors could provide different contexts where learners would have to listen out for articles; and perhaps using a dictation method, instructors could have the learners write down all articles that they hear. One way to achieve this would be to have a transcript of a conversation where the articles were removed. Learners would then have to listen to the conversation and fill in the blanks when they heard an article. Instructors can explain how in spoken dialogues the article *the* and *a* tend to be reduced to a schwa /ə/ as the weak form of *a* and the weak vowel in *the* /ðə/. Learners could also receive training in article production in order to sound more native-like in the use of articles. This could be achieved by using a software program like Praat whereby learners record themselves using articles in sentence-initial position, sentence-medial position and sentence-final position. These sentences could be different configurations of art + n and art + adj + n. For example, for sentence-medial position, one could insert an indefinite or definite article to practice in an art + n or art + adj + n configuration as in (5).

(5)

(a) He hopes to buy a cat for his daughter's birthday. (indefinite art + n)
(b) He hopes to buy the cat for his daughter's birthday. (definite art + n)
(c) He hopes to buy a black cat for his daughter's birthday. (indefinite art + adj + n)
(d) He hopes to buy the black cat for his daughter's birthday. (definite art + adj + n)

Learners could then compare their own recordings with those of native English speakers by measuring the length of their articles. This type of practice was found to be beneficial to Japanese L2 learners of English in an intervention conducted by Snape and Yusa (2013).

Based on the findings from the current study, it is clear that there are pedagogical implications in terms of autonomous learning for ESL and EFL learners. For ESL learners, the chance to interact and speak in English should be maximised, either inside the classroom or outside the classroom, or both. To use English and listen to speech in an English-speaking setting is a good opportunity to improve in the suppliance of articles and become more target-like in that suppliance. Conversely, for EFL learners, though their chances of having natural conversations in English with native speakers are less likely, there are still possibilities open to them such as online English classes, online language exchange partners, and use of audio and video to listen to news delivered in English by native speakers. Both learner groups would likely benefit from an increase in naturalistic exposure to native speaker English. As well as in-class activities with Praat, ESL and EFL learners can benefit from recording themselves and analysing their own speech, beyond just the sentence level. For example, keeping a spoken daily journal or diary of each day's activities by recording individual thoughts. Then, the audio file can be loaded into Praat for analysis.[5] This would be one way all learners could try to improve accuracy in article use, as well as other functional morphology.

One of the limitations of the task used in the current study is that it is not free production. The participants were asked to create a story using the pictures provided, and, in doing so, some participants tried to be more careful in their telling of the story, which led to more pauses and unnatural use of articles. A future study should include more than one production task to see if indeed free production elicits more target-like unstressed articles compared with an elicited picture description task. A free production task could be interviews where learners are encouraged to discuss different topics. Further limitations include not implementing a more detailed background questionnaire about each participant's use of English. This would be helpful in regard to spoken English. This may reveal how much the roles of input, intake and use of the L2 play in the restructuring of the IL structures needed to represent L2 morphology. Also, the number of participants' article productions in the current study is small. In order to provide a more accurate picture of what may be possible in

[5] The audio file has to be converted into a WAV file in order to be able to open it in Praat. Free software for converting audio files is available online.

terms of target-like suppliance, a larger population of L2 learners at higher proficiency levels needs to be tested. For instance, higher proficiency could be based on OQPT results, or a test such as IELTS, where speaking is a component of the IELTS exam. Any speaking scores above a certain threshold would determine whether learners are advanced speakers of English. This is a limitation of the current study as the OQPT is solely a written exam. Despite these limitations, the current study shows that even when functional morphology, like articles, is supplied, it may be non-target-like use.

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Factors Affecting Chinese Learners' Acquisition of English Plurality

Ziming Lu and Yicheng Wu

Abstract Although the acquisition of English grammatical morphology among Chinese learners has been widely studied, limited attention is attached to the difficulties in acquiring English plural morphology, and its complexity is underestimated. This study explores in cognitive terms what makes English plural morphology difficult for Chinese learners. Data of English plural marking errors made by Chinese learners were collected from the Chinese Learner English Corpus (CLEC) and analysed from four perspectives: lexical referent types, lexical countability, grammatical number agreement and contextual function. The results show that Chinese learners' consistent failure to supply plural marking to nouns in obligatory contexts is not a random performance but a systematic behaviour. The underlying cause for the residual difficulties in the acquisition of English plural morphology is related to the cross-linguistic differences in the conceptualisation of number.

Keywords Number · Plural morphology · (Non)referentiality · Collectivity

1 Introduction

In the field of language acquisition, the real learning challenges are arguably found in the acquisition process of functional morphology, which is called "the 'tight spot' for acquisition process flow" (Slabakova, 2006, p. 324; Montrul & Slabakova, 2002). A number of studies indicated that syntax presents the least challenge for second language (L2) learners (e.g. Bardovi-Harlig, 1992; Haznedar, 2001; Ionin et al., 2013; Slabakova, 2008; White, 2003, inter alia), and the view of "semantics-before-morphology" in acquisition is also supported with robust evidence (e.g. Dekydtspotter & Sprouse, 2001; Gürel, 2006; Lardiere, 2005; Slabakova, 2006, 2008, 2016). The challenge with functional morphology is not only the basic requirement with regard to "which forms go with which features" (Lardiere, 2005, p. 179),

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but also the integrated knowledge of syntax and other information (such as semantics, pragmatics and prosodics). Lardiere (2005) clearly outlined the mapping difficulties lying in functional morphology and pointed out that the mapping between form and meaning in grammatical morphemes is not merely a one-to-one situation. The English past tense morpheme *-ed*, for example, albeit simple in form, is functionally more complex than just indicating the past tense. It can also encode perfective aspect, irrealis mood in conditionals and politeness, among other usages (see Lardiere, 2005, for details). Slabakova (2006) suggested that since grammatical morphemes are composed of features of form and meaning as well as others, it is possible that these features are not acquired at the same time. The assumption is supported by DeKeyser (2005), who, by summarising multiple studies, concluded that the syntactic and semantic features of grammatical morphemes are quicker to acquire for L2 learners and the from-meaning mapping, especially when the mapping link is not transparent, is the locus of challenges. For example, studies on the acquisition sequence of English articles have demonstrated that *zero* article, whose form-meaning mapping requires more information, is acquired at the later stage by L2 learners of all levels regardless of their native languages, while the indefinite article *a* is the first one to be acquired (e.g. Lu, 2001; Master, 1990, 1997; Sun, 2016).

The difficulties in acquiring grammatical morphemes among Chinese EFL learners have been widely studied, especially with the focus on English articles and verb inflections, as learners' native language lacks such functional morphemes. The problems about the acquisition of plural morphology confronted by Chinese EFL learners, however, are not equally addressed. The pluralisation rules in English seem easy to acquire. Based on Ellis' (2006) list of determinants used to measure the difficulties of grammatical knowledge, English plural morphology represents regular features of high frequency in terms of its large application scope and high reliability concerning its application to a large percentage of nouns. From a pedagogic perspective, according to Robinson (1996), pluralisation is structurally regular and does not require complex explanation. Thus, in the field of morphology acquisition, the research focus is rarely placed on the problems of plural marking.

Although the basic rules of English pluralisation appear to be straightforward and are formally taught, Ellis (2006, p. 458) warned that "being an easy to 'grasp' feature does not guarantee its accurate use". The plural marking errors made by Chinese EFL learners are not rare and can be largely classified into two types in the extant literature: the plural morphology is supplied in inappropriate contexts or absent in obligatory contexts (see Chen, 2000; Jia, 2003; Gui & Yang, 2003; Hu, 2007, 2011a, Yang, 2014; among others). The former type involves errors such as adding the regular plural morpheme to irregular forms (e.g. *mans* for *men*, *childs* for *children*, *sheeps* for *sheep*) and double marking (e.g. *womens* for *women*) and also errors of supplying it to mass nouns (e.g. *milks* for *milk*, *informations* for *information*) and singular nouns (e.g. *a boys* for *a boy*). Yet as documented in relevant studies, this error type does not constitute the majority. Rather, the failure to produce plural morphology in obligatory contexts is the main issue. In particular, Hu (2011a) found that the plural marking errors related to bare nouns are significantly large in number. Another noticeable feature regarding the underuse of plural marking found in Jia

(2003) is that Chinese EFL learners often inconsistently supply plural morphemes with the same nouns: sometimes, the nouns are marked correctly, and sometimes they are not marked at all.

The variability in plural morpheme use among Chinese EFL learners does not seem to be complex but plural marking errors, especially the underuse of plural markers in obligatory contexts, are recognised as one of the most persistent errors made by Chinese learners, and the situation does not improve with the development of learners' English proficiency (Young, 1993; Lardiere, 1998a, 1998b; Jia, 2003; Hu, 2011a, 2011b). The grammatical rules of plural *-s* may be easy to learn via explicit formal instruction, but these rules may take a long time to (or never will) be internalised as a part of Chinese EFL learners' linguistic knowledge, which can be used subconsciously and automatically. According to Jiang (2004, p. 606), the successful acquisition of a grammatical morpheme means the morpheme "can be used with consistent accuracy in spontaneous language use". Thus, English plural morphology may be easy to learn but difficult to acquire.

In addition, learners' knowledge of plurality has been found to have impact on their performances on articles and verb inflection (e.g. Butler, 2002; Chan, 2016; Jiang, 2004; Yoon, 1993). In particular, Jiang (2004) demonstrated that the challenges of verb agreement with complex noun phrases faced by Chinese EFL learners lie in the insensitivity to plural morphemes. Since the situation of mastering English plural morphology among Chinese EFL learners does not receive the attention it deserves, the present study aims to contribute to this field by analysing plural marking errors made by Chinese EFL learners in an attempt to understand the challenges faced by learners and to provide some suggestions on the teaching of English plurality.

Some possible causes for the residual difficulties in acquiring English plural morphology among Chinese EFL learners have been discussed in the literature, such as the complexity of English plural morphology, cross-linguistic influence, information redundancy and input frequency, among others. Details about the discussions are reviewed in Sect. 2. Section 3 introduces the methodology adopted in the research. The corpus data analysis is presented in Sect. 4, and some insights drawn from the results are discussed in Sect. 5. Section 6 is the conclusion with pedagogical implications.

2 Challenges in Acquiring Plural Morphology

Dekeyser (2003) distinguished two types of difficulties in grasping linguistic features: the objective ones concerning the complexity of the features themselves and the subjective ones related to the actual acquisition challenges experienced by language learners. Relevant literature has indicated that the challenges in acquiring plural morphology faced by Chinese EFL learners are a mixture of both objective and subjective complexity. Some relevant discussions are reviewed in this section.

2.1 *Objective Difficulties: The Complexity of English Plural Morphology*

Unlike articles, which are structurally simple (there are only four forms including *zero* form) but functionally complex, plural morphology on nouns appears both structurally and functionally straightforward. Structurally, plural morpheme variants are limited (i.e. [iz], [s] or [z]) and phonologically regulated in most cases. Irregular plural forms such as *tooth -teeth*, *wife -wives*, *child -children* or no changes at all, such as *sheep* and *Chinese,* are not large in number. The semantic cue of plural morphemes in English is to indicate that the number of discrete entities is more than one. Nevertheless, the mapping between meaning/function and form in English plural morphology is considerably more complicated than this, as it is not a one-to-one mapping.

First, the plural morphology encodes countability, or the noun head taking a plural marker is conceptualised as discrete entities, as in (1).

(1) a. *I would like some beer*.
b. *I would like two beers.*

Beer in (1a) denotes a food substance while in (1b) with the plural *-s*, it denotes discrete units of the substance.

Second, plurals in English receive generic interpretations when used in bare forms, as in (2).

(2) *Dogs bark*.

The plural morpheme attached to *dog* does not emphasise the plural quantity but denoting a generic interpretation expressing "unlimited states" in Huddleston and Pullum's (2002, p. 406) words. It means the state of barking holds for all time as long as the entities identified as dogs exist.

Third, the plural morphology indicates distributive interpretation in predicates, as in (3).

(3) a. *Her daughters are teachers.*
b. *Her daughters are a treasure.*

The property of being a teacher in (3a) is ascribed distributively to her individual daughter, whereas the singular *treasure* in (3b) without distributive reading indicates the collective property of being a treasure ascribed to the set of her daughters.

Cases involving form and meaning mismatch make things more complicated. It is possible for a formally plural NP to be conceptualised as a single unit and therefore treated as a singular (as in 4(a)), and vice versa (as in 4(b)).

(4) a. *Three years is really a long period*.
b. *The committee are friendly.*

Although collective nouns like *committee* in (4b) are said to be optionally plural in most cases (cf. Huddleston & Pullum, 2002), their singular and plural treatments are still significant in terms of semantics. The plural conceptualisation emphasises a

plurality of members of the collection, and the singular treatment views the collection as one unit. Thus, English plural morphology can not only encode plural but also singular, generic and distributive meanings as long as the conditions are satisfied. Clearly, there is no one-form-one-meaning mapping in English plurals, and the mapping links in some cases are far from transparent.

2.2 Subjective Difficulties

2.2.1 The Influence of the First Language

Learners' knowledge of their first language (L1) is also a source of difficulties, and native speakers of different languages may experience different levels of difficulty in learning a second language. It has been widely accepted that L1 has a significant influence on the comprehension and production of the functional morphemes in L2, especially when their L1 lacks the morpheme of the same function. Schwartz and Sprouse (1996) advanced a hypothesis addressing the importance of L1 in early L2 acquisition. According to them, at the early stage, learners tend to identify the morphemes in L2 that are comparable or equivalent to the ones in their native language and assume these morphemes are organised and used in the same way, including under what condition the morphemes are applied and when the morphemes are obligatory or optional. Thus, it is rational to expect that learners whose native languages lack the overt morpheme with a similar function in L2 have more challenges than those whose L1 is closer to L2 in terms of functional morphology, and multiple empirical studies have also supported such a prediction. For example, the difficulties in acquiring English articles when learners' native language lacks such morphemes have been relatively well analysed (e.g. Butler, 2002; Chen, 2000; Ionin et al., 2004; Liu & Gleason, 2002; Snape et al., 2013).

However, the presence of overt morphemes with a similar function in L1 does not guarantee an easy L2 acquisition process flow as "the extent of feature reassembly required could add further difficulties" (Lee & Lardiere, 2019, p. 75). For example, the bidirectional study conducted by Ionin et al (2013) demonstrated that L1 Spanish–L2 English learners experience more difficulties than L1 English–L2 Spanish learners in acquiring definite determiners, although these morphemes with the similar function exist in both languages. They stated that the acquisitional difference should be attributed to the fact that the definite determiners in Spanish are associated with genericity while such association is not that strong in English.

Chinese, unlike English, does not have overt and productive morphemes on nouns to mark plurality, and it relies on the classifier structure for numeration (as (5a)), or bare noun phrases to indicate plurality of unspecified numbers (as 5(b)). The structural distinction in plural number expressions in L1 is assumed to have an impact on the acquisition of English plurals (e.g. Young, 1993). Hall (1944) provided evidence that seems to support this assumption, as the study showed, in Chinese Pidgin English,

plurals are expressed by means of quantifiers instead of noun inflections, which resembles the form of the Chinese classifier structure.

(5) a. 他 吃 了 三 個 蘋果。
ta *chi* *le* *san* *ge* *pingguo*
He eat ASP three CL apple
'He ate three apples.'

b. 他 喜歡 花。
ta *xihuan* *hua*
He like flower
'He likes flowers.'

Some scholars argue that 們-*men* in Chinese can be categorised as a plural or collective marker similar to the English plural *-s* (e.g. Chan, 2004; Chao, 1968; Li, 1999), as instantiated in (6).

(6) 學生 們 回 家 了。
xuesheng *-men* *hui* *jia* *le*
student PL return home ASP.
'The students have returned home.'

們-*men* superficially behaves like English plural *-s* as it also suffixes to nouns and can indicate plurality with a collective sense. But unlike English plural morphology, which is productive and reliable, the use of 們-*men* in Chinese is rather restricted. It is typically attached to nouns (including pronouns) that refer to human beings or personalised entities. It does not co-occur with numerals or other quantity-indicating structures in NPs in most cases (if not all). Additionally, it normally receives a definite interpretation which makes it not a purely plural marker or as Li (1999) suggested, it is not the same plural marking with the English *-s*. The use of classifier structure to indicate numbers and the lack of reliable noun inflection of the same function seem to justify the frequent deletion of the plural marker *-s* by Chinese EFL learners.

2.2.2 Redundancy and Saliency

Ellis (2006) stated that grammatical forms that are often redundant are considered more difficult to acquire for second language learners compared with non-redundant

ones. Plural morphemes can be redundant and often unnecessary to interpret in contexts where numerals and other more noticeable quantity expressions exist. Therefore, plural morphemes are often overshadowed by these more noticeable quantity expressions and appear low in saliency. Semantic redundancy and the lack of perceptual saliency have impact on shaping learners' attention and are considered in the literature possible causes for the difficulties in acquiring plural morphology (e.g. Ellis, 2006, 2008; Talmy, 2008; VanPatten, 2004; Young, 1993).

In Chinese, such redundancy in quantity expressions is rarely observed. As emphasised in Li (1999), quantity expressions (such as classifier phrases) and the plural indicating 们-*men* in Chinese do not typically co-occur. According to Ellis (2008), learners' L1 experience leads them to seek more salient and non-redundant cues to interpretation, and thus, with the presence of quantity expressions, it is reasonable to expect Chinese EFL learners' non-successful acquisition of English plural morphology. However, the results of some empirical research contradict the prediction: in Chinese EFL learners' performance, either all markers of number are absent, or plurality is marked on more than one element of the NPs (Young, 1991, 1993; Hu, 2011a, 2011b). Specifically, the plural quantity information in contexts encourages plural marking on noun heads, and the two are shown to have a positive correlation (Hu, 2011b).

Young (1993, p. 83) justified the conflict between the theoretical prediction and empirical data of Chinese EFL learners by stating that English plural morphology is not perceptually salient for L2 learners, and it is possible for Chinese EFL learners to acquire English plural morphology as "a purely formal set of contrasts with little semantic salience". However, this justification does not seem to be approved by empirical data. Yeni-Komshian et al. (2001) conducted a study investigating the acquisition of English plural *-s* and the third person *-s* among Korean EFL learners whose native language also lacks equivalent functional morphology. Their study demonstrated that the performance of plural *-s* by Korean speakers is worse than that of the third person *-s* that is considered "entirely redundant" by Ellis (2006, p. 436). This gap becomes gradually larger with the increase of learners' proficiency. In other words, with the same physical saliency and similar degree of redundancy, the plural *-s* is more difficult to acquire. Although there is no empirical evidence so far showing that Chinese EFL learners have the same acquisition divergence as Korean EFL learners, the research of Yeni-Komshian et al. (2001) suggested the existence of other possible causes for learners' difficulties other than redundancy and saliency in acquiring plural morphology.

2.2.3 Countability and Conceptual Preference

Countability is also considered closely related to plurality as plural morphology is only applied to countable nouns. Hence, learners' accurate understanding of nouns' countability in L2 is supposed to be a possible challenge, as "the perceptual system of noun countability used by native speakers of English is not necessarily describable, explainable or acquirable by second language learners" (Yoon, 1993, p. 284). Butler

(2002) also reported that L2 learners find distinguishing between count and mass nouns problematic. Chan (2016) suggested that Chinese EFL learners' difficulties in determining the countability of nouns in certain cases are due to the use of classifiers. According to her, Chinese EFL learners rely on classifiers indicating numbers and may have a different perception of noun countability, which leads to plural marking errors. Jia (2003), however, denied such an assumption. In her study, the participants added plural morphemes to mass nouns such as *snow*, *grammar* and *pollution* which are also perceived as uncountable in Chinese, and the errors of marking singular nouns such as *a boys* are not rare. The inconsistency with plural marking on the same nouns also indicates the complexity of this issue.

Despite the debate on the perception of countability, Yang's (2013) research implied that the acquisition of English plural morphology is related to Chinese EFL learners' conceptual preference of nominals. He built his hypothesis on the grounds that native Chinese speakers categorise objects by their textures while native English speakers categorise objects by shapes. With a series of experiments involving English plural morphology, Yang (2013) demonstrated that along with the increase of English proficiency, there is a tendency among Chinese EFL learners to adopt the shape standard to classify objects. That is to say, the acquisition of English plural morphology has an impact on learners' cognitive model. Unfortunately, to our knowledge, there is no other similar research on how learners' conceptual preferences influence the acquisition of English plurality, but Yang (2013) suggested a potential cause for the acquisition difficulties.

2.2.4 Other Possible Challenges

Jia (2003) suggested that the underuse of English plural morphology in obligatory contexts and the overuse of it in inappropriate contexts are partially due to an insufficient English input. The more frequently learners encounter English pluralised nouns, the more possibly they produce plural morphology correctly. The frequency effect in language acquisition has been discussed in various accounts (e.g. Ellis, 2002, 2006; Gass & Mackey, 2002) and is clearly related to the difficulties during the acquisition process, but it cannot explain the residual difficulties for learners at a near-native level (Lardiere, 1998a, 1998b).

Other factors have been proposed and tested to be related to the acquisition of plurals. Hu (2011a, 2011b) and Young (1993) explored the variation of plural marking performed by Chinese EFL learners, and their studies demonstrated that phonological environment is strongly related to the production or omission of the English plural marker *-s* by Chinese learners. They both agreed that phonological conditioning is dependent on the phonological features of the Chinese language. Hu (2011a, 2011b) added that semantic, syntactic and lexical factors all have significant effects on learners' plural marking behaviours.

There are many other factors addressed in the literature relating to grammatical morphology acquisition, such as the role of input (e.g. Van Patten, 2004), the role of age (e.g. Jia, 2003; Slabakova, 2006), the role of learning environment (e.g. Klein &

Dittmar, 1979; Tarone, 1985) and the role of metalinguistic knowledge (e.g. Chan, 2016). As the current study explores the sources of acquisition difficulties by studying the incorrect output of English plural morphemes among adult EFL learners, these factors that are not directly related to the study are not further elaborated on.

2.3 Remaining Questions

The existing research presents many possible factors influencing the acquisition of English plural morphology among Chinese EFL learners, but some important questions are not directly answered. Studies have shown that the most persistent error made by Chinese learners is the underuse of plural markers with bare nouns. What are the properties of bare nouns prompting the behaviour? Is it a systematic or a random behaviour? As some studies have indicated (e.g. Yoon, 1993; Jia, 2003; Sorace, 2003; Slabakova, 2006), L2 learners can never achieve the native-level mastery of grammatical morphemes. Then, in the acquisition of English plural morphology, which aspect of the Chinese language blocks the process and constantly prevents Chinese EFL learners from supplying plural markers on bare nouns? To fill these gaps, a corpus-based study with a particular focus on the underuse of plural morphemes was conducted.

3 Method

The present study focuses on the acquisition of plural number marking in English by adult Chinese EFL learners. Apart from noun inflection, Huddleston and Pullum (2002, p. 334) pointed out that plurality is also relevant to the other parts of grammar, such as agreement and selection within the NP, pronoun-antecedent agreement and subject-verb agreement. This study focuses on noun inflection only, and by examining the plural marking errors made by Chinese university students, it aims to identify the features of the errors (such as error types, the context wherein errors occur) and explore the underlying causes for the acquisition difficulties.

We conducted a corpus-based analysis using the Chinese Learner English Corpus (CLEC), which consists of one million words of written compositions of Chinese EFL learners who are labelled with five levels: senior middle school (st2), non-English major college years 1–2 (st3), non-English major college years 3–4 (st4), English major college years 1–2 (st5) and English major college years 3–4 (st6). The corpus is annotated with grammatical tags (automatically) and error tags (manually). Since the study focuses on noun inflections, we selected errors from st5 and st6 with the tags np3 (concerning number agreement with other elements, e.g. *a hills*), np5 (concerning plural marking on uncountable nouns, e.g. *more and more wheats*) and np6 (concerning the omission of plural *-s* or determiners and other errors related to numbers, e.g. *one of the important day*, *a women*). The reason for choosing st5

and st6 is to control the influence of other potential factors during the acquisition process, as English majors, in general, have better linguistic knowledge and are assumed to have more English input and formal instructions than the other groups. Written compositions by st5 and st6 are produced under similar conditions, which also eliminates the impacts of some other possible factors, such as chances of self-correction and psychological stress levels.

Data collected from the corpus were further manually sorted and annotated, and the instances involving errors of unmarked NPs in semantically singular contexts were eliminated. The remaining errors were annotated at two levels, viz. the contextual level and the lexical level. The contextual level concerns the contexts where the errors occur, including not only discourse environments but also phrasal features. The lexical level deals with the features of the heads of NPs to which plural markers are or should be applied. As summarised in Fig. 1, all the errors were annotated from both functional and formal perspectives at each level. The formal features regard the syntactic rules related to plurality, such as words' countability and number agreement with other components (including verbal predicates and quantifiers). The presence of quantifiers that do not have to collocate with plural nouns, such as *some* and *all*, was not considered a grammatical cue for plural marking.

The functional features include lexical semantics and discourse functions. Different from grammatical countability, lexical referent types place a focus on the prototypical existing form of entities denoted by noun heads in the real world. For example, *furniture* denotes a concrete existence albeit grammatically uncountable, and *chance* refers to an abstract concept though grammatically countable. In a larger setting, nominal expressions can be analysed along with more semantic/functional parameters. (Non)referentiality is generally a semantic property of NPs and is about speakers' intention to use an expression "to pick out some independently distinguishable entity, or set of entities, in the real world" (Huddleston & Pullum, 2002, p. 399). However, the interpretations of (non)referentiality in specific contexts are far more complex than this, and the variety of sophisticated definitions given in the literature makes things worse. In this research, (non)referentiality was annotated mainly based

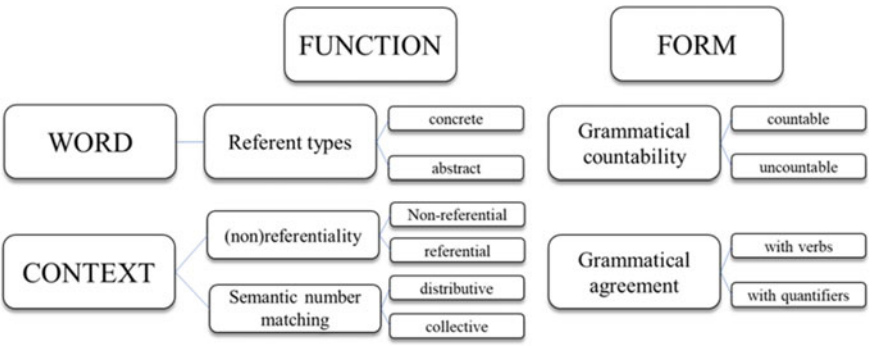

Fig. 1 Factors annotated to errors

on the criteria summarised from Chen (2009), i.e. whether the entity denoted by the NP in question is (1) unique, (2) thematic prominent and/or (3) presupposed to exist in the given contexts. Collectivity/distributivity as another dimension regarding the meanings of plural nominal expressions proposed by Moravcsik (2003) was annotated as well. Since the research focuses on the nominal number, this pair was analysed as a nominal category. Following Corbett (2000), distributive NPs concern the separation of members in a set while collectives "specify the cohesion of a group" and are "sometimes manifested in joint activity" (ibid:119).

All the error instances collected from the corpus were annotated by the two authors who are specialised in semantics and syntax with extensive experience in semantic annotations in research projects. With discussions on the understanding of each factor in individual cases between the authors, a high inter-rater reliability was obtained (>90%). The annotated data were further compared based on their frequency and percentage distribution within and across factors and groups to draw meaningful interpretations. We also conducted a collostructional analysis (Stefanowitsch & Gries, 2003) with some words that are suspiciously related to the error-making behaviours to test if they are strongly associated with certain types of error according to the results of Fisher's exact test. The details of the results are presented in Sect. 4.

4 Results

In this section, a general picture of errors associated with the annotated factors in both st5 and st6 is first presented. Given the research questions, an analysis of differences and similarities in plural marking behaviours between st5 and st6 is followed immediately. The second half of the section is devoted to the details of errors associated with factors on contextual levels, which were not extensively analysed in the aforementioned research.

4.1 A General Picture of Frequency Distribution of Factors in St5 and St6

After manual sorting, the token counts of remaining pluralisation errors in st5 and st6 were 603 and 663, respectively. The errors in st5 involved 262 types of noun and 342 types were identified in st6. By dividing the type counts with the token counts of nouns involved, lexical diversities of each group were calculated. The students of st6 demonstrated higher lexical diversity (51.7%) in comparison with st5 students (43.4%), indicating their English proficiency levels. Given the total word counts of each set (214, 510 in st5 and 226, 106 in st6), the normalised error counts were 562 and 586. Interestingly, the st6 group representing higher English proficiency did not show a better performance in plural marking.

After normalising, there was almost no difference in the counts of occurrences of most factors as shown in Fig. 2, excluding the structures of the NPs if they are modified or in bare forms. The st6 students made more errors with NPs of bare forms (57.0%) while st5 students were more confused with modified NPs (67.4%).

It should be noted that although the students of st6 used more types of noun as exhibited in the sorted data, there was a common set of nouns occurring in the plural marking errors made by both st5 and st6 students. The set consisted of 77 noun types as shown in Fig. 3. This shared group was made up of nouns such as *country*, *chance*, *day*, *job*, *person*, and *student* which are commonly used daily. In addition, the shared nouns took up 36% of error tokens in st5 and 43% in st6, implying that lexical complexity is not the cause for persistent plural marking errors.

Figure 4 exhibits some details about the preferences of the listed factors in each group. In general, st5 and st6 students showed similar behaviours when making errors. Coinciding with other studies, the result showed that the omission of plural marking on countable nouns contributed to the largest portion of errors in both groups (82.3% in st5 and 83.1% in st6). Yet nouns' referent types seemed to have more impact on st6 students' performance (abstract: concrete ≈ 3:2) than on st5 students' (abstract: concrete≈ 1:1). When type frequencies of these nouns were considered (illustrated in Fig. 5), the distinction was observed as well.

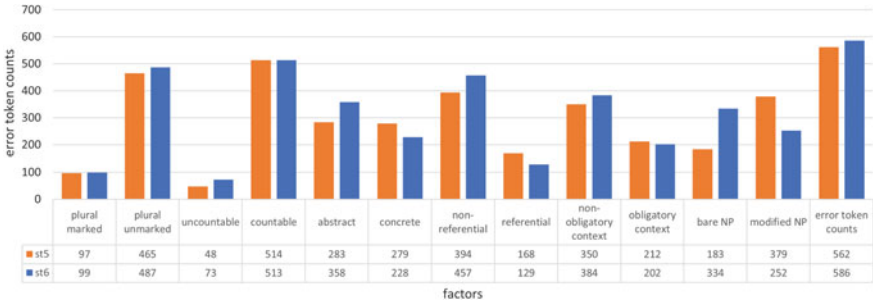

Fig. 2 Factors presented in errors made by st5 and st6 with relevant error token counts

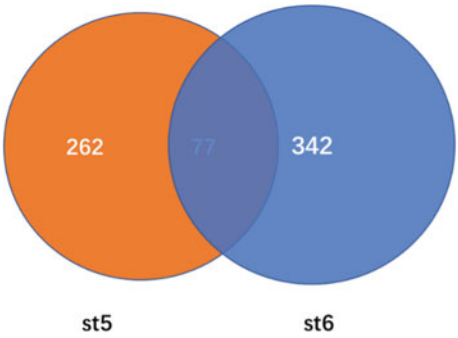

Fig. 3 Type counts of shared nouns in errors made by st5 and st6

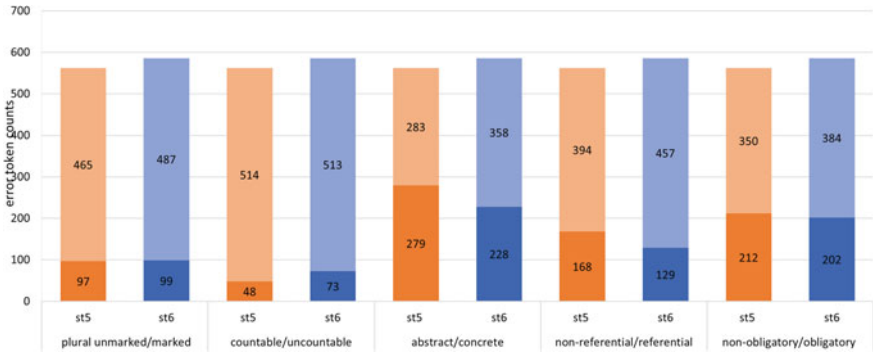

Fig. 4 Ratios of each factor pair presented in errors made by st5 and st6

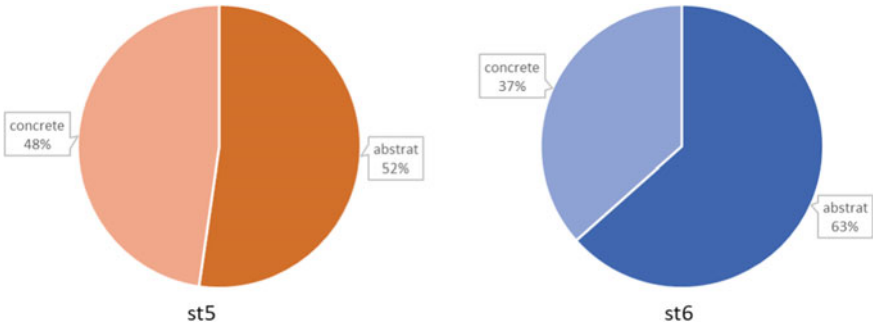

Fig. 5 Type frequencies of concrete/abstract nouns in errors made by st5 and st6

4.2 Influence of Contextual Factors on the Plural Marking Performance

4.2.1 Grammatical Number Agreement

There were many instances involving grammatical disagreement with numbers, as in (7).

(7) a. *They don't need to copy many thing by hand. (st5)*

b. *Human are social animals. (st6).*

In both instances, singular forms are used in grammatically plural contexts. In (7a), the determiner *many* which particularly selects plural noun heads within NPs is used to modify a singular form, and in (7b), the predicate is in plural form while the subject is grammatically singular. It seems that the grammatically plural obligatory contexts do not have any impact on the application of plural morphemes to noun heads, and the data also supported this assumption.

Figure 6 illustrates how grammatically obligatory contexts impacted the perfor-

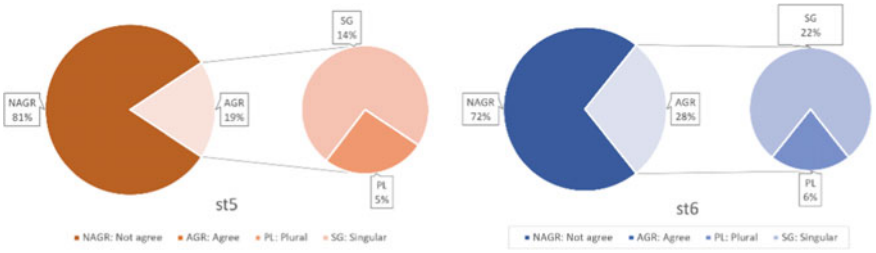

Fig. 6 Plural marking in grammatically obligatory context among errors made by st5 and st6 students

mance of incorrect number marking. According to Fig. 4, only 37.7% of the instances in st5 provided clear grammatical cues for number marking, including morphological changes on verbs, presence of determiners or other modifiers, such as indefinite articles, partitive quantifiers (e.g. *each, every, one of*), cardinal numbers that particularly select singular or plural noun forms and emphatic reflexives. For st6, about 34.5% of the instances with plural marking errors showed grammatical cues. As visualised in Fig. 6, among all the instances with grammatical cues for numbers, 19% were grammatically correct in st5, whereas the percentage increased to 28% for st6. Some instances of such features are listed in (8).

(8) a. *Also as a child, they carry a small lantern in their hand and visit others. (st5)*

b. *When we come back, we can use these knowledges in our practical work. (st5)*

c. *When human is striking through all these centuries for development, this problem became more and more outstanding. (st6)*

d. *Their existences pollute the social mode, threaten the security of the public and even the nation. (st6)*

The underlined parts in (8) are where errors occur. In accordance with overt grammatical cues, all these instances follow the grammar of number agreement. The contexts in (8a) and (8c) semantically require plural countable nouns. As in (8b) and (8d), the given grammatical contexts require pluralised noun heads, but the head nouns used are uncountable. In both st5 and st6, most errors with plural marking in grammatically obligatory plural contexts were due to the confusion with words' countability, with only two exceptions as in (9), but such errors took up only 2% of the total in each group.

(9) a. *You are wonderful friends and the time we spend together is always full of joy. (st5)*

b. *However, the poor invent the worker won only a worthless paper certificate of award and two hundreds of RMB. (st6).*

4.2.2 (Non)distributivity and (Non)collectivity

(8a) above also presents a strange match of the subject number with the predicate. The singular form NP in the predicate induces a non-distributive reading which does

not match the plural number of the subject in the given context. (8a) means all the children together hold one lantern, but it is not the natural understanding of the real situation. In other words, (8a) represents an instance of using a singular NP to denote a distributive meaning.

The influence of this functional dimension did not exist in all the errors, yet it was associated with many problems. According to the data, 225 instances (210 after normalisation) in st5 and 148 (131 after normalisation) in st6 showed collective/distributive functional cues in the contexts. All these errors were further annotated. Based on the most natural understanding of the contexts, there were instances such as those involving singular form NPs used to denote collective meanings (tagged as *collective*, as in (10a)), NPs with plural inflection but singular determiners denoting collective meanings (tagged as *non-collective*, as in (10b)), NPs with plural inflection denoting distributive meanings (tagged as *distributive*, as in (10c)) and NPs of singular forms but denoting distributive meanings (tagged as *non-distributive*, as in (10d)). The proportions of each type among all the collected instances are illustrated in Fig. 7.

(10) a. ***Collective**: Human are social animals. (st6)*

b. ***Non-collective**: As far as students are concerned, allocation by government has been an old stories. (st5)*

c. ***Distributive**: In fact, feminists want to surpass men in every fields. (st6)*

d. ***Non-distributive**: They only like to spend all the spare time with their lover. (st5)*

In Fig. 7, although the number of errors involving the mismatch with (non)distributivity and (non)collectivity shrank in st6 compared with st5, it is still evident that the collective interpretations of NPs were equally difficult for both groups. In addition, both st5 and st6 students tended to use distributive quantifiers such as *every* with pluralised nouns and use singular form nouns as obliques of partitive quantifiers such as *most of* and *one of*. The students of both groups also made mistakes by collocating singular noun heads with adjectives such as *different* and *distinctive*. Take *every*, *one of* and *different* as examples. We calculated their

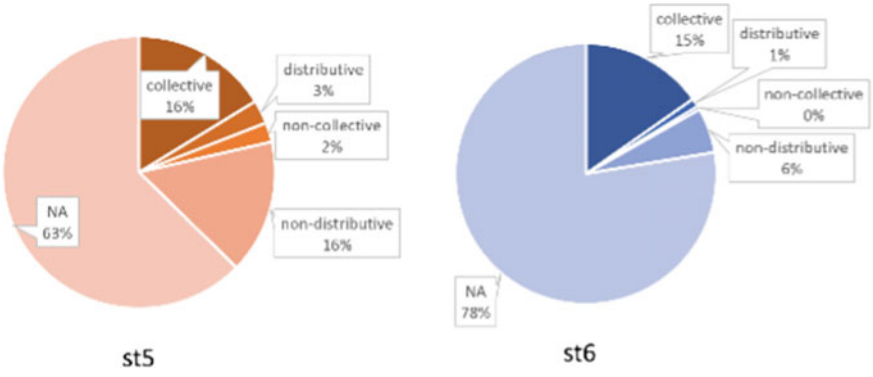

Fig. 7 (Non)collective and (non)distributive NPs among all instances collected

Table 1 Collocational preference in selected examples of errors

	st5		st6	
	Observed freq	Expected freq	Observed freq	Expected freq
Every + NPp	13	0.6	5	0.7
One of + NPs	21	0.6	6	0.3
Different + NPs	17	0.4	4	0.5
p-value	P(Fisher exact) <0.01		P(Fisher exact) <0.01	

observed and expected frequencies with wrongly marked noun heads. Details of their collocational preference are listed in Table 1. Although the observed frequency of each category reduced in st6, the *p* values still indicate the students' tendencies to use such patterns.

4.2.3 (Non)referentiality

Referentiality was also found closely related to incorrect number marking among the students. Non-referential contexts caused more problems for both st5 (70.1%) and st6 students (77.9%) with plural marking. As shown in the data, the students of both groups tended to drop plural marking on nouns of non-referential interpretations, as instantiated in (11).

(11) a. *Computer has appeared in most of work field. (st5)*

b. *If they read books with this kind of attitude, book can also do nothing to help them improve their ability of thinking. (st6)*

The underlined parts in (11) are countable NPs in bare singular forms, which is not allowed in English grammar. In (11b), the student marked plurality on the noun *book* at its first occurrence but missed the marking when the same lexicon appeared again in the same sentence. This implies that the student was aware of the noun's countability. Other potential factors responsible for the failure of supplying plural marking in the second clause should be explored, such as non-referentiality.

In addition, the underlined NPs in (8a), (8c), (9a) and (9b) above are all considered non-referential as they do not refer to any specific or unique entity with thematic significance. Table 2 shows how the noun heads of singular and plural forms were distributed in (non)referential contexts, and the distribution is shown in Fig. 8.

Table 2 Distribution of singulars and plurals in (non)referential contexts in the collected instances

(Non)referentiality	Inflection	st5	st6
Referential	Singular	146	112
	Plural	34	33
Non-referential	Singular	352	438
	Plural	70	79

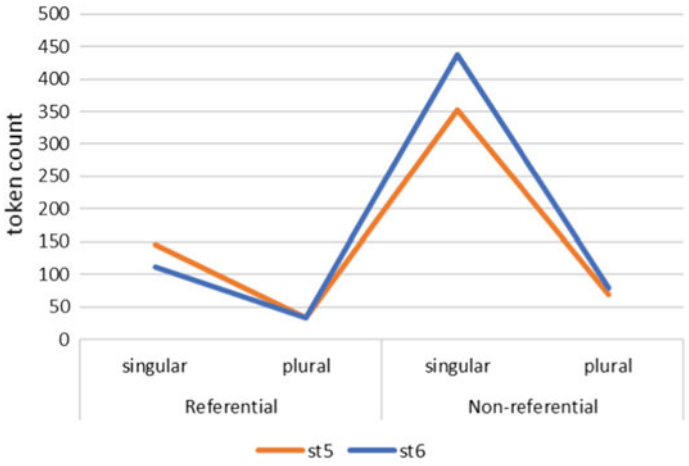

Fig. 8 Relation between plural marking and (non)referentiality in the collected instances

Table 3 Distribution of bare/modified NP in (non)referential contexts in the collected instances

(Non)referentiality	Modification	st5	st6
Referential	Bare	9	22
	Modified	171	123
Non-referential	Bare	204	362
	Modified	218	155

Although in general, plural marking was absent in most cases with both referential and non-referential interpretations, it is obvious that there was a greater tendency among the students to drop plural marking in non-referential contexts.

Data also demonstrated that bare NPs in most errors received non-referential interpretations while NPs with modifiers did not show such a correlation. Details are listed in Table 3.

Errors were also made due to the confusion with polysemies, such as *time/times* and *work/works*, but they were not large in number in either group as only eight cases of this type were identified in each group. The next section provides explanations for these results and reveals the hidden source of difficulties faced by Chinese EFL learners in acquiring plural morphology.

5 Discussion

With the results presented in Sect. 4, we are in the position to answer the questions raised in Sect. 2. Chinese EFL learners, regardless of their English proficiency levels and mastery of grammar knowledge, all tend to omit plural marking with bare nouns.

The most prominent finding as indicated by the data is that Chinese learners are in particular reluctant to supply plural markers to bare nouns of non-referential or collective meaning. Given the fact that non-referentiality and collectivity are not overtly marked in either English or Chinese and they are delivered mainly relying on contexts, it is possible to assume that the underuse of plural morphology among Chinese EFL learners with non-referential and collective bare nouns is attributed to the failure of associating non-referentiality and collectivity with plurality. More details about the assumption are discussed below.

5.1 English Proficiency and Lexical Knowledge

First of all, English proficiency does not play a significant role in plural marking performance in accordance with previous studies. The students of st6 with a better English command did not perform better in terms of supplying plural morphemes in obligatory contexts compared with st5 students. For both groups, more than 80% of plural marking errors were due to the underuse of plural morphemes. As indicated in Figs. 2 and 5, st6 students used more uncountable nouns and nouns referring to abstract concepts in terms of both token counts and type counts. Nevertheless, this was not enough to suggest that lexical complexity is a major obstacle in the process of plural morphology acquisition. On the one hand, as exhibited in Fig. 4, there was no obvious preference for abstract/concrete nouns involving plural marking errors among st5 students, and on the other hand, st5 and st6 students persistently made errors with the same set of nouns that are not complex either in countability or referent types. What is more, many nouns in the shared set are listed among the most frequently used 500 words by CLEC, such as *people, time, job, work, student* and *school,* suggesting that a high frequency of use does not guarantee their correct plural marking. We are not denying that the students might indeed find some nouns confusing regarding countability and referent types, such as polysemies like *work/works* and *time/times*, but as instantiated in 11(b), the students demonstrated inconsistent performances in number marking on the same noun, and such cases were not rare. Thus, it is not convincing to say that incorrect plural marking is due to the lack of lexical knowledge.

5.2 Contextual Factors

5.2.1 Grammatically Obligatory Contexts

As shown in Figs. 2 and 4, grammatically obligatory contexts also did not prevent incorrect plural marking, but the low percentages of the presence of obligatory contexts in both groups implied that the learners in most cases were aware of or paid attention to the number information and the agreement with other number

expressions. The increased percentage of noun inflections in accordance with obligatory contexts in st6 also indicated that syntactic knowledge develops along with the improvement of the learners' English proficiency, suggesting that syntactic knowledge is better mastered than morphological knowledge by the advanced learners.

5.2.2 Form-Meaning/Function Mapping on the Contextual Level

The results also support the findings in other studies by showing that the most common errors made by the Chinese students involved omitting plural marking in obligatory contexts, especially when the semantically plural noun heads were in bare forms. When contextual meaning was considered, as illustrated in Table 3, it was evident that most bare NPs involving incorrect plural marking were found in non-referentials. As demonstrated in Figs. 2 and 4, non-referential contexts were associated with most of the errors in both groups and particularly with the errors of plural marker drops. As to collectivity and distributivity, this pair also caused problems for the learners in both st5 and st6. The advanced learners (st6), as exhibited in Fig. 7, had a better mastery of distributives compared to st5, but there seemed to be no improvement with collectives. Thus, the continuing failure to supply plural markers to NPs by Chinese EFL learners is not simply a random performance error but related to a systematically incorrect form and function mapping.

Non-referentials and collectives, in general, do not have overt formal marking in English, and semantic non-referentiality and collectivity can be matched with various grammatical categories. Fodor and Sag (1982) argued that NPs introduced by determiners such as *a* and *the* are semantically ambiguous in terms of referentiality, and they require additional discourse or contextual information for hearers to determine the referential interpretation (e.g. Chen, 2009; Strawson, 1964). In order to reduce the ambiguity and help readers or hearers correctly understand the expressions, speech producers should construct a suitable structure as well as a context to denote (non)referentiality. The production of such constructions is based on speakers' perception of situations in the real world and, hence, subjective. Chinese EFL learners show a general tendency to express non-referentiality by NPs in singular forms as shown in the data, which implies that they conceptualise entities of non-referential reading as a singular unit.

Unlike referentiality denoting relations among members within a set, collectivity and distributivity concern the relationship between a set or members of a set and a foreign set or a foreign entity. Thus, it involves not only NPs but other structures specifying the relationship. In this sense, the comprehension and production of collectives/distributives largely (if not completely) rely on contexts as well. According to the results outlined in Sect. 4, the Chinese students showed the tendency to choose singular NPs to indicate collective meanings as well as distributive meanings. Unlike errors with collectives, however, the failure of matching distributive meanings with proper forms is merely a problem of performance. Also, the students systematically used plural NPs with distributive quantifiers such as *every* and *each* and used singular

NPs as obliques of partitive quantifiers such as *one of* and *most of*. This implies that the students inclined to construe distributives as separate individuals and collectives as coherent units, although they matched them with incorrect forms. Along with the improvement of their English proficiency, the occurrences of errors involving distributives declined.

Interestingly, the adjective *different* also caused problems. Sigrid (2000) analysed *different* as a comparison operator and addressed that it has a distributive force and plural-dependent readings. It presupposes the existence of a set of entities of certain properties, and all salient subsets of the set are different from each other. Thus, the semantics of *different* involves both collective and distributive components, which is likely to confuse.

5.3 Construals of Semantic Entailments

According to Slabakova (2008), the knowledge of morphology includes three aspects: (a) the passive recognition of the morpheme in comprehension, (b) the successful production of the morpheme in proper contexts and (c) the correct construal of the morpheme's semantic entailments. The present study did not explore the first aspect but suggested that learners have difficulties in supplying plural morphemes in appropriate contexts. As the data show, however, the failure of suppliance can be improved as long as learners correctly construe the number. Thus, the major and persistent obstacle faced by Chinese learners is the third aspect.

It has been widely acknowledged among linguists that the number concept is perceived differently in English and Chinese (e.g. Chen, 2009; Cheng & Sybesma, 1998; Chierchia, 1998; Li, 1999; Yoon, 1993). Chierchia (1998) argued that nouns in classifier languages, such as Chinese, are all mass by default, and mass nouns are inherently plural. As introduced in Sect. 2, Chinese allows bare form NPs to indicate plural numbers, without overt plural marking. When numeration is needed, classifiers have to be present to individuate proper portions. Different from Chinese, English is a language with count and mass distinctions, and thus plurality in English is not an inherent property in all nouns and overt markers are needed. In the case of numeration, English countable nouns can join numerals directly as their denotations are readily individuated.

Chierchia's (1998, p. 345) representation of the quantification domain (adopted in Fig. 9) can help explain the number conceptual differences between English and Chinese.

The bottom level lists individuals representing singulars, and the sets in the above levels are plurals. These sets are ordered by a part-whole relation, and the singular individuals are the subsets of any plural set containing them. Therefore, based on the analysis above, Chinese nouns, such as 蘋果 *pingguo* "apple" without classifiers, do not have the denotation of the bottom level while in English, the bottom level constitutes the reference of singular NPs such as *a book*, and they need pluralisation to move to the upper levels.

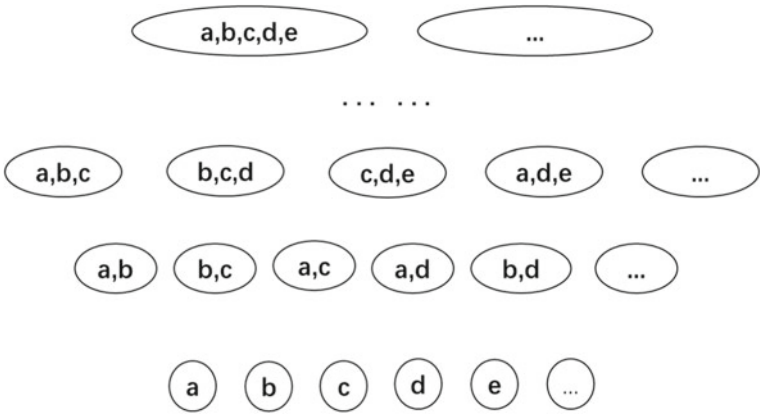

Fig. 9 Domain of quantification

Non-referential NPs typically refer to kinds or denote properties possessed by any possible entities. According to Chierchia (1998), individuals associated with a certain property form a kind, and Chinese nouns are naturally kind referring, as they denote multiple individuals of shared features. With the cognitive model formed by their native language, it is highly possible for Chinese learners to construe English non-referential NPs that are also kind denoting in the same way in Chinese and use bare form nouns without plural marking to indicate non-referential meaning.

Collectives concern sets of individuals and can be viewed as separate sets and therefore singular or joint individuals and thus plural. English pluralisation joins individuals at the lower level to form upper sets and Chinese nouns refer to sets directly, as shown in Fig. 10.

Chinese bare nouns are ready to denote collective meanings without further formal modifications. English NPs of collectives can be viewed either as a signal set or pluralised individuals and accordingly can match either singular forms or plural

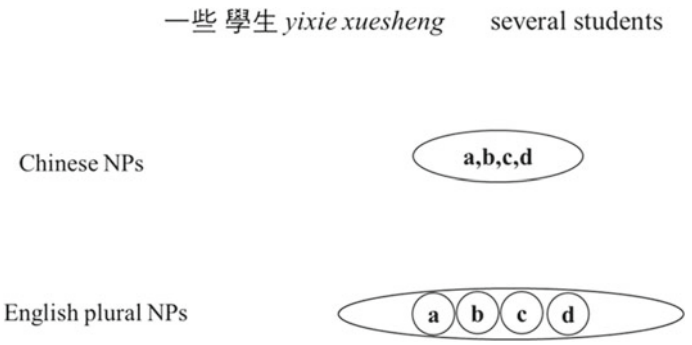

Fig. 10 Conceptualisation of sets in Chinese and English

forms. This distinction is considered an underlying reason for Chinese students' consistent confusion with collective NPs in English.

To sum up, lexical knowledge and syntactic rules may cause problems in the acquisition of English plural morphology for Chinese EFL learners, but the obstacle that blocks the acquisition process lies in the mapping between concept and semantics. As analysed above, bare singular form nouns in Chinese are by default mass, and therefore, the concept of plurality for Chinese speakers is not semantically salient. When plural numbers with specific quantities are expressed, classifier structures are used, and in other words, the concept of plurality becomes salient when numerating. In contrast, English is a language distinguishing between count and mass nouns, and bare singular countable nouns cannot be used alone without plural markers. That is to say, the number concept denoted by countable nouns in English is always semantically salient. In the contexts of non-referentiality and collectivity, for Chinese learners, plurality without numeration is default and therefore non-salient. The cognitive model formed by the use of their native language makes native Chinese speakers naturally construe bare singular form nouns as denoting kinds/collective concepts and consistently and subconsciously apply this model to EFL learning.

6 Conclusion

In this research, we investigated what makes English plural morphology difficult for Chinese learners, based on the CLEC corpus, which suggests that Chinese students are facing long-lasting challenges with English plural morphology, although the grammatical rules of plural marking seem straightforward. We collected data involving plural marking errors in CLEC and tagged each instance from four perspectives: lexical meanings, countability, syntactic agreement and contextual meanings. We then analysed how these factors influence the acquisition of English plural morphology.

Our findings indicated that there was no obvious difference among the students of different English proficiency levels in terms of making errors with plurality, and the students tended to omit plural marking in obligatory contexts, especially with bare form NPs. Lexical complexity is not identified as a major obstacle in the process of plural morphology acquisition. On the one hand, there was no obvious inclination to abstract or concrete nouns with plural marking errors; on the other hand, the students persistently made errors with the same set of nouns, regardless of their countability or referent types. Problems of number agreement with determiners, predicates and reflexives are also considered minor, and the data showed improvement in this perspective when the English proficiency level rose.

We found that the consistent failure in supplying plural markers occurred in non-referential contexts and collective contexts. The kind reading and collective reading are two parts of the conceptual structure, yet both involve non-transparent mappings between form and meaning as well as mappings between concept and meaning. Unlike English, Chinese nouns are by default mass and lack individual interpretation.

Thus, without numeration, the concept of plurality is not semantically salient for native Chinese speakers, especially in non-referential and collective contexts. The cognitive model formed by the use of the Chinese language causes residual difficulties for Chinese learners in the acquisition of English plural morphology.

The current study has a few limitations. First, the research was corpus based, and there was an absence of contact with the students who produced the compositions. If interviews could have been conducted with the students who made the plural marking errors, more insights into Chinese EFL learners' conception of numbers might have been revealed. Second, due to the lack of reliable data on individual students' performances in each group, some statistical measures (such as t-tests, z-scores) could not be performed. Therefore, more detailed distributions of target factors were not depicted. Third, the corpus used in the research is not open and was developed before 2003. There is a chance that the information is not too recent, and some possible new features in the performance of plural marking among Chinese EFL learners might be overlooked in this study.

Despite these limitations, some important pedagogical implications can still be drawn from the study. First, although the basic grammatical rules of plural morphology appear to be straightforward, sufficient practice of the rules in the classroom cannot be neglected. Teachers can gradually introduce various mappings of plural *-s* with other functions, such as the use with generic reading, distributive reading and individualising reading.

Second, since the English plural morpheme *-s* is both physically and conceptually non-salient for Chinese learners, it is necessary to increase its saliency in both form and meaning. Teachers can frequently point out plural morphemes within NPs. In addition, the meaning/function of the morpheme cannot be disregarded. It may not be helpful to simply explain the function of plural *-s* as indicating the number of more than one, as the concept of plurality in Chinese learners' mind is mapped to bare singular noun forms. Thus, the function of plural *-s* can be introduced with an emphasis on the existence of discrete individuals.

Third, plural morphology should be practiced in plausible and meaningful contexts. As analysed in Sect. 5, plurality becomes salient for Chinese learners when numerating. This is an existing cognitive model and does not need too much practice. For EFL learners of intermediate level or advanced level, practicing plural morphology with numerals or other quantity expressions may not make much difference. Teachers can design communication practice provided with contexts of non-referentiality and collectivity for students and offer timely feedback. Teachers may also need to interview students who make a certain type of error frequently and understand their confusion with the number concept.

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Motion-Path Expressions in L2 English and Pedagogical Implications for Multi-word Verb Use: A Comparison Among Native Speakers of Chinese, Korean, and English

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Abstract This study examined how the typological characteristics of the first language (L1) affect the motion-path formulation of motion events in English as a second language (L2) among native speakers of Chinese, Korean, and English, and discussed their pedagogical implications for multi-word verb use. Sixty-one university students participated in an elicited writing task in English. Written narratives were analysed quantitatively and qualitatively. Results showed that both native speakers of equipollently-framed Chinese and verb-framed Korean were less likely to use verb satellites to encode the path of motion than native speakers of satellite-framed English. Five pivotal features—underuse, replacement, misuse, pragmatic inadequacy, and confusion of word class—emerged in the use of multi-word verbs in Chinese and Korean speakers' expressions of motion events. The findings of this study were interpreted through the lens of cross-linguistic influences on learners' written narratives in L2 English. A discussion of applicational practice centred on teaching English prepositional verbs and phrasal verbs to address learners' writing weaknesses.

Keywords Motion-path encoding · Multi-word verb · ESL · L2 English · Chinese learners

1 Introduction

The way in which actions, movements, and locations are expressed in verbs or verbal phrases varies across languages. Particular differences in the typology among languages rest on the expression of motion events focusing on the *path* and *manner* of

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a movement or action. Talmy (1985) observed differences in lexicalisation patterns of expression across languages, in which the meaning of manner or path in motion is expressed differently in a surface verbal form among languages. Since there is no one-to-one semantic-to-surface association, some languages encode a combination of semantic elements in a single surface form, while other languages express a single semantic element through a combination of surface forms (Talmy, 1985). Talmy (2000) further classified languages into two categories—verb-framed languages and satellite-framed languages—based on how the language maps events onto linguistic structures. Verb-framed languages, such as Korean, Japanese, Spanish, Turkish, Hebrew and Arabic, encode the path of motion as a key semantic component in the main verb (e.g. *enter, exit* or *collapse*). In contrast, satellite-framed languages, such as English, German, Dutch and Swedish, express the path of motion in a particle, called satellite (e.g. *in, out* or *down*) rather than in the main verb.

Given that the significant interface between semantics and surface verbal forms is different in the expression of the path of a motion across languages (Talmy, 1985), this study investigated how native Chinese speakers would express motion events in English as a second language[1] (L2), compared to native English and Korean speakers. We included English speakers as a primary comparison group because the target L2 English is satellite-framed language, and Korean speakers as a secondary comparison group because Korean is a verb-framed language. The results of this study are interpreted through the prism of cross-linguistic influences on L2 production, which in turn has important implications for pedagogical practices for Chinese speakers and East Asians. To point towards applications for practice drawing upon theoretical and empirical bases, we first review theories and linguistic characteristics, and then present empirical data and findings.

1.1 Theoretical Framework

Different languages encode the semantics of motion verbs differently based on linguistic constraints imposed by a given language. Focusing on whether the manner of motion and the path (or direction) of motion are expressed within the main verb or in a separate lexical item as an extended verbal phrase, Talmy (2000) claimed that the world's languages function differently with respect to the way in which the semantic construal of an event is mapped onto the syntactic structure of the language. Among key sentential elements, Talmy's main focus is placed on the verb: "the typology consists of whether the core schema [framing event] is expressed by the main verb or by the satellite" (p. 221).

According to Talmy's (2000) classification of verb-framed languages and satellite-framed languages, the manner of motion refers to an expression of distinct motion using verbs, such as *run, slide, walk* or *fall*, while the path of motion refers to

[1] Second language (L2) and a foreign language (FL) are used interchangeably because the focus and scope of this study have little to do with learning contexts.

the direction of motion, such as *into, across* or *down*. The manner and path can be expressed within the verb as part of its root meaning or in a verbal particle or satellite. In the verb-framed language, the main verb directly encodes the path of motion without using an additional particle, as in *escape, exit* and *collapse*. In the satellite-framed languages, the path of motion is encoded in the satellite verbal particle, as in *(run) away, (walk) in* and *(fall) down*, while the manner of motion is conflated in the main verb (i.e. *run, walk, fall*) as the verb expresses the mode of action.

Slobin (2004) augmented Talmy's binary classification by adding equipollently-framed languages to refer to a language that functions as neither a verb-framed nor a satellite-framed language. Equipollently-framed languages offer the symmetrical treatment of manner and path by assigning equal weight to the expression of manner in the main verb as a semantic component and path in a satellite-like lexical item. Slobin (2004, 2006) categorised Chinese as an equipollently-framed language by arguing that manner and path are simultaneously encoded in verbal lexicons in a parallel form functioning as a compound verb. For example, according to Talmy, the sentence 瓶子飄過石頭旁邊 */Ping2zi piao1guo4 shi2tou2 pang2bian1/* is interpreted as *The bottle floated [Motion and Manner] past [Path] the rock* (Talmy, 1985, p. 107). In this interpretation, 飄 */piao1/* is considered the main verb encoding the manner of motion *float*, while 過 */guo4/* is viewed as a particle (i.e. satellite) encoding the path of motion *past*. Hence, Chinese is categorised as a satellite-framed language. According to Slobin (2004), however, the manner of motion and the path of motion are expressed in a coordinative way; that is, the path of motion 過 */guo4/* (*past*) is not a satellite but a verb that is equally weighted to the verb 飄 */piao1/* (*float*). The sentence is interpreted equivalently to *The bottle floated [Motion and Manner] and passed [Motion and Path] the rock*. Therefore, it seems to be logical to categorise Chinese as an equipollently-framed language.

These classifications bear differing views and interpretations. Croft (2003) suggested that additional types be included in the typological breakdown to address grammatical complexities involved in the constructions of motion events because some languages, such as Icelandic, Dutch, Bulgarian and Japanese, use more than one category to encode complex events in the sentence. There are cases that motion events are expressed both in the verb and in the satellite in those languages. Croft (2003) also classified the class of symmetric constructions into serial verbs (e.g. Thai and Mandarin Chinese), coordinated verbs (e.g. Japanese), and complex stems (e.g. Kiowa and Klamath). This implies that purported classifications are to be placed on a continuum because they often straddle more than one category depending on the criteria used. Notwithstanding the different views of the classification, Talmy's typology has provided a valuable framework for comparative studies of lexicalisation patterns and encodings of motion events in linguistics and psycholinguistics. With this in mind, we compared the typological characteristics of English, Chinese, and Korean below.

1.1.1 Typological Differences in Lexicalisation Patterns Among the English, Chinese, and Korean Languages

According to the typological classification (Slobin, 2004), the three languages—English, Chinese, and Korean—represent each category of lexicalisation patterns as a satellite-, an equipollent-, and a verb-framed language. Goldin-Meadow et al. (2009) noted that the distinction of these categories depends primarily on how the *path* of a motion is expressed. Hence, we illustrated how the *path* of a motion is encoded for *a man ran into the building* in English, Chinese, and Korean, for comparison purposes using one of the basic manner verbs (e.g. *run, walk* and *fly*).

(1) English: He ran into the building.

(Manner is encoded in the main verb, *run*, and path in the satellite, *into*)

(2) Chinese:

他	跑	進	了	樓。
/Ta1	pao3	jin4	le	lou2/
he	run	into/go	in (past tense)	the building

a. He ran into the building.

(Manner is encoded in the main verb, *pao3*, path in the particle *jin4*)

b. He ran and went in the building.

(Both manner and path are encoded in the main verbs *pao3* and *jin4*)

(3) Korean:

그는	건물	안으로	달려	들어갔다.
/Gu-nun[2]	geonmul	ahneuro	dalyeo	dulgotda/
he	building	into/inward[2]	running	entered

He entered the building by running.

(Path is encoded in the main verb, *enter*, and manner is encoded in the subordinate adjunct, the gerund form *running*)

Example (1) *He ran into the building* in English expresses the manner of the motion *run* in the main verb itself and encodes the path of the motion *into* a separate lexical item as an adjunct to the verb (i.e. satellite). This is a typical example of a satellite-framed language expressing the path of a motion. The semantic components of the action (both motion and manner) are conflated in the main verb (i.e. the action verb *run* indicates a movement and the mode of action *run* specifies the meaning of *go faster than a walk*, compared to the words *walk, stride, tread, gait, step, tramp*, etc.), while the path of motion is expressed in a satellite *into*. The English sentence

[2] Nominal marker.

follows the order of the subject (S) + verb (V) and embeds the past tense within the verb.

Chinese, as shown in example (2), also has the S + V order, but the past tense is indicated using an independent past tense marker, 了 /le/, as Chinese verbs have the same forms in the present, past, and past perfect. The path or direction of motion is expressed by the character 進 /jin4/. This is subject to the interpretation of the element 進 /jin4/ in its word class and is the source of different classifications. If this syllable is viewed as a particle (as in *a* in the example), indicating the direction or result of the action 跑 /pao3/, Chinese is classified as a satellite-framed language as what Talmy (1985) perceived. However, if it is considered a verb (as in *b* in the example), meaning "go in/enter" as in 進來 /jin4lai2/ (enter—come, come in), the syllable 進 /jin4/ has an equipollent component with the main motion verb 跑 /pao3/. Chen and Guo (2009) classified the word 進 /jin4/ as a path verb meaning "enter". Thus, the manner of an action (跑 /pao3/) and the path of an action (進 /jin4/) are encoded in parallel as serial verbs (V1 + V2) or as a complement in a verb compound (Li & Thompson, 1981). This is the basis on which Slobin (2004) provided his classification of Chinese as an equipollently-framed language.

In example (3), the main verb in Korean is located at the end of the sentence with an inflection indicating the past tense of the action. The meaning of *into* is embedded within the main verb 들어갔다(enter), which directly indicates motion path.[3] This feature qualifies the Korean language as a verb-framed language, in which path is folded into the main verb while manner is constructed outside the verb. By taking all of these linguistic components into account, the sentence *He ran into the building* is expressed as *He entered the building by running*. The manner of motion *run* is expressed by another component in the form of a gerund or a prepositional phrase.

Although the linguistic properties can be debatable, the typological differences among English, Chinese and Korean, as demonstrated in the above examples, warrant a comparative study of language production by native speakers of these languages. The following section reviews previous studies in the light of cross-language transfer and interlanguage relations.

1.1.2 Cross-Linguistic Influences on the Encoding of Motion Events in L2 English by East Asians

Cross-linguistic influences on L2 learning have been well documented in the literature of second language studies, from word recognition (Pae et al., 2017) to concepts (Odlin, 2005). Studies of motion event construals are no exception (Brown, 2015; Brown & Chen, 2013; Park & Ziegler, 2014; Spring & Horie, 2013). The encoding

[3] The above sentence can also be written as 그는 건물로 달려 들어갔다/Gu-nun gunmul-ro dalyu duluhgotda/. Notably, there is another component that adds the meaning of *into*. The equivalent form of the English particle *into* in Korean is used with a combination of a noun 안, meaning *inside,* and an auxiliary word 으로, which expresses the direction of the action verb. This kind of auxiliary word is called a *helping word,* 조사, 助詞 in Korean. Importantly, it is not part of the main verb in the Korean language.

of the manner and path of a motion event expressed by English learners has been examined as to how their L2 production is characterised by the typological characteristics of L1. Based on Slobin's (2004, 2006) categorisation of equipollently-framed Chinese, Spring and Horie (2013) examined motion event formulation among Chinese-speaking and Japanese-speaking learners of English as well as native English speakers, analysing video clips consisting of various motion events. Results showed a robust L1 typological influence on Chinese and Japanese speakers' framing preference in L2 English. Native English speakers tended to produce satellite-framed expressions significantly more than did Chinese and Japanese learners of English. Both Chinese and Japanese learners of English were less likely to express the manner of motion than monolingual English speakers in speech. Significant differences were found in the tendencies of motion-manner encoding between Chinese and Japanese speakers. Native speakers of Chinese tended to encode manner in the main verb in English similar to native speakers of English, irrespective of English proficiency and length of residence in the U.S. In contrast, Japanese speakers were less likely to express the manner of motion than their Chinese counterparts probably due to Japanese speakers' tendency of focusing less on the manner of motion in their native language (Spring & Horie, 2013).

Path and manner construals in the expressions of motion events have been investigated among speakers of Japanese, Chinese, and English. Brown and Chen (2013) found, in a study of the construal patterns of the manner of motion in speech and gesture among native speakers of Chinese, Japanese and English, that English and Chinese speakers encoded manner in speech significantly more frequently than did Japanese speakers. These findings indicate that cross-linguistic differences exist in the depiction of a motion based on typological characteristics and that typological differences affect the speaker's cognitive conceptualisation of motion events in both L1 and L2 bidirectionally. The findings by Brown and Chen (2013) also endorse the three-way typological distinction in the construal of motion, with Chinese being an equipollently-framed language, as proposed by Slobin (2004).

The findings of studies along the same lines point to a close tie between L1 and L2 production. Brown (2015) showed, in a study of bilinguals' and monolinguals' encoding of the manner of a motion in speech and gesture in the three languages of Chinese, Japanese and English, that not only did the universal features of language development characterise the encoding of manner in L2 speech, but bidirectional interactions were also shown between the properties of L1 and L2 shaped by the construal of manner in gesture. She interpreted these results as a "convergence" and interrelationship between L1 and L2 in the use of manner-highlighting gestures. Ji (2017) also investigated the conceptual salience in the manner and path of motion events among Chinese-speaking English learners in a triad-matching judgement task using the thinking-for-speaking framework (Slobin, 1996). Results showed that Chinese learners of English with different proficiency levels demonstrated varying degrees of L1 typological constraints in manner and path categorisation preference. Since this study focuses on Chinese learners of English, we do not review studies of Koreans in this chapter.

Collectively, although the relationship between L1 and L2 skills is complex and multifaceted, what seems to be clear is the salient role of L1 typological characteristics in L2 production. Language-specific typological characteristics may reinforce the habitual encoding of a motion event in L1 and, therefore, they become deeply rooted in L1 use such that an individual cannot escape the influence of one's L1 (Slobin, 2006). This leads to solid cross-linguistic transfer onto L2 production, which bears significant implications for L2 pedagogy. This cross-linguistic transfer is also in line with Brown's (2015) claim of L1-L2 "convergence" and interlanguage relationships as well as bilinguals' cognitive shift or conceptual restructuring as a result of bilingualism (Park & Ziegler, 2014). Since the verb + satellite form in English has to do with multi-word verbs, studies of prepositional verbs and phrasal verbs usage by Chinese speakers will be briefly reviewed in the next section.

1.2 Multi-word Verb Use by Chinese Learners of English

English has a sheer number of multi-word verbs, including prepositional verbs (e.g. *look at, listen to*), phrasal verbs (e.g. *look up, look into*), and phrasal prepositional verbs (e.g. *look up to, put up with*). In particular, a large number of phrasal verbs that frequently occur in text and speech cannot be found in Mandarin Chinese (White, 2012; Zhang & Wen, 2019). Thus, the frequency of phrasal verbs was significant for both intermediate and advanced Chinese learners (Zhang & Wen, 2019). In addition, the semantic transparency of phrasal verbs varies, ranging from transparent (e.g. *pick up, put on*) to opaque or idiomatic (e.g. *pick on, put out*). Being polysemous in meaning makes English phrasal verbs more complicated. For example, the phrase *go on* has 21 different definitions (White, 2012). Such factors as frequency, semantic transparency, and exposure to L2 English are significant predictors of the mastery of English polysemous phrasal verbs. Indeed, research has shown avoidance of phrasal verb usage among native Chinese speakers (Liao & Fukuya, 2004), suggesting preemptive interlanguage negotiation due to the lack of presence in their L1.

1.3 The Current Study

Previous studies on cross-linguistic influences on L2 English motion event encoding have focused on the conflation of speech and gesture to reveal learners' cognitive and linguistic transfer within the framework of satellite- and verb-framed typology as well as the thinking-for-speaking framework (Brown & Chen, 2013). Given the typological differences, motion expressions by Chinese and Japanese learners of English were often compared with those of native English speakers at the same time in the examination of cross-linguistic influences on forms and functions such as L1 transfer, L1-L2 convergence, and cognitive shift (Brown, 2015; Brown & Chen, 2013; Brown & Gullberg, 2010, 2013; Ji, 2017; Park & Ziegler, 2014; Spring &

Horie, 2013). The impetus for this current study was to extend the literature by using written data, which were a different productive modality than speech that has been primarily used in the existing literature. Two research questions guided this study:

1. Are there differences in the path encoding of motion events in English among native speakers of English, Chinese, and Korean and between the two non-native groups of Chinese and Koreans?
2. What are the conspicuous features expressed in written narratives in L2 English by the two East Asian groups with respect to the path of a motion?

2 Method

2.1 Participants

A total of 61 university students participated in this study: 21 Chinese speakers (8 females, $M_{age} = 20.0$, $SD = 1.4$), 21 Korean speakers (18 females, $M_{age} = 20.5$, $SD = 1.4$), and 19 native English speakers (all females, $M_{age} = 21.1$, $SD = 3.1$). None of the native English speakers had learned Chinese or Korean. The Chinese- and English-speaking participants were recruited from a university in the United States, while Korean participants were linguistic majors at a comprehensive university in South Korea. Based on Brown and Gullberg's (2012, 2013) findings that showed no difference in English motion encoding between Japanese speakers learning English in English-speaking countries as L2 and in their native country as a foreign language (FL), we believed that the learning settings did not prevent us from comparing their encoding expressions for this current study. To reduce variations associated with learners' learning contexts and backgrounds, we controlled for learners' English proficiency assessed by sentence formulation skills in the analysis.

2.2 Materials

This study used Mayer's (1969) *Frog, Where Are You?* picture book as a prompt to elicit the participants' motion encoding in writing narratives. This wordless black-and-white picture book contains 24 pictures and depicts a boy and his dog's effort and adventure to find their pet frog that ran away overnight from their room. As a way of probing L2 learners' lexicalisation patterns, writing samples using a static picture book as a prompt would be more appropriate than spontaneous speech samples because written narratives overcome the temporal nature of speech with the benefit of more controlled circumstances (e.g. more time involved and higher self-monitoring in production) and thus, is typically more elaborate than temporal speech and manifest learners' underlying constructs (Cook, 2015). Previous research has also used the

Table 1 Selected picture numbers from *Frog, Where Are You?* (Mayer, 1969) and description

Pic#	Description of the Picture
1	A boy and his dog are sitting next to a jar with a pet frog in it in the boy's bedroom at night.
2	While the boy and his dog are sleeping in bed, the frog is trying to sneak out of the jar.
3	The next morning, the boy and the dog find that the frog is gone and the jar is empty.
4	The boy and his dog proceed to the woods and scream for the frog.
5	The boy climbs on a tree and looks into the tree hole for his missing frog, while the dog shakes another tree and causes a beehive to fall from the tree.
6	An owl flies out of the tree hole and startles the boy out of the tree, and the dog is chased by the bees.
7	A deer chases them, and they fall off a cliff.
8	The boy and the dog fall into a pond.
9	They lean over a lying tree trunk to look for the frog.
10	They find several frogs on the other side of the tree trunk.

frog story as a prompt in the investigation of motion events encoding mostly in children (e.g. Kellerman & van Hoof, 2003; Slobin, 1996).

In order to focus on motion events while maintaining the storyline of the story, 10 pictures out of 24 pictures were selected. The depiction of each picture used for this study are summarised in Table 1.

In order to gauge the English proficiency of the non-native speakers of English, general expressive English skills were measured. We used the Word Ordering subtest of the Test of Language Development–Intermediate: Fourth Edition (TOLD-I: 4; Hammill & Newcomer, 2008)[4] for that purpose. The subtest assesses the ability to formulate a meaningful sentence using a set of words provided in a random sequence by the tester. The stimuli for sentence formulation included three to seven randomly ordered words so that the impact of memory span could be minimal.

2.3 Procedure

Before the test administration, we provided participants with a summary of the storyline of *Frog, Where Are You?* (Mayer, 1969). The participants wrote on a blank page provided by the tester a description of each picture individually presented on the overhead projector in an in-class administration in exchange for extra credit. They were asked to describe what they saw in each picture of the story. After completing their writing about the picture story, the Word Ordering subtest was administered to the non-native participants. They were asked to write a grammatically correct and

[4] The subtest was originally designed as an oral measure to assess syntactic skills, but the modified version of the test was used as a written test.

complete sentence using words only presented on the overhead projector for two minutes.

2.4 Coding Scheme and Data Analyses

The collection of written narratives were keyboarded in verbatim into a learner corpus. We developed a coding scheme for data analysis to tally the presence of satellites in the narratives. Two raters coded independently, and then coding outcomes were compared to obtain inter-rater reliability. When a discrepancy was observed in coding, the two raters discussed the particular case in the presence of a third rater to come up with an agreement and independently recorded the initially discrepant cases. After resolving the initial disagreement between the two raters, 95% agreement between the two coders was achieved in the second round of coding.

For data analyses, the dependent variable was the frequency of occurrences of satellites. We identified the tokens of satellites, including post-motion-verbal particles (e.g. *fall down*), prepositions (e.g. *run toward*), and adverbs (e.g. *go outside*), for the satellite phrases used to encode the path of motion after the motion verb (see Talmy, 2000). In this process, we excluded non-motion verbal phrases, such as *look at, shout for, figure out,* and the like. We conducted a one-way ANOVA to detect statistical significance of L1 influence on satellite production among the three L1 groups, and Tukey's HSD post hoc comparisons and an ANCOVA to compare differences in satellite production between the groups.

3 Results

3.1 The Encoding of the Path of Motion

The first research question compared how native speakers of Chinese, Korean and English encoded the path of motion in their written narrations of the frog story in English. Given the unequal sample size across the three groups, we conducted Levene's test to ensure homogeneity of variance: $F(2, 58) = 2.11$, $p = 0.131$.

The native English speakers produced the most satellites ($M = 13.68$, $SD = 2.8$, range: 12.34–15.03); the Koreans showed reluctance to encode path into satellites ($M = 6.81$, $SD = 3.67$, range: 5.14–8.48); and the production of satellites by the Chinese speakers was somewhere in between ($M = 11.48$, $SD = 2.71$, range: 10.24–12.71). The ANOVA analysis results indicated a significant difference in the frequency of satellites produced by the Chinese speakers, Korean speakers, and native English speakers to describe the pictures presented for this study, $F(2, 58) = 25.97$, $p < 0.001$. Based on Cohen's (1988) conventions for interpreting effect size, the actual difference in the mean frequency of satellites was modest ($\eta_p^2 = 0.47$), suggesting

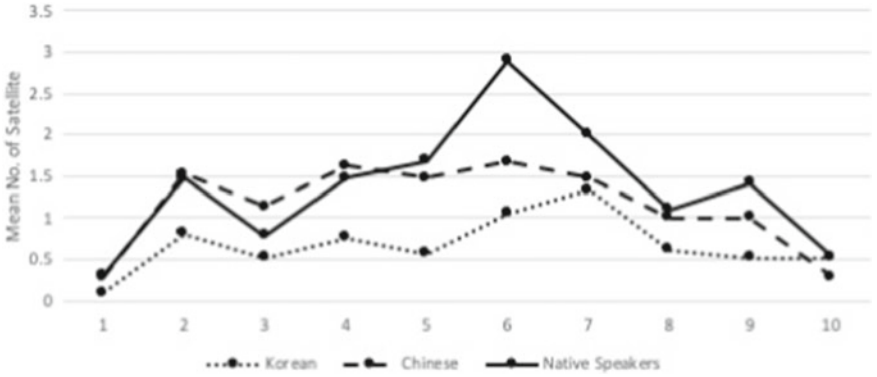

Fig. 1 Comparisons of satellites produced by the three L1 groups in each picture

that about 47% of the variance in the production of satellites was due to the L1 difference. Tukey's HSD post hoc test results indicated that the mean frequency of satellites produced by the native English speakers was significantly higher than the Korean speakers ($p < 0.001$) but not significantly higher than the Chinese speakers ($p = 0.071$). The results also showed that the Chinese speakers produced significantly more satellites than those by the Korean speakers ($p < 0.001$).

In addition to examining the satellite production as an aggregated form, we also compared satellite production across the three L1 groups on a picture-by-picture basis. A one-way ANOVA on each picture of the story with post hoc comparisons was run. The comparison of the mean frequency of satellites produced in each picture by the three L1 groups is illustrated in Fig. 1. A significant difference in the mean of satellites produced among three L1 groups was found in picture 2 ($F[2, 58] = 6.54$, $p = 0.003$), picture 3 ($F[2, 58] = 4.05$, $p = 0.023$), picture 4 ($F[2, 58] = 6.43$, $p = 0.003$), picture 5 ($F[2, 58] = 7.09$, $p = 0.002$), picture 6 ($F[2, 58] = 20.52$, $p < 0.001$), picture 7 ($F[2, 58] = 3.52$, $p = 0.036$) and picture 9 ($F[2, 58] = 4.89$, $p = 0.011$).

The total number of satellites produced in pictures 2, 3, 4, 5, 6, 7, and 9 were significantly different among the three L1 groups ($p < 0.001$). Post hoc analyses revealed significant differences between the Korean speakers and the native English speakers ($p < 0.001$) and between the Chinese speakers and the Korean speakers ($p < 0.001$). Pictures 2, 4, and 5 revealed significant differences in satellite framing between the Korean speakers and the native English speakers and between the Chinese speakers and the Korean speakers. Picture 3 revealed a significant difference in satellite framing between the Chinese and Korean speakers only. Pictures 7 and 9 revealed significant differences in satellite framing between the Korean speakers and the native speakers only. Picture 6 revealed a significant difference in satellite framing between the native English speakers and both the Chinese and Korean speakers.

Next, a one-way ANCOVA was conducted to determine if there was a group difference between the Chinese and Korean speakers on their production of satellites

in their narratives by controlling for their English proficiency ($n = 42$). In this test, the assumption of homogeneity of variances was tested and found tenable using Levene's test, $F(1, 40) = 2.401$, $p = 0.129$. The results of the ANCOVA showed a significant difference between the two groups: $F(1, 39) = 11.51$, $p < 0.001$, $\eta_p^2 = 0.37$.

3.2 Features Emerging from the Encoding of the Path of a Motion by Non-Native Speakers

The second research question sought to identify the prominent features of L2 English motion events encoding by the Chinese speakers, compared to the Korean speakers and the native speakers of English. The Korean learners' writing demonstrated a signature L1 Korean pattern of manner-path conflation in motion salient pictures, while the native English speakers showed clear encoding patterns of path in satellites and diverse use of manner verbs. For example, in picture 2, the native English speakers wrote:

- *The frog is climbing out of the jar that it is in.*
- *The frog is sneaking out of the jar.*
- *The frog may be scared and is now going to run away.*
- *The frog tip toed his way out of his frog bowl.*
- *The frog is getting out!*

In these examples, the native English speakers used a variety of motion verbs (e.g. *climb, sneak, run, tip toe*) for manner and unequivocal satellites (*out*, *away*) to encode path. The Chinese speakers tended to avoid using satellites (i.e. underuse) to encode path and used fewer manner verbs. For example, they used the verbs *escape* and *vanish* (rather than *run away*) more often than the native English speakers in the following examples:

- **Just now, the frog [were] trying to escape [from] the bottle.*[5]
- **In the morning the kid and the dog [were] surprised that the frog had vanished.*
- **The frog saw nobody around him so he start[ed] to escape because he [didn't] want to stay in a small bottle.*
- **The boy took [off] his clothes, laying on the bed.*

Similarly, the Korean speakers prevalently preferred single equivalent *seek* over phrasal verbs *look for*, and *return* over *go back*, as observed in their description of picture 4.

[5] The sentences with errors in satellite use were marked with an asterisk (*) and corrections were provided in brackets for the ease of reading. Given that satellites were our focal point, writing examples are illustrated in verbatim despite other grammatical errors in the use of articles, subject-verb agreement, and verb tense.

More evidence of underuse was also found in pictures 6 and 7, where quantitative data indicated a significant difference in satellite production between the native English speakers and the two East Asian groups. In picture 6, the native English speakers used *running away* or *sprinting away* to describe the scene where the dog was chased by the bees, whereas the Chinese and Korean speakers wrote: *They tried to escape, but they failed; The dog run immediately*; and *The dog is running fast to avoid the bees*. In these examples, again, the East Asians preferred single verbs such as *escape* or *run* for the motion without path encoding. Similarly, they also preferred *appear* over *show up*, as in *Suddenly, a big bird appear in front of him; Many animals appear to them.*

Misuse was another feature prominently identified in the Chinese speakers' data. This feature was shown as a tendency of dropping post-verbal prepositions after intransitive verbs and before objects in the descriptions of pictures 1 and 6—**There was a boy seating on his chair staring [at]a frog in a jar with his puppy in bedroom*; and **The poor dog was attacked by the bee and little fell out [of] the tree because owl scared him*—where the *at* and *of* were missing, respectively.

Besides underuse and misuse, picture 7 revealed more complicated patterns of post-verbal particles and prepositions used by the East Asian speakers. The native speakers used *fall off the cliff*, *pushed off the cliff,* or *rammed off the cliff* to describe the scene where the boy and the dog fell off the cliff after being chased by a deer. In short, typical examples provided by the East Asians included: (1) underuse (e.g. *They dropped from the tree* rather than *They fell down from the tree*), (2) misuse (e.g. **He slid to under tree)*, and (3) confusion in word class (e.g. **The boy and dog down at earth*). Examples (2) and (3) are discussed in further detail next.

4 Discussion

This study not only investigated how the native English, Chinese, and Korean speakers described the path of a motion event in writing but also compared lexicalisation patterns between the Chinese and Korean speakers' L2 production. The first research question was posed to examine group differences in the articulation of motion events illustrated in a picture book. Results showed significant differences among the three groups. Post hoc analyses revealed that the verb-framed East Asians were less likely to use satellites to encode the path of a motion in L2 English than their native English counterparts. There was a significant difference between the English speakers and the Korean speakers and between the Chinese and Korean speakers in the lexicalisation patterns of motion events in English.

4.1 *Equipollently-Framed Chinese Stance Between Satellite-Framed English and Verb-Framed Korean: Evidence of Cross-Linguistic Transfer*

The encoding of motion events is a complex yet salient phenomenon due to the linguistic properties unique to L2 English. Overall, our results provided empirical evidence for testing the linguistic transfer theory from the perspective of language typology. Specifically, our findings are consistent with those of previous studies: Native English speakers prefer to encode path in satellite lexical items significantly more than speakers of verb-framed languages (Brown, 2015; Brown & Gullberg, 2013; Spring & Horie, 2013). In addition, our findings also provided evidence that the Chinese speakers' production of satellite lexical items fell within the range of the satellites produced by the English speakers and the Korean speakers. Like the Chinese language theoretically placed in the middle in the spectrum of language typology as an equipollently-framed language, the Chinese speakers' expressions were placed around a midpoint between the English speakers' and Korean speakers' usage due to their L1 effects.

One major contribution of our study is to compare the three distinct L1 groups in an effort to examine the viability of the theoretical account through the lens of language typology and understand the learning process of Chinese- and Korean-speaking L2 English learners. In our study, the comparison between the two East Asian groups showed that the Chinese speakers used more satellites to encode the path of motion events than did their Korean counterparts. This difference called for further analyses of the two East Asian groups' L2 production qualitatively. If the cross-language transfer was negated, the articulation of motion verbs between the two groups should be similar, especially when considering Brown's (2015) universal development in bilingual construal of manner in speech. However, the results showed a significant difference between the two groups, which attested to cross-linguistic influences on L2 production. This finding is consistent with Slobin's (2004) assertion that speakers can hardly escape the influence of L1 and Brown's (2015) L1-L2 convergence and interrelationship.

4.2 *Implications for Theory and Methodology*

The findings of this study have theoretical and methodological implications. Theoretically, Slobin's (2004) tripartite classification of language typology (i.e. Chinese is equipollently-framed rather than satellite-framed) extended Talmy's (1985, 2000) dichotomy and took the special grammatical features of compound verbs in Chinese into consideration. Chinese linguists argue that the Chinese language has gone through an evolution from a verb-framed language to a satellite-framed language over time (Chen & Guo, 2009; Shi & Wu, 2014). Although most empirical studies on Chinese speakers' motion event encoding have treated Chinese as an

equipollently-framed language (Brown & Chen, 2013; Ji, 2017; Spring & Horie, 2013), more evidence from Chinese-speaking English learners' data could consolidate the typology of Chinese as such. Evidence generated from this study suggests that Chinese writers lean towards an equipollently-framed language, as shown in the Chinese participants' encoding patterns of the path of motion falling in between those of English and Korean. The findings of this study also indicate that cross-linguistic transfer should be deemed necessary in the development of theoretical models of L2 learning.

Methodologically, this study adds empirical evidence to the extant literature from writing samples. Previous research has investigated typological differences primarily relying on L2 learners' speech and gesture (Brown & Chen, 2013; Choi & Lantolf, 2008), leaving written output less explored. As Cook (2015) noted, written data demonstrate learners' underlying linguistic competence that temporal speech cannot exhibit. Hence, written samples provide another platform to evaluate English learners' underlying linguistic competence or traits over instantaneous performance in speech.

4.3 L1-Specific Features in L2 English Written Narratives in the Encoding of Motion Events: Chinese and Korean Learners' Conundrums

To further analyse the qualitative aspect of the motion event construals produced by the Chinese and Korean speakers, the second question was formulated to identify the locus of difference by investigating the salient linguistic features demonstrated in the description of motion events. Since the underuse or misuse of particular linguistic components and features can be a manifestation of the speaker's linguistic ability profile and their L2 English use, we qualitatively examined the Chinese and Korean groups' writing output to better understand their usage of verbs and related components.

In general, the two groups of East Asian speakers showed a tendency to use the main verb that coalesced with both manner and path, as in *exit* and *drop*, as opposed to multi-word verbal phases of *go out* and *fall down*. Such a tendency showcased East Asians' avoidance of using satellites to encode the path of a motion. This tendency could be seen as a variant of the underuse of multi-word verb phrases, which resonates with the findings of Liao and Fukuya's (2004) study that found avoidance of multi-word verbs. In addition to this typical underuse of satellites in motion events, the East Asian speakers tended to misuse prepositional verbs by leaving out the necessary preposition as multi-word verbal phrases. For example, they tended to produce a sentence **They look [at] a deer* and **There was a boy seating on his chair staring [at] a frog*… wherein the preposition *at* was not used for a prepositional verb *look at* and *stare at*. Another example of phrasal verb misuse is **They tried to figure [out] how to find it*, wherein the particle *out* was missing for a phrasal verb *figure out*.

This can be considered underuse of prepositions and particles. This may be natural language use in pragmatics because both Chinese and Korean languages do not have prepositions or phrasal verbs.

The absence of prepositions in the L1 system may also lead to an overuse of the given linguistic property to compensate for the lack of the concept in the language. The Chinese participants used an additional preposition as in **He had no idea where it went to*, where the preposition was unnecessary. Another misuse case was found in **They look at outside*, where the preposition *at* was needless to go with the adverb *outside*. However, this overuse of preposition *at* with the adverb may also likely result from the incongruence in the part-of-speech of the word *outside* between the East Asian languages and English. Specifically, the adverb in English *outside* can function as a noun at the beginning of a sentence in Chinese. For example, in the sentence 外面突然下雨了 (Lit., Outside suddenly raining; *It suddenly starts raining outside*); 外面 (/wai4mian4/, outside) is used as a noun.[6] Hence, it might have been natural for a Chinese speaker to produce a sentence like **He goes to outside* as the same structure as *He goes to the store*, treating *outside* as a noun that collocates with a preposition *to* to form the prepositional phrase *to the store*. In our Chinese speakers' data, this part-of-speech confusion was frequently observed in L2 English production, due most probably to L1 effects. Similar articulations were also observed among the Korean speakers, as in **He went to the outside with his dog*. In Korean, *outside* (밖), *inside* (안), *up* (위), and *beneath* (아래) themselves are nouns. These words need to have auxiliary words called 조사, 助詞, *helping word*, in order to express the direction or path of an action verb as in 밖으로, 안으로, 위로, and 아래로.

In reviewing the Chinese participants' data, the example **They are saving because down of the cliff is a pool* indicated the Chinese speakers' confusion of the adverb *down* as a noun as well. Similarly, another production, **The boy and dog down at earth,* revealed the Korean speakers' confusion of the adverb *down* to be an action verb. Since Korean is a verb-final language in which the verb is located at the end of the sentence, adverbs can come right after subjects. For example, the Korean sentence 그는 아래로 갔다/*Gu-nun ahraero gatda*/ (he went downward) has the subject-adverb[7]-verb order (**He down went*). This Korean linguistic feature may

[6] The word 外面, *outside,* used in the beginning of the sentence can be viewed as an example of the *topic-comment* structure of the sentence typically found in the Chinese language, in which the speaker introduces the topic up front and states an intended message. Further description is not provided on this because it is beyond the scope of this study. Regardless of its interpretation, however, what is clear is that the word *outside* is used as a noun in the sentence. In addition, the word *outside* in English constitutes an adverb, a preposition, an adjective, and a noun. However, in the given sentence, outside is not used as a noun, as in Chinese.

[7] In the Korean language, technically speaking, the adverb as one of parts-of-speech is a concept that is borrowed from English, because the concept of adverb under the Korean grammar is slightly different from that of English. The phrase " 아래로" actually consists of a noun (아래) + a helping word indicating "direction" (로), which is called 조사(helping word). Hence, although 아래로can be translated into *down* in English, it has a technically different grammatical component.

cause Korean speakers to mistake adverbs for verbs in L2 English by placing the adverb right after the subject. The example **They try to over the dead tree* also showed their confusion of the adverb *over* to be a verb by missing out the real verb for the *to*-infinitive construction in the sentence. These expressions suggest that L2 learners tend to rely on L1 linguistic properties when producing sentences in L2 while acquiring L2 due to solid L1 effects, which is also consistent with Brown's (2015) L1-L2 convergence. These misuses caused by pragmatic inadequacy and confusion of word class could be labelled as variants of misuse.

Picture 7 with dramatic motions warrants further investigation. While native English speakers mainly used *fall off the cliff* to describe the scene where the boy and the dog fell off the cliff after being chased by a deer, the examples produced by Chinese speakers, such as **He falls down [off] [the] cliff*, reveal another barrier beyond underuse and misuse due to L1 influences on L2 output. Although conceptually acceptable, it exposes non-native speakers' lack of pragmatic knowledge of particles between *off* and *down* to be used to describe this motion (as well as the definite article). Specifically, while *fall off* indicates the protagonist being away from the cliff surface as the start of the falling motion, *fall down* denotes more of the character being on the ground as a result. Another similar example was identified in the description of picture 6: **He is surprised at that he fall down [off] the tree*. Without a lexicalisation system with diverse satellites to encode path in the Chinese and Korean languages, it is plausible that Chinese and Korean speakers fail to recognise which one, *off* or *down*, to use after the motion verb, even if they realise a lexical spot for a particle to encode the path of motion.

Collectively, East Asians' narrative patterns in motion events that are different from that of native English speakers could be summarised as follows: (1) underuse referring to a preference for equivalent single motion verbs conflated with path (e.g. *escape*, *seek, drop*) over phrasal verbs (e.g. *run away*, *search for, fall off*); (2) replacement (variant of underuse) involving replacing phrasal verbs with semantically equivalent single verbs, despite pragmatic differences between the two (e.g. *look for* vs. *find*, *look at* vs. *watch*); (3) misuse referring to dropping post-verbal prepositions after intransitive verbs to take an object (e.g. **search frog, *shout the frog*); (4) pragmatic inadequacy (variant of misuse) showing a lack of pragmatic knowledge in choosing and judging which post-verbal particle to encode path (e.g. *fall off* vs. *down*); and (5) confusion of word class (variant of misuse); meaning the improper use of word class, especially when prepositions, particles and adverbs can function after a verb serving the same purpose of encoding path as a satellite, and can oftentimes be used together as a bundle of words.

4.4 Implications for Pedagogy

The findings of this study bear significant implications for applications in practice. Pedagogically, this study provides learners' predominant underuse, misuse and overuse of particular verbal structures as well as overall linguistic choice and

tendency shown in L2 English output. Since the number of Chinese students ranks top in U.S. college classrooms (Institute of International Education, 2018), the findings of this study can be incorporated into L2 lesson plans or classrooms to directly tackle learners' challenges in learning English as L2. Several pedagogical implications can be drawn from the results of this study.

First, Chinese and Korean learners of English tend to encode motion events fewer than native English speakers. Therefore, learners would take advantage of L2 English instructional practices that address this linguistic feature in order to fully grasp phrasal verbs which are absent in their L1 linguistic system. Although it is not the most effective practice to teach English learners to rote linguistic technicalities for particular prepositions, adverbs or particles, it would be pedagogically appropriate to emphasise some basic grammatical rules. For example, an intransitive verb requires a preposition to take an object in the form of multi-word verbs. These rules, however, start with a solid foundation of learners' knowledge of English verbs.

Second, lesson plans for Chinese and Korean learners can be based on learner corpora that show non-native speakers' interlanguage. Learner corpora provide opportunities for contrastive interlanguage analyses in the comparison of (1) learner data with native speaker data to uncover learners' recurring patterns (e.g. misuse, under- and overuse, and their variants in satellite framing, as shown in this study) and guide material design and time investment in instruction, and (2) learner data over time to determine whether errors are L1-specific transfer difficulties or developmental (Granger, 2003). Native speaker corpora (or dictionaries), however, do not illustrate the difficulty of words or structures for learners (Granger, 2003).

Third, East Asian learners could use instructional practice on more fine-grained manner verbs in their vocabulary repertoire. Accompanied by verb vocabulary expansions, instructors could introduce some hands-on activities to demonstrate the manner and path difference with post-verbal prepositions and particles for the instruction of phrasal verb bundles. For example, White (2012) adopted an inductive approach to tap into learners' mastery of the combinations of verbs and particles (or prepositions) in phrasal verbs. In his study, White (2012) implemented the following five-step conceptual approach with theoretical rationale and pedagogical purposes: (1) A new orientation towards phrasal verbs; that is, reorientation of perception from arbitrary combinations of phrasal verbs to conceptually motivated constructions, such as mapping the meaning of particles (e.g. *up* and *out*) onto spatial relations to learners' zone of activity; (2) Students' collection of phrasal verbs through *phrasal verb hunting* from resources such as newspapers, magazines, web pages, and course texts to foster autonomous learning and target language immersion; (3) Group discussion of meaning using an *exploration worksheet* for students to engage in think-aloud strategies; (4) Express meanings of phrasal verbs through drawings to make logical sense and generate personal meaning within a context and to reinforce memory; and (5) Share drawings with peers to verbalise and internalise the concepts. Although outcome differences between pre-test and post-test were modest, student feedback was overwhelmingly positive, particularly on their conceptualisation of phrasal verbs. White's (2012) systematic classroom applications were tested effective and could be one way to facilitate East Asian's mastery and adequate usage of multi-word verbs.

5 Conclusion

The uniqueness of this study can be summarised in four ways. First, cross-language influence can be a plausible explanation for interlanguage relations. Adults typically have linguistic skills firmly established, unlike children who are still in the developmental phase, such that they have a deeply ingrained linguistic default, which can be resistant to restructure and change by L2 learning. Second, the results of this study are in line with the notion of Chinese as a typology between the satellite-framed and the verb-framed language in a linguistic typological spectrum (Chen & Guo, 2009; Slobin, 2004, 2006). Third, the results of this study expand the evidence of motion event encoding by speakers of different typological L1s in elicited written narratives, as opposed to speech data on which previous research relied. Last, the qualitative analysis of the writing data for prominent patterns and features reveals linguistic characteristics related to Chinese and Korean learners' tendency to formulate phrasal verb structures in written narratives in L2 English.

Future research is warranted to address the limitations of this study and expand its scope. The Chinese and Korean participants recruited from the same learning environment would be more comparable to each other, although the participants' English proficiency was controlled for in the analysis for this study. Although previous research has shown no difference between Japanese L2 and FL learners' performances in L2 English motion event encoding (Brown & Gullberg, 2012, 2013), one cannot rule out the possibility that L2 learners immersed in the target language learning environment would acquire nuanced linguistic patterns and usage of English prepositions and post-verbal particles better than FL learners. More research is needed to investigate the effect of such factors as a learning environment on learners' L2 production. In addition, although we did not analyse non-motion verbs (e.g. learners' use of *watch* instead of *look at*) because they are beyond the scope of this study, a comparison of the use of verbal expressions between motion verbs and non-motion verbs would help us understand L2 learners' linguistic choice and usage in written narrative or speech in L2. Informed by the overall complication of the prepositional verb lexicalisation system with diverse prepositions and particles in English, the findings on the Chinese and Korean speakers' writing output from viewing static pictures point toward a natural direction for future investigations into their non-motion verbal phrase construction and potential barriers in L2 production.

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