

# Nominal and Verbal Morphology in the Early Acquisition of French: A First Study of the Relation Between Comprehension and Production



Edy Veneziano

**Abstract** The chapter presents a study of the relation between the comprehension and production of articles and subject clitic pronouns in 2-year-old French-acquiring children. The production of grammatical morphemes occurring in the spontaneous speech of ten children was related to the performance these same children obtained in a comprehension task testing the children's understanding of the grammatical morphemes in question. Success in the task required children to retrieve the meaning of homophonous or nonce words on the sole basis of the category-specific grammatical morpheme preceding them – a definite article for nouns and a third person subject clitic pronoun for verbs. Overall, results indicate that comprehension and production are closely related. For the majority of the children, a high level of comprehension corresponded to a high level in production. The profile of one participant, and to a lesser degree that of two others, suggests that production might be ahead of comprehension. It should be noted, however, that in this study comprehension could not be assessed with the same degree of detail as spontaneous production. To shed further light on this issue, future studies should find a way to assess children's comprehension in finer detail, include additional participants, as well as plan studies that assess both production and comprehension longitudinally. Moreover, in order to better evaluate what children have acquired and how they have acquired it, it is suggested that studies of early language acquisition should include both comprehension and production as a standard method of analysis.

**Keywords** Acquisition of French · 2-year-olds · Production and comprehension · Grammatical morphemes · Articles · Subject clitic pronouns

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E. Veneziano (✉)  
Laboratories LPPS (UR 4057) and MoDyCo (UMR 7114), University of Paris & CNRS,  
Paris, France  
e-mail: [edy.veneziano@u-paris.fr](mailto:edy.veneziano@u-paris.fr)

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## 1 Introduction

As this volume attests, Dorit Ravid is a leading figure and a source of inspiration to many researchers in the field of language acquisition, to which she has extensively contributed. Among the topics she has tackled are the acquisition of oral and written grammatical morphology and the relationship between them (e.g., Bar-On & Ravid, 2011; Ravid & Zilberbuch, 2003). This paper relates to this line of research by presenting a first study of the relation between the comprehension and production of grammatical morphemes – in particular articles and subject clitic pronouns– in 2-year-olds acquiring French.

One way of looking at children's grasp of these morphemes is to consider how they comprehend and use them in nominal and verbal contexts. In French, as in many other languages, articles usually precede nouns. In contrast, subjects, particularly subject clitic pronouns, precede verbs, either immediately – as in simple verb forms such as the indicative present (e.g., *il mange* 'he eats') – or distanced from the verb by one or more intervening elements – as in compound verb constructions when, for example, an auxiliary verb occurs between the subject and the past participle form (e.g., *il a mangé* 'he has eaten').

Consequently, the morphosyntactic context in which words occur is considered to largely contribute to determining their grammatical category (e.g., Clairis, 1984; Lazard, 1984; Maratsos & Chalkley, 1980). Thus, if children understand the function of grammatical morphemes, they will also be able to assign noun or verb status to words they encounter for the first time and disambiguate the meaning of words in the event of homophony (e.g., for English, *the meat* vs. *they meet*; for French, *le /li/* 'the bed' vs. *je /li/* 'I read'). Furthermore, although there is no one-to-one relationship between word category and meaning, as words that are nouns tend to refer to objects and entities, while words that are verbs tend to refer to actions or states.

In a recent study of 2- to 4-year-old children acquiring/speaking French, Veneziano and Parisse (2018) (hereafter referred to as V & P) assessed the children's understanding of grammatical morphemes such as definite articles and subject clitic pronouns by considering the meaning that children attributed to the word immediately following either the article (the nominal context) or the subject pronoun (the verbal context). The words were either homophonous in French or were nonce – invented, therefore novel – words that could thus function as either nouns or verbs: only the preceding grammatical morpheme could be used to attribute either an object or an action/state meaning to them. So, if a child attributed the meaning suggested by the preceding grammatical morpheme to a homophonous or nonce word, and did so in a consistent and statistically significant way over the items proposed, we considered that the child understood the function of the grammatical morpheme in the utterance presented. The results of that study, as well as of earlier preliminary ones (Veneziano & Parisse, 2011; Veneziano et al., 2010), showed that, at all ages, children were able to retrieve the object or action meaning of homophonous or nonce words on the sole basis of the information provided by the type of grammatical morpheme preceding them. Although 4-year-olds

outperformed the 2- and 3-year-olds, as a group, these younger children succeeded in the task as well. Wide individual differences were however observed, particularly in the younger group.

In the present study, we analyzed the relation between comprehension and production of the above-mentioned grammatical morphemes by some of the 2-year-olds who participated in the V & P study. Comprehension was assessed using the results that children obtained in the comprehension task of the V & P study (see Sect. 2.1 below for more details on the task). Production, consisting of the spontaneous speech the same children uttered while interacting with the experimenter before and during the comprehension task, was evaluated using a detailed method devised specifically for the present study (see Sect. 2.2 below for details).

### *The relation between comprehension and production*

Adults' comprehension and production of their native language tend to be at the same level of proficiency. Such coincidence does not seem to be present during children's language acquisition, and the level of concordance between the two modes of language functioning can itself be considered a developmental variable (e.g. Clark & Hecht, 1983).

In studies comparing production and comprehension where the latter was assessed in controlled situations, comprehension seemed to be either ahead of the children's production or the children behaved differently in the two modes. For example, Sachs and Truswell (1978) found that children who only produced single-word utterances in their spontaneous speech could understand the meaning of word combinations even when their comprehension involved performing unusual or improbable actions on objects. Thomson and Chapman (1977) found that children who overextended words in production did so to a much lesser extent in comprehension.

Comprehension also appears to be ahead of production for grammatical morphemes. Several experimental studies have shown some comprehension of grammatical morphemes before children are assumed to be able to systematically produce them in their speech. Perception studies have shown that infants are sensitive to the grammatical morphemes of the language they are exposed to (Höhle et al., 2004; Kedar et al., 2006; Shi & Melançon, 2010; Shi et al., 2006). In studies requiring the active response of the children, comprehension also seems to be ahead of production. Children in their second year of life, whose utterances did not contain function words, responded better to instructions expressed by utterances that contained grammatical morphemes than to utterances that did not (Petretic & Tweney, 1977; Shipley et al., 1969), or to utterances that contained ungrammatical function words (Gerken & McIntosh, 1993). More recently, several experimental studies have shown that children can assign meaning to nonce words according to the syntactic context in which they occur: an object meaning when nonce words occur in a nominal context and an action meaning when they occur in a verbal context (Bernal et al., 2007; Cauvet et al., 2014; Naigles, 1990; Waxman et al., 2009).

Studies of perception and of early comprehension of grammatical morphemes therefore indicate that children have sensitivity and later some understanding of

grammatical morphemes before they are assumed to produce them at all or produce them appropriately. However, these studies, for the most part, report group results and very little data exist on the development of both comprehension and spontaneous production of grammatical morphemes in the same children considered individually. The present study is a first attempt to fill this gap by providing data on the relation between comprehension and production in 2-year old children acquiring French. The study compares the results obtained in the V & P comprehension task by ten 2-year-olds to their production of grammatical morphemes as it occurred in their spontaneous speech. As will be made clearer later, five of these children successfully completed the V & P comprehension task (this group will be called Group S) and the other five did not successfully complete the task (this group will be called Group NoS).

Results of the present study will thus provide empirically founded data on how knowledge of this aspect of language stands in the two modes of functioning. In particular, we will test the hypothesis about the priority of comprehension relative to spontaneous speech production. If this hypothesis is correct, we should expect that the spontaneous production of articles and subjects by children in Group NoS should not show proficiency, whereas the children in Group S could have either low or high levels of production. In fact, given that the study provides only a snapshot of children's comprehension at one particular time, it is not possible to determine when they achieved their understanding. If this happened close to the time of participation in the task, production should not yet be mastered; instead, if comprehension was achieved some time before participation in the task, then production could be of a higher and similar level of mastery to that of comprehension. Moreover, given that the children who did not successfully complete the comprehension task are less advanced in their understanding of grammatical morphemes than the children who successfully completed it, it is expected that the level of production of children in Group NoS will be lower than that of the children in group S. In Sect. 2.2 below we describe the method of analysis devised in this study to classify children's production of grammatical morphemes at four levels of proficiency.

In addition to testing the hypothesis about the developmental priority of comprehension over production, the study of both modes of functioning in the same children will provide a more precise view of children's knowledge of nominal and verbal French grammatical morphemes, compared to analyzing only one mode of functioning, as is usually the case in early language acquisition studies. Moreover, the comparison will also enable us to assess the level of coincidence between the two modes of functioning: when a child shows a high level of proficiency in one of the two modes of functioning, the distance between it and the other mode will provide insights into the child's overall level of mastery of the language aspect under study, the coincidence between the two being itself considered an additional indicator of mastery (Campbell et al., 1982; Clark & Hecht, 1983).

In what follows, we will first provide details about the V & P comprehension task, as well as about the criteria used therein to consider that a child successfully completed it and their application to the present study. Then, we will consider the theoretical and empirical background to the analysis of production and present the

method devised here to evaluate the children's use of grammatical morphemes, from the early production of *fillers* (known in the literature as underdetermined elements occurring where grammatical morphemes would be expected) to the production of the appropriate morphemes in 90% of the places where they are required, which is the acquisition criterion proposed by Roger Brown and his colleagues (e.g., Brown, 1973; Cazden, 1968), still in use today as the criterion for acquisition. Finally, we will present the results obtained in this first study and discuss their significance.

## 2 Evaluating the Early Acquisition of French Grammatical Morphemes

### 2.1 Comprehension of Grammatical Morphemes

#### 2.1.1 General Properties of the V & P Comprehension Task

The comprehension task applied by V & P, the results of which are used in the present study, has several original features that strongly suggest children's understanding of the grammatical morphemes involved when the task is successfully completed (see, for more details, Veneziano & Parisse, 2018):

1. In addition to nonce words – usually presented to the children in comprehension situations of a similar kind – it uses homophones, words existing in spoken French and found in a large sample of French child-directed speech (CDS).<sup>1</sup> These words can have either action or object meaning in the language. In the task, the meaning can be disambiguated only by correctly processing the grammatical functors preceding the homophonous word. For example, /pus/ can correspond to either the noun *pouce* 'thumb' or the verb *pousse* 'push', depending on whether it is preceded by the definite article /lə/ – /lə pus/ – in which case it

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<sup>1</sup>In the V & P study, participants were not tested on their knowledge of the homophonous words used in the task. This knowledge in fact was not expected, since these kinds of comprehension tasks usually use only nonce or invented words which are by definition unknown to the children. Nonetheless, V & P analyzed a large sample of French CDS (child-directed speech) to examine whether the words were likely to have been heard by the children. French CDS from CHILDES (MacWhinney, 2000) and from the samples analyzed in Veneziano & Parisse (2010) (the two data sets containing in all 1,913,796 words), showed that, with the exception of the verb *trancher* [to slice], all the French words used in the V & P comprehension task were present in the CDS samples analyzed, some occurring with greater frequency than others. Homophones were used similarly as nouns and verbs, with the exception of *marche* for which the verb ('walk') occurred more frequently than the noun ('step' in a stairway).

is interpreted as ‘the thumb’<sup>2</sup> – or by the subject clitic pronoun /il/ – in which case it is interpreted as /il pus/ ‘he pushes’. The use of extant homophonous words that have everyday meanings in the language has the advantage of providing the children with a more natural setting compared to a task where only nonce words are presented. Moreover, the use of homophones provides a good glimpse on how children process words that they are likely to encounter in their everyday interactions. The identification of homophones did not seem to render the task easier or more difficult for the 2-year-olds as the V & P study did not find significant differences in performance between the homophones and the nonce items;<sup>3</sup>

2. The grammatical context necessary to distinguish nouns from verbs – and in the task, object from action meaning – was kept to its minimally contrastive expression: only a definite article for nouns or a subject clitic pronoun for verbs distinguished the two utterances;
3. Each child in the study dealt with equivalent numbers of noun and verb contexts for homophonous words. This allows a good assessment of children’s capacity to provide differential interpretations according to the respective, minimally contrasted, grammatical contexts;<sup>4</sup>
4. The behavior on which children were evaluated required their active choice between two images, one representing the object meaning and the other the action meaning of the homophone or nonce word.

### 2.1.2 The Participants in the Comprehension Task of the V & P Study

Ninety children participated in the V & P comprehension study, 30 in each of three age groups: 2, 3 and 4 years old. All children came from monolingual, French-speaking, middle-class homes and were interviewed in a quiet room of either the daycare center (for the 2-year-olds), or the public kindergarten (for the 3- and

<sup>2</sup>In French /lə/, /la/ and /le/ may be definite articles, respectively, masc. sing (*le*), fem sing (*la*), and plural (*les*), or object clitics that occur before the verb. In the context of the V & P task, however, the interpretation of /lə/ and /la/ as preposed object clitics is not plausible for the structure presented – *le X* ---e.g., *le /pus/* -- where *le* as a preposed object clitic pronoun would imply an ungrammatical subjectless structure (\**\_\_le pousse* ‘*\_\_it* –masc sing – push(es). Such a structure is unlikely to be heard by the children: no such structure was found in several samples of CDS addressed to children of the same age range as that of the participants. Moreover, in many items, the clitic, if considered as a preposed object pronoun, would not be appropriate to refer to the object of the action pictured (e.g. *le /pus/* would be inappropriate to refer to the table being pushed by a boy as it should have been *la /pus/*). In addition, in the V & P study, there was no statistically significant difference in the number of identification errors when the word in the *la/le*+word structure was a homophone whose interpretation was a transitive vs an intransitive verb.

<sup>3</sup>The percentage of 2-year-olds successfully identifying the required numbers of items was 17% for nonce words and 23% for meaningful words, a difference that is not statistically significant (tested by a 2 × 2 contingency table:  $\chi^2(1, N = 60) = 0.104, p = 0.747, ns.$ )

<sup>4</sup>The same lexical item was however not presented in the two grammatical contexts to the same child as that would have involved in addition the capacity for categorial flexibility.

4-year-olds) that the children attended in Paris. All the children were described as typically-developing by their professional caretakers or teachers. The parents of the participants gave their consent to their child's participation by signing an authorization form.

### 2.1.3 The Material of the Comprehension Task in the V & P Study

The children were presented with 15 items, 12 containing homophonous words and three nonce words (the entire list is given in Table 1 by type of word and alphabetical order within each type).<sup>5</sup> The meanings of the words presented in the noun and verb contexts were represented by pairs of pictures shown on a computer screen. For the homophones, one picture represented the word's object meaning and the other

**Table 1** The 15 items used in the study, divided into homophonous and nonce words, and listed in alphabetical order within each category

Homophones	Noun context	Phonetics	English meaning	Verb context	Phonetics	English meaning
<b>Homophonous words</b>						
/bwa/	le bois	/lə bwa/	the wood (pieces of)	elle boit	/ɛl bwa/	she drinks
/kuʁ/	la cour	/la kuʁ/	the courtyard	il court	/il kuʁ/	he runs
/fɛʁm/	la ferme	/la fɛʁm/	the farm	elle ferme	/ɛl fɛʁm/	she closes
/ʒu/	la joue	/la ʒu/	the cheek	ils jouent	/il ʒu/	they play
/li/	le lit	/lə li/	the bed	elle lit	/ɛl li/	she reads
/maʁʃ/	les marches	/le maʁʃ/	the steps	ils marchent	/il maʁʃ/	they walk
/mɔ̃tʁ/	la montre	/la mɔ̃tʁ/	the watch	elle montre	/ɛl mɔ̃tʁ/	she shows
/pɔʁt/	la porte	/la pɔʁt/	the door	il porte	/il pɔʁt/	he carries
/pus/	le pouce	/lə pus/	the thumb	il pousse	/il pus/	he pushes
/ʁi/	le riz	/lə ʁi/	the rice	elle rit	/ɛl ʁi/	she laughs
/tɛləfɔ̃/	le téléphone	/lə tɛləfɔ̃/	the telephone	il téléphone	/il tɛləfɔ̃/	he telephones
/tʁɑ̃ʃ/	la tranche	/la tʁɑ̃ʃ/	the slice	elle tranche	/ɛl tʁɑ̃ʃ/	she slices
<b>Nonce words</b>						
/ʃim/	la chime	/la ʃim/		elle chime	/ɛl ʃim/	
/dav/	le dave	/lə dav/		elle dave	/ɛl dav/	
/gɔt/	la gotte	/la gɔt/		elle gotte	/ɛl gɔt/	

<sup>5</sup> A pilot study indicated that 15 was the total number of items that the children could reasonably attend to. The proportion of nonce words (20%) seemed appropriate so as not to compromise the naturalness of the experimental setting aimed at by the use of homophonous words.



a) Choice for /li/ ('bed/read'): on the left, the correct choice when presented in noun frame (*le lit* 'the bed'); on the right, the correct choice when presented in verb frame (*elle lit* 'she reads').



b) Choice for nonce word /ʃim/: on the left, the correct choice when presented in noun frame (*la chime*); on the right, the correct choice when presented in verb frame (*elle chime*)



**Fig. 1** Examples of screen displays for the items presented to the children. (a) Choice for /li/ ('bed/read'): on the left, the correct choice when presented in noun frame (*le lit* 'the bed'); on the right, the correct choice when presented in verb frame (*elle lit* 'she reads'). (b) Choice for nonce word /ʃim/: on the left, the correct choice when presented in noun frame (*la chime*); on the right, the correct choice when presented in verb frame (*elle chime*)

its action meaning, performed by a person. For nonce words, one picture represented an unfamiliar object that did not have a specific name in adult language, and the other represented a person performing an action that could not be described in French by a single existing verb (see Fig. 1, which is a snapshot of the screen presented for (a) a homophonous word; (b) a nonce word). The children were asked to point to the picture corresponding to what they heard (see the procedure below).

Four lists of the same 15 items were compiled. Taken together, the lists were constructed in such a way as to control for the order in which the items were presented, for the noun or verb context for each homophonous or nonce word, and for the position on the screen of the picture corresponding to the requested item (on the right or on the left of the screen). In each age group, over all the participants, the four lists were presented the same number of times.



### 2.1.4 The Procedure of the Comprehension Task in the V & P Study

During the administration of the task, the children were seated beside the Experimenter and in front of a computer screen. With each item, the corresponding two pictures – an object and an action -- simultaneously appeared side by side on the screen (see Fig. 1). For each item, children were asked either: *montre-moi* ‘show me’: [definite article] X or [third person clitic pronoun] X, where X was either a homophonous or a nonce word both sounding the same in the two contexts (see Table 1). For example, for the homophonous word /li/, the item presented was either *montre-moi: le lit* ‘show me: the bed’ or *montre-moi: elle lit* ‘show me: she reads’. The pictures appearing on the screen were the same for both the noun and the verb context of the word.

The test items were preceded by four training items. The first two presented a single picture and were meant to ensure that the children knew how to point to pictures on the screen. The next two items presented, like the test items, two pictures simultaneously – first two objects, and then an object and an action performed by a person. These items were intended to ensure that the children understood the instruction and could point to one of the two pictures depending on what they heard. The testing phase began immediately after with the presentation of the 15 test items, one after the other, and for each item the experimenter asked the child to show either ‘the X’ or ‘s/he X’ (see the example provided above), which the children did by pointing to the picture they thought corresponded.

All the sessions were videorecorded. The pointing responses of the children were coded during the experiment and were double-checked later from the video recordings.

### 2.1.5 The Criteria of Success for the Comprehension Task in the V & P and in the Present Study

Items were considered to be correctly identified when children pointed to the picture of an object for items presented in noun contexts, and to the picture of an action for items presented in verb contexts. An individual child was considered to have successfully completed the comprehension task beyond chance level when s/he correctly identified at least 12 out of the 15 items proposed.<sup>6</sup> In the V & P study, this criterion was reached by 30% of the 2-year-olds, 33% of the 3-year-olds and 67% of the 4-year-olds, with statistically significant differences between the older group and the two younger groups. For meaningful homophones, the minimum number of items that children needed to correctly identify was 10 out of the 12 presented.<sup>7</sup>

In the present study, we considered that a child had successfully completed the comprehension task when all the following criteria were met: 1. Success in at least

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<sup>6</sup>The probability of correctly identifying 12 out of 15 items by chance is .011, with  $p = q = 0.5$ .

<sup>7</sup>The probability of correctly identifying 10 out of 12 items by chance is 0.019, with  $p = q = 0.5$ .

12/15 of the *total number* of items; 2. Success in at least 10/12 of the *meaningful homophone* items; and 3. Success in at least 2/3 of the *nonce word* items. Although this number of nonce items does not reach the .05 probability level set to guarantee success beyond chance level,<sup>8</sup> this requirement prevents success to be granted on the exclusive basis of the successful identification of homophones and, together with the other two criteria, provides additional evidence that it is the grammatical context that determines the child's interpretation.

## 2.2 Production of Grammatical Morphemes

### 2.2.1 Acquisition in French-Acquiring Children

Children start by producing grammatical morphemes sporadically and only later on produce them systematically where they are expected (for French, e.g., Bassano, 2008; for Spanish, e.g., López-Ornat, 1997; for Italian, e.g., Pizzuto & Caselli, 1992; for cross-linguistic studies see for example, Dressler, 1997). Following the early studies by Brown and collaborators (e.g., Brown, 1973; Cazden, 1968), it is customary to consider that a grammatical morpheme is acquired when it is appropriately produced in at least 90% of the contexts where its presence is required.

For French, articles are considered acquired when children produce them in at least 90% of the required prenominal positions and use the forms appropriately, conforming to the requirements of gender, number and definiteness -- that is, *le* /lə/ (masc. sing. def), *la* /la/ (fem., sing., def), *les* /le/ (fem/masc, pl, def), *un* /œ̃/ (masc, sing, indef), *une* /yn/ (fem, sing, indef), *des* /de/ (masc/fem, pl, indef).<sup>9</sup> Subject pronouns are considered to be mastered when they are produced in preverbal contexts appropriately and in at least 90% of the cases where they are required, either in the immediately adjacent position for simple verb forms (as in *il part* 'he leaves') or before an auxiliary or modal verb in compound verb forms (as in *il a couru* 'he has run' or *elle veut dormir* 'she wants to sleep').<sup>10</sup>

For determiners, some data suggest that the 90% criterion is attained between 2;5 and 3;3, the latter age being when all the children in a cross-sectional study attained the criterion (Bassano, 2008; Bassano et al., 2008). For the production of subjects, the few studies that have specifically looked at this aspect for the entire child's production suggest that the age range is higher. At 2;9, the criterion was not attained in the longitudinal study of one child (Bassano, 2008). In the longitudinal study of 4

<sup>8</sup>The probability of correctly identifying all the three items by chance is 0.112, which is greater than the  $\alpha$  level set at 0.05. In the Veneziano & Parisse study, all the three items were correctly identified by 17%, 37% and 57% respectively of the 2-, 3- and 4-year-olds.

<sup>9</sup>There are also the partitive articles *du* (masc, sing), *de la* (fem, sing), used to refer to an unspecified quantity of food, liquid, or other uncountable matter.

<sup>10</sup>The subject and the main verb may be separated by more than one element as, for example, when an object pronoun occurs in preposed position: *je l'ai pris* 'I it have taken →I have taken it'.

children, none of them showed that accomplishment by the end of the studies (between 2;0 and 2;7) (Veneziano & Clark, 2016), and in a study of 3 children analyzed longitudinally until 2;7, only one child had attained the 90% criterion for subjects (Salazar Orvig et al., 2021).

### 2.2.2 Development before the Attainment of the Acquisition Criterion

Is it possible to evaluate the production of elements occurring in prenominal and preverbal contexts before children attain this high level of mastery?

In their second year of life, children start using syllabic, mostly vocalic, underdetermined elements – referred to in the literature as *fillers* – in prenominal and preverbal positions (e.g., Kilani-Schoch & Dressler, 2000; Liéo, 1997; Pepinsky et al., 2001; Veneziano, 2003, 2017; Veneziano & Sinclair, 2000). While most studies consider fillers a single transitional phenomenon towards full-fledged grammatical morphemes, others show that fillers themselves undergo a progression, during which their meaning and function for the child develops (e.g. Kilani-Schoch & Dressler, 2000; Peters, 1997; Peters & Menn, 1993; Veneziano, 2001, 2017; Veneziano & Sinclair, 2000). Concerning the early acquisition of French, previous studies have shown that it is possible to distinguish three periods in the production of fillers, all occurring before articles and subject clitic pronouns attain the Brown acquisition criterion mentioned above (Veneziano, 2017; Veneziano & Sinclair, 2000). The three periods of filler production for French-acquiring children were described as follows:<sup>11</sup>

1. Premorphological period, in which fillers are phonologically underdetermined (essentially /ə/, /e/ and /a/ sounds) and occur in the immediately adjacent prenominal and preverbal positions. At this time, there is no significant difference between the fillers produced in the two positions, either in terms of the percentage of positions presenting a filler, or in terms of the types of elements produced in the two positions. Children appear to follow the dominant phonoprosodic characteristics of the language – in French, an iambic pattern constituted by a first unstressed syllable followed by an accented one of the consonant-vowel type (e.g., Demuth, 2001, 2019; Kilani-Schoch & Dressler, 2000; Pepinsky et al., 2001; Veneziano, 2017; Veneziano & Sinclair, 2000; Vihman et al., 1998) – as well as the dominant distributional co-occurrences present in the input (Taelman et al., 2009; Veneziano & Sinclair, 2000).
2. Protomorphological period, in which both fillers and phonologically well-formed grammatical morphemes (henceforth WFGM) are produced. There is now a significant difference between the elements produced in prenominal and in preverbal positions: For example, /i/ is produced only in preverbal position and /o/ mainly in that position, while /ɛ̃/ and /yn/ are produced only in the prenominal one (e.g., Veneziano, 2017);

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<sup>11</sup>The terms were also used by Dressler and collaborators (e.g., Dressler, 1997) to describe periods in the overall development of children's grammar.

3. Quasi-morphological period: This period is characterized by the predominance of WFGM over fillers. While the elements of this period are produced differentially before nouns and verbs, specific grammatical morphemes – in particular, articles and subject clitic pronouns – do not yet reach Brown’s acquisition criterion of required presence (90% of obligatory contexts) and their use is not yet completely appropriate (i.e., they present errors of commission).

### 2.2.3 Method for the Evaluation of the Early Production of French Grammatical Morphemes Used in this Study

In the present study, the developmental path described above provided the basis for the evaluation of the spontaneous production of elements in prenominal and preverbal positions by children. We distinguished four levels (from low to high) in the production of these elements, each level being characterized by a number of features, as specified below:

Level 1 –

- (a) Fillers are the most frequently produced elements in prenominal and preverbal positions;
- (b) There is no significant difference between the elements produced in the two positions;
- (c) The elements occurring in preverbal subject position are only found in the immediate preverbal position of simple forms, such as the indicative present form, and not in the subject position of complex forms (Veneziano & Clark, 2016, 2021).

Level 2 –

- (a) Both fillers and phonologically well-formed articles and subject clitic pronouns are produced;
- (b) The types of elements produced in prenominal and in preverbal positions are significantly different;
- (c) The elements occurring in preverbal subject position are only found in the immediate preverbal position of simple forms, such as the indicative present form, and not in the subject position of complex forms (Veneziano & Clark, 2016, 2021);

Level 3 –

- (a) Phonologically well-formed articles and subject clitic pronouns<sup>12</sup> are more frequent than fillers;
- (b) The types of elements produced in prenominal and in preverbal positions are significantly different;
- (c) There is some variety in the articles and subject clitic pronouns produced in the prenominal and preverbal positions, respectively;

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<sup>12</sup>We included the phonologically close form /i/ for /il/ ‘he’ found in certain variants of everyday French, one of which is heard by the participants in the study.

- (d) The elements occurring in preverbal subject position are also found in larger constructions containing past participles preceded by an auxiliary verb (e.g., *on a donné* 'we have given') and/or infinitives preceded by a modal verb (e.g., *il veut boire* 'he wants to drink').
- (e) Neither articles nor subject clitic pronouns attain the criterial level of 90% of production in required contexts.

Level 4 –

To credit a child with this level, the child's production needs to show features a, b, c and d of level 3 above, as well as

- (e) the appropriate presence of the target elements in 90% of contexts that require them.

### 3 Participants in the Present Study and Analysis of the Data

Before starting the comprehension task, each child in the 2-year-old group conversed with the experimenter about daycare and home activities, as well as about a picture book. This period of familiarization helped these young children to be more at ease during the comprehension task and allowed us at the same time to collect a sample of spontaneous speech from them.

For this first study, from the sample of thirty 2-year-olds who participated in the V & P comprehension task, we took the first two sets of five children that could be included in each of the following two groups:

1. Group Success (Group S) constituted by five children who succeeded in the comprehension task. These children reached the criterion described earlier for overall items (at least 12/15 correctly identified items), for meaningful homophones (at least 10/12 correctly identified items); and for nonce words (at least 2/3 items correctly identified). The age range of this group was 2;3 – 2;9 (age expressed in years;months), the mean age 2;7, and the SD 2 months and 6 days;
2. Group No Success (Group NoS) included five children who did not successfully complete the task. These children did not attain the criterion of success on the items: They correctly identified fewer than 12/15 total items, fewer than 10/12 homophone items and fewer than 2/3 nonce items. The age range of this group was 2;3 – 2;10, the mean age 2;6, and the SD 2 months and 6 days.

The children in the two groups were presented with the same number of nominal and verbal contexts.

The spontaneous speech of the ten children – transcribed in CHAT format and linked to the videorecordings – was analyzed for the elements present in the pre-nominal and preverbal positions where respectively determiners and subjects are required. These positions were coded for the presence/absence of elements, and elements were then coded as being fillers or WFGM, as well as for appropriateness to the specific context. We also coded for types of verb forms (mostly, indicative present, infinitive and past participle) and listed all the different types of determiners and subjects produced.

## 4 Results

### 4.1 *Relation between Comprehension and Production in Group S*

Table 2 presents the relevant data for Group S: from left to right, the sex and age of each child, the number of total and meaningful items successfully identified, and the production score obtained for articles and for subjects, and in parentheses the number of nouns or verbs on which the production level was based. As the table shows, four out of the five children in this group had a production score at level 4 (the maximum obtainable here) for both articles and subject clitic pronouns, the two grammatical morphemes used contrastively in the comprehension task. The fifth child, the youngest in this group (2;3), reached level 3: his production shared all the features with the other children with the exception of the criterion of 90% of presence in contexts where the morphemes were required. Thus, on the whole, the spontaneous speech of children who successfully completed the comprehension task shows a level of mastery of at least the same level as that suggested by the children's performance on the comprehension task. Indeed, level 3 differs from level 4 only on the attainment of Brown's acquisition criterion. However, the proficiency level tested by the comprehension task shows an understanding of the function of nominal and verbal grammatical morphemes, not the obligatoriness of their presence. Thus production level 3 should be taken to show a similar level of proficiency as that manifested by successful completion of the V & P comprehension task.

#### 4.1.1 *Details on the Spontaneous Production of Grammatical Morphemes in Group S*

Level 4 of grammatical morphemes in spontaneous speech production can be exemplified by the profile of participant 1, which is representative of the profiles of the other three participants who obtained the same score.

For articles, all the elements were WFGM (criterion a); consequently, the elements occurring in prenominal position were different from those occurring in

**Table 2** Group S: Results obtained on the comprehension task and on the spontaneous production of the children who succeeded the comprehension task

Participants	M/F	Age	Comprehension task		Production level	
			All items	Meaningful homophones	Articles	Subj cl pro
P1	F	2;9	14	12	4	4
P2	M	2;9	14	11	4	4
P3	M	2;9	13	12	4	4
P4	M	2;3	13	10	3	3
P5	F	2;8	12	10	4	4

preverbal position (criterion b); the child produced a variety of article types: both definite and indefinite articles, masculine and feminine, as well as singular and plural forms (criterion c). In the relatively small sample of speech there was a large variety of articles such as *la, le, les* (the); *des* (some); *un* (a), and articles were produced in 100% of the contexts where they were required (criterion e of level 4).

Concerning subject clitic pronouns, 88% were WFGM (including acceptable /i/ for /il/ (he) (criterion a); the child produced a variety of subject clitic pronouns as well as a subject NP (criterion c): *je* (I), *il* (he), *elle* (she); subjects occurred before indicative present V-forms but also in a larger construction with an auxiliary between the subject and a past participle (*j'ai fait* 'I have made') (criterion d); and subjects were produced in 94% of the contexts where they were required (criterion e for level 4).

The four children in group S who show this profile might even have, in production, compared to comprehension, a better understanding of how the grammatical morphemes tested in the V & P comprehension task work in their language. To clarify this point a comprehension task testing obligatoriness of use should also be devised and administered to 2-year-old children.

## 4.2 *Relation between Comprehension and Production in Group NoS*

Table 3 presents the same kind of data as Table 2 for the children in Group NoS. As the table shows, in contrast to the children in Group S, none of the five children in this group reached level 4 in the spontaneous production of articles and subject pronouns and only one child reached level 3 for both grammatical morphemes. For articles, two more children scored at level 3; one child reached level 2 (predominance of fillers; differentiation in types between prenominal and preverbal positions) and one child scored at level 1 (the elements produced in the preverbal and prenominal positions were not significantly different from each other). For subject pronouns, in addition to the child who scored at level 3 for both articles and subjects, three children scored at level 2 and one child at level 1.

**Table 3** Group NoS: Results obtained on the comprehension task and on the spontaneous production of the children who did not succeed in the comprehension task

Participants	M/F	Age	Comprehension task		Production level	
			All items	Meaningful homophones	Articles	Subj cl pro
P6	<b>M</b>	<b>2;5</b>	10	8	2	2
P7	<b>F</b>	<b>2;7</b>	9	8	3	2
P8	<b>F</b>	<b>2;3</b>	9	8	1	1
P9	<b>F</b>	<b>2;10</b>	9	7	3	2
P10	<b>M</b>	<b>2;7</b>	7	5	3	3



### 4.3 *Comments on the Results of Spontaneous Production*

The results on the production of articles and subject pronouns are in line with those reported in the literature for French, where articles are reported to be acquired between 2;5 and 3;3 and subject pronouns from 2;7 and later. The analysis of the ten children studied here shows that levels 3 or 4 were attained for articles by children aged 2;3 to 2;10 and for subject clitic pronouns by children aged 2;3 to 2;9, within the range of the earlier studies. Moreover, here also the acquisition of articles seems to occur before that of subjects: eight of the ten children attained level 3 or 4 for articles but only 6 children did so for subjects.

### 4.4 *Comparison between Children in Groups S and NoS on the Level of Production of Grammatical Morphemes in their Spontaneous Speech*

The level of production of articles and subject clitic pronouns of the children in Group S was significantly higher than that of the children in Group NoS. The mean level of Group S was 3.8 (SD = 0.447) and that of Group NoS was 2.4 (SD = 0.894). A t-test showed that the difference between the two groups is statistically significant ( $t = 3.13$ ,  $p < 0.01$ ,  $df = 8$ , one-tailed). This result indicates that children who are shown to have a good comprehension of grammatical morphemes also have a high score of production and, reciprocally, those who do not provide evidence of comprehending the grammatical function of these morphemes also have a lower level of production in spontaneous speech.

## 5 Summary and Discussion

The aim of this study was to provide some data on the relation between the comprehension and production of grammatical morphemes such as articles and subject clitic pronouns in French-acquiring children. To this end, we created two groups of 2-year-olds who had either successfully completed (group S) or not (Group NoS) the comprehension task in the V & P study and analyzed in detail the same grammatical morphemes as they occurred in the same children's spontaneous speech.

For *comprehension*, the children's correct choice in a sufficient number of items (statistically beyond chance level) revealed their ability to interpret the nominal and verbal grammatical contexts contrastively, considered clear evidence of the children's understanding of the nominal and verbal grammatical morphemes involved.

The spontaneous *production* of these same grammatical morphemes was analyzed for the children in the groups S and NoS using a coding system specifically devised for this study. This scoring system, based on previous work on the

development of fillers, allowed assessment on four levels: level 3 presents enough features to consider that the relevant grammatical morphemes are used as appropriately and contrastively as in comprehension, while level 4, the highest level of the system, shows in addition the attainment of Brown's acquisition criterion (appropriate production of the grammatical morpheme in at least 90% of the positions where it is required). Results of the analysis of the production of the ten children showed that six of them attained level 3 or 4 for both articles and subject clitic pronouns, two children attained level 3 only for articles and had lower scores for subject pronouns, while the remaining two children scored at levels 1 or 2 for both.

The distribution of the children over these production scores is related to their results on the comprehension task. All the children in group S showed proficiency in the production of the targeted grammatical morphemes: Four attained the highest score of 4 and one attained level 3 on both articles and subject pronouns. In contrast, none of the children in Group NoS attained the highest level of production, whether for articles or for subject pronouns, and only one attained level 3 on the two morphemes. For the other four children in this group, two attained level 3 but only for articles, while the other scores were at levels 1 or 2. Consequently, the level of production attained by the children in Group NoS was significantly lower than that attained by the children in Group S.

#### *The relation between comprehension and production*

What do these results tell us about the relation between comprehension and production?

Does comprehension precede production?

Given that all the children in Group S have a production score of level 3 or 4, our results do not provide clear evidence that comprehension precedes production; rather, they suggest that good comprehension and good production of grammatical morphemes go hand in hand. It should however be noted that these results offer only a snapshot of the children's abilities at a particular time. Consequently, we do not know whether the children in Group S would have successfully completed the comprehension task before their production scored at level 3 or 4, a possibility that cannot be totally excluded.

Is there evidence that production precedes comprehension?

The results of the children in Group NoS present a mixed picture: As for the two children whose production scored at levels 1 or 2 for both articles and subject clitic pronouns, results indicate that production is not ahead of comprehension but, as for the children in group S, that comprehension and production correspond, here at a low level of understanding. For the child whose production scored at level 3 for both articles and subject pronouns, production appears to be ahead of comprehension. Concerning the two children whose production scored at level 3 for articles but scored at lower levels for subject pronouns, it might appear that the production of articles is ahead of comprehension. However, the comprehension task involves contrastive understanding of the *two* kinds of grammatical morphemes, something that is not involved in the appropriate and diversified use of articles only, so that, in these cases, the priority of production over comprehension cannot be established. These

intermediate cases are nevertheless interesting in that they reveal some issues about how the two modes of functioning are assessed as well as the importance of the joint analysis of production and comprehension for a more comprehensive understanding of the way acquisition proceeds, points that are taken up again below.

For Group S, it might be supposed that the four children whose score was at level 4 for both articles and subject clitic pronouns showed a higher level of proficiency in production than what was revealed by the successful completion of the comprehension task. It should be noted, however, that the V & P comprehension task does not provide information about this feature and thus it could be the case that, if tested appropriately, these children would have manifested understanding of that requirement as well. Thus, although it might seem that production shows a higher level of mastery than that manifested in comprehension, further investigation is needed to clarify whether production precedes comprehension for this particular issue.

Thus, on the whole, the results of the two groups indicate that comprehension and production are closely related: For nine of the ten children studied here, a high level of comprehension corresponded to appropriate and diversified production of grammatical morphemes, while a low level of comprehension corresponded to a low level of production in at least one of the two grammatical morphemes under study.

One of the participants (Participant 10 in Group NoS) does not fit this overall trend. This child, whose production is at level 3 for both articles and subject clitic pronouns, seems to provide a counterexample to the general hypothesis that production is not ahead of comprehension, as he appears to have a higher level of performance in production than in comprehension. And two other participants in Group NoS might appear to be more advanced in production than in comprehension for the production of articles, showing a level 3 of appropriateness and diversification for these morphemes.

Although, as discussed above, these cases call for further research, it should be noted that production and comprehension could not be evaluated with the same degree of detail. While it was possible to assess children's production of grammatical morphemes in a relatively fine-grained way, this was not possible for comprehension. The comprehension task could only be scored dichotomously as pass or fail. This is because, below the criterial number of items, success by chance alone could not be excluded. Thus, either children showed high level understanding of the grammatical function of both morphemes, or they could not be considered to have that understanding. Consequently, it was not possible to determine whether the children who did not reach the criterial number of items might have nevertheless used the immediately preceding syntactic context to attribute object or action meaning to the homophonous or nonce words, without yet having sufficient mastery to generalize their knowledge to the criterial number of items. In the case of Participant 10, however, this seems unlikely as this child correctly identified the lowest number of overall and of meaningful homophonous items in Group NoS (7 and 5, respectively): his case seems a genuine counterexample that only future research on a larger sample can clarify.

*The joint study of production and comprehension in early language acquisition*

The study presented here highlights the relevance of analyzing both production and comprehension, not only to better assess the overall level of acquisition of particular language aspects, but also to gain further insights into the acquisition process.

Cases such as Participant 10, and to a lesser degree Participants 7 and 9, discussed above, reveal the limitations of taking into account only the results of one mode of functioning. On the basis of comprehension alone, these children, having failed the task, were considered to have no understanding of the grammatical morphemes involved. Instead, on the basis of production alone, Participant 10 would have been credited with knowledge of the appropriate and diversified use of both articles and subject clitic pronouns, and the other two participants with having acquired articles and noun phrase structure. Taking into account both comprehension and production results calls instead for a more nuanced approach to these children's knowledge and for further investigation. For example, it would be necessary to check whether other kinds of comprehension tasks would result in better performance, or whether the children's appropriate production reflects a genuine understanding rather than knowledge about surface regularities or heavy dependence on conversational support. In any case, assessment based on only one modality will be interpreted differently in view of the results obtained on the other, while further insights into how these children might go about acquiring the grammatical morphemes under study could be gained.

Another issue for which the analysis of both production and comprehension in the same children would provide interesting data is that of the degree of coincidence between the two modes of functioning. This is assumed to be lower in the language-acquiring child than in the expert language user. In the present study, production and comprehension appear for the most part to be close to each other at both the high and the low end of proficiency. Although these initial results need to be confirmed in a larger study, they nonetheless suggest that even in the early period of language acquisition there might be more coincidence between the two modalities than would have been expected.

*Issues for future research*

As already mentioned, in the present study production could be assessed in greater detail than comprehension. Indeed, in order to guarantee that a child's correct responses were not due to chance, performance on the comprehension task could only be scored as pass or fail. Future research should find ways to provide a more nuanced evaluation of children's performance in the comprehension task. One possibility could be to increase the number of items, and/or the number of pictures to choose from (while keeping the task still manageable for young children), thus allowing the attribution of different scores according to the number and type of items correctly identified beyond the minimum number required. To make performance on comprehension and production more comparable, it would also be useful to introduce items that could check whether the children understand that the presence of grammatical morphemes is necessary within the nominal and verbal phrases.

Moreover, to precisely address the issue of the priority of one mode of functioning compared to the other, longitudinal data would be helpful. At the moment, we know of only one case study in which comprehension and production data on the acquisition of French grammatical morphemes are reported longitudinally (Veneziano, 2017; Veneziano & Parisse, 2018). The study concerned one French-acquiring child who was administered the V & P comprehension task at home on a monthly basis, while the naturally-occurring spontaneous interactions between the child and familiar partners were recorded in hourly sessions. The results of that study showed that the child successfully completed the comprehension task for the first time four months after she attained level 2 in production and two months after the number of WFGM was greater than that of fillers. However, since the coding system for the analysis of the production of grammatical morphemes was not the same as that devised for this study, her level of production for articles and subject clitic pronouns should be reassessed to find out whether level 3 for both articles and subjects was attained before or after the successful completion of the comprehension task. This longitudinal approach would better enable us to determine the developmental relation between the two modalities. Note however, that this approach would not be exempt from problems such as the increasing familiarity with the task items given their successive presentations.

As a final note, it should be pointed out that the results reported here concern the acquisition of French and thus they cannot be generalized cross-linguistically. Languages vary considerably in how they distinguish noun from verb contexts, in particular in relation to the degree to which they rely on nominal and verbal morphology, on the presence of nominal determiners, the obligatory or non-obligatory requirement of subjects (i.e., whether a language is pro-drop or not, e.g., Rizzi, 1982), the use of serial verb constructions or whether a language is agglutinative or not. As a function of such language-specific features, children encounter different configurations that may lead them to pay attention to different cues that impact differently on how they go about learning grammatical morphology and the distinction between nouns and verbs. The complexity of verb morphology in Hebrew makes its acquisition a particularly interesting case in point (e.g., Ashkenazi et al., 2016).

Nonetheless, the present study can provide insights for language acquisition in general. The acquisition of category-specific grammatical morphemes and of the related noun-verb distinction is a process that spans over time and this likely applies to most languages as well as to both production and comprehension. Moreover, since production and comprehension data alone are likely to over- or under-estimate children's knowledge of the relevant features (e.g. Clark & Hecht, 1983), future studies of early language acquisition should integrate information from both modalities as a standard method of analysis in order to better evaluate what children have acquired and still need to acquire, as well as to understand how they have acquired this knowledge.

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