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CHAPTER 2

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In this chapter, we examine the properties of filler syllables as transition forms in the development of referring expressions. In particular, we hypothesize that fillers are precursors of referring expressions. We focus on the distribution, the phonological form and the referential function of fillers in prenominal and/or preverbal positions, in comparison to others forms in these positions. Results show that first, the substantial presence of fillers does not lie in lexical factors, and that they are used in combination with other prelexical forms. Second, their variable realizations are not due to a phonological deficit, and they also exhibit paradigmatic patterning with the use of specific consonants. Fillers also share some of the functional characteristics of grammatical units, since their distribution and presence suggest that they play a role in the construction of the verbal and nominal categories. Moreover, in the preverbal position, children's use of fillers varies according to the topic of the utterance. In conclusion, filler syllables exhibit the formal and functional characteristics of a transitional category and an adult-like paradigm of referring expressions at the same time, and should be studied as such.

Keywords: filler syllables, referential expressions, prenominal position, preverbal position, first grammatical units, phonological form, distributional factors, referential function

1 Introduction

One of the main goals of this book is to capture the gradual emergence of the first referring expressions, from both a formal and functional perspective. The aim of the present chapter is to examine the status of filler syllables as transition forms in the development of referring expressions in early French. In particular, we hypothesize that fillers are precursors of referring expressions in spite of their non-adult realizations at the observed period. Before examining this hypothesis in several sets of data from French-speaking children, we first review the literature on fillers and different perspectives concerning their role in early acquisition.

1.1 Fillers in the context of the development of referring expressions

Referring can be done using different morphosyntactic forms, such as pronouns or noun phrases introduced by a determiner. Children's acquisition of the different referring expressions is not an all-or-none process, i.e., acquired vs. not acquired, but rather a gradual one. For instance, while some semantic-referential distinctions between definite and indefinite determiners are acquired early, such as specific vs. non-specific reference or labeling vs. deictic reference, other functions like the anaphoric function of definite determiners are acquired later on (Hickmann, 2003; Karmiloff-Smith, 1979; Maratsos, 1976).

Along with the various uses of referring expressions, children need to acquire their formal properties, i.e., their phonological shapes and their distribution. In child productions, positions where referring expressions are expected may be occupied differently. They may be empty, filled with adult-like forms, contains only nouns, or contain forms called "filler syllables" (Peters & Menn, 1993), which are variable, "unglossable syllables". Although adult-like morphemes become predominant as mean length of utterance (MLU) increases, all of these different forms may coexist at some point in development. To capture the gradual development of referring expressions, we need to address the question of these early forms, which share distributional characteristics with referring expressions.

Some authors do not take fillers into account when studying the acquisition of referring expressions because they do not deem them to have any grammatical value. For instance, Coene (2006) sees fillers as elements produced in place of morphological units that do not carry any of their morphosyntactic features such as number, gender and person.

In other cases, filler syllables were not taken into consideration, either because they were disregarded during the transcription process, or because they were excluded without dealing with their potential morphological status (Hughes & Allen, 2013; Pine & Lieven, 1997; Schaeffer & Matthewson, 2005; Valian, Solt & Stewart, 2009, *inter alia*). The exclusion of filler syllables could be construed to mean that their occurrence in children's data is rare. However, several studies have shown that fillers represent between

10% and 60% of prenominal and/or preverbal forms, at least in French (Bassano, Maillochon & Bottet, 2008), English (Peters & Menn, 1993), and Greek (Christofidou & Kappa, 1998).

In the cases where they have been studied, filler syllables have been observed through the study of the development of grammatical morphemes (Bassano, 2000; François, François, Sourdot & Sabeau-Jouannet, 1977; Grégoire, 1937; Kilani-Schoch & Dressler, 2000; López Ornat, 2001; Peters, 2001; Peters & Menn, 1993; Veneziano & Sinclair, 2000, *inter alia*). Their exact nature is subject to discussion, as suggested by their various labels: "article-like elements" or "schwa-forms" (Karmiloff-Smith, 1979), "underspecified positional place holders" (Kilani-Schoch & Dressler, 2000), "Prefixed Additional Elements" (Veneziano & Sinclair, 2000), and "fillers or "filler syllables" (Bassano, 2000; Peters, 2001; Peters & Menn, 1993).

Several studies have focused on the variability of filler syllables. Peters (2001) showed that their shapes vary: fillers can be realized as a single vowel, a single consonant, or a syllable composed of different vowels and consonants. Fillers are also subject to individual variation: they are not observed in all children (López Ornat, 2003) and they may be used in different proportions by different children (Peters & Menn, 1993). The onset and frequency of filler use may also differ according to the language being acquired (Veneziano, 2014).

The uncertainty surrounding the phenomenon of fillers has raised several questions and has led to numerous studies focusing either on the development

of referring expressions or on the acquisition of morphosyntax. These studies have approached fillers from different angles. For some, fillers are seen as a homogeneous category, regardless of the child's linguistic level. An example is Bottari, Cipriani, and Pilosi (1993/94) who view fillers as "monosyllabic place holders" that possess the same syntactic function as grammatical morphemes, but lack morphological and phonological status. For other authors (Gerken, Landau & Remez, 1990), function morphemes are fully encoded by children, but their non-adult realizations, such as omissions or fillers, depend on performance or "speech production limitations". This latter perspective would imply that from the moment phonology is acquired, adult forms – or at least approximated versions of adult forms without morphological marking – should be expected in prenominal and preverbal positions. We can wonder whether the phonological forms of fillers are indeed phonological approximations of the target morphemes or whether their forms may reflect their transitory properties as well.

Other authors (Kilani-Schoch & Dressler, 2000; Lleó, 2001; Peters, 2001; Peters & Menn, 1993; Veneziano & Sinclair, 2000, *inter alia*) consider fillers as multidimensional elements that are evolving from a "pre-morphological" to a (quasi-)morphological phase (Dressler & Karpf, 1995). Initially, fillers are mostly vocalic elements and are thought to have purely phono-prosodic properties, depending on the language's sound and rhythmic regularities. During the second phase, known as "proto-morphological", filler syllables keep on being produced for prosodic purposes but also start to share some

characteristics with adult grammatical morphemes, from the standpoint of both their formal and their functional dimension. According to Veneziano (*inter alia*, 2003), the transition between the pre- and proto-morphological phases is reflected in the distribution and forms of fillers. In the productions of two French-speaking children, this author found that during the second phase, fillers differed as to whether they were present or absent, and in form, depending on whether they were in front of nouns or in front of verbs. This ongoing specialization was regarded as a sign of the construction of noun and verb proto-categories[1]. In this view, the construction of grammatical paradigms, such as pronouns and determiners, and the use of differentiated fillers reflect the construction of clearly contrasted categories such as verbs and nouns.

In the final period, called "morphological", the phonological form of filler syllables is close enough to the adult targets to be clearly identified. Their distribution matches the distribution of adult forms and they seem to fulfill the same functions.

In the following section, we focus on studies that have attempted to understand the construction of preverbal and prenominal morphemes, and in particular, on those providing either positional and distributional, or semantic and pragmatic, explanations to the development of pronouns, determiners, and their filler counterparts.

[1] See, among others, Tomasello (2003) or Veneziano (2003) for a discussion about the construction of adult syntactic categories.

1.2 Construction of the pronoun and determiner categories

Contrary to other Romance languages, in adult French, both prenominal and preverbal positions are usually occupied by a morpheme. With the exception of a few attributive uses, determiners are mandatory for common nouns both in referential and in non-referential uses. Finite verbs are generally preceded by a pronoun, even in dislocations, i.e., a clitic subject and/or object pronoun[2], a strong demonstrative or another pronoun such as an interrogative or indefinite pronoun. Cases where a noun phrase acting as the subject directly precedes a verb are much less frequent (Hickmann, 2003). In short, in their experience of adult language, children are generally frequently exposed to the presence of a short grammatical morpheme preceding the lexeme.

1.2.1 Positional and distributional factors in the emergence of pronouns and determiners

For some authors who take a prosodic approach (Demuth, 2001; Demuth & Tremblay, 2008), early pronouns and determiners are treated as prosodic elements that fill a specific language-dependent rhythmic pattern. In this approach, early function morphemes and fillers are treated together as a

[2] We cannot include a linguistic discussion on the status of clitic subjects, considered either as full pronouns and/or as affixes. For a discussion on French language acquisition, see De Cat (2005) and Culbertson and Legendre (2008), among others.

"phonological class" of elements that share segmental (specific consonants, reduced vowels) and prosodic (unstressed syllables, part of a prosodic foot) properties, and as cues to segmentation and labeling (Gerken, 1996; Gerken et al., 1990). The presence of these early prelexical[3] forms is not part of morphological development but is related to the acquisition of prosodic units, and their production depends on the length of the lexeme's phonological phrase. Before children acquire full grammatical morphemes, prelexical forms are thought to appear as part of the phonological word, together with the lexeme. In this case, they are in a weak prosodic position, and are prosodified with the subsequent lexeme, which occupies a strong prosodic position. Demuth and Tremblay (2008) postulate that a prelexical form and the lexeme that follows are first prosodified as a binary foot, and so prelexical forms would be prosodified at a higher level (such as the prosodic word). This approach might explain why fillers and generally determiners usually occur before one- and three-syllable lexemes (Demuth & Tremblay, 2008), although it does not explain all occurrences (Le Mené, 2017; Le Mené & Yamaguchi, 2017). In this view, prelexical forms are analyzed in terms of their absence or presence for satisfying the prosodic constraints of the language in question, but it does not explain why fillers occur instead of determiners or pronouns, or account for the variety of phonetic realizations of prelexical forms. Moreover, is there a difference in the production of adult

[3] For convenience sake, prenominal and preverbal positions together will be referred to as "prelexical positions" even though these positions do not concern lexemes other than verbs or nouns.

grammatical morphemes vs. that of fillers? And if their presence is dependent on the syllabic length of the lexeme that follows, then shouldn't we expect specific lexemes to be systematically associated with prelexical forms?

Such accounts have been proposed in the literature on grammatical morpheme development. For instance, in addition to the progression from a large significant effect to a more marginal effect of the rhythm factor – mentioned above in the discussion of filler phases – Taelman, Durieux, and Gillis (2009) also observed that distributional factors can influence filler frequency. According to their study, the presence of schwa-like fillers would have less to do with prenominal position than with the words preceding the noun phrase. These "anchor words", which are highly associated to determiners in adult discourse, would confirm the significance of a distributional pattern such as the lexical and syntactic frames described by Pine and Lieven (1997). In their study, carried out with a usage-based approach to the acquisition of syntactic categories, Pine and Lieven examined the degree of dependency between lexemes and prelexical forms. With a focus on definite and indefinite noun phrases, the authors looked at whether children's first productions were characterized by a high degree of determiner variation ("overlap") in the prenominal slot. Their results showed that when a noun was repeated, the proportion of overlap was very low: the children tended to use particular nouns with particular prenominal forms. These frozen phrases could demonstrate children's limited ability to reuse determiners across lexical contexts. In that study, however, the authors took into account

adult morphemes only and did not include fillers and omissions in their analysis. But if a wider perspective is taken including both adult forms (determiners and pronouns) and protoforms (omissions[4] and fillers), as suggested by Salazar Orvig et al. (2013), then would we expect the same kind of frozen uses, or would we rather expect variation phenomena to be more frequent than repetition of the same noun phrases?

1.2.2 Semantic and pragmatic factors in the emergence of pronouns and determiners

Formal, distributional factors are not regarded in all studies as the only factors involved in pronoun and determiner emergence. Other studies have focused instead on the semantic and pragmatic dimensions.

Regarding prenominal position, authors like Bassano et al. (2008) and Nashawati (2010) found that determiners were used in specific semantic contexts: they were more frequent preceding nouns referring to concrete inanimate entities than preceding nouns referring to animate entities or abstract inanimate entities. In addition, Bassano et al. (2008) found that omissions were mainly produced with animates, and that proto-morphological fillers tended to be produced in contrast to determiners and omissions preceding abstract inanimate nouns.

[4] The word "omission" is frequently used when a form is absent in a location where it is expected. The use of this term may imply a process from the child's viewpoint, which is why we use the more neutral expression "no form" in this chapter.

In a more discourse-pragmatic perspective, authors like Rozendaal & Baker (2008) and Salazar Orvig et al. (2013), have shown that morphology and pragmatics do not develop separately but jointly, and that most of the referential values of determiners are acquired early on, around the age of three years. In contrast, other authors (e.g., Karmiloff-Smith, 1979) argue that the plurifunctionality of determiners is not fully acquired until a late period, between the ages of 8 and 12 years, with forms being acquired in an unifunctional way.

We should point out that only a few studies on determiners have also focused on the potential pragmatic dimension of filler syllables. For these studies, two different approaches can be mentioned: some authors (Feldman & Menn, 2003; Kilani-Schoch & Dressler, 2000) addressed the issue of utterance function (in a proto-illocutionary mode), while other authors like Salazar Orvig et al. (2008, 2013), Morgenstern (2009), and Le Mené (2017) focused on the referential dimension. By analyzing the referents' discursive statuses, these authors showed that fillers are not produced randomly but compete with omissions at first and then later, with determiners, in relevant referential oppositions. According to the authors, these contrasts could be the reflection of the child's early sensitivity to the relation between grammatical morphemes and functions.

Regarding the preverbal position, studies on the development of pronouns in French-speaking children suggest that first-, second-, and third-person pronouns develop differently. Some authors have shown that first-person

pronouns take an adult-like form before second- and third-person pronouns do (Ricard, Girouard & Gouin Decarie, 1999). Others have noted that third-person pronouns are produced in an adult-like way before first- and second-person pronouns (Belzil, 2007; Hamann, Rizzi & Frauenfelder, 1996). Differences in the observed developmental patterns may derive from the methods used to collect and/or analyze the data, but they lead to different types of explanations. To account for the earlier use of first-person pronouns, as Ricard et al. (1999) observed, two kinds of hypotheses have been set forth. A linguistic hypothesis, the "semantic complexity" hypothesis (Clark, 1978), states that first-person pronouns are acquired earlier because they only refer to one discourse participant, the speaker, whereas other pronouns refer to different discourse participants or entities. Cognitive hypotheses, such as the "speaker bias" hypothesis (Deutsch & Pechman, 1978; Huxley, 1970), the "theory of mind" hypothesis (Bates, 1990; Dale & Crain-Thoreson, 1993) and the "visual-perspective-taking" hypothesis (Girouard, Ricard & Gouain Decarie, 1997; Loveland, 1984; Ricard et al., 1999), state that first-person pronouns are acquired earlier because the speaker (the child him/herself) is the reference point and is thus immediately accessible. To accurately use second- or third-person pronouns, children need to acquire the capacity to share others' mental or visual perspectives. To account for an earlier use of second- or third-person pronouns, as observed by Hamann, Rizzi, and Frauenfelder (1996), Hamman (2002), and Belzil (2007), Belzil (2007) suggested that first-person pronouns do not need to be produced (or at least

not in an adult-like way) because the referent is a given participant in the situation of communication and can be easily retrieved. This hypothesis is related to the discourse-pragmatic approaches proposed to explain the presence or absence of subjects in children's utterances (see Allen, Hughes & Skarabela, 2015). None of these studies on the differentiated development of first-, second-, and third-person pronouns mention the production of "filler syllables". Only Hamann (2002) specifies that "clearly identifiable pro-forms" such as [l] or [i] for *il* ('he') and [j] for *je* ('I'), seen as "phonetic approximations", were counted as clitics, that schwas or [e] for *je* ('I') were not counted as clitics, and that some "unidentifiable" pro-forms were excluded. However, if fillers were taken into account as a specific category of analysis to refer to the speaker, to the interlocutor or to discourse entities, would the same kind of observations and conclusion be made? Should we expect the same distribution of fillers independently of the targeted referent or can we expect, as observed in prenominal position in terms of referential vs. non-referential contexts (see Le Mené, 2017), the proportion of filler syllables to vary according to the referent?

1.3 Corpora used and outline of this chapter

In this chapter, we address some of the issues discussed above and raised in research on filler syllables. We do so by studying forms in prelexical positions

in a large corpus of cross-sectional data and longitudinal follow-ups from French-speaking children[5], as described in Table 1. The longitudinal data is divided into two subcorpora and concerns six children: the "longitudinal A" corpus [6] contains 32 sessions and includes six children, while the "longitudinal B" corpus [7] contains many more sessions with two of the children in the "longitudinal A" corpus. The cross-sectional[8] and longitudinal corpora were recorded during naturally-occurring dialogues of the children at home with their mother, father, siblings, or the observer.

Type	No. of children	Age range	MLU range	Total no. of sessions
Longitudinal A	6	1;7-2;6	1.36-3.35	32
Longitudinal B	2	1;0-4;3	1.00-7.26	37
Cross-sectional	17	2-2;4	1.30-2.96	30

Table 1. Data used

	MLU range	Age range
MLU Group 1	1.32-2.00	1;7-2;5
MLU Group 2	2.02-2.50	1;10-2;11
MLU Group 3	2.52-3.37	1;11-3;5

[5] This corpus was compiled from several existing sets of data; Anaé and Madeleine from the Paris Corpus, the Childcare Corpus, the Nashawati Corpus, the Salazar Orvig corpus and the Yamaguchi Corpus. All corpora are described in Appendix I.
[6] See Appendix I: Anaé and Madeleine from the Paris corpus; Nashawati Corpus, Salazar Orvig Corpus and Yamaguchi Corpus.
[7] See Appendix I: this corpus contained more sessions from two children, Adrien (from the Yamaguchi corpus) and Madeleine (from the Paris corpus).
[8] See Appendix 1: the Childcare corpus

Table 2. Data groups for quantitative analyses

For the quantitative analyses, all children included in the cross-sectional and longitudinal A corpora were divided into three groups, as detailed in Table 2. The significance of formal and functional phenomena was assessed through various statistical analyses detailed in each section.

In Section 2, we compare the presence and absence of forms in prelexical position in the whole corpus of longitudinal and cross-sectional data, in order to assess the weight of fillers in children's productions throughout development, in both the prenominal and preverbal positions. In Sections 3 and 4, we focus on the formal and functional properties of filler syllables to better understand their properties. Section 3 examines the formal properties of fillers, from the phonological and distributional angles. If filler syllables were part of the next lexeme, then for phono-prosodic or distributional reasons we would expect them to share phonological properties with that lexeme (Section 3.1). If fillers emerge in a specific pattern along with the lexeme that follows, be it a construction frame or a prosodic unit, then a regular co-occurrence of fillers with specific lexemes can be expected, as tested in Section 3.2. To further explore this issue, we focused on preverbal positions in Section 4, adopting a functional approach. More specifically, fluctuation in the proportion of fillers is analyzed according to the type of referent. We conclude by discussing our results in terms of the development of referring expressions.

2 Prenominal and preverbal forms at the onset of language production

2.1 Identifying the forms

Our study focuses on the possibility that fillers are precursors of referring expressions. Considering that fillers emerge from positional constraints (Veneziano & Sinclair, 2000), we identified them using strict positional criteria and disregarded segmental and functional criteria. As for formal criteria, we took a conservative position: any form produced in a non-adult realization in a position where a pronoun or a determiner was expected was counted as a filler, excluding uninterpretable forms (see below). In the literature, "phonological / phonetic approximations" of target morphemes are often seen as adult forms. This raises several issues: first, what counts as a "phonological approximation"? If we consider the determiner *le* ('the') produced in an adult fashion [lə], is [ə] an approximation, since the vowel corresponds to the target vowel? Or do we consider that the missing consonant is too big of a difference from the target form? And what about [tə], which has a consonant, but it is not the target one? Deciding *a priori* what a phonological approximation is would have led us into a circular reasoning process, due to our phonological analysis in Subsection 3.1.

Consequently, we chose to retain, as adult forms, only those forms that do correspond phonetically to adult forms. Another issue brought up by the concept of "phonological approximation" concerns their nature. This term may imply that while the morphological, distributional, and functional features of the target forms are present, the phonological component is still in the process of acquisition. In order to be sure of this, we need to analyze the child's whole phonological system, to see whether phonology is indeed in the process of acquisition. To answer this question in Subsection 3.1, we need to identify these forms specifically, frequently labeled as "phonological approximations" in order to compare them with the child's phonological system.

This conservative position was adopted for all of our data, so as to stay as close as possible to the description of forms and avoid the risk of overinterpreting the data. Our first step was to identify the forms. All prelexical positions were coded. Similar codings were adopted for (proto)-nouns and (proto-)verbs. In order to get the clearest picture of the distribution of forms, cases where the grammatical morpheme was not mandatory were excluded, i.e., all potentially licensed cases of a null determiner in proper nouns and quasi-proper nouns (*maman*, *'mommy'*, *papa, 'daddy'*) as well as some non-referential uses for nouns, and all infinitive and imperative forms of verbs. Three common categories (no forms, fillers, and target grammatical

forms) were defined; the preverbal position needed two additional categories (amalgams and other adult forms).

No-form: No-forms occurred when proto-nouns or proto-verbs were preceded neither by a filler nor by a lexical or grammatical morpheme, as in Examples 1 and 2, respectively.

(1) Clément, 2;3, MLU 2.96[9]

Cle [e sa? vwaty ?]
'et ça? voiture ?' 'and that? car?'

(2) Madeleine, 1;11, MLU 2.62

Mad [fɛjœ̃isi]
'fait rien ici' 'does nothing here'

Note that a no-form preceding a verb does not necessarily correspond to a null subject (or zero pronoun). For instance, in Example 3 the verb is followed by an overt referring expression, which is the subject of the utterance.[10]

(3) Elodie, 2;2, MLU 2.02

Elo [pati ***la dame***]
'pa(r)tie ***la dame***' 'gone ***the lady***'

[9] Example captions indicate the name of the child, his/her age (years; months) and the Mean Length of Utterance (MLU) for the cited session. The first three letters of the child's first name are given in lowercase (e.g. Cle for Clément), Fat stands for father and Obs for observer. When the children's utterances are transcribed phonetically (between square brackets [ ]), the interpretation in French is given in inverted commas. An approximate English translation is also given between inverted commas. Braces indicate uncertain transcriptions or alternative interpretations. {X} stands for uninterpretable or inaudible segments. In the interpretations and translations, 'F' stands for a filler syllable, '/' stands for a pause, '§' marks overlapping segments.

[10] This could be regarded as a proto-dislocation, with the clitic resumptive subject truncated (De Cat, 2007; Klein, Jullien & Fox, Chapter 6, this volume).

Filler: A filler was defined as an additional vowel or syllable preceding a proto-noun or a proto-verb, as in Examples 4 and 5, respectively.

(4) Margaux, 2;3, MLU 2.62

Mar	[***ə***ʃœʃ]	
	'***F*** singe'[11]	'***F*** monkey'

(5) Daniel, 2;0, MLU 2.02

Dan	[***a***tu]	
	'***F*** tou(rne)'	'***F*** turns'

Amalgam: In some cases, as shown by Kilani and Dressler (2000), a sequence formed by a vowel and a verb can be interpreted either as filler + verb or as no-form + verb. This phenomenon concerns verbs such as *être* ('be') or *avoir* ('have') used as full verbs, as in Example 6, or as auxiliaries.

(6) Madeleine, 1;9, MLU 2.0

Mad	[***e***pœ]	
	'***A*** peu(r)'[12]	'***A*** afraid'

Such phenomena correspond to the evolution of the preverbal position, as shown by Veneziano and Clark (2016). However, because our focus was the presence vs. absence of a precursor of a referring expression, we needed to be cautious in our interpretation. Therefore, we preferred not to count them either as fillers or no-forms. A conservative position was adopted, which is why they were set apart from both fillers and no-forms. We called them amalgams.[13]

[11] In the French and English interpretations of the children's utterances 'F' stands for a filler syllable.
[12] In the French and English interpretations of the children's utterances 'A' stands for a potential amalgam.
[13] However, for practical reasons, in the other chapters of this book amalgams were included in the filler category.

Target form: Target forms occurred when adult-like forms preceded nouns and verbs. All determiners (definite, indefinite, possessive, and demonstrative determiners) were included in this single category. In preverbal position, target forms included both clitic personal pronouns (all persons), as in Example 7, and clitic demonstrative pronoun in the *c'est* construction, as in Example 8. Full left and right dislocations were included in this category when the clitic resumptive pronoun clearly preceded the verb, as in Example 9.

(7) Julien, 2;3, MLU 1.92

Jul	[***ɛle*** kase]	
	'***elle*** est cassée'	'***it*** is broken'

(8) Clément, 2;3, MLU 2.28

Clé	[***se*** de flœʁ?] ((Clé essaye de mettre une pièce du puzzle))	((Clé tries to put a piece into the puzzle))
	'***c'est*** des fleurs?'	'***is it*** flowers?'

(9) Pauline, 2;3, MLU 2.52

Pau	[me mwa ***ʒ***vulɛde zjø]	
	'mais moi ***j(e)*** voulais des yeux'	'but me ***I*** wanted eyes'

Other adult form: Other adult forms were identified when a proto-verb was preceded by a lexical form[14], as in Example 10, or a strong pronoun (personal, demonstrative, possessive, indefinite, interrogative or relative), as in Example 11.

(10) Daniel, 2;3, MLU 2.5

Dan	[***ɔto*** egaje]	
	'***auto*** est garée'	'***car*** is parked'

[14] This lexical form was analyzed for the prenominal position also.

(11) Rémi, 2;3, MLU 1.32

Rém [***sa***maʁʃ ***sa***maʃʔ]
‘***ça*** marche ça marche?’ ‘***it*** works ***it*** works?’

In some cases, the prelexical forms could not be transcribed or interpreted, as in [tate dadade defoɕe] where only the proto-verb [defoɕe] (*‘défoncé/er’ – ‘smashed/to smash’*) could be interpreted. In other cases, it was difficult to assign an interpretation to the form preceding the filler or the amalgam, as in [si:m adone mo] (*‘XX a donné moi’ – ‘XX gave me’*). All these cases were coded as uncertain (UNCT).

Inter-coder agreement was computed for 10% of the corpus. The score was 95.81 and Cohen’s kappa was 0.95. Distribution differences across the MLU groups were computed using a Kruskal-Wallis test.

2.2 Results

Tables 3 and 4 present the distribution of prenominal and preverbal forms, respectively. In each table, “total %” indicates the percentage of each type of form (Target forms, Fillers, No-forms, etc) for the total number of occurrences in all sessions for each MLU group. For each type of form the minimum and the maximum percentages indicate the range of values for calculating the distribution of forms in each session.

	Target forms			Fillers			No-forms			Uncertain	N=
	Total %	Range of %		Total %	Range of %		Total %	Range of %		Total %	
		Min	Max		Min	Max		Min	Max		
All MLU groups	39.4			30.2			29.1			1.3	3411
MLU GR 1	17.3	0.0	50.0	38.8	5.6	75.0	42.5	11.1	66.0	1.4	856
MLU GR 2	34.5	8.5	100.0	33.0	0.0	70.7	30.9	0.0	53.6	1.6	1135
MLU GR 3	56.6	20.0	87.5	22.9	0.0	56.9	19.6	5.3	55.6	1.0	1420

Table 3. Distribution (in percentage) of forms in the prenominal position (total for all sessions, and maximum and minimum values), by MLU group

	Other adult forms			Target forms			Fillers			Amalgams			No-forms			Uncertain	N=
	Total %	Range of %		Total %	Range of %		Total %	Range of %		Total %	Range of %		Total %	Range of %		Total %	
		Min	Max		Min	Max		Min	Max		Min	Max		Min	Max		
All MLU groups	6.7			42.7			22.1			12.8			15.0			0.7	4053
MLU GR 1	4.1	0.0	23.5	27.2	0.0	75.0	26.9	4.4	64.9	17.0	0.0	61.5	24.2	0.0	66.7	0.7	607
MLU GR 2	6.9	0.0	50.0	35.6	2.3	86.7	26.3	0.0	69.4	14.3	0.0	28.0	16.2	0.0	46.2	0.7	1214
MLU GR 3	7.2	0.0	20.8	50.8	15.2	96.0	18.6	0.0	43.5	10.9	0.0	22.0	11.2	0.0	23.4	0.8	2232

Table 4. Distribution (in percentage) of forms in the preverbal positions (total for all sessions, and maximum and minimum values), by MLU group

Tables 3 and 4 show that target forms increased as MLU increased, both in the prenominal position (Kruskal-Wallis rank sum for the three MLU groups; χ^2 :22.42, df:2 p<.001) and in the preverbal position (Kruskal-Wallis rank sum for the three MLU groups; χ^2 :12.28, df:2 p=.002). Moreover, the comparison of target forms in the preverbal and prenominal positions did not yield a significant difference (Wilcoxon, U: 658, df:1, p=.1272). In contrast, the percentage of no-forms decreased, both in the prenominal position (Kruskal-Wallis rank sum for the three MLU groups; χ^2 :14.99, df:2 p<.001) and in the preverbal position (Kruskal-Wallis rank sum for the three MLU groups; χ^2 :8.78, df:2 p=.012). In the preverbal position, there was no significant difference for other adult forms. Individual differences (see min and max in Table 4) and category heterogeneity probably account for this lack of significance.

Notably, according to Tables 3 and 4, fillers occurred in 30% of the prenominal positions and 22% of the preverbal positions. Moreover, individual data showed that all children used fillers during the period observed - generally in both positions, but only in the prenominal position for three children.

Fillers paint a complex picture, however, since there was no significant difference between the MLU groups, whether for the prenominal position (Kruskal-Wallis rank sum test for the three MLU groups, p=.106 and p=.258

for MLU2 vs. MLU3) or for the preverbal position (Kruskal-Wallis rank sum test for the three MLU groups, p=.114 and p=.706 for MLU2 vs. MLU3). However, considering previous studies on filler use in French (Bassano, 2015) for the prenominal position, a linear development is not expected: fillers can be expected to first describe a rising curve and to then decline when adult forms begin to increase. One explanation for the variability observed in our cross-sectional data, notwithstanding the consistency in terms of age, could be that not all children are necessarily at the same point in their morphological development. If this were the case, we should observe rising then falling curves in the longitudinal corpus, although not necessarily at the same ages. Let us look at two different cases (from the six longitudinal follow-ups). Figure 1 presents the distributions of adult targets and fillers, by age for the two children.

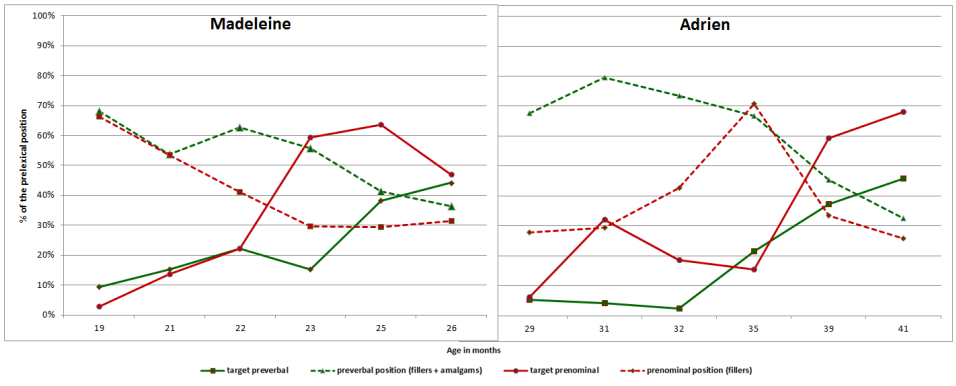

Figure 1. Distribution (in percentage) of target forms and fillers in the prenominal and preverbal positions by age in months for two longitudinal follow-ups.

Figure 1 shows that the two children exhibited different patterns even though their curves for target forms are rising and their curves for fillers (and amalgams) exhibit complementary shapes. Moreover, prenominal and preverbal fillers do not follow similar developmental curves for the same child: they do not reach the same values, do not have the same shapes, and their peaks and dips do not occur at the same time. For Adrien, preverbal fillers were already numerous at the beginning of the observations, continued to increase until he was 31 months old, and then began to decrease when adult target forms appeared. He also has a neat inverted V curve for prenominal fillers (with a peak at 35 months). Madeleine showed the opposite pattern with a clearly declining curve for prenominal fillers, suggesting that these fillers had reached their maximum frequency at the study onset (when she was 19 months old) and could do nothing but decrease in the months that followed. For her, however, preverbal fillers declined more slowly than prenominal ones.

2.3 Discussion and tentative conclusion

A first glimpse at the distribution of forms in the prelexical position suggests that the children in our study were in the midst of a transitional period, with a rather large number of target forms and also no-forms and fillers in both the prenominal and the preverbal position. This first result confirms the finding

that such a transition is prevalent in the acquisition of French and needs to be taken into account when considering the emergence of referring expressions. Moreover, the fact that we studied 59 sessions suggests that fillers are a pervasive phenomenon in French for the prenominal and preverbal positions alike. At the same time, this phenomenon was not homogenous here, whether on categorical grounds or on individual ones.

Two parallel issues now need to be investigated. We need not only to further examine the conditions under which fillers are used or not used, by focusing on their formal and distributional features but also we need to understand their fluctuations. Certainly, individual variability can be seen as a relevant factor but the individual sessions differed not only in chronological terms but also with respect to the activities carried out and the discourse topics discussed[15]. It is therefore necessary to look at other factors accounting for this heterogeneity. Is this heterogeneity due to lexical factors (are fillers lexically specific) or do they vary according to functional factors, in which case they would be proto-grammatical in nature?

[15] de Weck, Hassan, Heurdier, Klein & Salagnac (Chapter 9, this volume) and Vinel, Salazar Orvig, de Weck, Nashawati & Rahmati (Chapter 10, this volume) address the impact of activity and speech genre on the use of referring expressions. Da Silva-Genest, Marcos, Salazar Orvig, Caët & Heurdier (Chapter 3, this volume) consider the influence of the subject position on the use of weak forms (including fillers) versus strong forms.

3 Formal and distributional properties of filler syllables

This section examines the formal properties of fillers, by focusing first on their phonological properties and then on their distributional features.

3.1 Specific phonological properties of fillers

Fillers may vary in form from a single vowel or a single consonant to a syllable composed of various vowels and consonants. So far, however, variations in the form of fillers have only been studied in terms of their vocalic content (e.g. Veneziano, 2003; Veneziano & Sinclair, 2000).

The present study focuses on a less-studied phonological aspect of filler syllables: consonant content. While several studies of fillers have dealt with consonants (Feldman & Menn, 2003; Peters & Menn, 1993; Taelman et al., 2008, *inter alia*), few have compared them to the acquisition path of consonants in lexical words by the same children, which is the case in the present study. In lexemes, vowels are often acquired earlier and are more stable earlier than are consonants (Rose & Wauquier-Gravelines, 2007). By contrast, the various stages of consonantal development need to be studied longitudinally over many months and even years. The study of consonants realized in filler syllables can be compared to that of consonants realized in lexemes, in terms of age of acquisition but also in terms of developmental

path. This could provide phonological insight into the nature of fillers. In line with the various hypotheses about the nature of fillers detailed in the introduction of this chapter, we will try to answer three main questions about consonant realizations.

The first question follows from the "performance view" (Gerken et al., 1990) stating that non-adult realizations of grammatical morphemes may be due to production limitations. If this is the case, then these limitations could show up in two different ways. First, if a given consonant is not produced by the child due to articulatory reasons, then it should be absent from all words, including lexical words. Second – in the light of the literature on phonological acquisition – realizations of unacquired phonemes should be phonologically close to the target phonemes (for French acquisition, see dos Santos, 2007; Rose & Wauquier-Gravelines, 2007; Yamaguchi, 2012, *inter alia*). Thus, we ask whether consonants appear in fillers at the same time as they occur in lexemes, and whether non-target-like consonants are a phonological approximation of the target morpheme.

The second question is in line with the "prosodic view" (Demuth, 2001; Gerken, 1994) whereby filler syllables are produced for prosodic reasons. In this view, the question of form of fillers is often ignored; emphasis is instead placed on whether fillers are absent or present, irrespective of their segmental content.

However, language acquisition studies focusing on interactions between prosody and segments, such as Rose (2000) or Goad (1997, 2001), suggest that the segmental content of a weak prosodic position is often a copy of the segmental content of the strong prosodic position within the same prosodic domain. For instance, in CVCV words, where the last syllable occupies the head of a foot according to these authors, we generally observe regressive consonant harmony (hereafter abbreviated CH), as illustrated in Example 12.

(12) Clara, 1;03, from Rose (2000)

[bɑbuː]	'debout' /dəbu/ `standing'
[bapæː]	'Gaspard' /gaspɑʁ/ (name)

If fillers are prosodified with the subsequent lexeme as belonging to a weaker position, then shouldn't they be subject to CH with the subsequent consonant? That is the focus of our second question.

The third question takes the "developmental" view (Bassano et al., 2008; Kilani-Schoch & Dressler, 2000; Lleó, 2001; Peters & Menn, 1993; Salazar Orvig et al., 2013; Veneziano & Sinclair, 2000, *inter alia*) according to which fillers evolve from prosodic entities into precursors of grammatical units. In this view, fillers are not full grammatical units, and their form should reflect this incompleteness. Phonologically, this would translate into underspecified phonological features, which would be realized as unmarked segmental content (Avery & Rice, 1989). If so, are consonants in fillers realized as unmarked segments?

Below, we begin by presenting the method we used to answer these three questions. Then we analyze the different types of consonants that appear in prenominal and preverbal forms. At the end of this subsection, the predictions are discussed in the light of the results obtained.

3.1.1 Method

We analyzed consonant realizations in filler syllables located in strict prenominal and preverbal slots for the extended sessions of Madeleine and Adrien ("longitudinal B" corpus, see section 1.3). Overall, 1405 filler consonants were analyzed, using the PHON[16] software (Rose & MacWhinney, 2014). We compared these realizations with the consonant realizations in lexical words, for the same children and the same sessions, presented in Yamaguchi (2012).

In the present study, we looked in particular at the syllable onset position and we only selected filler syllables composed of a consonant-vowel form (hereafter abbreviated CV). We confined our analyses to productions where the expected grammatical words begin with /l/ and /ʒ/, for two reasons. First, these are frequent consonants in French grammatical words: in the definite masculine singular and feminine singular articles *le, la* (both translated as *'the'*) and in the first-person singular subject pronoun *je* (*'I'*). Second, these

[16] The PHON software allows alignment and phonetic transcription of media-based data, and facilitates the phonological analysis of transcriptions. For more information, see https://www.phon.ca/phontrac

consonants are very different phonologically: they belong to different natural classes, and they do not share many distinctive features. Moreover, they are not acquired at the same time in lexical words (Yamaguchi, 2012). The expected grammatical words were identified on the basis of situational and referential cues, and based on morphological agreement with the following lexeme.[17]

3.1.2 Results

3.1.2.1 Accurate realizations of consonants and consonant harmonies

First, we classified the realization of consonants in the prelexical position as expected consonants, CHs and other consonants. Figure 2 and Figure 3 present the results for /l/ grammatical words and Figure 4 and Figure 5 present the results for the expected *je* (*'I'*), where capital Z stands for [ʒ].

[17] Examples of identification are provided in Section 4 for *je* (*'I'*).

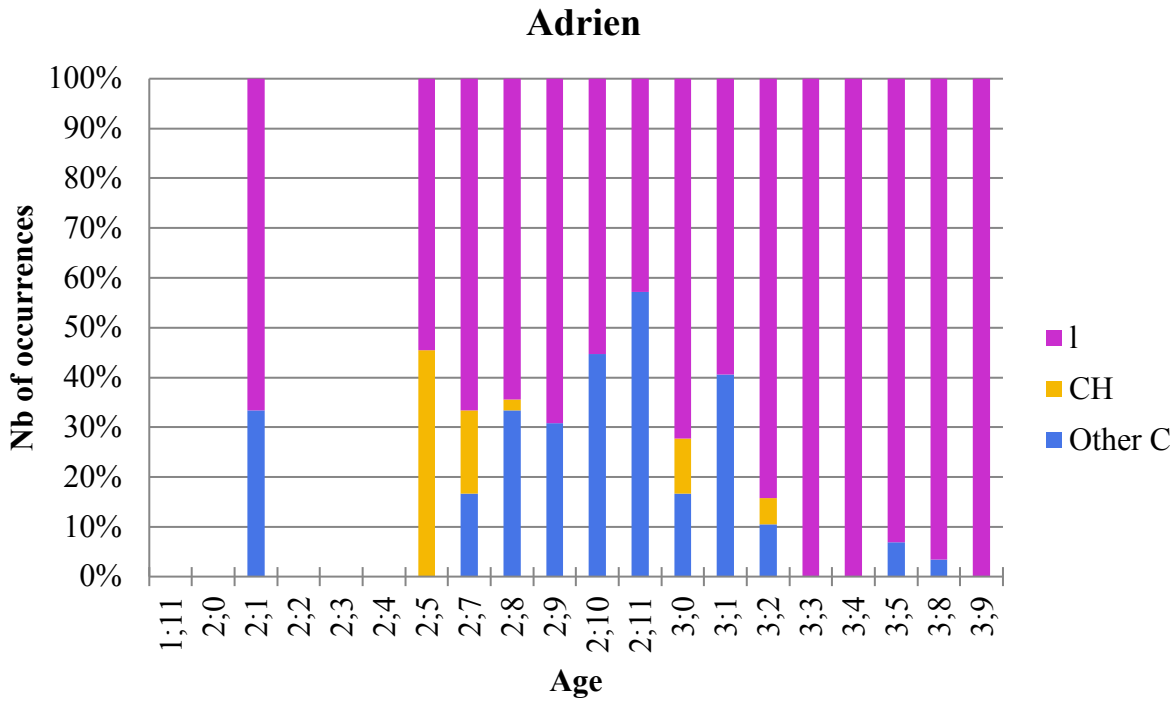

Figure 2. Types of consonants in prenominal forms where *le* or *la* (*'the'*) was expected (Adrien).

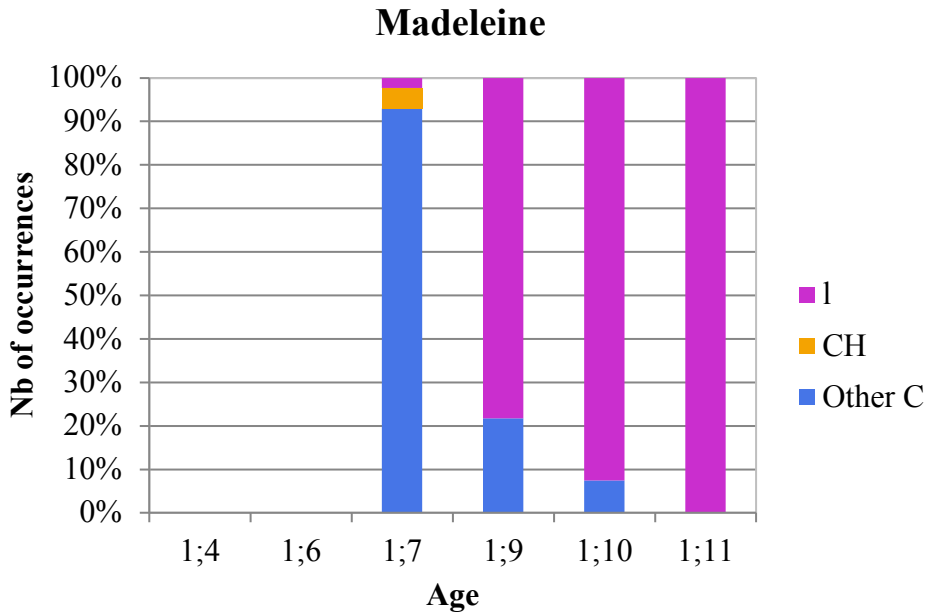

Figure 3. Types of consonants in prenominal forms where *le* or *la* (*'the'*) was expected (Madeleine).

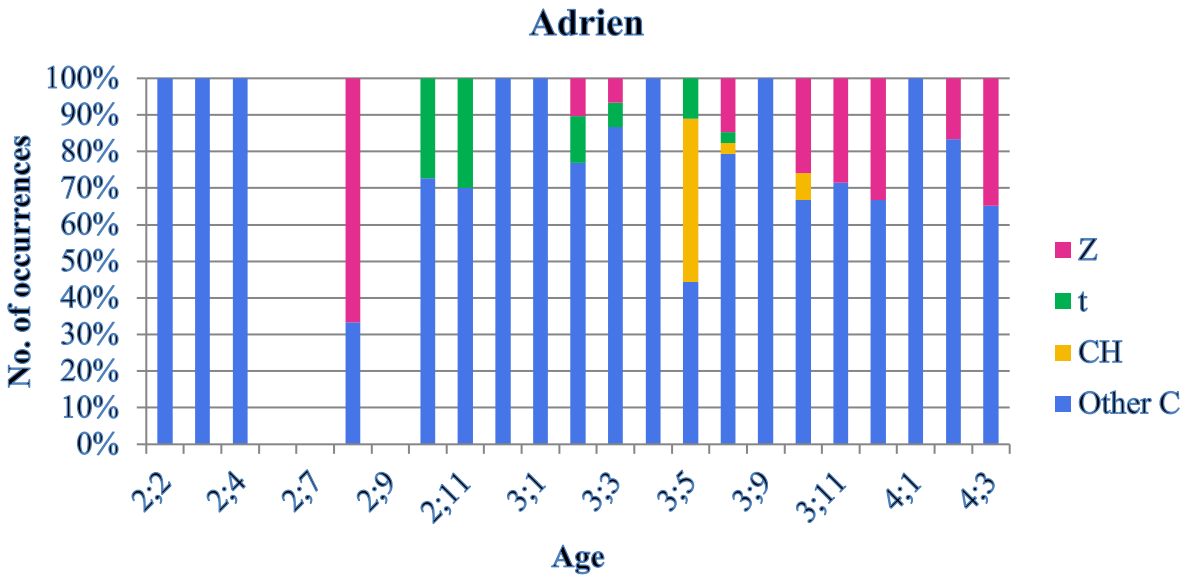

Figure 4. Types of consonants in preverbal forms where *je* (*'I'*) was expected (Adrien).

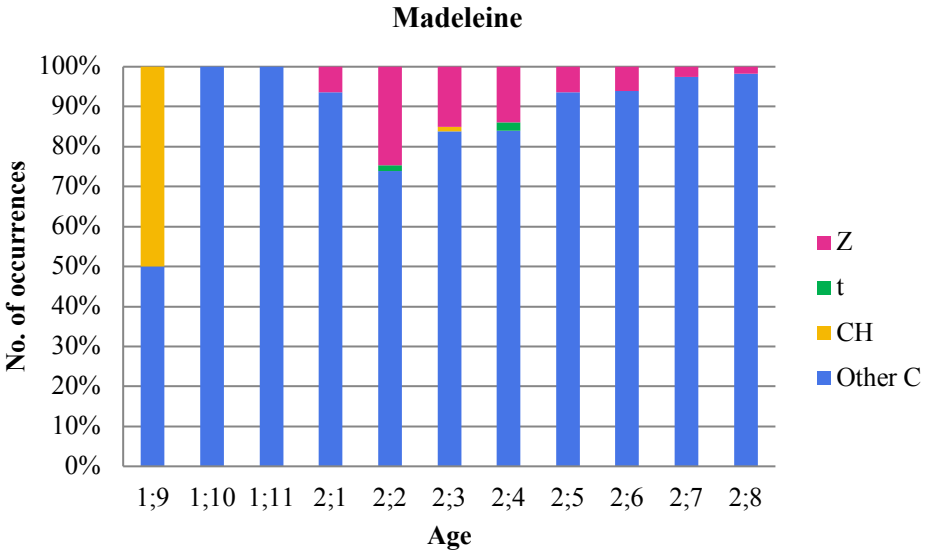

Figure 5. Types of consonants in preverbal forms where *je* (*'I'*) was expected (Madeleine).

As seen in the above figures, CH represents a small proportion of the consonant realizations by both children, and is used in both the preverbal and the prenominal positions. Both of these patterns contradict the prosodic hypothesis.

As for the expected realizations, in the prenominal positions, [l]-forms represented a large proportion of the realizations, in both fillers and adult forms. However, between 1;11 and 3;9, 20% of Adrien's forms began with other consonants, and between 1;4 and 1;11, 31% of Madeleine's forms began with other consonants. In the preverbal position, the numbers differed from those in the prenominal position. Most preverbal forms began with a consonant other than the expected /ʒ/, as Figure 4 and Figure 5 show. These results nevertheless support the syntactic hypothesis: most of the consonants in CV fillers were not realized as expected, which might be explained by a phonological deficit. To verify this hypothesis, we looked at the unexpected realizations of consonants in fillers.

3.1.2.2 Inaccurate realizations of consonants in lexemes and in prelexical forms

Even if a child has a phonological deficit, consonant realization is not random. In lexemes, before a consonant is produced accurately, it is realized in a phonologically approximate version (for instance, see dos Santos, 2007; Rose & Wauquier-Gravelines, 2007; Yamaguchi, 2012 for French).

As shown in Table 5, Adrien's realizations of /l/ at the syllabic onset of lexemes consisted mostly of the consonant [j] and CHs, out of the 29

inaccurate realizations of /l/. Only two occurrences of [t] and one of [d] were realized when /l/ was targeted in lexemes. Madeleine had only four inaccurate realizations of /l/, with 2 occurences of [d], one of [j] and one CH. We compared these realizations with unexpected consonant realizations in fillers. In the following tables, each kind of unexpected realization is shown as a percentage of the total number of unexpected realizations **(**indicated in the last column)**.**

	Realizations	[j] %	[n] %	[t] %	[d] %	CH %	N
A	Lexemes	44	-	7	3	44	29
	Fillers	6.25	2.5	17.5	61.25	12.5	79
M	Lexemes	25	-	-	50	25	4
	Fillers	6	6	80	4	4	50

Table 5. Percentages of unexpected realizations of /l/ in lexical words and in prenominal fillers, across all sessions

In prenominal fillers where /l/ was expected, consonant realizations consisted mostly of the oral stops [t] and [d] for both children, adding up to about 80% of the unexpected consonant occurrences (Example 13). These consonants cannot be considered as phonological approximations of /l/, since they share few phonological feature values in French. Even though they share place of articulation, /t/ and /d/ are obstruents while /l/ is a sonorant, and they are stops while /l/ is continuous and produced with a lateral airflow. From a phonological point of view, realizing [t] or [d] for /l/ in French is surprising. Consonants that are phonologically closer to /l/ – like [j], which differs from /l/ only by the [±lateral] feature, or [n], which shares 60% of its feature values

with /l/ – accounted for only a small proportion of the unexpected realizations in prenominal filler syllables.

(13) Madeleine, 1;7, MLU 1.85

Mad [ta kle]
`F clé' 'F key'

Let us now turn to the unexpected realizations of the consonant /ʒ/. Since /ʒ/ is acquired late, we found a substantial proportion of non--[ʒ] realizations. Instead of collapsing all the sessions together, we divided them into two phases in which particular patterns of consonant realizations emerged, as shown in Table 6.

		Coronal fricatives %	[d] %	[v] %	[t] %	[k] %	[n] %	[j] %	[l] %	[w] %	[m] %	[ʁ] %	CH %	N
A, 2;2-3;11	Lexemes	**46.5**	20.5	1.1	1.1			29.5					1.1	88
	Fillers	**12**	42.7	0.4	6.4	0.8	0.4	23.9		0.4			3.2	197
A, 4;0-4;3	Lexemes	**42.4**	18.2									6		44
	Fillers	**49**	37.3	2				9.8	2					51
M, 1;7-1;11	Lexemes	**88.9**									11.1			9
	Fillers	**3.6**	3.6				35.7	7.1	42.8		3.6		3.6%	28
M, 2;1-2;8	Lexemes													0
	Fillers	**91.1**	2.8		1.2	0.6	0.6	2.2	0.3					322

Table 6. Percentage of unexpected realizations of /ʒ/ in lexical words and in preverbal fillers

In lexical words, the most frequent unexpected realization of /ʒ/ for both children was a coronal fricative, which shares many phonological features with /ʒ/ (manner and place). These are shown in boldface in Table 6. Coronal fricatives (in our data: [z], [ʃ], [ç], [ɕ], [dʒ], [tʃ], [tɕ], [s], [dz]) are a phonological approximation of /ʒ/, which is a complex consonant bearing marked feature values. The realization of a lexical /ʒ/ via a coronal fricative was stable during the different time periods.

In contrast, for preverbal positions where /ʒ/ was expected, different patterns emerged over time. In Adrien's case, the first unexpected realization of /ʒ/ was [d], followed by the [j] realization. These realizations are different from the lexical words at the same age, where /ʒ/ is realized by a close consonant nearly 50% of the time. During a second phase, starting at age 4;0 for Adrien, consonant realizations followed the same pattern in preverbal fillers and in lexemes, with a coronal fricative being produced in both cases. Madeleine exhibited a different developing pattern of unexpected realizations, beginning with a substantial proportion of the sonorants [l] and [n], which share few phonological features with /ʒ/, before evolving to a majority of coronal fricatives from the age of 2;1. Both children began by non-approximations of target consonants and then used coronal fricatives.

These results suggest that, at least at an early phase, the consonants found in CV fillers are not approximations of the target consonants /l/ and /ʒ/. In

prenominal positions where *le* or *la* (*'the'*) was expected, the consonants consisted mostly of [t, d], which are phonologically far from /l/, and in preverbal positions where *je*, and maybe *tu* (*'you'*) was expected, [j, d, l, n] were produced the most.

3.1.3 Discussion and tentative conclusion

We discuss these results in the light of the questions asked in Section 3.1. For the first question, we can say that the non-adult realizations were not phonologically close to the expected consonant in prelexical slots, invalidating the performance view. Moreover, although /l/ was realized accurately in all lexemes at 2;4 for Adrien and at 1;6 for Madeleine, it was not realized in expected prenominal forms. The same holds true for /ʒ/: Madeleine's [ʒ] realizations, for example, are a minor part of her preverbal forms, even though she had acquired /ʒ/ several months earlier in lexemes. These results rule out the performance hypothesis: if grammatical morphemes are not realized in an adult fashion, it is not due to a production limitation. Moreover, these results question the concept of phonological approximation of filler syllables: if children are able to produce accurate target consonants in lexemes, then why are target consonants still approximated in prelexical forms? This phonological approximation suggests that prelexical forms are not fully stable, or not fully specified phonologically, and thus are still transitory forms. The possible influence of prosodically weak positions on the

phonological form of prelexical forms remains to be investigated in further studies.

Our second question asked whether the realization of fillers would depend on the subsequent lexeme, as prosodic approaches suggest. In this view, fillers are an extension of the next lexeme, because they are part of the same prosodic unit. This tight relation should be visible via consonant harmony. However, CH represented a small proportion of the prelexical forms, and most of the consonants in filler syllables had variable realizations. This variability cannot be explained in terms of the form of the specific targeted morpheme, nor in terms of the segmental content of the next lexeme.

Finally, a particular set of consonants occurred frequently in the early prelexical fillers. These consonants, namely [t, d, j, n], share a coronal place of articulation, which is considered to be the phonologically unmarked place of articulation (Avery & Rice, 1989; Paradis & Prunet, 1991), especially in French (Yamaguchi, 2012). As for manner of articulation, we found two stops, which are the unmarked counterparts of obstruents, and [j] and [n], which are unmarked compared to the other sonorant /l/. We suggest that these unmarked consonants are phonologically underspecified, in accordance with the developmental view. While our study focused on consonants, it should be noted that earlier studies on vowels confirmed the developmental perspective for fillers. For instance, in Veneziano's (2003) study, at an early phase fillers consisted of the vowels /a, e, ə/, which are unmarked as well (Jakobson,

1941). In the developmental view, the transitional status of filler syllables may be reflected as an underspecified consonant and vowel realization: they are not realized in the same way as are phonological segments in lexical sounds, but they are not fully specified phonologically either.

3.2 Are fillers lexically specific?

Fillers were realized with a specific set of consonants, which cannot be explained by a phonological deficit or by the subsequent lexeme's initial consonant. However, fillers could still be interpreted as lexically specific. One might consider, following usage-based studies (Pine, Freudenthal, Krajewski & Gobet, 2013; Pine & Lieven 1997, for determiners), that in the first phases of development, children do not possess adult-like syntactic categories, and prenominal and preverbal forms are not productively combined with lexical items but belong to various construction frames. Therefore, forms in the prelexical position can be expected to be systematically associated to specific lexical types. This would still be consistent with the lexical and prosodic hypotheses.

Since each session included in our corpus did not necessarily involve the same lexical types (lemmas), we wondered whether the irregular results observed in Section 2.3 could be explained by a formulaic association between fillers (or target forms) and lexical items.

3.2.1 Coding

In order to investigate this issue, we used the cross-sectional corpus and the longitudinal A corpus described in Table 1 and we considered three possible types of occurrence[18] for each lexical item used in the same session. In the **single occurrence** case, the lexical item occurred only once in the session. In the **same grouping** case, the lexical item was associated with one or more forms belonging to the same group, i.e. adult forms (determiners for nouns or clitic pronouns for verbs), no-forms, or fillers. Example 14 shows a verb associated only with fillers throughout the session.

(14) Adrien, 2;11, MLU 2.45

Fat	non non non casse pas Adrien on va les remettre dedans, non !	'no no no don't break Adrien we're going to put them inside, don't !'
Adr	[***ti***kaɛ] [***e***kaɛ] [***e***kas ***e***kas] 'F casse F casse F casse F casse'	'F break F break F break F break'

In the **fluctuation** case, the lemma was associated with at least two different categories of prenominal or preverbal forms, such as a no-form and a filler, or an adult form and a filler, etc. Example 15 illustrates a case of fluctuation between three categories.

(15) Alice2, 2;3, MLU 2.44

Alice and her mother are building a castle

Ace28	[mwa / fɛʁ ʃato // is / isi] 'moi / faire château // {X} / ici'	'me / make castle / {X} / here'

[18] This is not a classical overlap analysis like the ones conducted by Pine and Lieven (1997). Cases classified under *same grouping* can still be overlapping.

(…)

Ace30	[mwa ɔsi mwa sisi fɛ **ɛ̃**ʃato] 'moi aussi moi aussi/celui-ci fais un château'	'me too me too/this one make a castle'

(…)

Ace32	[vwala / mɔʃenononо {xx} / wej // mwa ʒvœ kujyʁ **ɛ**ʃato la /// vala / jek tu se fini / sə ʃato] 'voilà / {XX XXXX XX} / {XX} // moi je veux co(nstr)uire F château là /// voilà / {XX} tout c'est fini / ***ce*** château'	'there / {{XX XXXX XX} / {XX} // I want to build F castle there /// {XX} all it's done / this castle'

3.2.2 Results

Table 7 presents the distribution in percentages of the noun and verb lemmas according to the degree of variation of forms in the prelexical position. In the table, "total %" indicates the percentage of each type of occurrence for the total number of occurrences of all sessions. For each type of occurrence the minimum and maximum percentages indicate the range of values when calculating the distribution of lemmas in each session..

	Single occurrence			Same grouping			Fluctuation			N
	Total %	Range of %		Total %	Range of %		Total %	Range of %		
		Min	Max		Min	Max		Min	Max	
Noun lemmas	50.5	20.0	83.3	22.8	0.0	66.7	26.6	0.0	60.0	1292
Verb lemmas	46.1	0.0	80.0	21.3	0.0	100.0	32.6	0.0	75.0	848

Table 7. Distribution (in percentage) of the noun and verb lemmas according to the types of occurrences in the prelexical position (total for all sessions, and maximum and minimum values)

The results are quite similar for nouns and verbs. If we exclude the fact that between 46% and 50% of the lemmas occurred only once per session[19], Table 7 shows that when proto-verbs or proto-nouns occurred more than once in a session, the children did not necessarily use them with the same category of prelexical forms. There was no significant difference between the same grouping and fluctuation cases.

For both nouns and verbs, fluctuation was mildly negatively correlated to the frequency of adult forms (ρs: -0.3579, p=.00538 for nouns, and ρs:-0.3639, p=.0046 for verbs). Even though the correlation was not very strong, this confirms a developmental trend: the more children use target forms, the more stabilized their use of prenominal and preverbal forms.

Another question must be answered here: Were fillers involved more often when a lemma was used with different prenominal forms (fluctuation) than when it was used with the same kind of form (same grouping)? In Table 8 we present, for the prenominal and preverbal positions, the lemmas presenting fluctuation and the lemmas occurring with the same kind of prelexical form, either a target form, a no-form, or a filler (same grouping). This last group of lemmas was divided into two groups: cases involving fillers and cases involving forms other than fillers, either adult forms or no-forms (no fillers).

	Fluctuation	Same grouping	N

[19] Salazar Orvig et al. (2013) showed that most nouns are used only once in a session. In accordance with discursive continuity, children use other devices to refer to the same entities in subsequent utterances.

	Including fillers %	Not including fillers %	Total Fluctuation %	Fillers %	Adult forms %	No-forms %	Total Same grouping %	
Noun lemmas	70.93	29.07	53.83	22.71	51.8	25.42	46.17	639
Verb lemmas	62.68	37.32	60.39	22.10	45.30	32.60	39.61	457

Table 8. Distribution (in percentage) of noun and verb lemmas associated (or not) to fillers, according to whether or not fluctuation was present in the prenominal and preverbal positions

Table 8 shows that fluctuation involved a high percentage of fillers. In contrast, the absence of fluctuation mostly involved target forms and a few no-forms. The absence of fluctuation was generally associated with systematic uses of adult forms (which could be different target forms, insofar as the absence of fluctuation does not correspond to the absence of overlap) whereas the presence of fillers clearly pointed to a transitional process during which the children tried combining different forms with the lexical items. At the same time, the fact that the same grouping case was not the dominant case and that fillers were mainly involved in fluctuation further suggests that they are not lexically specific. Other factors seem to be just as likely to affect the way prelexical positions are filled by children.

3.3 Tentative conclusion

The results presented in this section paint a rather complex picture of the emergence of grammatical referring expressions in the prenominal and preverbal positions. The results reported in Section 2 exhibited considerable

heterogeneity in the proportions of fillers (both with respect to no-forms and with respect to adult forms) that were not correlated with the children's linguistic development. One possible explanation could lie in individual styles (Peters & Menn, 1993). However, this factor alone cannot account for the fact that the evolution from null forms to adult forms followed an irregular curve. Note that the results of this section showed that fillers were more often than not associated with fluctuation. Not only were they not lexically specific but their presence cannot be fully explained by formal factors (lexical items or syllabic structures). Moreover, the children's non-adult realization of filler syllables was neither due to a phonological deficit nor to consonant harmony with the following lexeme. In fact, the analysis of the consonants in fillers showed that their realization was different from that of consonants in lexemes, and that their underspecification suggests a transitional status[20].

4 Functional dimensions of filler syllables

A final question needs to be addressed: If fillers are a transitional phenomenon, do they have functional properties? Can referential features

[20] In order to have a more complete picture of these uses, it would be necessary to compare the distributional properties of fillers with those of determiners and pronouns in the input. Even though Marcos, Salazar Orvig, da Silva-Genest & Heurdier (Chapter 7, this volume) partially address this issue, a specific study should be devoted to it.

explain fluctuation? In this section, we explore a first aspect of possible functional/pragmatic values.[21] Are fillers preferentially used in certain referential contexts? This question has already been discussed for the prenominal position. For instance, the study by Salazar Orvig et al. (2013) on the acquisition of definite and indefinite articles showed that when indefinite determiners are not yet fully acquired, children tend to produce more fillers or omissions than definite determiners in contexts where indefinites would be expected (particularly in non-referential contexts). By analyzing distributional and functional factors together, Le Mené (2017) and Le Mené and Yamaguchi (2017) also found that fillers and omissions were more frequent in non-referential contexts than in referential ones and, simultaneously, that the first adult forms were more frequent in referential contexts. More specifically, the authors showed that definite articles and fillers containing consonants appeared more often than indefinite articles and fillers containing vowels for referential and particular discourse objects. These initial contrasted uses suggest that referential features may influence not only the choice of adult morphemes but also the way children make use of transitional forms such as filler syllables. In the current study, we tried to answer the same question by focusing this time on the preverbal position. If fillers are precursors of grammatical units, as we suggest, fillers in the

[21] da Silva-Genest et al. (Chapter 3, this volume) look more thoroughly at the attentional and discursive status of the entities referred to when fillers are used.

preverbal position could be precursors of personal subject pronouns and as such, may vary according to the topic of the utterance.

This new analysis was conducted on the cross-sectional corpus and the longitudinal A corpus of 60 sessions presented in Tables 1 and 2. Considering that in adult language, the topic of the utterance has a high probability of being the subject and thus to be in preverbal position, we identified the topic (discourse participants such as speaker or addressee, or discourse entities) of the utterances. However, we were faced with a methodological problem, since, as emerging devices, fillers are indeterminate with respect to the type of target pronoun. In order to identify the topic of the utterance, we relied on cues other than the form of the preverbal unit. Three main criteria were thus taken into account, as illustrated below with reference to the self: children's actions or gestures in context, as in Example 16, previous mention of the referent, as in Example 17 and parents' reactions to the child's utterances, as in Example 18.

(16) Madeleine, 1;10, MLU 2.1

Madeleine is standing up with a coffee cup from her tea set in her hands.

Mad	[ipɔt]	
	'F porte'	'F carry'

(17) Madeleine, 1;10, MLU 2.1

Madeleine is showing her tiger headband to the observer.

Obs	tu mets ***tes oreilles*** ?	'will you put your ears on?'
Mad	[jə me ***lezozɛj***]	
	'F mets les oreilles'	'F put the ears on'

(18) Madeleine, 1;10, MLU 2.1

Madeleine starts climbing the stairs.

Mad	[əʒɛʒe le løo]	
	'F chercher l'est là/haut'	'F go get, it's upstairs'
Mad	[***ə***ʒɛʒe]	
	'F che(r)cher'	'F go get'
Obs	tu vas ***le*** chercher ?	'are you going to go get it?'

Following Benveniste (1966), we distinguished four categories of referents: SELF, ADDRESSEE, WE (self and addressee), and DISCOURSE ENTITIES. In some cases, the preverbal form of the utterance was categorized as non-referential. In other cases, we could not identify a specific referent or determine whether or not the use was referential. The latter cases were excluded from this new analysis, which explains the differences between the counts in Section 2 and the present section.

Figure 6 illustrates the percentages of the different types of forms observed in preverbal position (no-form, amalgam, filler, clitic pronoun which corresponds to target form in other sections, and other adult forms), for each of the four categories identified.

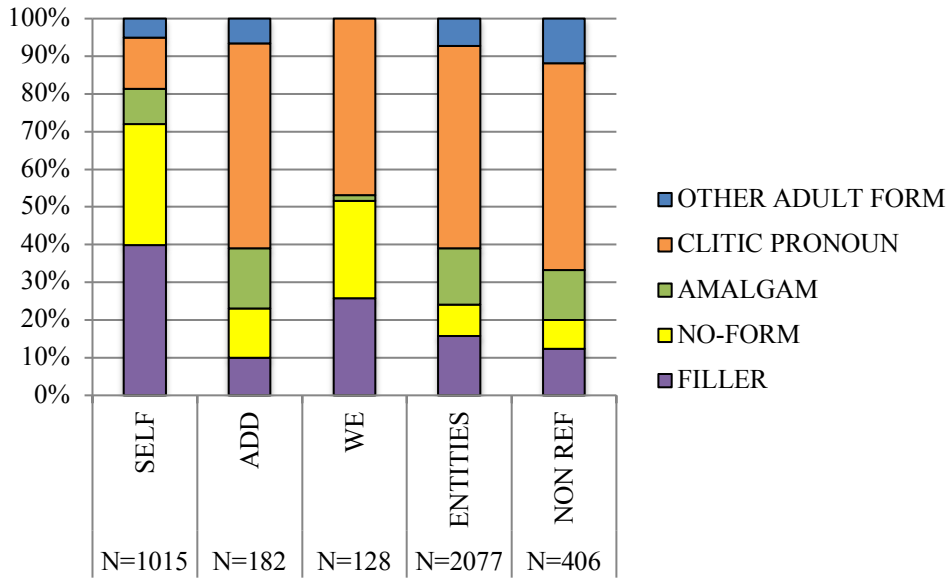

Figure 6. Distribution (in percentage) of the different types of forms in preverbal position, by type of referent.

Figure 6 shows that the percentages of the different forms varied across the types of referent. In reference to the self, the children mainly used fillers (40%) or no-forms (32%). In reference to both the self and the addressee, although fillers and no-forms were also frequent (26% each), clitic pronouns represented 47% of the occurrences. In all other cases (reference to the addressee, discourse entities, or non-referential cases), clitic pronouns represented 54%-55% of the occurrences, and the percentages of the other forms varied between 7% and 16%.

Most utterances focused on the self or on entities. References to the self and references to entities exhibit a contrasted distribution of forms. For instance, clitic pronouns were significantly less frequent in self-references (14%) than

in entities-references (54%) (Kruskal Wallis test: X^2=31.18, p<.001). Fillers and no-forms were significantly more frequent when they referred to the self (40% and 32% respectively), than when they referred to a discourse entity (16% and 8% respectively; Kruskal-Wallis for fillers, X^2=8.31, p=.004; Kruskal-Wallis for no-forms, X^2=22.69, p<.001).

In order to confirm these results, generalized mixed models for these three categories were run, considering MLU and reference to entities and self as fixed factors, and children and sessions as random factors. The model with the best fit for each preverbal form was obtained by comparing models using likelihood ratio tests, fixed factors were excluded by backwards elimination of non-significant effects.

Fixed Effects	Est*.	S.E.	Z	*p*	Random Effects	Var.	S.D.	*C*-Value[22]
Clitic Pronouns								0.821
Intercept	-3. 1232	0.6635	-4.707	< .001	Session	0.3497	0.5913	
Self	-2.0287	0.1127	-17.998	< .001	Child	0.8679	0.9316	
MLU	1.6012	0.2666	6.006	< .001				
Fillers								0.788
Intercept	-1.3748	0.6234	-2.205	.0274	Session	0.3230	0.5683	
Self	1.2546	0.0929	13.505	< .001	Child	0.6769	0.8228	
MLU	-0.5486	0.2527	-2.171	.0300				
No-form								0.766
Intercept	-0.3812	0.5349	-0.713	.476	Session	0.2741	0.5235	
Entities	-0.4936	0.1430	-3.452	< .001	Child	0.1392	0.3731	

[22] The models were assessed using C statistics, which indicates whether the predicted binomial outcome is better than chance. Hosmer and Lemeshow (2000) considered that *C*-values below .5 indicated a model that is not better than chance whereas *C*-values above .7 are reasonable and above .8 are strong.

Self	1.1355	0.1389	8.173	< .001
MLU	-0.6836	0.2159	-3.167	< .001

*Est.: Estimate; S.E.: Standard Error; Var.: Variance; S.D.: Standard Deviation.
Number of observations: 3803, Grouping factors: Sessions: 59, Children: 23

Table 9. Regression tables for Clitic Pronouns, Fillers and NO-FORM in pre-verbal position

The three best-fitting models presented in Table 9 confirmed that the type of referent was a relevant factor that accounted for the contrasted use of fillers, clitic pronouns, and no-forms.

The distribution of fillers was thus referent-dependent and may precede the use of different personal pronouns. One can wonder, however, if fillers were used with verbs that were used specifically for the referent SELF. In fact, although we showed in Section 3.2 that fillers occurred with verbs that could also be used with other categories of prelexical forms, the lemmas themselves could be "referent-dependent" (see Budwig & Wiley, 1995).

The next qualitative analysis thus dealt with verbs that were produced, during the same session, both in utterances where the topic was the child herself and in utterances where the topic was an entity. This enabled us to single out the functional referential factor as potentially explaining the differences observed in Figure 6. This selection narrowed the analysis down to 14 children, 25 observations, and 658 verbal utterances, which, combined with variation among the children, did not allow us to perform statistical analyses.

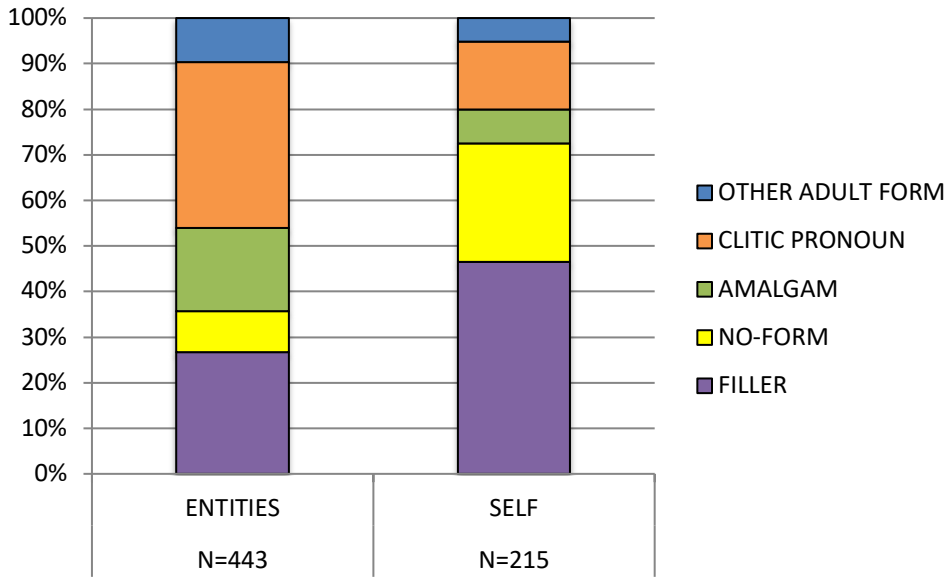

Figure 7. Distribution (in percentage) of the different types of forms in the preverbal position, by type of referent, for verbs produced both in utterances referring to the self and in ones referring to entities in the same session.

Figure 7 illustrates the percentages of the different forms observed in the preverbal position when the child referred to her/himself or to entities with the same verb within a given session. In reference to the self, for verbal lexemes that were also used in reference to entities in the same session, fillers represented 47% of the forms produced in the preverbal position. In reference to entities, fillers represented 27% of the forms produced in the preverbal position. The same discrepancy showed up when we compared the cases where a no-form was observed: the percentage of cases where the referent was not verbalized was greater in reference to the self (26%) than in reference to entities (9%). However, the opposite pattern was observed for the production of clitic pronouns and other adult forms: when the children referred to entities, they produced more of these forms than when they

referred to themselves. Examples 19 to 22 illustrate the case of two children who, within the same session, used the same verb in reference to an entity with a clitic pronoun, and in reference to the self with a filler.

(19) Madeleine, 2;1, MLU 2.8

Madeleine is trying to put the observer's coat on an armchair.

Mad	[***i*** tɔ̃b]	
	'i(l) tombe'	'it's falling'

(20) Madeleine, 2;1, MLU 2.8

Madeleine is telling the observer about her recent fall down the stairs.

Mad	[***le*** tɔ̃be dɔ̃ lekalje]	
	'**F** ai/est tombée dans l'escalier'	'F fell down the stairs'

(21) Anaé, 2;3, MLU 3.05

Anaé is reading a story about Little Brown Bear with her mother.

Ana	[usəbœ̃ ***i*** vø pa sa pupe]	
	'Ours / Brun i(l) veut pas sa poupée'	'Brown / Bear doesn't want his doll'

(22) Anaé, 2;3, MLU 3.05

Anaé is asking her mother for a cookie.

Ana	[pu ***ɛ*** vø ***øk*** sukɛt mamɑ]	
	'yy **F** veux F chouquette maman'	'F want F cookie Mummy'

Overall, this data shows that the children's use of fillers varied according to the topic of the utterance, which suggests that fillers, at this stage in child development, may already be precursor forms of various different personal pronouns. The large number of filler syllables observed in utterances referring to the self is in fact specific to self-reference. In the children's productions, reference to the self seems to be underspecified, possibly because the self is a given participant that is highly accessible in the situation (see Hughes &

Allen, 2006, and da Silva-Genest et al., Chapter 3, this volume, for analyses of the interaction between reference and givenness when children use fillers).

5 Discussion and conclusion

The aim of this chapter was to examine the status of filler syllables in the development of referring expressions. We hypothesized that, contrary to acquisition studies that have disregarded these forms, fillers are precursors of referring expressions in spite of their non-adult realizations at the observed period. Our examination of filler syllables and their use in children's data provided insight into the properties they share with adult referring expressions.

As our first study showed (Section 2), fillers represented nearly a quarter of all occurrences of obligatory forms in both the prenominal and the preverbal positions. Moreover, every child we studied produced filler syllables, at least in the prenominal position. Filler syllables were produced across all MLU groups studied (1.32-3.37), and in all groups of ages (1;7-3;5) present in our corpora. Their use represented a substantial and pervasive phenomenon in the children's prelexical productions, and their inclusion in the study of children's referring expressions in prelexical positions may reveal unseen developmental phases.

However, filler use was far from homogeneous and regular. The proportion varied considerably among the children. This variability showed up here even within the filler category itself: as Section 2 showed, fillers did not evolve in the same way in the preverbal and prenominal positions for all children, confirming the results of Veneziano's (2003) study.

Section 3 examined the formal (3.1) and distributional (3.2) properties of filler syllables. These studies showed that the variable forms and presence of fillers did not lie in lexical factors, and their absence and variable realizations were not due to a phonological deficit in adult grammatical words. Instead, their variability can be explained in terms of the emergence of a paradigm of diverse forms exhibiting transitional characteristics. In a phonological perspective, we found that fillers lacked the formal properties of adult targets, but they also exhibited paradigmatic patterning: the use of specific consonants in the prelexical position. In a distributional perspective, we noted that fillers were used in combination with other lexical forms.

At the same time, as precursors of grammatical units, the fillers shared some of their functional characteristics. As shown by Veneziano (2003) and confirmed in Section 3, the distribution and presence of fillers over time was different in the preverbal and prenominal positions. These results suggest that fillers play a role in the construction of the verbal and nominal categories, and thus behave like proto-grammatical words.

Moreover, the variable presence of fillers can be accounted for in terms of functional uses, as highlighted in Section 4. The distribution of various realizations in the preverbal position depended on the topic of the utterance. When in a given session, the same verb was used in utterances where the child and discourse entities were identified as topics of the utterance, there was a larger proportion of filler syllables in reference to the self than in reference to entities.

Children's production of fillers vs. adult forms, or their absence, could provide insight into their diverse functional uses. Our results based on French children's productions are consistent with the experimental work done by Gerken and McIntosh (1993). In comprehension tasks, 2-year-old English-speaking children treated adequate, real grammatical morphemes differently from inadequate, real grammatical morphemes or pseudo-grammatical morphemes in the same position. These results suggest that the children were aware of the different forms used in prelexical positions and treated them differently.

In this chapter, we proposed that fillers are precursors of referential expressions and should be studied as such. The results showed that the paradigm of referring expressions is still unstable and under construction, even at the age of 3;6, which showed up in the functional study but also in the phonological and distributional studies. Note in addition that in the different corpora used here, the youngest child was 1;6 years old, and the lowest MLU

was 1.32. It is probable that the children studied had gone through earlier developmental phases where fillers were not produced at all, or were produced differently. Many authors such as Peters and Menn (1993), Kilani-Schoch et al. (1997), Veneziano and Sinclair (2000), Peters (2001), and Feldman and Menn (2003), suggest that fillers appear first for prosodic reasons (Demuth, 2001; Demuth & Tremblay, 2008). In a future study extending our analyses to younger children, we could verify whether the use of fillers, during that earlier phase, is also variable and whether this potential variation depends solely on the prosodic constraints of the language and not on different functional uses, as is the case later on.

In this perspective, one issue needs to be further investigated: Why do fillers have different phonological forms? As we have demonstrated, at least the consonants that the fillers contain do not depend on the subsequent lexeme or on phonological deficits. If the use of fillers varies according to their different pragmatic functions, maybe their phonological form varies also according to pragmatic functions.

Finally, the co-existence of filler syllables and adult-like forms or their absence raises several questions about the factors underlying their realization. All these questions have been partially answered for the prenominal position for French (see Le Mené, 2017) but need to be tackled further.

In conclusion, filler syllables exhibit the formal and functional characteristics of their dual nature as a transitional phase and a paradigm of referring

expressions, and should be considered as precursors of grammatical words. For this reason, the study of fillers is important if we hope to understand the process via which referring expressions develop. More generally, the use of filler syllables shows us that during language development, there are transitional phases specific to proto-morphemes and to emerging paradigms in which functional factors also intervene. They also show that we should not neglect fillers in our quest for a better understanding of language acquisition.

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