

The Status of Filler Syllables in Children's Early Speech

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1. Introduction

Researchers have long noted the presence of 'filler syllables' in children's early speech (e.g. (1)). Bloom (1970) was one of the first to document their use, and Peters (1983, 1997, 2001, Peters & Menn 1993) continues to raise the issue as a problem.

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|-----|------------|-----------|--------------------------------------|
| (1) | Eric 1;10 | ə find it | '(I can't) find it' (Bloom 1991:152) |
| | Seth 1;7.3 | [ə hat] | 'ə hot' (Peters & Menn 1993:748) |
| | | [ŋ daw?] | 'NG down' |

There have been several proposals regarding the status of these 'filler syllables'. The first is that these are 'proto-morphemes,' or early attempts at producing grammatical function morphemes and/or words. In the Bloom example above, for instance, the schwa seems to stand for *I can't*—a pronoun plus a negative auxiliary verb. Peters & Menn (1993) similarly report that their subject Seth uses filler syllables in place of prepositions, and Lleó (1997, 1998, 2000) reports the early use of fillers in Spanish, where they seem to play the role of determiners. Fillers have also been noted in morphologically rich Bantu languages like Sesotho, where they appear in the place of noun class prefixes, as well as subject agreement and tense markers (Connelly 1984, Demuth 1988).

However, Dresler & Karpf (1995), Venezino & Sinclair (1997), and Cristofidou & Kappa (1998) claim that fillers seem to function as 'semantically empty prosodic placeholders,' which do not easily lend themselves to morphological analysis and tend to disappear over time.

In addition to their indeterminate status within children's developing linguistic systems, filler syllables are interesting in that they are reported to

appear in some children's speech, but not in others. Current proposals do not account for this type of individual variation.

The purpose of this paper is to provide a unified prosodic framework for further exploration into the nature of filler syllables in children's early speech, one which can account for the linguistic status of fillers in children's developing grammars as well as provide a framework for understanding why some children produce them and others do not. In addition, our account will provide a means for understanding how and why fillers eventually disappear over time. We begin with a case study below.

2. The Data

The data presented below were collected from child M between the ages of 1;8.3 and 1;10.24 years. During this time his MLU ranged from 1.2 to 1.8. Biweekly recordings of 1 hour each were video and audio taped at home during interactions with his parents. Acoustic analyses were conducted using the PRAAT program, primarily to determine the acoustic correlates of stress. A factor which made this child's speech particularly interesting was that he received Spanish input from his mother and English input from his father. Sessions 1, 3, and 5 were recorded during interactions with his mother, and sessions 2, 4, and 6 were recorded during interactions with his father. Despite the fact that he received bilingual input, the vast majority of the child's attempted words were in English.

Figure 1 shows the total number of words and fillers in M's speech in each of the six sessions. Note that fillers became productive only during session 3, when there was an increase in the number of words produced.

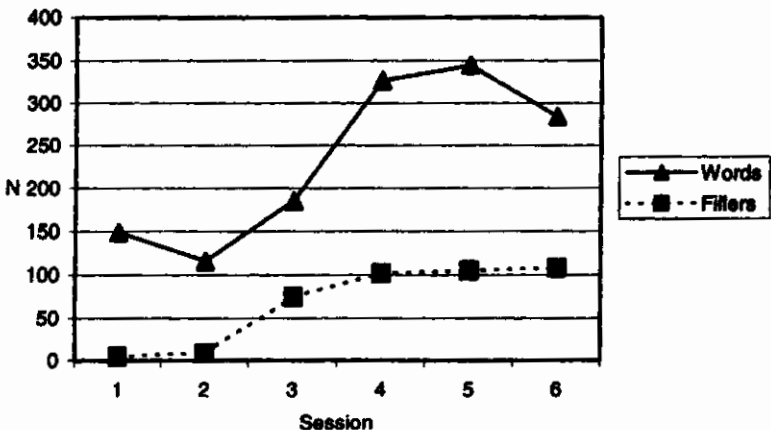


Figure 1: Number of words and words produced with fillers

with fillers, even if the onset consonant is voiced (cf. the lexical items provided in (2)).

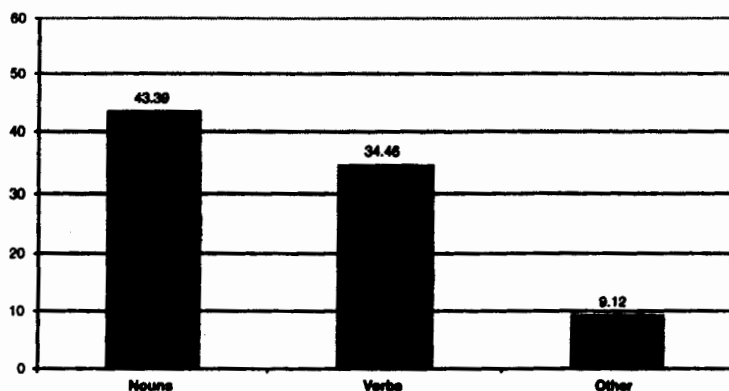


Figure 3: Percentage of fillers by lexical class

It should be noted that some of the contexts for the random use of fillers come from M's repetition of a particular lexical item – e.g. "[ə'sit^h, ə'sit^h, 'sit^h, ə'sit^h, 'sit^h, 'sit^h, ə'sit^h]."

(2)	No Filler	Filler	with Fillers
sit	['sit ^h]	[ə'sit ^h]	50%
bus	['b ^h əs]	[ə'bəs]	66%
big house	['b ^h ig haus]	[ə'big haus]	33%
dad	['d ^h æd]	[ə'dæd]	10%
down	['d ^h on]	-	0%

In sum, child M began to produce fillers at the age of 1;9.14 years, and produced them with roughly 28.75% of his words for the remainder of the sessions. However, he did not use fillers randomly with all word classes. Rather, 92.38% of his fillers were produced with nouns and verbs. That is, M's fillers were restricted to contexts where grammatical morphemes are most likely to occur. This distributional evidence provides support for the likely proto-morpheme status of fillers in this child's speech.

2.2. The Prosodic Distribution of Fillers

If, on the other hand, fillers are 'semantically empty prosodic placeholders,' filling a position in some sort of 'prosodic template,' we should expect to find

them restricted to certain prosodic contexts. Alternatively, if we find that fillers occur randomly with words of different prosodic shapes, this would argue against their status as prosodic placeholders.

We first examined the phonological characteristics of the fillers themselves. We found that 97% were schwas [ə], 2% were the nasals [n] and [m], 1% were other vowels such as [o] and [ɪ], and 98% were unstressed. Thus, the vast majority of M's fillers were unstressed schwas. Although they varied slightly in duration, they were generally relatively short. Furthermore, they did not seem to reflect hesitation ('uhhh'), indicating lexical access or utterance planning. Rather, they seemed to form part of a larger prosodic unit in combination with the following lexical item.

We then considered the prosodic contexts in which M's fillers occurred. To do this, we distinguish the base form of the lexical item produced, independent of the presence of a filler. For example, if the produced form is [ə'sɪtʰ], the base lexical item is the monosyllabic stressed syllable ['sɪtʰ]. As expected for an English-speaking child, the majority of base words attempted were monosyllabic, and few base forms contained three or four syllables. Figure 4 shows the percent of words of different numbers of syllables produced with fillers. The low frequency of three and four syllable words accounts for the noisy data in sessions 3 and 4. Note that M produced fillers randomly with words of one, two, and three syllables. Thus, the occurrence of fillers does not appear to be governed by the number of syllables in the base form.

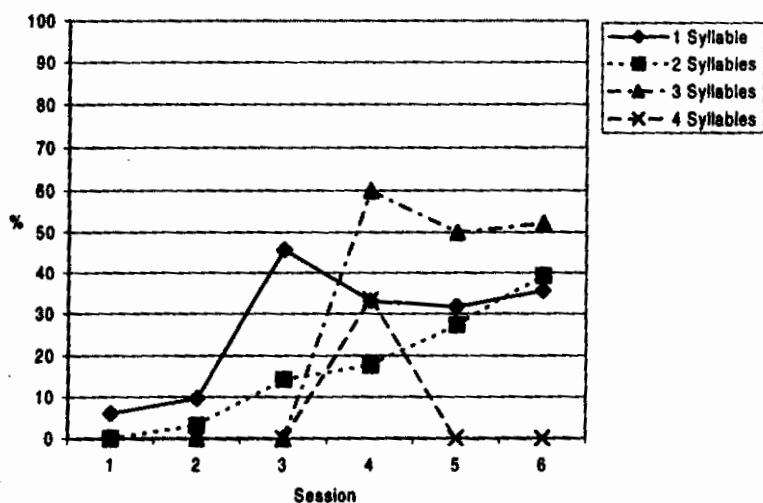


Figure 4: Percentage of base lexical items of different syllable lengths produced with fillers

2.1. The Syntactic Distribution of Fillers

One of the issues raised in previous research is the grammatical status of fillers. We first examined the grammatical contexts in which fillers occurred in M's speech by noting the distribution of fillers across different word classes. If fillers occurred randomly across all word classes, this could argue for an articulatory basis for fillers, where they might, for instance, represent the onset to voicing. If, however, fillers were found to occur primarily with word classes such as nouns and/or verbs, this would point to their probable proto-morpheme status, since each of these word classes is commonly preceded by clitic morphemes. Figure 2 shows the number of words produced in each class, where prenominal adjectives are classified as nouns and other words include prepositions, adjectives, and interjections.

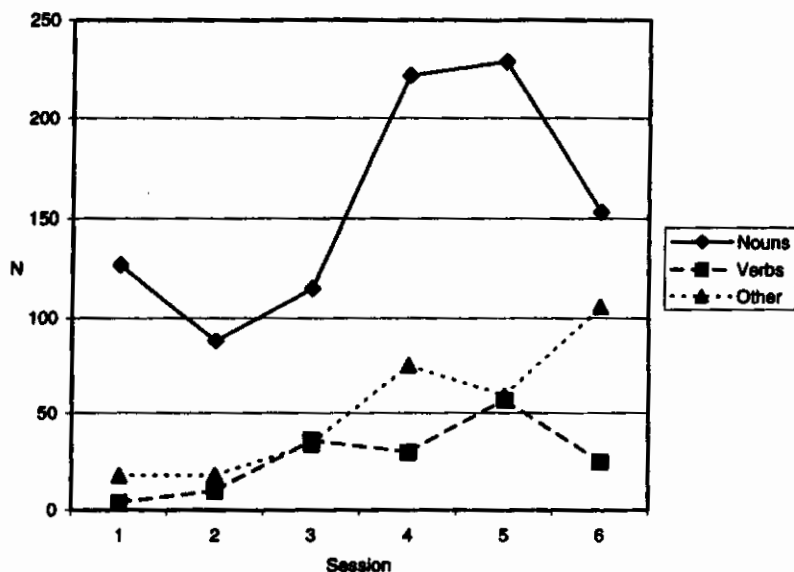


Figure 2: Number of nouns, verbs, and other words produced

Figure 3 shows the percent of nouns, verbs, and other words produced with fillers. As can be seen here, a large percentage of both nouns and verbs occur with fillers, but few words from other classes are produced with fillers. This demonstrates that M did not produce fillers randomly with words from all classes, arguing against an articulatory/onset to voicing explanation for the presence of fillers. This is further supported by the fact that fillers occur randomly with nouns and verbs, regardless of the voicing of the initial consonant, and that words from other word classes occur much less frequently

Finally, we examined M's base lexical items in terms of their prosodic shape (trochaic versus iambic feet). Again, as expected for a child learning English, the majority of words attempted were monosyllabic stressed feet (S) or disyllabic trochaic (Sw) feet. In contrast, iambic (wS) feet were rare. The distribution of fillers with words of different prosodic shapes is shown in Figure 5. Since the frequency of some prosodic shapes was very low, the frequency of fillers as a function of word shape was again somewhat noisy. Note, however, that by session 6 fillers were used most frequently before words with an initial stressed syllable (trochaic feet), and least frequently before words with an initial unstressed syllable (iambic feet).

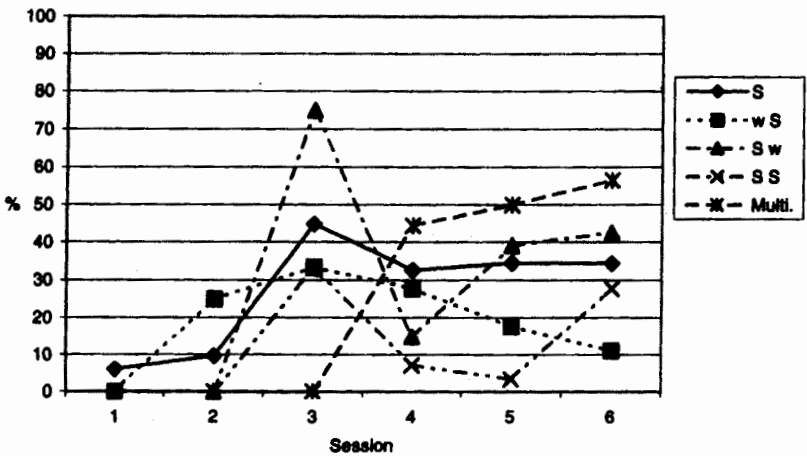


Figure 5: Percentage of base lexical items of different prosodic shapes produced with fillers

An examination of some target words that begin with an unstressed syllable proved instructive. When used without a filler the initial unstressed (unfooted) syllable was omitted, but this form was sometimes prefixed with an unstressed filler (3).

(3)		No Filler	Filler
banana	/bə'nænə/	['bænə]	[ə'bænə]
eleven	/ə'levn/	['lən], ['levn]	

That the form [ə'bænə] contains a filler is shown by the fact that the /b/ onset to the word is mapped into the child's truncated form, and this is then prefixed

with a filler. Similar forms are found in children's Spanish around the same age (e.g. Sofa 1;8-10 (Gennari & Demuth 1997, Demuth 2000)).

(4)		No Filler	Filler
	the doll	/la mu'feka/ ['meka]	[e'meka], [a'mweka]
	to the rabbit	/al ko'nexo/ [a'lexo]	
	a hammock	/una:a'maka/ [na'maka]	

In sum, M's fillers occur randomly with words of different numbers of syllables, suggesting that their presence cannot be explained by a minimal length 'template.' Furthermore, his fillers occur on average before 42.59% of trochaic feet and only 11.11% of the time before iambic feet (or unfooted syllables). The fact that they occur randomly before trochaic feet indicates again that they do not fill a prosodic template. However, when they do appear, they have the status of an unfooted syllable followed by a trochaic foot, as shown in (5).

(5)	PW
	/ \
	Ft
	/\
	σ 'σ (σ)

That is, although M's fillers are not 'semantically empty prosodic placeholders,' they are prosodically constrained to take the shape of an unfooted syllable. This is expected if M's fillers represent proto-morphemes occurring before nouns and verbs. English unstressed subject pronouns, as well as many determiners, prepositions and auxiliaries/modals occur in exactly this prosodic context. It thus appears that M's fillers are prosodically constrained, but not by any sort of 'template' output form. If so, we would have expected fillers to be produced before all lexical items beginning with a stressed syllable, and with no lexical items beginning with an unstressed syllable. These findings are consistent with Peters & Menn's (1993) reports of fillers in their subject Seth, and with reports of fillers from several other Spanish-learning children (Leo 1997, 1998, 2000). But a question remains as to just how 'typical' this child might be in his use of fillers. We turn now to the question of individual variation.

3. Individual Variation and the Prosodic Hierarchy

Peters (1983) has long noted that children exhibit individual variation with respect to filler use, suggesting that children who are more *expressive/gestalt* (using longer verb-like units) tend to produce fillers more than children who are more *referential/analytic* (using primarily nouns) (cf. Nelson 1981). We

propose that these descriptive generalizations about individual language learning 'styles' can be elegantly captured by appealing to the Prosodic Hierarchy (Selkirk 1984, Nespor & Vogel 1986).

(6) The Prosodic Hierarchy

Utt	Phonological Utterance	I think Sue likes the dolly
IP	Intonational Phrase	Sue likes the dolly
PP	Phonological Phrase	likes the dolly
PW	Phonological Word	the dolly
Ft	Foot	dolly
σ	Syllable	doll
μ	Mora	do

Given the different levels of prosodic structure outlined in the Prosodic Hierarchy—all of which (with the possible exception of the mora) must eventually be acquired by speakers of all languages—one of the challenges for the child is to enter the prosodic system at some level of structure. We suggest that more 'referential' children may initially focus on the Foot level, whereas more 'expressive' children may initially focus on higher levels of structure such as the Phonological Word or even the Phonological Utterance. Since much of the study of children's early phonological systems has focused on segments (cf. Vihman 1996), and 'expressive' children's speech often lacks identifiable words or segments (Nelson 1981), it is likely that these children's speech has generally been underrepresented in studies of developing phonological systems.

With respect to child M, it appears that when he produces fillers his utterances contain more than just a Foot. That is, he produces higher-level prosodic structures, such as Phonological Words, that can contain an unfooted (filler) syllable, just like many Spanish-speaking children of the same age (Gennari & Demuth 1997, Demuth 2000). This typically occurs several months in advance of such forms in English-speaking children's speech. Roark & Demuth (2000) suggest that this is due to the higher frequency of these Phonological Word shapes in the ambient language—28.3% of words in Spanish, compared with only 3.8% in English. That is, almost one third of the words Spanish-speaking children hear have an unfooted syllable, as compared with almost none in English. We argue that these frequency effects in the input may bias children to focus on different levels of the Prosodic Hierarchy, which

would account for why Spanish-learning children represent larger prosodic structures earlier than their English-learning peers. We suggest that although M's target words were primarily English, the Spanish input he received may have helped focus his attention on higher levels of prosodic structure earlier than many English-speaking children, leading to the abundant use of filler syllables.

Naturally, this "Levels of Prosodic Structure Hypothesis" will need to be evaluated against other studies of monolingual English- and Spanish-learning children. This hypothesis also makes certain testable predictions: first, it suggests that children learning languages with more complex/larger Phonological Words will tend to focus earlier on higher levels of the Prosodic Hierarchy, and thus will have more filler syllables than those learning languages like English, where the vast majority of 'words' are composed of a monosyllabic Foot. Second, it predicts that the emergence of prosodically licensed grammatical morphemes will appear earlier in such languages than in languages like English. Both predictions gain support from studies of Spanish (Lleó & Demuth 1999), Italian (Bottari, Cipriani & Chilosi 1993/94), Greek (Cristofidou & Kappa 1998), Swedish (Santelmann 1998), Sesotho (Connelly 1984, Demuth 1988, 1992, 1994), and Turkish (Aksu-Koç & Slobin 1985). Third, if such findings are robustly confirmed, we should expect to find other interactions between different levels of linguistic structure in children's developing grammars as well. These types of interactions are beginning to be more widely recognized in adult linguistic systems, in part due to the development of Optimality Theory (Prince & Smolensky 1993).

4. Conclusion

In this paper, we presented data from child M, who began to produce fillers at 1;9.18 years. He produced them primarily with nouns and verbs, and often produced the same lexical item both with and without fillers. The filler itself tended to be an unstressed schwa, resulting in utterances that contain a Prosodic Word composed of a Foot and a preceding unfooted syllable. We argued that the word class and prosodic distribution of these fillers point to their status as proto-morphemes in the child's developing grammar. We further hypothesized that the child's bilingual input from Spanish and English may have helped to focus his attention on higher levels of the Prosodic Hierarchy. We also proposed that both individual and language-specific differences in the use of fillers and the emergence of early grammatical morphemes can be handled from the perspective of different levels of the Prosodic Hierarchy. This hypothesis makes testable predictions regarding the course of early cross-linguistic prosodic development, and provides a linguistically motivated framework for capturing individual and language-specific differences with respect to the use of fillers in both monomorphemic and multimorphemic contexts (Demuth 2001).

If M's Spanish input influenced the shape of his early English utterances, this would also have implications for our understanding of bilingual acquisition. Several studies indicate that, contra early proposals by Leopold (1948), bilingual children develop early and separate phonological and morphological systems (Paradis 1996, Paradis & Genesee 1997). It is still an open question as to whether high frequency phonological or prosodic structures of one language might enhance the earlier acquisition of such structures in the other language. It is hoped that the present study will stimulate further examination of these issues.

Endnotes

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