The Status of Filler Syllables in a Brazilian Cochlear Implanted Child's Early Speech

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Abstract

Researchers of language acquisition have long noted the presence of 'filler syllables' in children's early speech. In addition to their questionable status within children's developing linguistic systems, filler syllables are curious in that they are reported to appear in some children's speech, but not others. The purpose of this paper is to provide a unified framework for further exploring the status of filler syllables in a Brazilian cochlear implanted child's (CIC) early speech. The corpus analyzed here forms part of a longitudinal corpus on the acquisition of Brazilian Portuguese (BP) by a Brazilian cochlear implanted child. The meetings were recorded in situation of spontaneous speech in a naturalistic way.

1. Introduction

Soon after researchers began systematically studying language acquisition in young children they noted the presence of 'filler syllables' in children's early speech (Bloom 1970, 1973; Peters, 1977, 1983, 1985; Peters & Menn 1993).

There have been several previous 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 other words. Peters & Menn (1993) report that their subject Seth uses filler syllables in place of words like prepositions, and Lleó (1997, 1998) reports to early use of fillers in Spanish, where they seem to play the role of determiners.

Fillers have also been noted in the morphologically rich language Sesotho, where they appear in the place of noun class prefixes as well as subject agreement and tense marking Connelly (1984), Demuth (1988). However, Peters & Menn have also noted that fillers seem to fill the role of semantically empty 'prosodic placeholders'. In addition to their questionable status within children's developing linguistic systems, filler syllables are curious in that they are reported to appear

in some children's speech, but not others. It is not clear what could account for this type of individual variation.

However, studies on language acquisition in children with cochlear implants (CI)[1] have focused on speech perception and speech production skills (Tye-Murray, Spencer & Woodworth, 1995; Fryauf-Bertschy, Tyler, Kelsay, Gantz & Woodworth, 1997).

But what can we tell about the linguistic status of fillers in a Brazilian cochlear implanted child's (CIC) developing grammars? We begin with the case study below.

2. Subject and Method

The data presented below were collected from child G, who after having had meningitis at the age of 1 year and 5 months, knew a profound bilateral hearing loss. The child is from middle-class family and his parents are university graduates.

Biweekly video taped recording of 1 hour each were conducted in the rehabilitation centre. The meetings were recorded in situation of spontaneous speech in a naturalistic way. The data referring to both the child and his interlocutor were phonetically transcribed on a perceptual basis by a first researcher and the transcriptions were checked by the author of this paper or another researcher. Only the data whose transcriptions were agreed upon by both researchers were taken into consideration here.

The data were segmented into words only when child's utterances had more than one stress prominence. Utterances were identified according to standard intonational and pause criteria. Given that utterances with more than one prominence generally appear in later periods (from 2;5 on for hearing children), until then the whole utterance (including unintelligible ones) was analyzed as a token.

Finally, since the analysis of the data was meant to be qualitative rather than quantitative, all the different intonational contours and relevant phonological processes were registered even if they appeared only once.

[1] A cochlear implant (CI) is a surgically implanted electronic device that provides electrical stimulation to the surviving spiral ganglion cells of the auditory nerve while bypassing the damaged hair cells of the inner ear. A cochlear implant provides both adults and children with access to sound and sensory information from the auditory modality (Clarke, 2003).

3. Results and discussion

According to Demuth's (1996a, 1996b) proposal, children's word template starts with core syllables and then change to a binary foot. This second stage would be very early in the acquisition process and most of the studies (Allen and Hawkins 1980, Fikkert 1994, Gerken 1994, Archibald 1995, Demuth 1996ab, Taelman 2004) claim that this foot has a trochaic pattern. After stage III, children go to a stage where prosodic words can be larger than a foot, and finally they reach the adult pattern.

The proposal of a prosodic word that is one foot long, which was originally advanced based on Germanic languages, has been extended to other languages[2], as well. The common property among these views is that the prosodic development goes from the lowest level up to higher levels of the prosodic hierarchy in a bottom-up fashion (Selkirk 1984, Nespor and Vogel 1986). If the prosodic development takes place in a bottom-up fashion, children's utterances should be one syllable long in the beginning and later grow in size.

Another way to look at prosodic development was proposed by Scarpa (1999, 2000), working with the acquisition of BP. What has seen in the data of BP is that normal hearing children's (NHC) utterances are rarely produced as monosyllables. When children produce monosyllables, they repeat them and add preceding filler-sounds. Therefore, Brazilian NHC are not following the same development as proposed for Germanic languages (Santos 2003; Scarpa 1999, 2000). So, taking into account the fact that the prosodic hierarchy can be filled by one syllable, Scarpa points out that nothing should prevent the earliest prosodic template of the first "words" from being templates from a higher level. Thus, the prosodic development occurs in a top-down fashion in her analysis.

As for a NHC, should we expect the same for a Brazilian cochlear implanted child? For instance, what we found can be seen in the examples below.

In the examples (1) and (2) what we can see is that the segment sequences the child cut from his interlocutor's utterances are phonological phrases or part of phonological phrases and not words.

[2] Hochberg (1988ab), for instance, assumes that children acquiring Spanish start with a binary constituent, although no tendency was – either trochaic or iambic – found for the binary constituent.

	Child's production	Target or Adult's utterance	
(1)	[o.adi.o]	oa. 'asi.o Olha, assim ó	Look, like this
(2)	Adult:	a.vi.'aw. 'va.mus de.ze.'a u. a.vi.'aw Avião, vamos desenhar o avião	The plane. Let's draw a plane.
	[avã u vião]		draw the plane
(3)	[u.viã#a.nã.adi.tia#aviã.o.o.gã]	a.vi.'aw naw. Asi. Tia. A.vi.'aw oa. 'gra.di Avião. Não, assim tia. Avião, olha, grande	The plane. No, like this aunt. The plane, look, the big one

As we can see in (1), the child's utterance corresponds to a whole phonological phrase in the adult language. In the example (2), the child cut the adult's utterance, taking part of one phonological phrase.

In (3), the child's production examined here takes only part of the nouns using the prominences of the adult's utterances as the basis for his cuts (/nã. aviã. gã/), what seem in consonance with Scarpa's study (1999) and these results are also in consonance with other findings in the literature (Gebara 1984; Santos 2001, 2003).

What characterized the first period of BP acquisition is that the CIC´s utterances can have the same segmental sequence that adults have (Teixeira Carneiro 2007a), as showing in examples below:

	Child's production	Target or Adult's utterance	
(4)	[noboati]		?
(5)	[Ma.ma.'ma.na]	Ba.'nã.na	Banana
(6)	[a.ba.'ba.lu]	ca.va.lo	the horse
(7)	[a.fe.sa]	'fe.ʃa	Close

As shown in (4) and in accord with Scarpa's study for NHC (1994), these sequences are not always words in the adult language. The child used segmental sequences - filler-sounds -, whose function is to fill the intonational template in order to complete the intonational contour that carries the 'meaning'.

As was showed in (2), the child's target was larger than the contour to be used; he took parts of the adult's utterances, usually the

most prominent ones. Another case where child used filler-sounds was when the segmental sequence cut out from adult sentences was not sufficient to fill the intonational template, as in (5), (6), (7). In order to fill these templates, child used filler-sounds to fill initial weak positions. Child is working with the association of intonational contours and 'meanings'. So, this strategy is not responsible for any cue for parameter setting. However, since all the utterances must have a prominence, this strategy bootstraps child's utterances so that he can have stress prominences.

Changing the stress is the most radical way to fill the chosen contour and it is not common because the cut-off from the input is made from the nuclear syllable (8). In the cases of words with more or less syllables, other ways of tone filling are needed. So, the child has different possibilities to fill pre-nuclear syllables (that is, the left side of the contour): earlier filler-sounds (9), lengthening of the nuclear syllable (10). Only later he confines his data to a binary constituent. Before, the child used three syllable utterances and the stress should have been applied to this string. By now the child can distinguish the two levels - intonational and word level -, and work with them independently. Consequently, the utterances can be smaller or larger than three syllables.

	Child's production	Target or Adult's utterance	
(8)	mu.'ti.ta	'mu.zi.ka	Song
(9)	a.'pi.pa	'pi.pa	Pipa
(10)	pa:u	paw	Wood

We mapped G's development of the intonational system grouping the contours according to their use (2007a). Au beginning G has an inventory of intonational contours from which he interacts with his partner in different ways. It is possible to analyze child's early utterances as having only a prosodic meaning (declarative, interrogative), without having a lexical meaning associated to them (Vigário and Frota 1992). While the utterances do not have a segmental structure, which appears only later on, in the discourse, they have only a prosodic meaning. So, the variety of contours and the treatment of the utterances as a non-analyzed string found in our study (2007a) agree with the suggestion that early speech is not organized by grammatical categories, but by relations between the conceptual meanings and the phonetic output (Dore, Franklin, Miller, and Rammer's 1975). Our results indicate that there is no isomorphy

between contours and their meanings, although there is a distinctive intonational system being acquired.

We identified that G use different strategies[3] to place the stress prominence on his utterances before the adult algorithm of word stress is used productively. The data examined (Carneiro 2007b) show that child is not restricted to monosyllables in the beginning of the acquisition process, but he rather start with long sequences of segments. After this unconstrained sequence of syllables (first strategy), the child starts producing three-syllable sequences (second strategy). The phonological process is to add filler-sounds to fill different contours in the first strategy and the contour chosen for prosodic structuring in the second strategy. These filler-sounds always fill pre-nuclear positions, pushing the prominence to the right. If they were used in order to fill a trochaic binary foot, we would expect to find them to the right of the word, after the last stressed syllable. These strategies occur predominantly in certain periods of the acquisition process with some overlapping in some periods.

Taking into account the fact that the prosodic hierarchy can be filled by one syllable, Scarpa (1999) points out that nothing should prevent the earliest prosodic template of the first "words" from being templates from a higher level at prosodic development for the acquisition of BP. Ours findings seem in accord with the acquisition of BP for normal hearing children (Santos 2003; Scarpa 1999) and in accordance with Scarpa's proposal (1999, 2000).

4. Concluding remarks

The strategies discussed allow us to consider two general approaches to the language acquisition process. The first one has the word as the basis for the acquisition process, while the second one takes the phonological phrase as children's starting point.

The findings about BP show that the bottom-up hypothesis for the acquisition of prosody must be re-thought. Children acquiring BP start from higher levels (utterance or phonological phrase) and only later work with the word level, which supports a top-down view of prosodic development. Therefore, the present results and the data

[3] The strategies discussed were based in Santos's study for normal hearing children (1998, 2001). The strategy of structuring an intonational contour leads child to set the boundary and direction of word stress and the stress template strategy shows that child is working with a binary constituent as a stress template. The adult algorithm is only reached after child set the extrametricity parameter and learns the extrametrical elements.

discussed in this paper pose problems for a bottom-up model of prosodic acquisition and support the top-down approach. Our results reveal also, that the status of the fillers produced by the Brazilian cochlear implanted child studied here approaches to the normal hearing children findings. Finally, this paper point the need of furthers studies exploring the status of filler syllables in a Brazilian cochlear impanted child's (CIC) early speech.

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