

Filler Syllables: What Is Their Status In Emerging Grammar?

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Abstract

Although it has long been observed that some children incorporate un glossable syllables into their early utterances, it has been difficult to integrate these 'fillers' into theories of language acquisition. Because they straddle preconceived boundaries between phonology and morphosyntax, and between pragmatics and lexicon, they do not fit neatly into linguists' notions about 'modules' of language. Moreover, the perceptual characteristics of languages that seem to lead children to produce fillers are closely tied to prosody -- the area of phonology in which we have the least adequate tools. Fillers have been reported in quite an array of languages, and yet they seem to be more common among learners of some languages than others. Even when language is held constant, children seem to vary immensely as to whether they produce fillers at all. With more researchers reporting fillers in more languages, it seems time to (1) review what we now know about fillers, including the major types that have been observed and the major functions for which learners seem to use them; (2) propose a reasonably unified set of criteria for identifying them; (3) list some open questions; and (4) suggest an approach that will promote their further study.

Filler Syllables: What Is Their Status In Emerging Grammar?¹

1. Introduction

Soon after researchers began systematically studying language acquisition in young children they began to notice that some children would incorporate unglissable syllables into their utterances (e.g. n down; ə hot; ŋ go), particularly as they moved from the 'one-word' to the 'two-word' stage. At first this phenomenon was either ignored, or remarked on but then left to one side (e.g. Braine 1963). Depending on researchers' focus, and on the particular children they were observing, they called these syllables 'placeholders' (Bloom 1970), 'presyntactic devices' (Dore, Franklin, Miller & Ramer 1976); 'fillers' (Peters 1977), or 'phonological extensions' (Macken 1979; Peters 1986). (See Peters 1986 for an early review.) Lois Bloom was the major exception: in her 1970 book she carefully described and tried to account for the many schwa 'placeholders' she found in her data on children's early combinations; in her 1973 book she noted Allison's use of a more complex placeholder of the approximate form /wida/. On the whole, however, this phenomenon has not been followed up on until recently.

In the present note I will use the term **fillers**. There are several reasons why it has been difficult to integrate fillers into theories of language acquisition. One problem is that they do not fit neatly into linguists' notions about 'modules' of language because at the very least they straddle the preconceived boundaries, such as those between phonology and morphosyntax, and between pragmatics and lexicon.

A second problem is that the perceptual characteristics of languages that seem to lead children to produce fillers are closely tied to prosody, particularly rhythm and melody, and this is the aspect of language for which we have had the least adequate descriptive and analytical tools. What we have most glaringly lacked are tools for capturing the prosodic qualities both of input speech in different languages and of children's early productions. This lack is neatly summarized by Berman & Slobin: 'Perhaps if standard writing systems reflected prosodic distinctions, as they do phonological ones, linguistics would have long since treated prosody as part of grammar.' (Berman & Slobin 1994, p.109). However, Gerken's pioneering research (Gerken 1987, Gerken, Landau & Remez 1990, Gerken 1994, 1996 a, b) revealed that, at a stage when children are not yet producing functors, they nevertheless are aware of their presence and distribution. In particular, she found that when children with low MLUs are asked to imitate sentences, (i) they are more likely to *omit* functors which surround *familiar* content words than when the content words are not familiar; but (ii) they do imitate 'functoids' that are phonetically similar but not identical to the functors of English. This suggests that, because of their normal lack of phonetic prominence, functors may at first seem to children like familiar but weakly specified 'frames' which provide 'slots' for the phonologically and semantically more prominent open-class words.

A third problem has to do with lack of uniformity. Since they were first noticed, fillers have been observed in quite an array of languages (currently at least Danish, English, French, German, Greek, Italian, Norwegian, Portuguese, Sesotho, Spanish, Swedish, and possibly Turkish), and yet a 'filler strategy' may be more common among learners of some languages than others (Peters 1997). Even when language is held constant, children seem to vary immensely as to whether they produce fillers at all. For example, among English-learners, Peters' subject Minh produced a great many (Peters 1977), as did her subject Seth (Peters 1983, 1995, 1996), while Menn's son Daniel (Peters & Menn 1993) produced no syllabic fillers, though possibly consonantal ones (see below). Looking at children studied by a single researcher we find that Bloom's Eric produced many more fillers than did Kathryn or Gia (Bloom 1970), and that Brown's Adam, Eve and Sarah (Brown 1973) seem to have produced very few (although the lack of phonetic information in the transcripts makes this inference problematic). It is also surely the case that, because some researchers are more sensitive to the possibility of fillers, their transcripts will reflect prosodic attributes such as

¹ Thanks to Katsura Aoyama, Catherine Kawahata, and William O'Grady for comments on earlier drafts.

stress and rhythm more accurately than will the transcriptions of more syntactically oriented researchers, although I know of no study that has addressed this issue.

A fourth problem is that it now looks as though different children use fillers for different purposes -- see the discussion of phonological vs. protomorphological fillers, below. Moreover, fillers constitute a moving target, in that their characteristics change with the stage of language acquisition that is being passed through.

To date, therefore, there has been no unified approach to describing fillers, whether motivated by theory or by data. With more and more researchers reporting fillers in more and more languages, it seems time to attempt four goals: (1) to review what we now know about fillers, including the major types that have been observed and the major functions for which learners seem to use them; (2) to pull together from the literature a reasonably unified set of criteria for identifying them; (3) to list some open questions; and (4) to suggest a conceptual approach that will promote their further study.

Because the very nature of fillers changes with development, we need some kind of developmental framework within which to address them. For the purposes of this note I will adapt one from Wolfgang Dressler. In his project to compare the acquisition of morphology across some two dozen languages, (Dressler & Karpf, 1995; Dressler & Dziubalska-Kolaczyk, 1997; Kilani-Schoch, de Marco, Christofidou, Vassilakou, Vollman & Dressler, 1997) he proposes a distinction between **Premorphology**, **Protomorphology**, and **Morphology** proper. This sequence of these stages unfolds roughly as follows:

Premorphology: During this stage children produce utterances that contain more than one unit, but there is no evidence that such combinations are systematic. They include reduplications, truncations, and 'surface analogies' (Dressler & Dziubalska-Kolaczyk 1997, p.383) as well as the addition of fillers. All of these operations are quite 'local', in the sense that a child may base a single formation on some recently heard form but does not extend it more widely. Dressler thus considers these operations 'extragrammatical', and believes them to be guided by general cognitive principles such as 'minimal-grouping, figure-ground distinction, transparency, indexicality, iconicity, and inclusion' (Kilani Schoch et al., 1997, p.4) rather than by 'a separate, distinct grammatical module' (Dressler & Karpf, 1995, p.100). I suggest that the routine kinds of language that occur within specific interactive verbal routines tend to encourage and support premorphological productions.

Protomorphology: During this stage a system of morphological grammar is starting to develop. Formerly unanalyzed units are being analyzed, and analogies begin to be extended to more than one form, but they are so limited in productivity that Dressler et al. are only comfortable attributing them to quite form-specific 'proto-rules'. It seems to me that Braine's 'positional associative patterns', such as *all clean, all done, all dry, all gone, all through, all wet* (Braine 1976, p.9), are examples of this limited kind of productivity. As Braine's term suggests, children are becoming increasingly aware of 'positions' within an utterance, the contents of which are either stable or variable. Kilani-Schoch et al. (1997) note that this stage seems to be characterized by 'blind alleys' in which individual children temporarily pursue paths that do not lead neatly to the adult system. An example of such a blind alley is Daniel's evident hypothesis that the {Z} suffixes in English were phonologically rather than morphologically governed (Peters & Menn 1993). Thus, although children are becoming aware of word-formation patterns, protomorphology does not yet distinguish between inflectional and derivational morphemes (Dressler & Karpf 1995).

(Full) Morphology: This stage begins when combinations become systematic enough that we feel comfortable calling them 'rules'. Depending on their relative weight in the language being learned, the inflectional, derivational, and compounding subsystems of morphology also become recognizable.

2. A moving target: developmental changes and criteria for recognition

The particular dimensions along which fillers have been observed to vary change as language develops. Table 1 summarizes these changes with reference to the stages just described. One purpose of this note is to propose a common usable set of criteria for distinguishing these heuristic stages. An important influence on my thinking has been the

work of Veneziano and Sinclair (1997), who are the first researchers I know of to tackle head-on the elusive and changing roles of fillers in a child's developing grammar. In their analyses of the early language productions of a girl learning French, they ask an important and ingenious set of questions about the distribution of these fillers, and their possible sources in the adult language. One of their concerns is whether it is possible for researchers to differentiate between fillers that are only motivated by phonology and fillers that are truly protomorphemic. (An example is given just below.) The criteria presented for each stage are extracted from and supported by the characteristics listed in Table 1.

A. Premorphological (phonological) fillers are devoid of meaning. They seem to vary along two dimensions: segmental and rhythmic. Segmentally, most of the early fillers that have been reported tend to consist of full syllables, i.e. V or CV.² Because at this early (unsystematic) stage the researcher can not identify distributional correlates, and hence not (proto)syntactic functions, these early fillers have sometimes been considered to be 'phonological extensions' to glossable lexical items; their function has been proposed to be one of building an articulatory bridge from one word to two word utterances. Within filler syllables at this stage, the inventory of vowels that a child produces reflects phonology rather than morphology. For instance, in French the final vowel of an open-class lexical item is the most prominent, and hence the most salient. Veneziano and Sinclair (1997) found that the set of vowels included in the early fillers produced by their subject reflected the set of **all pre-final vowels** in the input, whether part of the same word or part of a preceding grammatical morpheme. In this sense they corresponded with purely **phonological** rather than **morphosyntactic** attributes of the input. Eventually their subject shifted to replicating the just the vowels of the grammatical morphemes that typically preceded the target lexical items. This is the sort of contrast which can help researchers differentiate premorphology from protomorphology.

Rhythmically, one function of these early fillers seems to be to preserve the number of syllables in and/or the prosodic rhythm of a target utterance (Peters 1977, Klein 1978, 1981; Peters 1983, Echols & Newport 1992, Echols 1993, Gerken & McIntosh 1993, Peters 1993, Gerken 1994, Scarpa 1993, Gerken 1996a, b, Peters 1997, Veneziano & Sinclair 1997). For example, between 1;7 and 1;9 Peters' subject, Seth, variably 'prefixed' open-class lexical items with unglissable syllables: tape ~ η tape; hot ~ ə hot (Peters & Menn, 1993), in the process making them sound more like full phrases.

Recognition criteria: Most importantly, these forms are not readily mappable onto target adult morphemes, have no systematic morphosyntactic function (however idiosyncratic), and may be restricted to full syllables -- although the possibility of purely consonantal fillers cannot yet be dismissed. In hindsight, once an individual child has moved past this stage, her premorphological fillers may be seen to have served as an utterance-planning bridge from one-word to two-word utterances and/or served a rhythmic function, enabling the child to achieve the gestalt of a full adult sentence. Thus, the ultimate decision about the status of a given child's early fillers must be made post-hoc: if they just disappear, they were purely phonological; if they evolve continuously into identifiable morphemes they were (or became) protomorphemic.

² It can be argued that sometimes they take the form of single-consonant suffixes, as with Daniel's use of [s/z] (Peters & Menn 1993). In fact, I wonder whether such segmental fillers may not have been systematically overlooked in the data, on account of their low salience to researchers.

	Phonological	Functional	Morphological	Production
Premorphology	Full syllable Limited set of vowels No/few consonants	Prosodic extender Not lexically selective	-----	Phonol. extension of item it is attached to
Protomorphology	Some match to set of morphemes in this position	Rhythmic placeholder Lexically selective Idiosyncratic	Morphological placeholder May be amalgamated	
Full morphemes	Match target within articulatory ability	Approaching adult	Split into subclasses Systematic	Becoming automatized

Table 1. Characteristics of fillers at different stages of development

B. Protomorphological fillers are transitional -- they are beginning to have some recognizable attributes of adult functors, both distributional and phonological (Peters & Menn 1993, Peters 1995, 1997). Although they increasingly take on the distributions of identifiable classes of target morphemes (e.g. protodeterminers, protoprepositions, or protoauxiliaries), these classes still seem to be internally undifferentiated (e.g. *a* has not yet been distinguished from *the*, or *can* from *will*). At the same time linear position may begin to play a noticeable role, in that fillers in different syntactic positions (e.g. in front of nouns or in front of verbs) may become increasingly distinguished on phonological grounds. For example, English protodeterminers may tend to begin with stops, while protoauxiliaries may include a nasal (Peters 1993, 1999, in press). It seems as if some children are trying to develop an 'item and slot' grammar

What makes it difficult to talk about the role of 'position' is its dual nature: on the one hand it plays a role in rhythm, on the other it plays a role in morphosyntax. Grammatical morphemes, whether bound or free, tend to be unstressed; as a result they participate in the rhythm of an utterance, in that they fall on the weaker beats. At the same time, grammatical morphemes have characteristic morphosyntactic positions, e.g. the determiner comes first in an English noun phrase. As utterances get longer and include more than one open-class item, position and rhythm begin to interact, particularly for those children who seem to be concerned with conveying the prosodic gestalt of a target utterance (Peters 1977, Klein 1978, 1981; Simonsen 1993; Peters 1997; Veneziano & Sinclair 1997). For example, Seth produced utterances such as *m pick ə fllowers*, and Simonsen's Norwegian subject Nora produced some very rhythmical sentences studded with unglossable vowels: *hun /e/ datt /e/ den /ε/ sengen* 'she [?] fell [out-of] that [?] bed'.

A new kind of incompletely analyzed production that may appear at the protomorphological stage comprises functor-like units which contain more than one syllable and which are based on frequent clusters of adult morphemes. (In English one finds forms such as *umma* 'I'm gonna', *unna* 'I wanna' or *didja* 'did you'.) At first they are rote-memorized and hence unsegmented; for this reason MacWhinney (1978) called them amalgams. Like monosyllabic protomorphemes, they incorporate aspects of adult morphosyntax that are not yet productive in the learner's grammar (Peters 1977, 1983), and they are used in functor-like ways³ (e.g. as protomodals (Peters 1996, 1999, in press). Before these multisyllabic amalgams are fully analyzed into their adult components, they may go through stages of partial analysis in which fillers again appear (Peters & Menn 1993, Peters 1996).

³ It is possible that researchers tend to classify one-syllable functors (e.g. articles) as 'fillers', but multisyllabic 'functor-chunks' (such as *wanna*, *gonna*, *didja*) as amalgams, overlooking the unitary-functor-like ways in which a child uses them.

Recognition criteria: Protomorphological fillers are beginning to take on some of the characteristics of adult functors, both distributionally and phonologically. Individual fillers may be identified with classes of target morphemes (e.g. protodeterminers, protoauxiliaries), but these classes are not yet internally differentiated. Fillers in different syntactic positions are becoming increasingly distinguishable on phonological grounds, although some protomorphological fillers may be multisyllabic amalgams modelled on frequently occurring clumps of target functors (e.g. *umma*, *didja*).

C. Fully morphosyntactic forms have split into subclasses, with distinct functions and with distributional patterns which roughly match those of adult functional categories. Although these classes are not yet fully fleshed out, they can now be said to be systematic.

Recognition criteria: their phonological form must match that of an adult target well enough to identify it without much question; their distribution must match that of the identified adult target without 'too many errors'.⁴; they seem to be used for much the same function as the adult target; their production is becoming increasingly fluent, suggesting their relegation to a separate (sub)section of the grammar, which is characterized by reasonably independent rapid automatic processing.

3. Open questions

Some of the things that we still do not know about fillers are summarized in the following developmental questions.

The role of 'position': When and to what extent is it meaningful to say that fillers are reflexes of incompletely perceived **positional slots**? We noted above the dual nature of 'position', for linguists as well as for learners, comprising both a linear, physical aspect which plays a role in the rhythm of a language, and a morphosyntactic aspect which helps the listener identify word classes (e.g. the functional category that precedes a noun rather than a verb, or the kind of inflection that attaches to a noun rather than a verb). In learning their language children surely note the linear physical characteristics of the positions of unstressed syllables long before they sort out the phonological and morphosyntactic properties of what typically fills these positions. I have speculated that a position can serve as a 'holding tank' for the accumulation of phonological and functional information that then can serve as a basis for further analysis and differentiation (Peters 1996, 1999, in press). Sonia Mariscal suggests (Mariscal, 1997) that positions may also contribute to the discovery of the morphosyntactic properties of accompanying open-class items; e.g. in Spanish, gender agreement on nouns may be bootstrapped by prior discovery of differences in preceding articles, differences which are then noticed in the rhyming concords on the nouns.

Within a language: Holding language constant, it would be useful to have quantitative information about the fate of fillers that are produced. To what extent are they 'blind alleys' that disappear without a trace? To what extent do they evolve into word-onsets? To what extent do they evolve into closed-class items?

Developmental changes: When phonological fillers evolve into (proto)-morphological fillers, how closely can we identify the point at which this happens? What criteria should we use? Are there systematic relationships between holophrases and fillers? between fillers and formulaic speech? between fillers and amalgams? Virginia Valian (pers. communication, July 1999) also asks how changes from prosody to syntax happen: construction? abstraction? triggering? interaction of perception with production? What evidence is there?

Developmental disorders: To what extent are fillers implicated in the phonological and morphological development of children with Selective Language Impairment?

⁴ Brown's '90% criterion' (1973) seems too strict. Certainly it is much stricter than needed to be able to say that a child is clearly 'working on' a particular class of morphemes. Furthermore, far from signaling that a child doesn't 'know' a morpheme at all, the commission of 'overgeneralization errors' suggests awareness of a morpheme and allocation of attention to it.

4. Conceptual considerations

Throughout my research on fillers I have assumed that their appearance is evidence of partial learning of grammatical categories. This is clearly a constructivist view which interprets a child's increasing ability to produce these hard-to-identify bits of speech as a sign of development-in-progress along several simultaneous fronts -- phonological, distributional, lexical, pragmatic, and syntactic. The assumption is that children must construct their grammatical categories on the basis of slow learning of phonological, distributional, and functional information embedded in the input.

A contrasting view is a more syntactic one based on the assumption that at any given point in development, children either do or do not 'have' the functional categories that underlie adult syntax. These categories may be available from the beginning ('innate'), or they may 'mature' (e.g. Radford, 1990), but it is not believed that learners construct them for themselves. Radford (1990) proposes three stages which, although they focus on different attributes, can roughly be equated with Dressler's and my own. (The following outline relies heavily on O'Grady (1997, pp.340-342.)

1. In the **pregrammatical** stage (generally before 20 months) utterances consist of single 'words' which show no evidence of syntactic categorization (e.g. into nouns, verbs, etc.) Although Radford does not discuss unsystematic combinations, including those with fillers, this stage seems closest to what we have been calling premorphology.
2. Radford notes that at around 20 months children begin to produce combinations of words which show some evidence of underlying patterns. These combinatorial patterns (which superficially resemble Braine's limited scope patterns) are believed to be fully productive. Radford calls this the **lexical** stage, at which children 'have' not only lexical categories (nouns, verbs, adjectives...) but also their syntactic projections. Although such fillers as appear at this stage are somewhat systematic, my guess is that he would interpret their appearance as insufficient evidence for fullblown functional categories, which he proposes 'mature' several months later. I identify this stage with protomorphology.
3. Finally, somewhere around 24 months children produce utterances in which functional categories such as determiners and 'inflections' can be identified on the basis of their structural properties. Radford's 1990 position is that these categories have now 'matured', allowing children to move into the **functional** stage -- the equivalent of our morphosyntactic stage.

Whichever interpretation ultimately turns out to be 'true', I think we must continue to try to understand what children are doing when they produce fillers of different types. To do this we need to understand the sorts of roles which fillers play in early grammars, including possibly helping bootstrap awareness of particular grammatical constructs or constraints. Such an approach requires adopting a child-centered, rather than adult-centered view of the developing 'grammar'. We can ask perceptual questions such as: *What might this language sound like to learners at differing stages of acquisition? What attributes are most salient? What are the relative roles of phonetics, prosody, and recognizable 'words' in allowing the learner to segment the speech stream?* We can ask questions about production such as: *Does the metrical structure of the target language foster the production of some prosodic structures over others (e.g. 1-syllable vs. 2-syllable vs. multi-syllable)?* More particularly, as suggested by Lleó and Demuth (1998): *What is the role of the metrical structure of syntactic phrases (e.g. noun phrases) in the early production of the grammatical morphemes (e.g. determiners) involved in that type of phrase?* We can also ask functional questions such as: *What is this learner using language for at this stage of development, i.e. what kinds of functions do particular fillers seem to be fulfilling for this child at this time? Are there identifiable pressures (social, cognitive, or other) that might lead her to try to grammaticize particular bits of language?*

A range of theoretical positions can thus be taken vis à vis fillers. The most obvious dichotomy is a phonological-grammatical one, which I state as positions I and II.

I. Fillers are purely phonological elements:

Position: Fillers are an **evanescent phenomenon** which appears in the early language productions of *some* children learning *some* languages. It is likely that they are influenced by prosodic patterns in the input as well as by the output style of the particular learner. Although observed in a range of languages, they have no connection to the development of the grammar of the adult language.

Evidence would be: A. They do not clearly correspond to any functional category/ies in the adult language. B. They just disappear. Moreover, there is a hiatus between the disappearance of fillers in a particular position and the identifiable appearance of the most closely related target category. Some fillers indeed seem to be of this variety, as witness the purely phonological fillers noted by Veneziano & Sinclair.

II. Fillers are early grammatical elements:

Position: Fillers are phonological evidence of a language learner's early awareness of (some) adult functional categories. Precursors of categories such as determiners and 'inflections' may appear as early as the late one-word stage. Some children learning some languages may find it (prosodically/phonologically) preferable to produce syllabic traces of such categories rather than bare nouns or verbs.

Evidence would be: Structural continuity with the development of an identifiable target adult category.

Position II can be further subdivided into a syntactic view and a constructivist view:

II-S. Fillers are evidence of innate syntactic elements:

Position: Fillers are phonological evidence of the **early availability** to language learners of (some) **adult functional categories**. For those categories which are present from the beginning, they will still have to develop in language-specific ways (phonology, morphosyntax) as well as cognitively (in terms of depth of nesting that can be managed).

Possible evidence: Adult-like syntactic properties are present *from the beginning*.

Questions: *Is there an identifiable **range of functional categories** in a given language which can appear first as fillers? All of them? Only certain 'easy' ones?*

II-C. Fillers are evidence of syntactic elements under construction:

Position: Fillers are phonological evidence that the learner is in the process of **constructing** a **grammatical/functional slot** on the basis of the input. In this view all learners must construct such slots, although not all produce evidence of the process in the form of 'syllabic traces'. Development that must take place within each slot includes further specification of phonological, morphological and syntactic properties.

Possible evidence: A. Although there is some early correspondence with the properties of an identifiable adult grammatical position, both phonological and morphosyntactic attributes are incomplete. B. The contents of this position differentiate gradually to allow for the range of adult forms that occur there. For example, protodeterminers differentiate into articles and demonstratives, or protomodals differentiate into auxiliaries, modals, and quasi-modals.

Questions: *When fillers do appear which are recognizably proto-grammatical, how gradual is the development of target-like attributes? Is the evidence more consistent with innate syntactic categories (position II-S) or with construction (II-C)?*

I hope that this review will clarify some of the issues regarding this relatively robust phenomenon and provide a more unified impetus to their future study.

References

- Berman, R. A., & Slobin, D. I. (Eds.). 1994. *Relating events in narrative: a crosslinguistic developmental study*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bloom, L. 1970. *Language development: Form and function in emerging grammars*. Cambridge, MA: MIT Press.
- Bloom, L. 1970. *Language development: Form and function in emerging grammars*. Cambridge, MA: MIT Press.
- Braine, M. D. S. 1963. The ontogeny of English phrase structure: the first phase. *Language* 39.1-13
- Braine, M. D. S. 1976. *Children's first word combinations*. Monographs of the Society for Research in Child Development, Chicago: University of Chicago Press (164).
- Brown, R. 1973. *A first language: The early stages*. Cambridge, MA: Harvard University Press.
- Dore, J., Franklin, M. B., Miller, R T., Ramer, A. L. H. 1976. Transitional phenomena in early language acquisition. *Journal of Child Language* 3.13-19
- Dressler, W. U. & Dziubalska-Kolaczyk, K. 1997. Contributions from the acquisition of Polish phonology and morphology to theoretical linguistics. *Language and its ecology: Essays in memory of Einar Haugen*, ed. by S. Eliasson & E. H. Jahr. New York: Mouton de Gruyter. 379-399.
- Dressler, W. U. & Karpf, A. 1995. The theoretical relevance of pre- and protomorphology in language acquisition. *Yearbook of Morphology 1994*, ed. by G. Booij and J. v. Marle. 99-122. Dordrecht: Kluwer Academic Publishers.
- Echols, C. H. 1993. A perceptually-based model of children's earliest productions. *Cognition* 46.245-296.
- Echols, C. H. & Newport, E.L. 1992. The role of stress and position in determining first words. *Language Acquisition* 2.189-220.
- Gerken, L. 1987. Telegraphic speaking does not imply telegraphic listening. *Stanford Papers and Reports in Child Language Development*, 26, 48-55.
- Gerken, L, B. Landau & R. Remez. 1990. Function morphemes in young children's speech perception and production. *Developmental Psychology*, 26, 204-216.
- Gerken, L. 1994. A metrical template account of children's weak syllable omissions from multisyllabic words. *Journal of Child Language*, 21, 565-584.
- Gerken, L. 1996a. Phonological and distributional information in syntax acquisition. In J. L. Morgan & K. Demuth (Eds.), *Signal to Syntax: Bootstrapping from Speech to Grammar in Early Acquisition* (pp. 411-425). Mahwah, NJ: Lawrence Erlbaum Associates.
- Gerken, L. 1996b. Prosodic structure in young children's language production. *Language*, 72, 683-712.
- Gerken, L., & McIntosh, B. J. 1993. The interplay of function morphemes and prosody in early language. *Developmental Psychology*, 29, 448-457.
- Kilani-Schoch, M., de Marco A., Christofidou, A., Vassilakou, M., Vollman, R. & Dressler, W. U.. 1997. On the demarcation of phases in early morphology acquisition in four languages. *Poznan Studies in Contemporary Linguistics* 33.
- Klein, H. 1978. The relationship between perceptual strategies and production strategies in learning the phonology of early lexical items. Bloomington Indiana: Indiana University Linguistics Club.
- Klein, H. 1981. Early perceptual strategies for the replication of consonants from polysyllabic lexical models. *Journal of Speech and Hearing Research* 24.535-551.
- Lleó, C. & Demuth, K. 1998. Prosodic constraints on the emergence of grammatical morphemes: crosslinguistics evidence from Germanic and Romance language. ms.
- Macken, M. A. 1979. Developmental reorganization of phonology: a hierarchy of basic units of acquisition. *Lingua* 49.11-49
- MacWhinney, B. 1978. *Processing a first language: The acquisition of morphophonology*. Chicago: University of Chicago Press.

- MacWhinney, B. 1995. *The CHILDES project: Tools for analyzing talk*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Mariscal, S. 1997. *El proceso de grammaticalization de las categorías nominales en Español*. Doctoral dissertation. Universidad Autónoma de Madrid.
- O'Grady, W. 1997. *Syntactic development*. Chicago: University of Chicago Press.
- Peters, A. M. 1977. Language learning strategies: Does the whole equal the sum of the parts? *Language* 53.560-573
- Peters, A. M. 1983. *The units of language acquisition*. New York: Cambridge University Press.
- Peters, A. M. 1986. Early syntax. *Language acquisition*, 2nd edition, ed. by P. Fletcher & M. Garman. 307--325. New York: Cambridge University Press.
- Peters, A. M. 1993. The interdependence of social, cognitive and linguistic development: Evidence from a visually-impaired child. *Constraints on language acquisition: Studies of atypical children*, ed. by H. Tager-Flusberg. 195-219. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Peters, A. M. 1995. Strategies in the acquisition of syntax. *Handbook of language acquisition*, ed. by P. Fletcher & B. MacWhinney. Oxford: Blackwell. 462-482.
- Peters, A. M. 1996. The emergence of catenatives from filler syllables. Paper presented at conference on Approaches to Bootstrapping in Early Language Development, Berlin, September 1996.
- Peters, A. M. 1997. Language typology, prosody and the acquisition of grammatical morphemes. *The Crosslinguistic Study of Language Acquisition*, ed. by D. I. Slobin. Hillsdale NJ: Lawrence Erlbaum Associates.
- Peters, A. M. 1999. The emergence of so-called 'functional categories' in English: A case study of auxiliaries, modals and quasi-modals. *LACUS Forum XXV*, ed. by S. J. Hwang & A. Lommel.
- Peters, A. M. in press. From prosody to grammar in English: the differentiation of catenatives, modals, and auxiliaries from a single protomorpheme". *Approaches to bootstrapping: phonological, syntactic and neurophysiological aspects of early language acquisition*, ed. by J. Weissenborn & B. Höhle. Amsterdam: Benjamins.
- Peters, A. M. & Menn, L. 1993. False starts and filler syllables: Ways to learn grammatical morphemes. *Language* 69.742-777.
- Radford, A. 1990. *Syntactic theory and the acquisition of English syntax*. Oxford: Blackwell.
- Scarpa, E. 1993. Filler-sounds and the acquisition of prosody: sound and syntax. Paper at Sixth International Conference for the Study of Child Language. Trieste.
- Simonsen, H. G. 1993. Models in the description of phonological acquisition. Paper at Sixth International Conference for the Study of Child Language. Trieste.
- Veneziano, E. & Sinclair, H.. 1997. From the surface inward: a discontinuous continuity in the emergence of grammatical morphemes. ms.