

Fillers as signs of associative learning

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Abstract

Young children often insert 'fillers' in their first multiword utterances: vocalizations that do not correspond to conventional words. For instance, it is hard to determine the meaning of the syllables [m] and [ɔ] in utterance (1). So far, fillers have been investigated in French (i.a. Veneziano & Sinclair, 2000; Kilani-Schoch & Dressler, 2000), English (i.a. Peters & Menn, 1993; Feldman & Menn, 2003), Spanish (i.a. Lopez-Ornat, 2001), but barely in Dutch. We will try to fill this gap in this paper by analyzing the longitudinal data of one Dutch child, Cato.

(1) [m] pick [ɔ] flowers (English speaking boy, age 1;6, from Peters & Menn, 1993)

Methodology

The data of Cato are part of the CLPF database (Fikkert, 1994, Levelt, 1994, available through CHILDES). They span a period of 10 months from age 1;10 (MLU=1.1, SD=0.4) until age 2;7 (MLU=3.9, SD=2.3). Bimonthly observation sessions were transcribed orthographically and phonemically.

Fillers were not annotated consistently in the original database. First of all, most targetless vowels were attached to words. We decided to detach these vowels, except when they could not be interpreted as an affix (Taelman, 2004). Secondly, there was a confound between articles and fillers in the original database, due to similarities in distribution and phonological form. We recoded the fillers and articles based on the phonological form of the child's rendition: if the form was a close approximation to the phonological form of an article, we interpreted it as an attempt at an article. All other instances were annotated as fillers, independently of the location in which they appeared. Based on this definition, we found 621 fillers. Most of them were schwas or schwa-like vowels (sometimes preceded by a consonant). Some were nasals: n, m, N.

Nasal fillers

At the start of observations, articulatory factors determined the insertion of nasal fillers to a high extent. Until age 2;0, words that started with a stop were often preceded by an homorganic nasal filler: /n/ before /d/ or /t/, /m/ before /b/ or /p/. Probably, this homorganic nasal consonant originated from the child's inadequate control of nasality during mouth closure. After age 2;0, the percentage of nasal fillers before stops diminished, signalling a better control of nasality. Now, nasal fillers frequently appeared in a new context: before nouns starting with an /h/. These nasals are reminiscent of the nasal in the Dutch indefinite article /ɔn/ that often occurs before nouns in the input. Our analysis revealed that the child had inferred a statistical rule from the occurrence of a nasal before /h/: she also produced nasal fillers before verbs starting with an h, and before attempts at targets that did not begin with /h/ in the adult model, but that were produced with an initial /h/ by the child.

Schwa fillers

Until age 2;0, schwa fillers were tied to specific lexical items: they almost only occurred after six specific function words: *ook* (Eng. 'also'), *is* (Eng. 'is'), *gaat* (Eng. 'goes', 'will'), *in* (Eng. 'in'), *op* (Eng. 'on'), *met* (Eng. 'with'). Two examples can be found in (2). The morphosyntactic status of the next words played a role as well: schwa fillers occurred a bit more frequently in determiner position before a noun than in other positions. Schwas in non-determiner position were not rare at all.

(2a) *ook* ∂ *fiets* (Cato, 2;0)
also F bike

(2b) *ook* ∂ *in pap* (Cato, 1;11)
also F in porridge

We found that the six function words had a special status in Cato's intake (=adult model of output). No other words occurred in front of an article as often as the six function words. From these highfrequent cooccurrences in the intake, the child had probably extracted strong associations between the six function words and a schwa. This schwa represents a common phonological characteristic of all Dutch articles (i.e. /ɔn/, /dɔ/, /hɔt/).

Schwa fillers were inserted more often in other contexts after age 2;0, although the likelihood of a schwa filler was still much higher if one of the six function words preceded. The proportion of schwa fillers in non-determiner position diminished. From age 2;1 on, full-fledged articles appeared in determiner position, mostly at the start of an utterance, and utterance internally when the surrounding syllables were rhythmically strong. This rhythmic condition also had a mild impact on the likelihood of insertion of a schwa filler.

Implications

Both nasal and schwa fillers show associative learning at a low level of abstraction. In case of the nasal fillers, the child acquired the association nasal – word starting with h. The schwa fillers were associated by the child with particular function words. These associations brought the child to use schwa fillers and nasal fillers in 'ungrammatical' contexts, more specifically in positions that do not allow a determiner. In case of the schwa fillers, the child unlearned these overgeneralizations, probably by focussing her attention on the distribution at the right side of articles in the input. Apart from associative learning, we discovered two other factors that had an impact on the insertion of fillers: (1) articulatory proficiency, and (2) a rhythmic preference. In the remainder of this paper, we will discuss these findings relative to previous research on fillers, and theories of grammatical productivity in early child language.

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