On the development of the productivity of plural suffixes in German

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Native speakers have the ability to fluently create and understand a plural for a given novel singular, and a singular for a given novel plural (Pierrehumbert, 2000). This productivity of plural suffixes involves generalizations that are based on relations between words (Pierrehumbert, 2006). We investigate the development and the nature of these generalizations over time.

We conducted two production experiments to study the productivity of plural suffixes in German with 20 five-year-olds, 20 seven-year-olds and 20 adults each (a total of 120 participants). In one experiment we asked participants to form the plural for 24 given singular words and 26 nonces, and in the other experiment we asked other participants to form plurals from given singulars.

For learners of German learning the set of plural suffixes is not straightforward as it has a rich set of plural suffixes (-@(n), -@r, -s and -∅) (Clahsen et al., 1992; Clahsen, 1999; Marcus et al., 1995; Wiese, 1996). Furthermore, the relation between the suffix and the phonology of the stem is complicated and not transparent (Mugdan, 1977). Moreover, singulars may end on strings that include -[@(n)], -[@r] and -[s] (Köpcke, 1988).

In generative phonology stems and suffixes are stored separately (Chomsky & Halle, 1968; Kiparsky, 1981, 1985). In probabilistic theories both simple and complex words are stored as wholes (Baayen, 2003; Pierrehumbert, 2000, 2003, 2006).

These two theories make different predictions concerning the production of nonces. If morphemes are stored separately, a speaker who is able to produce correct singulars and plurals will also be able to produce nonces by adding or stripping suffixes. In probabilistic theories of the lexicon the ability to produce a singular for a plural nonce or a plural for a singular nonce depends on the probabilities of each of these generalizations (Baayen, 2003; Pierrehumbert, 2003, 2006).

Figure 1 shows our results. The three top panels show the results of the singular-to-plural experiment. All groups are able to form plurals for words; the number of plurals for nonces increases with age. The lower three panels show the results of the plural-to-singular experiment. All groups are able to form singulars for plural words; adults are able to form singulars for plural nonces, but neither five-year-olds nor seven-year-olds are.

The results of our experiments can be understood as the consequence of probabilistic analyses of relationships in the lexicon. Since there is a limited set of
plural suffixes, a speaker can be confident about the ending of a plural form. There are more possible endings for singulars, and a speaker can be less confident about the form of a singular. A larger lexicon will lead to more confident productions of nonces. Our results are not expected on the basis of separate lexical storage of stems and suffixes. The asymmetry between words and nonces on the one hand and between the formation of plural and singular nonces on the other hand cannot be explained in such a theory.

Figure 1: The results for words (dark bars) and nonces (light bars). The top three panels show the proportion of formations of a plural for a given singular. The bottom three panels show the proportion of formations of a singular for a given plural.

References
Mugdan, Joachim. 1977. Flexionsmorphologie und Psycholinguistik: Untersuchungen zu sprach-