



Morphonotactic and phonotactic processing in German-speaking adults



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ABSTRACT

Based on the theoretical framework of Dressler and Dziubalska-Kořaczyk (2006a,b), the Strong Morphonotactic Hypothesis will be tested. It assumes that phonotactics helps in decomposition of words into morphemes: if a certain sequence occurs only or only by default over a morpheme boundary and is thus a prototypical morphonotactic sequence, it should be processed faster and more accurately than a purely phonotactic sequence. Studies on typical and atypical first language acquisition in English, Lithuanian and Polish have shown significant differences between the acquisition of morphonotactic and phonotactic consonant clusters: Morphonotactic clusters are acquired earlier and faster by typically developing children, but are more problematic for children with Specific Language Impairment. However, results on acquisition are less clear for German. The focus of this contribution is whether and how German-speaking adults differentiate between morphonotactic and phonotactic consonant clusters and vowel-consonant sequences in visual word recognition. It investigates whether sub-lexical letter sequences are found faster when the target sequence is separated from the word stem by a morphological boundary than when it is a part of a morphological root. An additional factor that is addressed concerns the position of the target cluster in the word. Due to the bathtub effect, sequences in peripheral positions in a word are more salient and thus facilitate processing more than word-internal positions. Moreover, for adults the primacy effect most favors word-initial position (whereas for young children the recency effect most favors word-final position). Our study discusses effects of phonotactic vs. morphonotactic cluster status and of position within the word.

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1. Introduction

Based on the theoretical framework of Dressler and Dziubalska-Kořaczyk (2006a,b), the Strong Morphonotactic Hypothesis is tested, which assumes that phonotactics helps in decomposition of words into morphemes: if a certain sequence

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occurs only or only by default over a morpheme boundary and is thus a prototypical morphonotactic sequence, it should be processed faster and more accurately than a purely phonotactic sequence.

But beyond this hypothesis, the experiments and analyses reported in this contribution are intended to explain differences in on-line processing of German phonological units according to:

1. whether they are at the same time morphological units, as some instances of /t/, /st/, /an/,
2. whether the position of morphological boundaries (+) makes a difference, e.g., /+st+#/ vs. ambiguous /+st+#/ or /s+t+#/,
3. whether word-initial vs. word-final vs. word-internal position makes a difference,
4. whether monophonemic vs. biphonemic status of a unit (/t/ vs. /st, an/) makes a difference,
5. whether different phonotactic binding strength (/an/ vs. /st/) makes a difference.

Finally, the processing results are compared with first language acquisition results.

The basic experimental method is to have the participants find /an, st, t/ under different conditions and to measure accuracy and reaction time. The focus of the analysis is on the interaction between phonotactics and morphotactics.

2. Research background

Dressler and Dziubalska-Kołaczyk (2006a,b) proposed the new morphonological subfield of morphonotactics as the area of interaction between phonotactics and morphotactics with gradual transitions between morphonotactics and ordinary phonotactics. On the one hand, ordinary phonotactics refers to phonotactic distributions which occur in intramorphemic word phonology and also beyond morpheme boundaries, and where the absence of cross-morphemic phoneme sequences is only due to the (phonological) chance effect of no morpheme boundaries occurring in certain positions. Thus German ordinary phonotactics includes both word-initial /an/ and /an+/, but only word-initial /t/ and /st/ without a morpheme boundary, because there exist no word-initial /t, s, st/ morphemes in German. An additional source of morphonotactic sequences, namely vowel deletion in morphological derivation (as in Polish word-initial [mx] in *mch* [mex] ‘moss’ → GenSg, *mch-u* and adjective *mch-ow-y*) does not occur in German.

On the other hand, prototypical morphonotactics refers to phonotactic sequences which never occur in lexical roots nor intramorphemically and are therefore illegal in ordinary phonotactics (Marshall and van der Lely, 2006), such as the consonant cluster /md/ in English *seem+ed* /si:m+d/ (i.e., there is no lexical final [-md] cluster, this cluster containing always an internal morpheme boundary). This represents the greatest degree of deviation of a morphonotactic (i.e., morphologically and phonologically motivated) phoneme cluster from an ordinary phonotactic (i.e., merely phonologically motivated) phoneme cluster.

Transitional cases between the two extreme phoneme groups are those that are morphologically motivated as a strong default, i.e. which are paralleled by very few exceptions of a morphologically unmotivated nature. Thus there are many more morphonotactic than purely phonotactic groups of the same type, such as in word-final German [pst].

Next come phoneme groups which are morphologically motivated as a weak default, i.e., which are paralleled by more exceptions of a morphologically unmotivated nature, as in word-final German [kst].

With the exception of prototypical morphonotactic groups on the one hand and purely phonotactic groups on the other, all of the above-cited types of groups allow a comparison between morphonotactic and purely phonotactic groups.

Based on these differentiations, our acquisitionist research groups in Kaunas, Poznan and Vienna have compared the acquisition of morphonotactic and phonotactic consonant clusters in Lithuanian (Kamandulyte, 2006), German (Freiberger, 2007; Fürst et al., 2011) and Polish (Zydorowicz, 2007, 2009, 2010). For Lithuanian and Polish, there was evidence that due to the interface between phonotactics and morphotactics, morphonotactic clusters are generally acquired faster by typically developing children. Partially comparable results have been obtained for English (Marshall and van der Lely, 2006; Zydorowicz, 2009). The results were less clear for German: whereas Fürst et al. (2011) found that typically developing children score much higher on an adjective gradation task containing morphonotactic consonant clusters than children with SLI, Freiberger (2007) who compared the early development of morphonotactic and phonotactic consonant clusters in a typically developing Viennese boy, did not find a clear advantage, but also no disadvantage for morphonotactic consonant clusters. Further data from 16 three-year-old typically developing Viennese children from high and low socio-economic status families (Korecky-Kröll and Dressler, 2013) as well as from three younger Viennese children aged 1;6–3;0 (Freiberger, 2014) confirm Freiberger’s (2007) findings that there are no significant differences in correct production of morphonotactic vs. phonotactic consonant clusters.

Nevertheless, in typical language development the interface between phonology and morphology appears to be facilitative or at least not hindering: in morphonotactic sequences morphology may help phonological acquisition. In contrast, SLI children have more difficulties with the acquisition of morphonotactic than of phonotactic sequences (Marshall and van der Lely, 2006) because grammatical interfaces are in general problematic for SLI children.

One reason for this difference in the acquisition of phonotactic vs. morphonotactic sequences could be that morphonotactic clusters might be processed faster than purely phonotactic ones. This has induced Dressler and Dziubalska-Kołaczyk (2006a,b) to propose the Strong Morphonotactic Hypothesis which assumes that also in adult processing phonotactics helps in decomposition of words into morphemes: if a certain sequence occurs only or by default over a morpheme boundary, it should be processed faster and more accurately than a comparable ordinary phonotactic sequence.

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