A repeated measures investigation of the processing of German trimorphemic words

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Recent research on the mental representation and processing of morphologically complex words has painted a picture that is much more sensitive to learning and much more variable across individuals than was previously thought (e.g., Ramscar et al., 2014; Schmidke & Kuperman, in press). This research suggests that the understanding of morphological processing requires that we take into consideration the individual language user's experience with lexical patterns and with individual lexical items.

For the most part, effects of such experience have been difficult to track experimentally because, in lexical processing experiments, each participant typically sees a particular stimulus only once, in order to guard against within-experiment practice effects. In the study that we report, we intentionally fostered a within-experiment practice effect in order to investigate the extent to which an individual's morphological processing varies over time and across tasks and the extent to which it can be affected by the nature of stimulus presentation.

The repeated stimuli in the study were German words that contain bimorphemic suffixes (comparable to English words such as *countability*) and German compounds that contain three stems, (comparable to English compounds such as *football game*). Because, in German, compounds are typically written without spaces, the German triconstituent compounds are written as a single string of characters (e.g., Eng. *football game* = Germ. *Fussballspiel*).

Thirty native speakers of German participated in the experiments. Participants were shown 75 stimuli (25 compounds, 50 suffixed words ending in either the suffixes *bar+keit, ig+keit, lich+keit,* or *sam+keit*) over three testing sessions. The sessions extended over a four-week period. The tasks performed in each session are show in Table 1.

Table 1. The design of the repeated measures investigation.

Time	Recognition Task	Production Task	Judgment Task
Session 1:	Visual word identification	Word typing	
Session 2:	Segmented visual word identification	Word typing	
Session 3:	Visual word identification task	Word typing	Segmentation

The segmented visual word presentation in Session 2 was created by using coloured fonts so that each word was seen in one of three conditions: (1) full morphological decomposition, (2) split between the first and second morphemes, (3) split between the second and third morphemes, and (4) split at a non-morphological boundary.

Our finding that morphological patterns persist in the typing record suggests that morphological effects are not limited to recognition situations in which participants are surprised by stimuli.

Rather, they seem to reflect the nature of internal representations. We discuss the manner in which these internal representations can change over time, both as a result of stimulus manipulation (as in Session 2) and as a result of repeated exposure to individual lexical items and exposure to morphological patterns.

References

Ramscar, M., Hendrix P., Shaoul C., Milin P., and Baayen, R. H. (2014). The Myth of Cognitive Decline: Non-Linear Dynamics of Lifelong Learning. *Topics in Cognitive Science*, 6, 5-42.

Schmidtke, D. and Kuperman, V. (in press). Individual variability in the semantic processing of English compound words. *Journal of Experimental Psychology: Learning, Memory and Cognition.*