“Uh/Uhm”: Conflicting recall effects of filler particles in German and English

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We present data of two recall experiments on filler particles (FPs) that attempt to replicate results presented in a study by Fraundorf and Watson [1]. FPs (e.g. uh/uhm) are classified as a type of disfluency which suggests that these FPs interrupt the speech flow. Using FPs is often seen as an undesirable aspect of speech production, especially in public speaking [2]. However, this view has been questioned from a speech perception perspective. Studies suggest that the listeners use FPs as beneficial cues to follow the speaker’s utterance. It has been found that FPs are more likely to occur at prosodic phrase boundaries [3] and are often produced before introducing a new topic or referent [4]. The systematic production of fillers can be used by the listener to retrace and predict the speaker’s message. [5] showed that disfluencies have a positive influence on the processing of the following speech material. Likewise, [6] showed that words preceded by a disfluency are better remembered. [1] tested these recall effects of FPs at the discourse level and found a beneficial effect of FPs for recall in their English data. To test whether disfluencies trigger similar processing behaviour, we replicate their study as a web-based experiment with German material.

Following [1]’s study on English, our study presented three short passages of a German translation of “Alice in Wonderland” [7] to the subjects, each in a different condition. There were three conditions regarding fluency: The fluent condition included no FPs or other hesitations while the filled pause condition included a FP token before six of the sentences. The other sentences remained unmanipulated. In the third condition the silent intervals were adapted to the same duration and positions as the pauses with the FPs in condition 2. Participants included 45 native speakers of German (mean age 31.2 years), who listened to the stories and, afterwards, were recorded as they retold the story in their own words. In the analysis, it was checked whether the participants remembered the key information of each event. The statistical analysis incorporated Generalised Linear Mixed Effects Models (Contrast coding and final model, see Table 1) and show that the participants recalled the content of the stories significantly better in the fluent condition than in the other two conditions (C1: Estimate = 0.5098, SE = 0.2021, z value = 2.522, $Pr(>|z|) < .01$, CI = [0.11993; 0.95432]). There was a trend for the second contrast that suggests that the long silence condition leads to better recall than the FP condition (C2: Estimate = -0.4520, SE = 0.2396, z value = -1.887, $Pr(>|z|) = .06$, CI = [-0.96744; 0.01798]). These results are contrary to Fraundorf and Watson’s findings who proposed an improved recollection of information after FPs.

Due to the conflicting results with [1], we conducted a second experiment using the original English material by [1]. 58 native English participants (mean age 31.4 years) participated in this experiment. This experiment had three conditions: a fluent condition, a long FP condition, and a short FP condition. The short FPs were created by shortening the long FPs by half of their duration to make them more similar to natural FPs. The experimental setup and procedure were the same as in the previous experiment. The statistical analysis using GLMMs (Contrast coding and final model, see Table 1) did not show any statistically significant effects (C1: (Estimate = 0.0674, SE = 0.1847, z value = 0.365, $Pr(>|z|) = 0.72$, CI = [-0.29912; 0.45693]), C2: (Estimate = 0.1944, SE = 0.2314, z value = , $Pr(>|z|) = 0.4$, CI = [-0.27079; 0.66927])). Neither the fluent condition nor the FP conditions improved or impaired the subjects’ recall, which is surprising as the material was similar to the one in [1]. Based on these results, we speculate that the web-based paradigm had an impact on our results and that the differences to [1] stem from the different experimental setups. Previous studies (e.g. [6, 8]) showed different results with respect to the benefit of FPs in memory tasks, which have also been attributed to differences in experimental design. We discuss our findings considering the effect of experimental setups.

Experiment 1	fluent	FP	long silence
Experiment 2	fluent	long FP	short FP
Contrast1 (C1)	2/3	-1/3	-1/3
Contrast2 (C2)	0	1/2	-1/2

Table 1: Contrast matrix of Experiments 1 & 2. The first contrast (C1) compares the fluent condition against the other two conditions, which is why the coded value for fluent is the same as the absolute sum of the values of the other two conditions. The second contrast only compares the FP condition to the long silence condition (Exp1) or the FP conditions with one another (Exp2), which is achieved by setting the value of the fluent condition to equal 0.

Final models for the statistical analysis: Model fit was done by utilizing PCAs (principle component analyses) to reduce the random structure of the models [9]: Model for Experiment 1: $glmer(Answer \sim C1 + C2 + (1 + C1 + C2 \mid Subject) + (1 \mid Story) + (1 \mid Plotpoint), family = binomial)$; Model for Experiment 2: $glmer(Answer \sim C1 + C2 + (1 + C1 + C2 \mid Subject) + (1 \mid Story/Plotpoint), family = binomial)$.

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