

Filled pauses from a cognitive and pragmatic perspective: how eye-tracking improves our knowledge of linguistic elements

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Filled pauses (FPs), small linguistic elements such as *uh* and *um*, have been approached from different domains, resulting in different findings. The study started in the field of psychology, where a FP was regarded as a reflection of underlying mental processes, such as cognitive processing, lexical search and anxiety (e.g. Goldman-Eisler 1968). Later studies noted however, that FPs also have a signaling function in interaction. They may signal a speaker's intention to hold the turn, announce a delay in speaking or signal a topic shift (e.g. Clark & Fox Tree 2002, Rendle-Short 2004). Recently, Crible, Degand & Gilquin (2017) proposed to change the symptom-signal dichotomy into a continuum, suggesting that FPs can fulfill both functions at the same time, to a greater or lesser extent.

In this study, we show how including speaker's eye gaze into the analysis of FPs can offer a better understanding of their cognitive and/or pragmatic function. It is a well-known fact that withdrawing gaze from an interlocutor can facilitate a speaker's cognitive processing (Argyle & Cook 1976). In this respect, it is unsurprising that gaze withdrawal often occurs when speakers are planning a turn or when speech is more hesitant (Kendon 1967). However, quantitative studies show that the co-occurrence FPs with gaze withdrawal is not as high as expected: only 63% of all FPs co-occur with gaze away from the interlocutor (Jehoul et al. 2017).

We collected a video corpus of three-party interaction, where the participants were equipped with eye-tracking glasses and had a conversation and brainstorm session in Dutch. This resulted in a corpus of 11 unscripted conversations and 8 brainstorm sessions (each 15 minutes). A combination of quantitative and qualitative techniques was used to test whether a difference in gaze behavior could be related to a difference in function.

The quantitative results show that gaze aversion is indeed a marker of a higher cognitive load. We found that gaze withdrawal occurs more frequently:

- (i) In co-occurrence with *um* in comparison to *uh*, supporting earlier claims that *uh* and *um* differ in function (Clark & Fox Tree 2002).
- (ii) In co-occurrence with turn-initial FPs, opposed to turn-medial FPs in conversations, which may be linked to the level of cognitive planning (Shriberg 1994).
- (iii) In co-occurrence with FPs in brainstorm sessions in comparison to free-range conversations, plausibly reflecting a different type of mental activity.

These results fed into a qualitative study of FPs in different positions in a sequence. It was found that FPs occurring in positions where cognitive issues were displayed (e.g. in word searches) are accompanied by different gaze behavior than FPs functioning on a pragmatic level (e.g. announcing a new element of a list). These results show that speakers' gaze is a useful resource to understand the cognitive and pragmatic features of FPs.

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