

## Disfluencies in alcoholized speech

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### Introduction and goals

The aim of this study is to clarify whether there is a significant difference in the number of disfluencies produced in speech under the influence of alcohol vs. sober speech, and thus can be used as an indicator for intoxication. More specifically we investigated nine linguistic and para-linguistic events which can be summarized under the broader term disfluencies and can be regarded as perceptible deviations from normal, fluent speech. Aside from the event counts the duration of filled pauses (hesitations) was examined as well.

### Method

Although a number of studies have been dealing with alcoholized speech (see (Chin & Pisoni, 1997) and (Künzel et al., 1992) for an overview) there exist few studies with a large number of subjects of both genders or with a precise measurement of the blood alcohol concentration. For this study we used the speech of 128 alcoholized subjects (66 male and 62 female) from the Alcohol Language Corpus (ALC)<sup>1</sup> with a blood alcohol concentration ranging from 0.5‰ to 1.68‰. The following events were counted as a function of alcoholisation (binary), gender and speech type (*read, spontaneous and elicited command&control*):

*Durations of hesitations, number of hesitations, long pauses, short pauses (<1sec), mispronunciation of words, repetitions, repairs, unusual elongations of sounds and word interruptions.*

Event proportion were statistically analysed using *mixed models* with the speaker as random factor, while the duration measurement was tested using classical *RM-ANOVA*.

### Results

Alcoholisation had a significant effect on eight of the events as shown in the following table ('total' denotes the sum of all disfluency counters; '↑' numbers increase significantly for alcoholisation; '-' no significant change):

<i>total</i>	<i>hes.dur</i>	<i>hes.num.</i>	<i>long.p.</i>	<i>short.p.</i>	<i>mispr.</i>	<i>repeat</i>	<i>repair</i>	<i>elong.</i>	<i>interr.</i>
↑	↑	↑	↑	-	↑	↓	-	↑	↑

The gender of the subject only had an influence on the number of hesitations. Further it turned out that the type of speech also affected the results frequently.

The small occurrence rate of some events in certain speech types turned out to be a problem (e.g. repetitions in command&control speech).

In the talk we will present examples of the counted events, more detailed statistical results and discuss the implications for automatic alcohol detection systems.

### References

- Barfüßer, S., Gilg, Th., Heinrich, Chr., Schiel, F. (2008). ALC Alcohol Language Corpus. *Proc. of LREC 2008*
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- Künzel, H. J., Braun, A., Eysholdt, U. (1992). *Einfluss von Alkohol auf Sprache und Stimme*. Heidelberg: Kriminalistik Verlag

<sup>1</sup>see <http://www.bas.uni-muenchen.de/Bas>