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Investigations on the influence of cue reactivity on relapse behavior in alcohol use disorder using innovative methods of statistical survival analysis

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The overall objective of this thesis was to clarify the extent to which functional neurobiological (functional magnetic resonance imaging (fMRI)) and psychophysiological (startle reflex) measures of cue reactivity are suitable predictors of severe relapse in individuals with alcohol use disorder (AUD). This could be achieved by complex modern methods of survival analysis. It could be shown that fMRI cue reactivity in the ventral striatum (VS) is suitable as a prognostic factor for relapse in patients suffering from AUD by calculating different fMRI-based aggregation measures which are not yet implemented in standard whole-brain fMRI software. For the VS a measure combining the spatial extent of cue-induced brain activation with the intensity of this activation was found to be most appropriate as a biomarker for relapse prediction.

Furthermore the startle response as a psychophysiological measure showed a moderator effect when evaluating differential medication effects of naltrexone and acamprosate. The results suggest that AUD patients benefit more from naltrexone than from acamprosate treatment, the more appetitive their startle response appears. In contrast the findings point to lower relapse risk for patients with an aversive startle response pattern when treated with acamprosate compared to naltrexone. The findings support the idea of an individualized treatment based on differential pharmacological treatment due to different underlying biological mechanisms which can be identified by the affective modulation of the startle response.

The presented methods offer a potential for future analyses of high clinical relevance, also in areas besides addiction (i.e. psychiatry, oncology).