

Inhibitory Control Training May Promote a More Aware Drinking Behavior in Young Female Individuals with Binge Drinking Pattern, but Cannot Improve Inhibitory Control

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Background

- ✓ Computerized inhibitory control trainings can reduce alcohol consumption, but not inhibitory control in Heavy Drinking samples^{e.g., 1,2}
- ✓ Binge Drinking (BD) behavior: Greater importance of drinking-related loss of control and inhibitory control³

- Development of an inhibitory control training with optimized training character^{e.g., 4} (individualized, adaptive, performance feedback)
- Investigation of sex differences^{e.g., 5}

Hypotheses

Training: Inhibitory control ↑ alcohol-related self-control ↑ BD behavior ↓



Methods

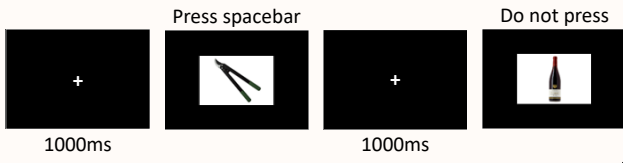
61 Participants (31 male [50.8%]; $M=25.36$ years old [$SD=3.895$; 19-37])

- >4/5 (female/male) drinks on the same occasion at least 2 times/month²
- Alcohol Use Questionnaire (AUQ⁶) binge score⁷>24: $M=35.43$ ($SD=9.87$)
- Alcohol Use Disorder Identification Test (AUDIT⁸) >7/8 (female/male): $M=16.11$ ($SD=5.23$)



Training

- **Training session:** Explicit Go/No-Go paradigm trains to withhold reactions to alcoholic drinks in contrast to gardening tools (part A) and circles in contrast to rectangles (part B) with 120 stimuli each



Two example stimuli of a training session in part A

- **Adaption:** Difficulty (% No-Go, presentation time) of each session depending on the performance in the previous session (commission errors, reaction time)
- **Individualization:** Individual stimuli chosen according to rankings (e.i., preferred drinks and neutrality of gardening tools) & performance feedback

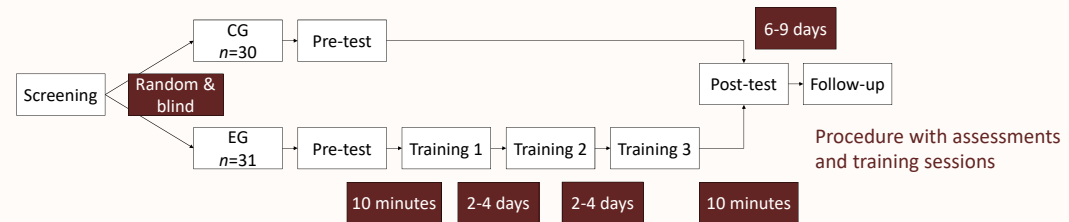
Primary outcome assessments

- **Inhibitory control:** Commission errors in the Go/No-Go task (% No-Go: 25, presentation time: 500ms) with alcohol Go, alcohol No-Go and geometric stimuli (pre & post)
- **Self-control over drinking:** Impaired Control Scale⁹ (pre & post)
 - Lack of intention to control drinking
 - Failures to control drinking
 - Perceived inability to control drinking
- **BD:** Frequency of 4/5 drinks per week & Speed of drinking (drinks per hour) during the last 7 days (pre & follow-up)

Discussion

- ✓ Changes in speed of drinking cannot be ascribed to improvements in self-control
- ✓ Training outcome: More aware drinking behavior in female, but not male individuals with BD

- ✓ Limitations: Small sample size, lack of an active control group, short follow-up
- ✓ Some effects are only marginal, however of moderate to large size
- When addressing BD behavior, sex differences seem to be highly relevant
- To improve inhibitory control in individuals with BD, other approaches may be necessary



Selected results

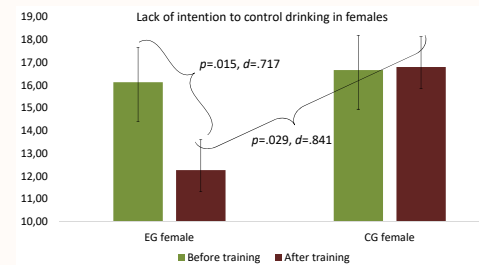
Interaction effects from ANOVAs/MANOVAs

Commission Errors; Failures to control drinking; Perceived inability to control drinking; Frequency of 4/5 drinks

n.s.

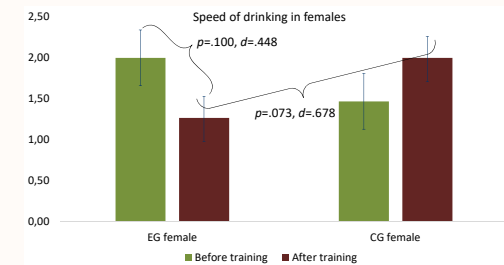
Lack of intention to control drinking:

- **Time*group**, $F(1,58)=4.179$, $p=.045$, $\eta^2_{\text{partial}}=.067$
- **Time*group*sex**, $F(1,58)=3.688$, $p=.060$, $\eta^2_{\text{partial}}=.060$
- **Time*group** ($p<.05$) only in females



Speed of drinking:

- **Time*group*sex**, $F(1,58)=2.817$, $p=.099$, $\eta^2_{\text{partial}}=.046$
- **Time*group** ($p<.05$) only in females



¹Di Lemma LCG, Field M. Cue avoidance training and inhibitory control training for the reduction of alcohol consumption: A comparison of effectiveness and investigation of their mechanisms of action. *Psychopharmacol.* 2017;234(16):2489-2498.
²Kilwein TM, Bernhardt KA, Stryker ML, Looby A. Decreased alcohol consumption after pairing alcohol-related cues with an inhibitory response. *J Subst Use.* 2018;23(2):154-161.
³Leeeman RF, Patack-Pechham JA, Rotzau MN. Impaired control over alcohol use: An under-addressed risk factor for problem drinking in young adults? *Exp Clin Psychopharmacol.* 2012;20(2):92.
⁴Smith JL, Dash NJ, Johnstone SJ, Houben K, Field M. Current forms of inhibitory training produce no greater reduction in drinking than simple assessment: A preliminary study. *Drug Alcohol Depend.* 2017;173:47-58.
⁵Townshend JM, Duka T. Binge drinking, cognitive performance and mood in a population of young social drinkers. *Alcohol Clin Exp Res.* 2005;29(3):317-325.
⁶Mehrabian A, Russell JA. A questionnaire measure of habitual alcohol use. *Psychol Rep.* 1978;43(3):803-806.
⁷Czapla M, Simon JJ, Friederich H-C, Herpertz SC, Zimmermann P, Loeber S. Is binge drinking in young adults associated with an alcohol-specific impairment of response inhibition? *Eur Addict Res.* 2015;21(2):105-113.
⁸Babor TF, La Fuente JR de, Saunders J, Grant M. *The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Health Care.* Geneva, CH: World Health Organization; 2001.
⁹Heather N, Tebbutt JS, Mattick RP, Zamir R. Development of a scale for measuring impaired control over alcohol consumption: A preliminary report. *J Stud Alcohol.* 1993;54(6):700-709.
¹⁰Schmidt J, Lamprecht F, Wittmann WW. Zufriedenheit mit der stationären Versorgung. Entwicklung eines Fragebogens und erste Validitätsuntersuchungen. *Psychother Psychosom Med Psychol.* 1989;39(7):248-255.

