

Can the effects of alcohol on motor task performance be negated by the effects of cocaine?



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Introduction

Stimulants and depressants are classes of drugs that increase and decrease central nervous system activity accordingly. What happens to cognition when these substances are mixed? We focused on fine motor task performance (FMT-perf), measured by keyboard typing speed. We chose alcohol as a depressant and cocaine as a stimulant for a set of reasons including high popularity [1] and confirmed effect on FMT-perf [2], [3].

Methods

- Recreational cocaine users found on Internet forums
- Following instructions, self-administering the drugs and reporting the results
- Dosages (per body weight kilogram):
 - 0.6 g of pure alcohol
 - 1.4 mg of cocaine
- Pauses to allow the drugs to take full effect
- FMT-perf measured in characters per minute (CPM) using a standardized typing speed tool
- Each participant did three measurements:
 - sober
 - on first substance
 - on both substances
- Substance order randomized

1. Preparation



Calculate the amount

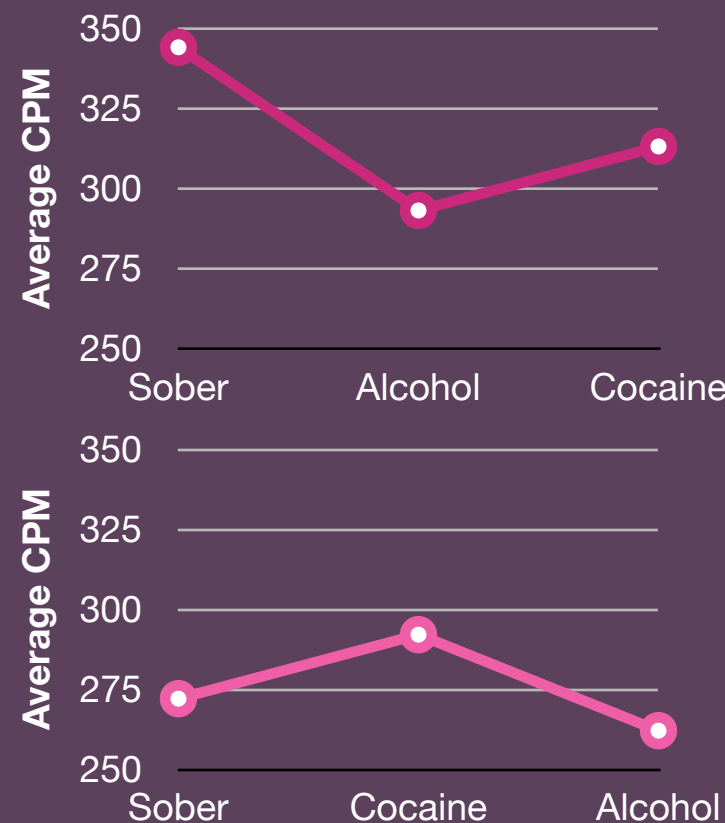


Prepare both substances

2. Questionnaire



Fill out a questionnaire



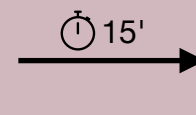
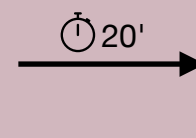
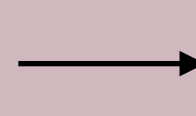
Hypothesis: Cocaine can cancel out negative alcohol effects on FMT-perf.

Results

- Not enough participants for a meaningful statistical evaluation
- **Preliminary results** (N = 7):
 - Average effect on FMT-perf
 - Alcohol -17%
 - Cocaine +7%
 - Combined -9%
 - In all participants
 - Alcohol decreased the FMT-perf
 - Cocaine increased the FMT-perf
 - For two participants the final FMT-perf was better than the base FMT-perf (+9% and +6%)

3. The Experiment

Take a substance... ...do a typing test.



Supplementary Resources

No-compromises version of the experiment, full methods, and a discussion about the validity:

<http://davinci.fmph.uniba.sk/~kovac254/cogsci/semproj/methods.pdf>



References

- [1] European Union and European Monitoring Centre for Drugs and Drug Addiction, *European drug report: trends and developments 2019*. Luxembourg: Publications Office of the European Union, 2019.
- [2] G. J. Connors and S. A. Maisto, 'Effects of Alcohol, Instructions and Consumption Rate on Motor Performance', p. 9, 1980.
- [3] S. T. Higgins, W. K. Bickel, J. R. Hughes, M. Lynn, M. A. Capeless, and J. W. Fenwick, 'Effects of intranasal cocaine on human learning, performance and physiology', *Psychopharmacology (Berl.)*, vol. 102, no. 4, pp. 451–458, Dec. 1990, doi: 10.1007/BF02247124.

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