

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. With seemingly opposite effects an unanswered question of what happens to cognition when these substances are mixed arises. 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. This choice was made for a set of reasons most important of which are high popularity [1] and proven effect of decrease [2]/increase [3] in FMT-perf. A no-compromises experiment design was created first and then simplified to an extent necessary to allow us to conduct it.

Methods

The experiment was done on recreational cocaine users. Participants were found on anonymous Internet forums and have done the experiment by following instructions, self-administering the drugs and reporting the results. Informed consent was obtained in the beginning of the experiment. Dosages were set to 0.6 g of pure alcohol and 1.4 mg of cocaine per body weight kilogram. Instructions included pauses that allowed the drugs to take full effect. The keyboard typing performance was measured in characters per minute using a standardized tool. Each participant did three measurements: sober, on first substance, on

both substances. The substance order was randomized. An in-depth description of the methods and a discussion about the reliability are a part of a separate document linked in the Supplementary Resources.

Results and Discussion

The hypothesis was that cocaine can cancel out negative alcohol effects on FMT-perf. So far, we haven't recruited enough participants to do a meaningful statistical evaluation. Preliminary data (N = 7) show that the average effect on FMT-perf was -17% for alcohol, +7% for cocaine and -9% combined. Cocaine increased and alcohol decreased the FMT-perf in all participants.

Doing the no-compromises version of the experiment was beyond the means of this project because of formal and budget requirements. However, the simplified version suggests this topic is worth studying.

Supplementary Resources

Full methods are available on this URL: <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.