



SMART DRUGS? Cognitive Enhancing Drugs and the Consequences on Healthy Populations



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Abstract

- Cognitive Enhancing Drugs (CED) include medications for ADHD (amphetamine & methylphenidate) or narcolepsy (modafinil).
- Cognitive Enhancement is the misuse of prescribed CEDs the non-medical reason of performance enhancement.
- Non-medical use of CEDs poses significant risks to both brain development and behavior (addiction, poor self-monitoring) of users.
- This paper examines the current literature on cognitive enhancement and argues that this practice causes detrimental neural effects on consumers and legal/ethical issues for our society.

Research Question

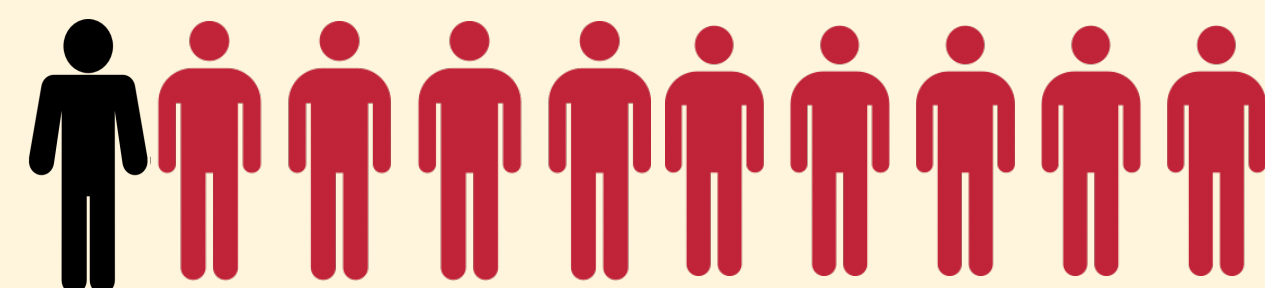
What are the implications of the misuse of Cognitive Enhancing Drugs among non-clinical population?

Methodology

- A literature review was conducted using the York Library Research System. Online databases: PsycINFO, PsycABSTRACT, and Web of Science.
- Results were limited to peer-reviewed journal articles including experimental research, clinical trial, systematic review and meta-analysis from 2010.

Prevalence

- Global Drug Survey in 2015 and 2017 showed an increase between 10-15% in non-clinical use of CEDs in various countries, with the 12-month prevalence of 11 – 25%.

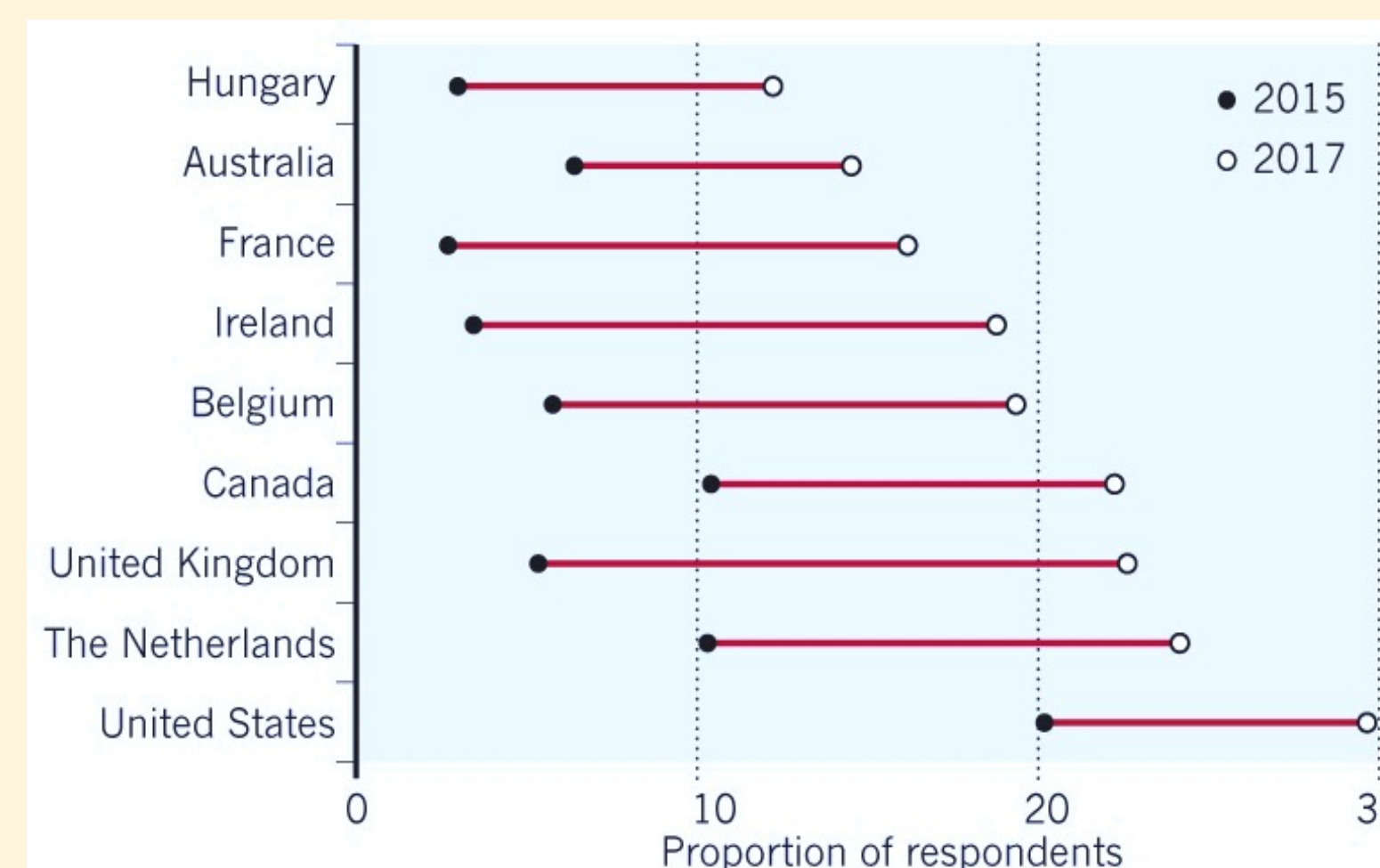


At least 1 in 10 UK and Canadian students indicated having used CEDs within the last 12 months.



Take Your Pill (2018), a Netflix documentary on CEDs (Photo by Goldman).

The misuse of Cognitive Enhancing Drugs has long term implications on brain development, behavior and society



9 countries with highest reported use of CEDs in 2017, according to Global Drug Survey (Maier et al., 2018).

Cognitive & Behavioral Concerns

- CEDs increase the levels of two important neurotransmitters: dopamine and norepinephrine.
- **Cognitive implications:** for young users, CEDs disrupt the maturation of the prefrontal cortex, a critical brain region which governs executive control and reward pathways.
- **Behavioral implications:** impairment of self-regulation, decision-making, problem-solving, likelihood of distractibility, locomotor hypertension, risk of addiction.
- **Modafinil & brain plasticity.** Abuse can to severe deprivation of sleep, withdrawal symptoms such as mood disruption, depression, anxiety, memory and concentration issues.

Ethical & Legal Concerns

- The practice highlights the hyper-competitive nature of modern society, in which humans are under unrealistic cognitive demand.
- Cognitive enhancement highlights the unequal distribution of wealth and legal issues concerning access to medical care.
- The misuse of CEDs is a violation of academic integrity, which contributes to adverse academic pressure and fear of coercion.
- It also downplays the importance of an inherent interest in learning and the active cultivation of knowledge and skills.

Recommendations

- Public-private partnership among the government, pharmaceutical industry and institutions to enhance the long term safety, efficacy and management of CEDs.
- More open conversation and collaboration between the scientific and public community.
- The development and promotion of more holistic & non-pharmacological strategies for cognitive functioning (exercise, cognitive training, etc.).
- More longitudinal, randomized clinical trial research on CEDs.