

Presentation title: Addiction Reconceptualized: Neural, Cognitive, and Behavioral Adaptations

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Abstract: 297 words

Addiction refers to the continual use of drugs (e.g., alcohol or opiates) or engagement in specific behaviors (e.g., gambling or video gaming) despite the occurrence of psychological or physical harm. Addiction is a process—initial drug use is transformed to abuse and, if sufficiently prolonged, dependence or addiction. This transition is characterized by unique neurobiological, cognitive, and behavioral alterations.

Our newly developed two-stage model of addiction delineates drug-induced changes in brain function—during stage one, from use-to-abuse and stage two, from abuse-to-addiction—related to reinforcement, hedonics, behavioural regulation, associative learning, and tolerance. Observed changes are due to underlying adaptations in the brain's reward and limbic pathways, and their interactions with specific regions of the prefrontal cortex.

In stage one, a drug user's cognition and behavior is governed by positive reinforcement, seeking out more drug due to its desirable properties; hedonics, the liking or enjoyment of taking the drug; impulsivity, in which the drug is spontaneously taken; classical conditioning, associating the drug's euphoric effects with specific stimuli and environments; and physiological tolerance, necessitating more drug consumption to achieve the same high.

Stage two sees a dramatic transition in the user's cognition and behavior, now regulated by negative reinforcement, taking the drug to avoid the noxious effects of withdrawal; hedonics, an intense wanting or craving for the drug; compulsivity, with the user compelled to take the drug; instrumental conditioning, wherein specific stimuli or environments evoke an automated

or habitual response; and behavioral tolerance, an anticipatory change in body state that counteracts the drug's forthcoming physiological effects.

The two-stage model aims to facilitate our understanding of addiction by providing accurate descriptors linking altered brain function to overt behavioural responding. By emphasizing the role of the brain, the model is also conceived to promote the de-stigmatization of substance (and behavioral) addiction.

Biography: 140 words

Dr. Derick Lindquist received his Ph.D. in Psychology, with an emphasis in Behavioral Neuroscience, from Yale University in 2004. He subsequently served as a Postdoctoral Fellow and Research Associate at Indiana University and the University of Kansas, respectively. He joined The Ohio State University in 2010 as an Assistant Professor. His research focused on the neurobiology of learning and memory and the long-term deleterious consequences of early-life ethanol exposure. In 2019, he joined the Jindal School of Liberal Arts and Humanities at O.P. Jindal Global University in Sonapat, India. He later developed and inaugurated the Jindal School of Psychology & Counselling as its Founding Dean. He has published more than 30 research and review articles in internationally recognized peer-reviewed journals and books. Throughout his career, he has sustained a passion for mentoring students at all stages of the academic journey.