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SQAB 2019: Perspectives on reinforcer efficacy

The Society for the Quantitative Analysis of Behavior (SQAB) had a strong and varied program provided by a range of expert speakers at the 2019 meeting in Chicago, Illinois. There was no formal theme, but presentations broadly addressed the factors influencing the efficacy of reinforcers, and the measurement of that efficacy. Conference attendees learned about research programs that use behavioral models to describe factors contributing to the ability of reinforcers to control behavior, such as effort (force), reinforcer delay and contingency variability. There were also presentations illustrating the use of sophisticated neurobiological tools to quantify the neural activity associated with behaviors of interest to SQAB attendees, nicely demonstrating potential biological mechanisms important for reinforcer-sensitive behaviors like remembering, foraging, and decision-making. Other presentations demonstrated the potential for the sensitivity of behavior to reinforcer delivery characteristics to serve as a marker in various human health-related contexts. This special issue dives more deeply into these topics.

The relevance of laboratory models for understanding the factors influencing the efficacy of drugs as reinforcers and potential treatments for substance use has been evident since the 1960s. It is a testament to the vibrancy of behavioral science that new insights and directions are being developed still. Four articles examine these new directions and the novel insights they generate. **Huskinson** reviews literature associated with drug self-administration to illustrate the important role of several factors not ordinarily considered in pre-clinical models. One is the unpredictability of drug delivery, captured using variable schedules of reinforcement. The other is the overall environment in which drug use occurs: whether a drug is plentiful (rich environment) or scarce (lean environment). **Pritschmann, Yurasek, and Yi** also seek to extend the validity of experimental paradigms used to examine drug self-administration. They examine the idea that choices between drug and nondrug alternatives (cross-commodity) tasks, especially those incorporating delays to reward delivery (delay discounting), will provide new insights into factors controlling drug self-administration. Their contribution scrutinizes the small but growing literature and makes a compelling case for using these techniques. Another methodological extension is described in a translational study by **Lutz and Childs**. They demonstrate the feasibility of modifying the rodent-based conditioned place preference paradigm to examine contextual effects on alcohol self-administration in human alcohol drinkers. One exciting feature of this study is the positive relationship between the magnitude of the conditioned responses to the environment and subsequent alcohol consumption, suggesting a target for interventions, as well as potential causal mechanisms. **Berry, Rung, Crawford, Yurasek, Vásquez Ferreiro, and Almog** also consider the role on contextual stimuli on drug self-administration, but their article focuses on the ability of natural areas/green space to enhance the likelihood that substance use interventions will be successful. Their review of the literature provides strong support for this thesis and suggests several processes that could be examined to understand the source of these relationships.

Many years ago I was introduced to the idea that choice situations could be approach-approach problems (desirable but difficult choices), approach-avoid problems (easy choices) or avoid-avoid problems (the “best of a bad job” as my Grandma would say). Another three articles examine factors that contribute to the efficacy of reinforcers within these situations. **Chen, Berg, Kemp and Grace** describe a series of studies with important implications for the ability for reinforcers to control behavior, that is, how individuals compare the magnitude of different stimuli. Such stimuli may signal reinforcer magnitude, which is a determinant of reinforcer efficacy. Another determinant is the effort required to obtain a reinforcer. **Pinkston** considers the literature examining force as an operant contingency and as a dependent variable in operant paradigms. The article reveals practical and theoretical knowledge gaps that need to be addressed to understand the extent and circumstances under which force exertion is aversive. Finally, **Zentall** provides a succinct review of his recent work developing a laboratory model of procrastination using pigeons and describes the extent to which data suggest conditioned reinforcers influence procrastination and choices to defer effort exertion consistent with a classical approach to understanding choice behavior: delay reduction theory.

We hope these articles will provide food for thought, generate even more discussion than the original presentations did, and suggest research questions and directions that we will hear about at future SQAB meetings.

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