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Evaluating the stability of measures of motivation and preference in a behavioral economic drug self-administration procedure

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Behavioral economics offers powerful tools for evaluating drug taking phenotypes in animal models of substance abuse. A traditional FR1 self-administration test reveals how much drug an animal chooses to take (i.e., preference), while a progressive ratio schedule says something about how hard the animal will work for a dose of the drug (i.e., motivation). The threshold procedure under study here allows simultaneous assessment of preference and motivation in each session by systematically reducing the dose received per infusion, thereby increasing the price per dose throughout. The analysis undertaken examines changes in parameters across 20 days of cocaine self-administration in order to assess their stability across time. Nineteen male and female adult mice from 3 strains (C57Bl/10J, C3H/HeJ, AKR/J) were used. Consumption data were averaged across the first 5 days, 10 days, 15 days, and all 20 days, and then separate demand curves fit to each. We did not observe significant differences in demand parameters across time. It is possible that the timing of our behavioral economic procedure does not capture the period of variability in demand. It is also possible that demand for cocaine is an inherently stable trait that does not substantially vary over time. Further analysis is currently underway to better understand potential changes in preference and motivation over the course of chronic cocaine self-administration and as a function of genetic background and sex.