Alcohol demand indices predict outcomes among heavy-drinking young adults receiving a brief intervention

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Aims: This study looked at the impact of baseline alcohol demand indices on alcohol consumption following a brief alcohol intervention.

Methods: Participants ($N = 150$, 43% female, 65% White, ages 17–20) were non-college-attending heavy episodic drinkers proactively enrolled in an intervention study that compared the efficacy of a motivational interview (MI) and relaxation training control (REL) on reducing alcohol use. Using self-reported data, we calculated participants' average number of drinks per week and frequency of heavy drinking (HD, 5+ drinks) at baseline, a 6 week follow up (W6), and a three month (M3) follow up. At baseline, participants also completed a hypothetical alcohol purchase task, by indicating how many alcoholic drinks they would purchase and consume across a range of prices ($0 to $20). From this task, five demand indices were calculated: Breakpoint (first price that completely suppresses consumption), Omax (maximum expenditure), Pmax (price at which demand become elastic), Intensity (consumption when drinks are free), and elasticity (slope of the demand curve, or sensitivity to price).

Results: Hierarchical regressions controlling for gender and baseline drinking showed that several demand indices were predictive of drinking outcomes. Specifically, greater baseline Omax and intensity, and less elasticity predicted more W6 drinks/week in the MI condition. At M3, greater baseline breakpoint, Omax, intensity, and less elasticity predicted more drinks/week in the REL condition. Demand indices were predictive of W6 HD frequency in the MI condition and M3 HD frequency in the REL condition.

Conclusions: The results suggest that elevated demand indices (except elasticity, which negatively predicted consumption) may be a risk factor of poor intervention response. However, there were differences according to condition, assessment period, and alcohol use measures.

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Pair housing of juvenile male rhesus macaques: A pilot study

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Aims: Current regulations are based on the assumption that social housing may be beneficial for nonhuman primates used in research that live in groups in their natural habitat. However, evidence supporting this assumption is limited. Moreover, the possible impact of social housing and subsequent separation on studies of abused drugs is unknown. Subordinate status and separation during social housing have each been shown to increase drug self-administration.

Methods: To begin to address these questions, we paired 6 experimentally-naïve juvenile (aged 3.15 ± 0.33 years) male rhesus macaques based on observations of aggressive, fearful, or neutral behaviors while individually housed. Animals were introduced to pair housing in three stages: protected contact, grooming contact, and ultimately full contact. Each pair progressed through all stages and no serious injury requiring separation occurred. Five-minute behavioral assessments were conducted by trained observers who recorded the frequency and duration of behaviors on a standardized form. Observations were made 3 times a day at the beginning of each phase.

Results: Comparison of behaviors in these animals before and during social housing revealed very low levels of stereotypy and anxiety-like behavior, such as pacing, yawning and vigilant scanning. However, the frequency of stereotypy was decreased further at the full contact phase relative to the individual housing stage. Aggressive and affiliative behaviors were increased immediately following full access, but aggressive behavior decreased with time while affiliative behavior persisted. Interestingly, aggression toward the observers during individual housing did not predict dominant status (evidenced by greater mounting) within the pair.

Conclusions: A critical question that remains to be resolved is whether social housing and separation will affect the response to drugs of abuse once these animals enter operant behavioral studies.

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Neural correlates of cross-commodity discounting in cocaine users and controls

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Aims: Cocaine users (CU) discount delayed monetary reinforcers to a greater extent than control participants (CP). In a prior study of cross-commodity discounting of cocaine and money in CUs, we showed that discount rate depended upon both the commodity and its temporal location. Here we compare chronic cocaine users vs. community controls on the behavior and brain activity from single and cross-commodity discounting for cocaine and money.

Methods: Participants chose between hypothetical quantities of money now vs. money later (M–M), cocaine now vs. cocaine later (C–C), money now vs. cocaine later (M–C), and cocaine now vs. money later (C–M) in a f MRI scanner. Indifference points and neural response were obtained.

Results: Single-Commodity. Consistent with prior research, CUs ($M \pm SEM$) discounted M–M significantly more than CP ($p < .01$). Group comparisons showed that during M–M, CPs had greater activity than CUs in the sup. parietal lobe, post. cingulate, insula and mid. frontal cortex, consistent with the behavior results. Interestingly, whole brain analysis (vox $p < .01$, etv 15, unc) revealed that during C–C, CPs had greater activity than CUs in the post. cingulate, amygdala, striatum, insula and mPFC, suggesting greater neural involvement when making choices for a substance they have never used.

Cross-commodity: During M–C, CPs had greater activity than CUs in the sup. parietal lobe, temporal lobe, posterior cingulate and sup. frontal lobe. During C–M, however, CUs had greater activity

than CPs in the striatum, orbital frontal cortex and mPFC. Finally, CUs had greater activity in the striatum, rostral PFC and inf. PFC during C–M than M–M, M–C and C–C.

Conclusions: We show that devaluing future rewards in cocaine users is greatest when cocaine is the immediately available reinforcer. Furthermore, cross-commodity devaluing in cocaine users involves the allocation of functional resources towards choosing the presently available cocaine option.

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A mixed kappa/mu partial opioid agonist attenuated cocaine-induced locomotion

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Aims: The purpose of this study was to evaluate an aminothiazolomorphinan, MCL-420, with partial agonist properties at mu and kappa opioid receptors to determine if it would reduce cocaine-induced locomotor activity in mice.

Methods: ICR mice were acclimated to the open field chamber for 30 min before vehicle or MCL-420 administration. Locomotor activity was measured in an Open Field Locomotor System with 16 light beams. MCL-420 was tested alone and in the presence of cocaine (20 mg/kg, i.p.). The number of ambulations over 120 min was recorded.

Results: MCL-420 at doses of 1 and 10 mg/kg did not have any effect on the number of ambulations per min in comparison to vehicle-treated controls. A dose of 30 mg/kg of MCL-420 produced a slight increase in the number of ambulations per min. MCL-420 at doses of 10 and 30 mg/kg reduced the cocaine-induced increase in the number of ambulations.

Conclusions: MCL-420 partially reduced cocaine-induced locomotor activity in a dose-dependent manner. The kappa/mu partial agonist properties of MCL-420 may account for it ability to partially suppress cocaine-induced locomotor activity.

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Trends in overdose deaths after release from state prison, 1999–2009

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Aims: Studies have demonstrated a high risk of death among former prison inmates, particularly from drug-related causes. We sought to assess trends in mortality due to all-cause and unintentional poisoning (overdose) among former inmates released between 1999 and 2009.

Methods: We conducted a retrospective cohort study of 76,208 inmates released from Washington state prisons (192,511 releases). Identities were linked probabilistically to the National Death Index to identify deaths. Incidence mortality rates (IMR, deaths per 100,000 person-years [p-y] of risk) were calculated for all-cause, unintentional injuries, unintentional poisoning, and opioid-related deaths. We computed standard mortality ratios (SMR) and 95% confidence intervals (CI) to compare IMRs to the non-institutionalized population, using data from CDC Wonder and adjusting for age, gender and race.

Results: There were 2462 deaths during 334,263 p-y after release from prison. The all-cause mortality rate (IMR) was 737/100,000 p-y. Among the major categories of death, the highest mortality rate was due to unintentional injuries (828 deaths; IMR 248/100,000 p-y) and occurred at a mean age of 40. Of these, 558 deaths were due to unintentional poisoning (IMR 167/100,000 p-y). Among all causes, opioids were involved in 315 deaths (IMR 94/100,000 p-y). Released inmates had a higher mortality rate than non-institutionalized Washingtonians from all causes (SMR 3.6, 95% CI 3.5, 3.7) and unintentional injuries (SMR 5.9, 95% CI 5.6, 6.3). Whereas all-cause mortality rates were higher among men than women (IMR 752 vs. 653/100,000 p-y), unintentional poisoning mortality rates were lower among men (IMR 154 vs. 236/100,000 p-y).

Conclusions: Our results demonstrate a persistent burden of overdose death after release from prison. To reduce the risk of overdose, it is critical to increase collaboration between criminal justice and community health and substance abuse service agencies to test and implement in-prison and post-release interventions after release from prison.

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Changing patterns of onset of nonmedical prescription opioid use relative to other drugs from adolescence to early adulthood

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Aims: Although adolescence is the period of highest risk of initiating nonmedical prescription (NMP) opioid use and there is a high prevalence of other drug use among NMP opioid users, little is known about patterns of onset of opioids and other drugs through this developmental stage. This study examines the relative prevalence and age of onset of opioids and other drugs within a cohort of adolescents using multiple cross-sectional surveys of the National Survey on Drug Use and Health (NSDUH).

Methods: Data from the 2002–2010 NSDUH were used to track drug use in a cohort from age 12–13 to 20–21 (i.e., 12–13 year olds (yo) in the 2002 NSDUH, 14–15 yo in 2004, 16–17 yo in 2006, 18–19 yo in 2008, and 20–21 yo in 2010). The prevalence of lifetime and past-year drug use was assessed at each age, as well as the age of onset of opioids and other drugs.

Results: At age 12–13 yo, lifetime prevalence of marijuana and NMP opioid use were equal (4%) but increased more rapidly for marijuana, reaching 52% by age 20–21 versus 23% for NMP opioid use. Among the 4% who used opioids by 12–13 yo, 18% had started marijuana use; this increases to 50% and 85% among those who start NMP opioid use by age 14–15 and 20–21 yo, respectively. Among those using opioids by 20–21 yo, 63% initiated marijuana use prior to opioids, 13% started use of both drugs at the same age, 9% started marijuana after opioids, and 15% never used marijuana. In contrast, 8% and 25% of those who started NMP opioid use by age 12–13 and