Neuroeconomics and addiction: funding opportunities at NIDA

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Substance use disorder (SUD) and “decision neuroscience”

• SUD is unique among other diseases and disorders because the key diagnostic criteria pertain to *decisions*
  – Taking drugs despite some awareness of adverse physical, social, and legal consequences
  – Decisions to use more drug than intended

*NIDA has a strong programmatic interest in biological underpinnings of normative and aberrant decision-making*
Developmental differences in decision-making

• Substance use and abuse peaks in adolescence and young adulthood

• Neurodevelopmental differences in:
  – risk appraisal?
  – reward sensitivity?

• Individual differences in:
  – children at psychosocial or genetic risk
  – resilient children
The classic behavioral economic finding in drug abuse:

Drug abusers show an increased *general* preference for immediate rewards over larger but delayed rewards

*Meth addicts vs controls*

Subjects see future earnings NOW, after every few data-entry keystrokes.
Clinical studies that DCNBR funds:

1. Decision/motivation/cognitive processes in healthy subjects only
2. Decision/motivation/cognitive processes in casual users of a drug
3. Decision/motivation/cognitive processes in persons addicted to a drug
4. Neurobiological signatures and behavioral predictors of treatment and recovery
1. Characterize decision/motivation/cognitive processes in healthy subjects only

- The burden is on YOU to sell the drug abuse relevance of the (normative) process you are proposing to study to:
  - CSR receipt and referral officers
  - Reviewers
  - NIDA program and Director
2. Study decision/motivation/cognitive processes in casual users of a drug

- Plan for referral for treatment of study applicants with clinically significant use
- Careful characterization and toxicology monitoring of alcohol and other drug use
- Acute administration effects of drug vs placebo (DSMP needed)
- Groupwise differences from controls
  - Chicken or egg? Premorbid differences versus chronic drug effects
3. Study decision/motivation/cognitive processes in subjects addicted to a drug

- Plan for care of study applicants whose use is clinically significant (clinical collaborator)
- Careful characterization and toxicology monitoring of alcohol and other drug use
- Clinical interview for all psychiatric disorders
- Be clear and provide rationale for:
  - Treatment-seeking versus non-treatment-seeking
  - Selecting for abuse of a single drug versus allowing comorbid use or abuse of another drug
Make sure your conceptualization of drug abuse is not facile

• Are drugs/cues always positively hedonic? Not so fast!

• During drug experimentation or casual use, drug deliveries can be rewarding

• Once addicted, drug use may be primarily negatively-reinforced
  – to terminate the aversiveness of withdrawal
  – “wanting” but not “liking”

• During therapy, drug cues may be aversive or conflict-eliciting in some patients

• Smokers may smoke to improve cognition
Review articles of the major motivational theories of addiction

- **Incentive-sensitization hypothesis**
  - Robinson and Berridge

- **Reward deficiency syndrome hypothesis**
  - Blum

- **“Striatal spiral” hypothesis**
  - Everitt and Robbins

- **Allostasis/antireward hypothesis**
  - Koob
Get clinical addiction expertise on your investigative team

• Peer reviewers (NPAS, RPIA, BRLE) will be aware of special issues in characterizing drug users or abusers
• Helps fit neuroeconomics in drug abuse context
• Clinical perspective on behavioral tendencies of addicts may inform or inspire task design
  – Co-PI (most solid)-complimentary roles
  – Co-I with significant time investment
  – Consultant (with strong letter)
    • Most dicey- maybe OK with smokers
    • Can be helpful to help frame or interpret normative studies
Omnibus program announcement on the Neuroscience of Drug Abuse

• No set-aside money, but will route your application to NIDA

• Has bullet point on neuroeconomics!
  – **R01 version** (PA-10-268)
  – **R21 version** (PA-10-269)
  – **R03 version** (PA-10-270) *

* For neuroimaging R03, consider an **I/Start** (PA-09-073)
  – Bigger budget than parent R03
  – Special review study panel convened by NIDA
Proposed merger of NIDA and NIAA into a single addiction institute

• For decades, NIAAA has funded alcohol research, while NIDA has funded non-alcohol drug research
  • For historical perspective on ATOD, see this paper

  o Changing political climate
  o More recent genetic and neuroscience data suggest that risks for addiction to alcohol versus other drugs, as well as addiction mechanisms, are more similar than different
  o High comorbidity between use of alcohol and other drugs

  o The NIH Scientific Management Review Board voted 12-3 to recommend to NIH director that NIAAA and NIDA be dissolved and a new addiction institute formed, including smoking portfolio from NCI and pathological gambling from NIMH, with new search for director