Predicting Alcohol Use Disorder Through Games: Alcohol Use and Behavior Phenotyping Test (AUBPT)

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Background
- A complex web of biopsychosocial factors underlie predisposition towards harmful alcohol use.
- We introduce the Alcohol Use Behavioral Phenotyping Test (AUBPT) – a computer-based dimensional assessment that can be culturally adapted to assess alcohol use behaviors across countries.
- AUBPT includes gamified versions of behavioral paradigms ("tasks") that can evaluate the transdiagnostic biopsychological constructs under the positive valence and cognitive domains of the Research Domain Criteria (RDoC) proposed by the National Institute of Mental Health (NIMH).

Subteam Structure
- Content: Conducts literature reviews on RDoC and behavioral tasks; sets task content and verifies construct validity
- Data Science: Develops functional, interactive app-based tasks; implements multi-platform integrations for login and data collection
- Implementation: Works with global partners to translate and culturally adapt tasks; drafts manuscripts and grant proposals

Collaborators

Current Outputs
- Fall 2021: Brain Connectivity in Alcohol Use Disorder: A Meta-review of Human Neuroimaging Studies (Ramachandran), Review of Computational Modeling for Substance Use Disorders (Knagaram)
- Spring 2022: A Systematic Review of Positive Valence, Negative Valence, and Cognitive Domains in Depressive Disorders, Bipolar Disorder, Anxiety Disorders, and Substance Use Disorders (Jha), Active Inference Modeling & Data Construction for AUBPT (Yu)

Mapping Our Tasks to RDoC
- RDoC is a NIMH framework that aims to investigate biobehavioral mechanisms behind multiple disorders.

Independent Studies

Next Steps
- Test AUBPT’s ability to predict risk of alcohol use disorders
- Create an AI to model individual patients’ performance on AUBPT and thereby identify their alcohol use phenotypes
- Adapt AUBPT in Hindi in addition to the work already begun for Portuguese and Swahili adaptations

Mapping Our Tasks to RDoC

RDoC Framework
- Negative Valence Systems
- Positive Valence Systems
- Cognitive Systems
- Systems for Social Processes
- Arousal and Regulatory Systems
- Sensorimotor Systems

Units of Analysis
- Game
- Decision
- Delay
- Double-Double
- Reward

Tasks:
- Probability Choice
- Devaluation
- Delay Discounting
- Drifting Double-Double
- Probabilistic Reward
- Stop Signal Task
- Go/No-Go

Mapping Our Tasks to RDoC

Task Development Workflow
- Research and compile the most fitting task elements from a literature review
- Create a task outline with visual elements, behavioral functions, and variables to be collected
- Review task outline and its textual components
- Meet with relevant global collaborators to review the task, translate English to the target language, and back-translate
- Use translated task for cultural adaptation
- Compare the original and back-translated text for validation

Task Navigation Page
- Stop Signal Task
- Delay Discounting Task

We are currently partnering with collaborators in São Paulo, Brazil and Moshi, Tanzania to adapt and implement the AUBPT tasks in those regions: