Measuring impulsive behavior in inner-city substance abusers using translational procedures based on preclinical research

M. Mattila-Evenden  
*Temple University*

J. Shack  
*Temple University*

C. Heeney-Buggey  
*Temple University*

J. Evenden  
*WiltonLogic*

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MEASURING IMPULSIVE BEHAVIOR IN INNER-CITY SUBSTANCE ABUSERS USING TRANSLATIONAL PROCEDURES BASED ON PRECLINICAL RESEARCH
Mattila-Evenden, M.1,2, Shack, J.1, Heeney-Bugsey C.1, Evenden J.3
1Dept of Psychiatry & Behav Sci, Temple U Med School, 2Dept of Psychiatry, U Penn & 3WiltonLogic, Media, PA

Introduction

• Impulsive behavior can result in patients with mental and neurological conditions such as schizophrenia, addiction, and ADHD. The mechanisms underlying impulsivity are complex and involve multiple brain regions and neurotransmitter systems.
• Impulsive behavior is an important symptom which is part of the diagnosis of disorders such as drug addiction, attention deficit hyperactivity disorder and personality disorders.
• Most methods used today measure the personality trait of impulsiveness and are not sensitive to short-term changes in impulsiveness, e.g. while undergoing drug treatments.
• Psychometrically validated procedures are necessary to test for changes in impulsivity among patients and may help to improve outcomes for patients, savings in time, and resources for treatment centers, and regulatory agencies.
• The approach presented here develops state-of-the-art translational procedures in ways which implicate affect decision making and behavior at the time of drug use (state impulsivity).

Since impulsivity is multi-factorial, each subject is designed to measure specific aspects of impulsiveness.

Translational Methods

• All the objective tests described in this poster were developed from procedures first used in preclinical studies using rats as subjects.
• Translational methods provide a link between basic biology and clinical application.
• Implications for test design:
  - Measure overt behavior, rather than verbal reports
  - Each task focused on one psychological concept
  - Simple task design with clear outcome from each action
  - Complexity and difficulty developed by building up simple components
  - No verbal test material

Subjects

• 33 subjects (19 M, 12 F)
• Various diagnoses
• Average 43.86

Test Battery

• Visual Analogue Scales
• Barnett Impulsivity Scale
• Swedish University Scales of Personality
• Discrete Trial N-back
• Uncertain Visual Discrimination
• Variable Consecutive Number
• Delay of Reward

Methods

• Visual Analogue Scales
  - Impulsion
  - Risk
  - Fear
  - Depression
  - Anxiety
• Barnett Impulsivity Scale
• Swedish University Scales of Personality
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Test Materials - Scales

• Visual Analog Scales
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Correlations

• n.s

• There were no significant differences between biological sexes or positive/negative associations with different impulsivity ratings
• All self-report measures had high internal consistency (Cronbach’s alpha range: 0.78-0.95)
• There was little or no interaction between personality or global self-report measures.
• Primary II - effects of diagnosis
• Secondary - associations with different impulsivity ratings
• Relationships amongst objective tests

Conclusions Relevant to Substance Abuse

• Substance abusers treated as inpatients did not report withdrawal or craving.
• Substance abusers generally had lower KBIT IQ, lower BIS planning and more adventure seeking.
• Substance abusing psychiatric patients did not differ from psychiatric patients who were not diagnosed as substance abusers in the objective tests.
• Little evidence of trait or state impulsivity in this sample of substance-abusers from a typical inner-city inpatient ward.
• Variations in trait and state impulsivity were not related to specific psychiatric conditions or diagnoses.
• Relationship established between state impulsivity, high reaction impulsivity and compulsive responding on VCN (difficulty to inhibit ongoing behavior pattern) similar to that hypothesized to underlie drug addiction.

General Conclusions

• Computerized administration of questionnaires and objective tests functioned very well with this population, despite their low average IQ and lack of familiarity with computers.
• As expected, the questionnaires did pick up differences amongst the patients, but these seemed to be more related to the participants general social situation (as exemplified by their history of legal problems) than with specific psychiatric diagnoses.
• In this population, impulsivity appears to be one component of personality associated with a general pattern negative affect.
• Objective tests, which measure state impulsivity, and in which the affective component has been eliminated, do not correlate with trait impulsiveness.
• Our hypothesis is that performance of objective tests of impulsiveness is related to aspects of cognition covered by term "executive function".