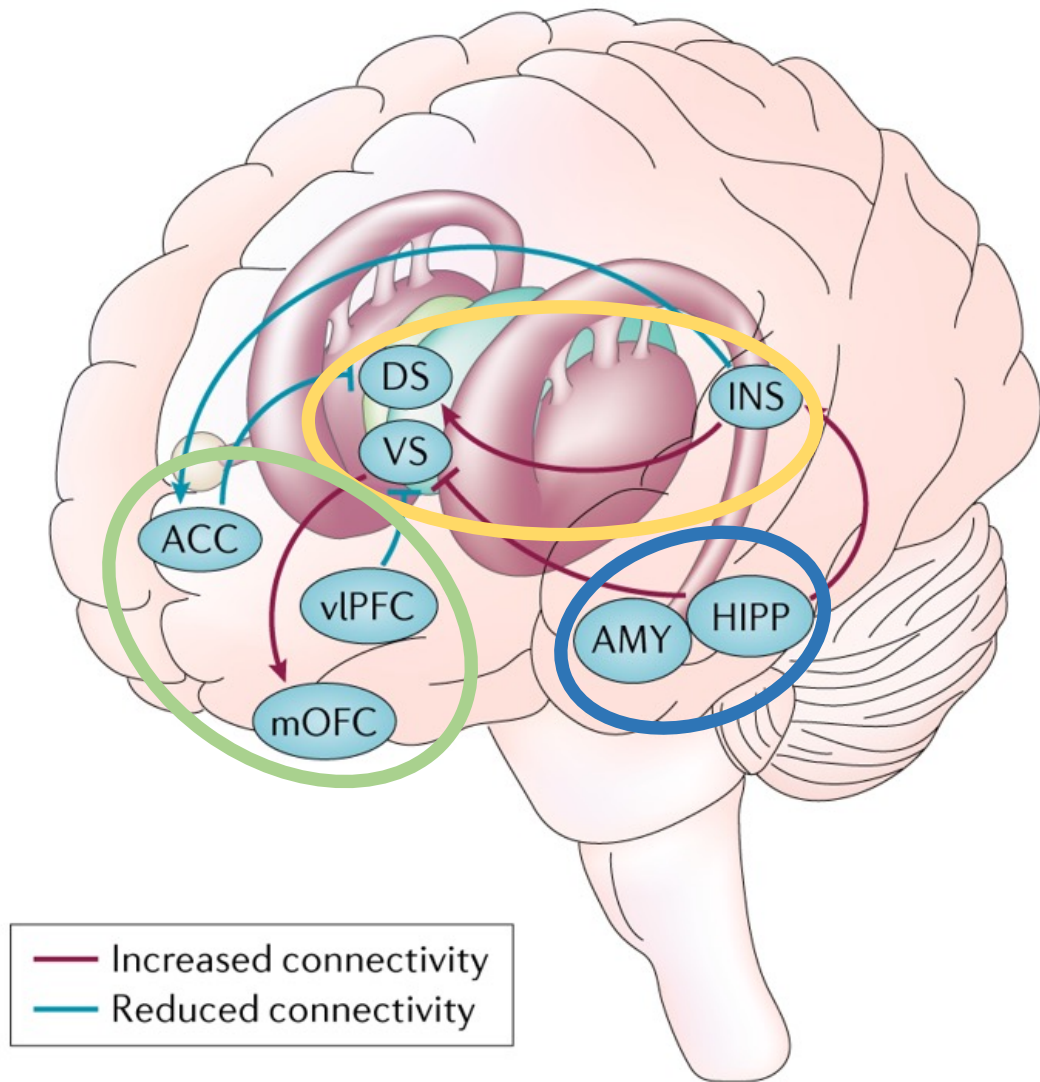
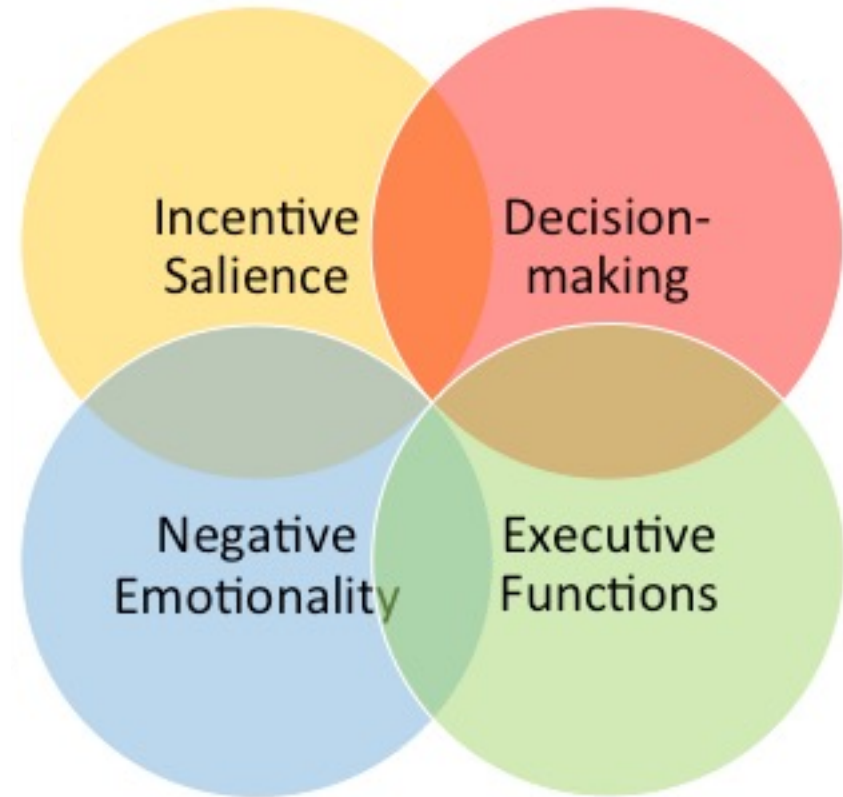


# Technology-related Addictions

Professor Antonio Verdejo-Garcia  
Co-Chair ISAM Neuroscience Interest Group  
MRFF Next Generation Clinical Researchers Fellow  
Monash Addiction Research Centre  
[antonio.verdejo@monash.edu](mailto:antonio.verdejo@monash.edu)



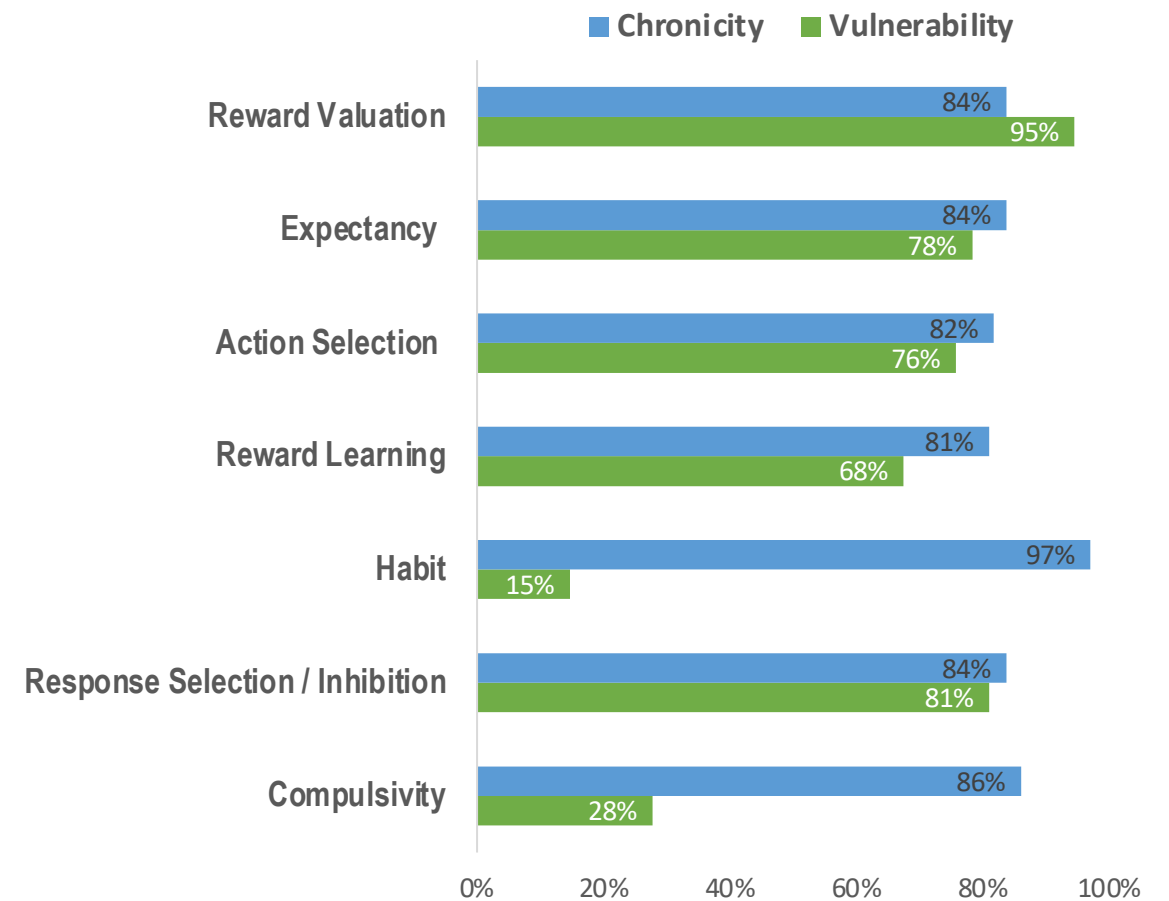
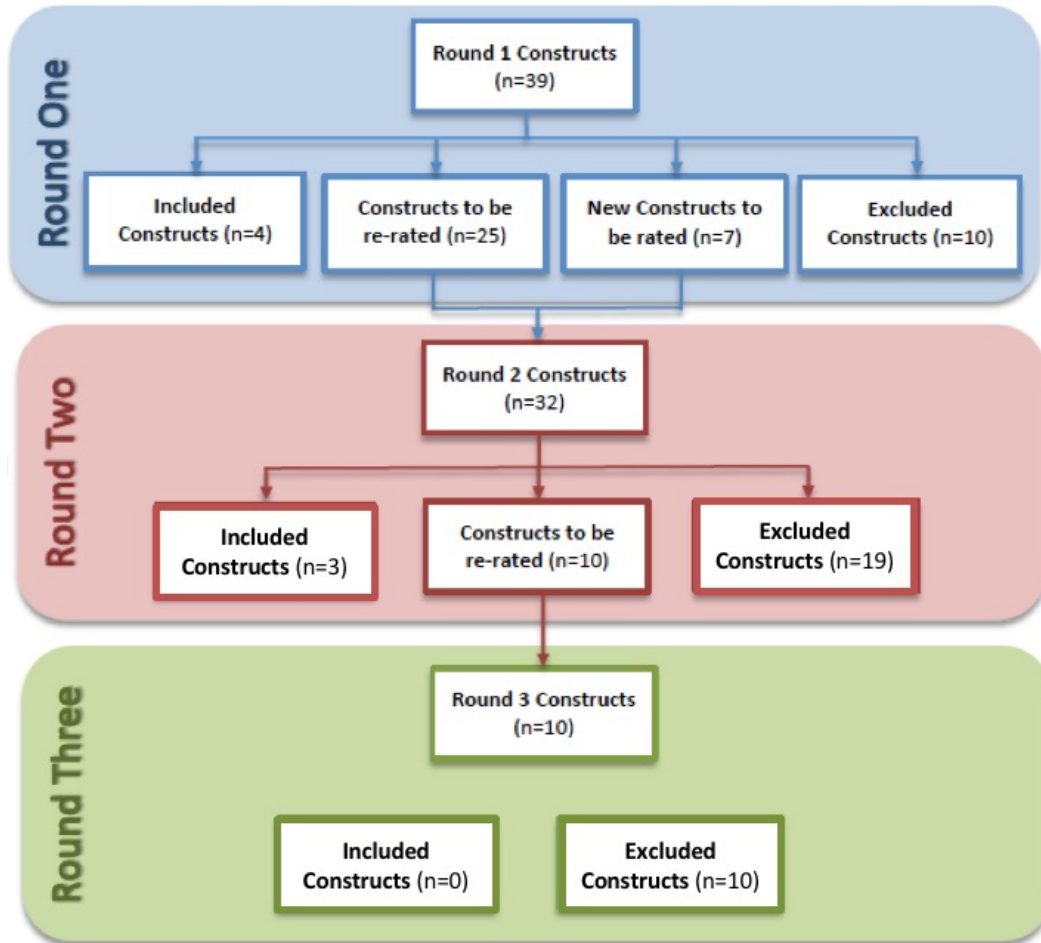
Potenza ... Verdejo-Garcia – *Nature Disease Primers* 2019



Verdejo-Garcia (Re: Kwako et al) – *Biological Psychiatry* 2016



# Delphi consensus – core addiction mechanisms



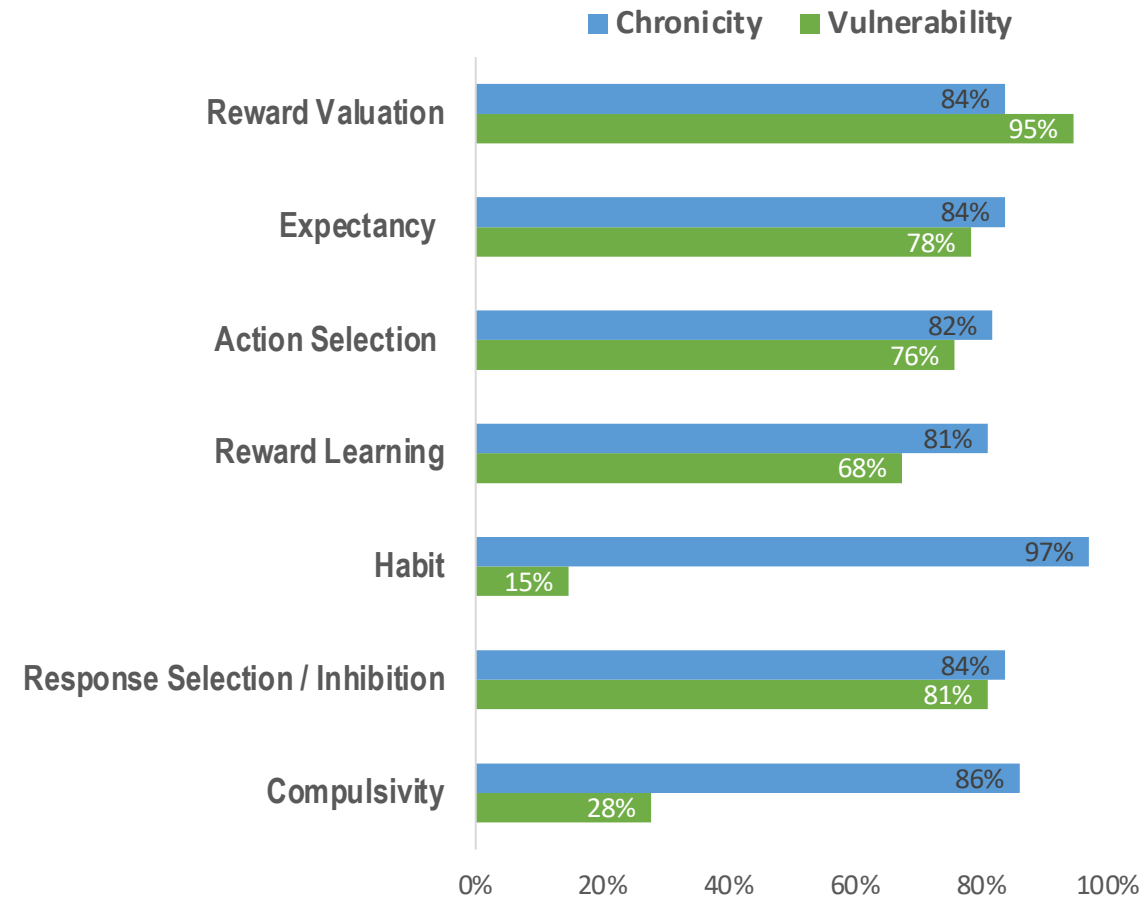
# Tech-related addictions

- Gaming disorder
- Problematic Social Network Site (SNS) Use
- Others (online pornography, binge watching)
- Vs medium (internet, mobile)



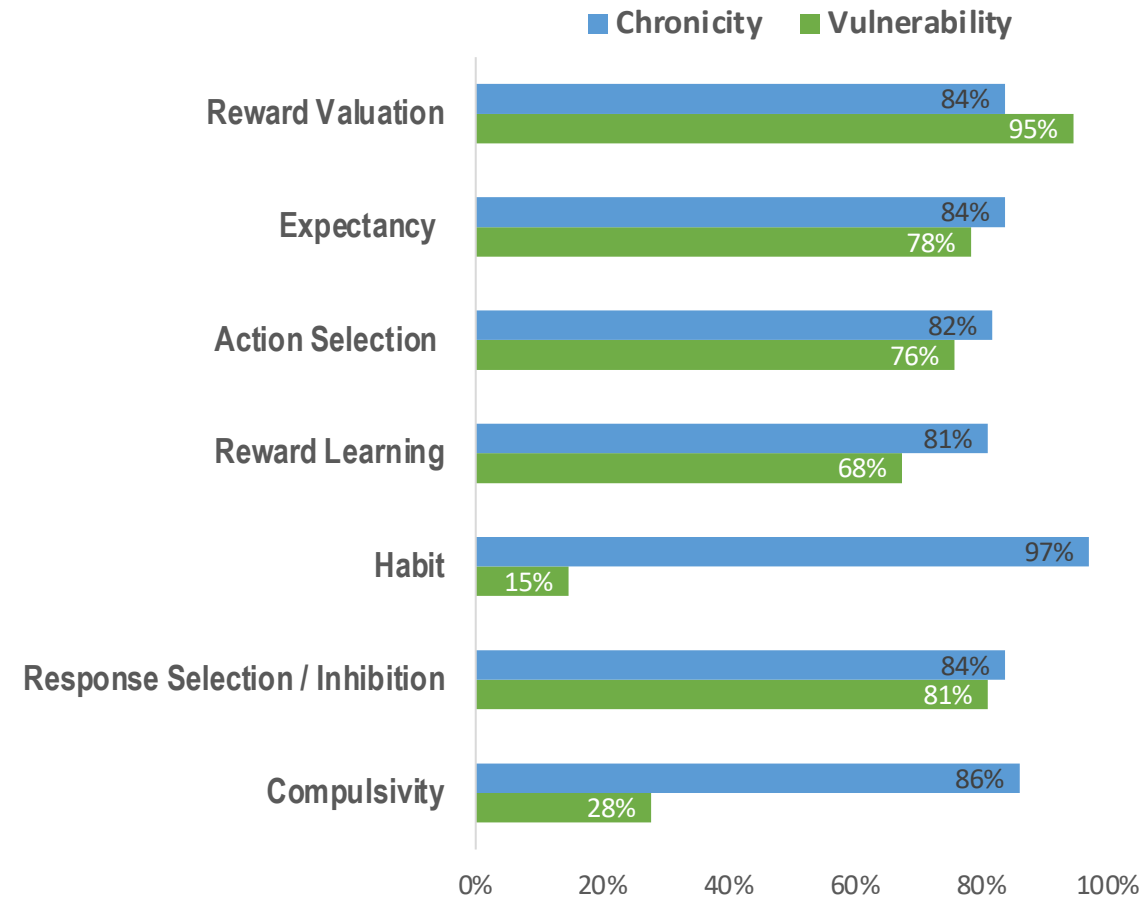
# Gaming

- In-game rewards
- Monetisation (loot boxes)
- Reward Learning (near misses)
- S-R (vs S-O) selection
- Biases / Beliefs



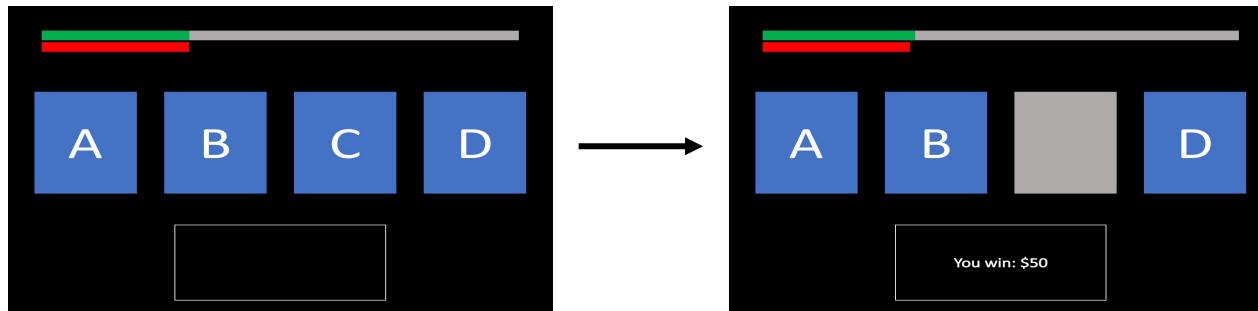
# Social Networks

- Social rewards
- Loading feed
- Reward Learning (algorithms)
- S-R selection (doomscrolling)
- Strong emotions



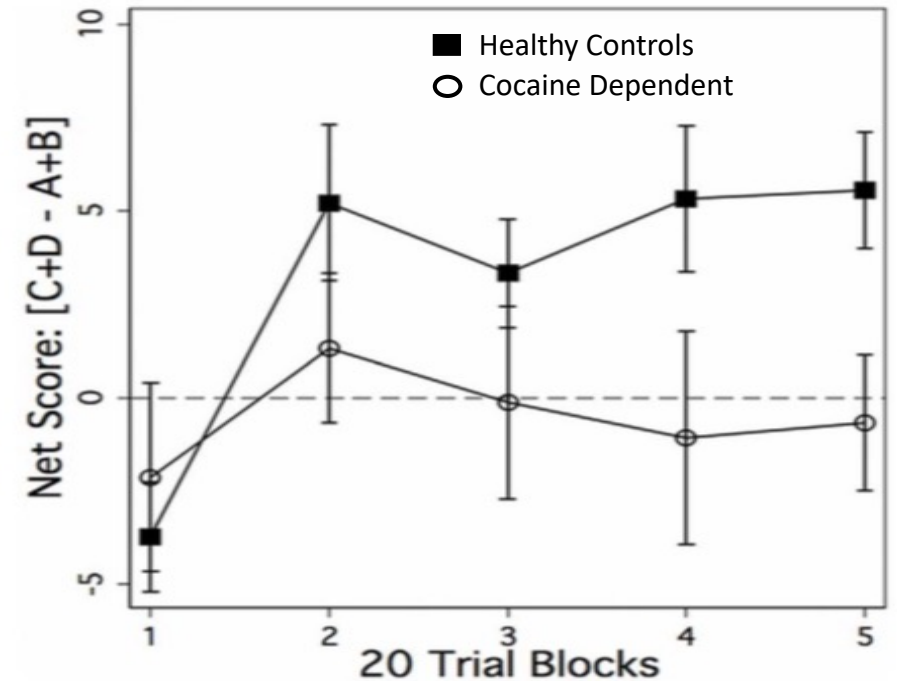
# Substance Dependent Individuals Display Aberrant Decision Making

Iowa Gambling Task



Decks A + B = Disadvantageous  
Decks C + D = Advantageous

100 Trials:  
First 40 Trials = Ambiguity  
Next 60 Trials = Risk



# Hypothesis

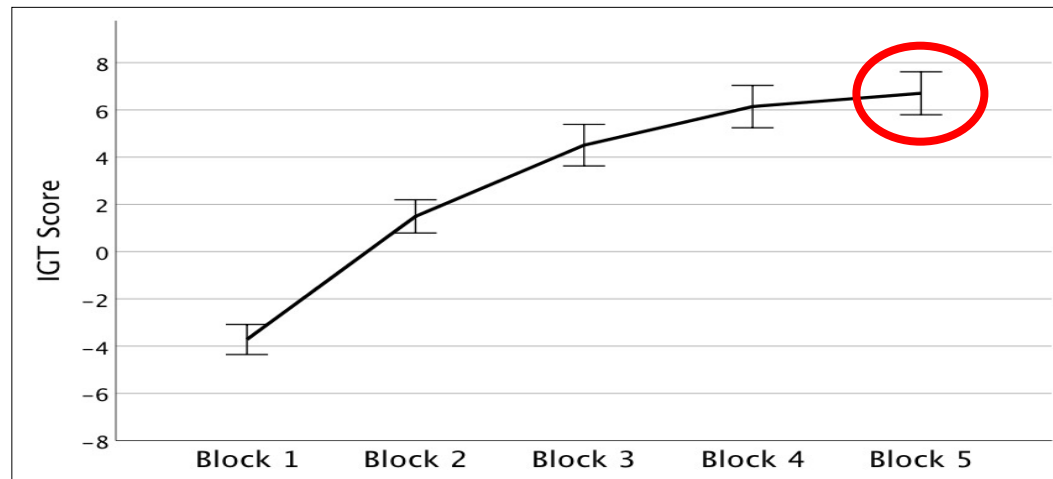
Problematic social media use will also be associated with this aberrant decision making in the Iowa Gambling Task

# Bergen Facebook Addiction Scale

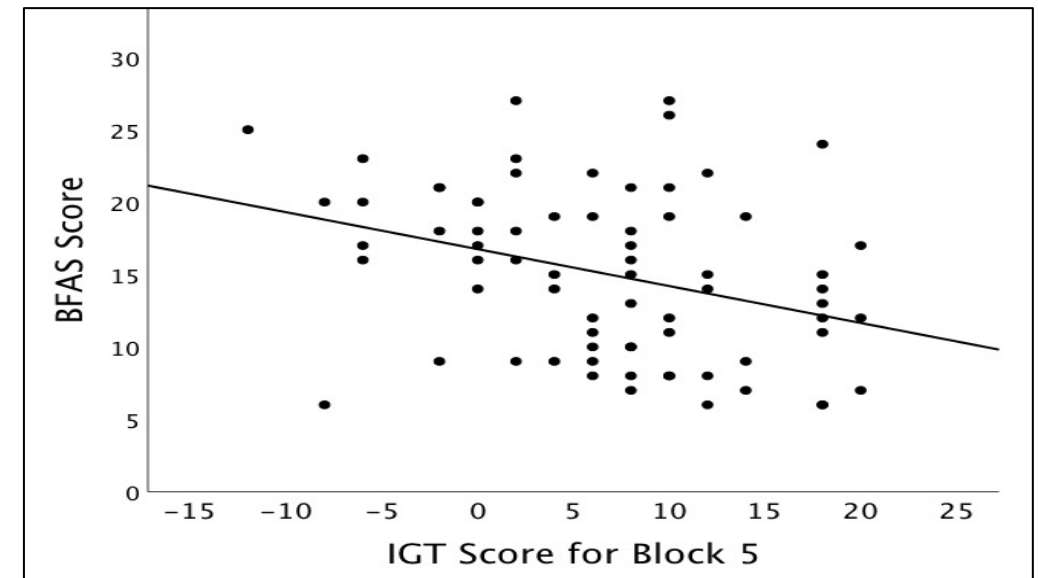
1. Do you spend a lot of time thinking about Facebook or plan your use of Facebook? (salience)
2. Do you feel an urge to use Facebook more and more? (tolerance)
3. Do you use Facebook in order to forget about personal problems? (mood modification)
4. Do you try to cut down on your use of Facebook without success? (relapse)
5. Do you become restless or troubled if you are prohibited from using Facebook? (withdrawal)
6. Do you use Facebook so much that it has had a negative impact on your job/studies?  
(conflict)

# Iowa Gambling Task Results

- N = 71 (44 females); Age: mean = 23.7 years, s.d. = 3.8
- BFAS scores: mean = 15.1, s.d. = 5.8, range = 6 to 27



IGT Score = (C+D) – (A+B)  
Blocks = 20 trials



$r = -0.31$   $[-0.52/-0.07]$ ;  $p = 0.005$

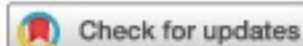
# SNS Use - Iowa Gambling Task

## Conclusions









- Greater problematic social media use is associated with worse performance in the IGT, similar to (albeit substantially less severe than) individuals with substance use disorders
- Appears that problematic social media users have a propensity towards risk
- They weight the **potential positive outcomes** of their decisions more than the potential negative outcomes

# Reverse engineering





# A unified online test battery for cognitive impulsivity reveals relationships with real-world impulsive behaviours

Antonio Verdejo-Garcia <sup>1</sup>✉, Jeggan Tiego <sup>1</sup>, Naomi Kakoschke <sup>1</sup>, Neda Moskovsky<sup>1</sup>, Katharina Voigt <sup>1</sup>, Alexandra Anderson <sup>1</sup>, Julia Koutoulogenis <sup>1</sup>, Dan I. Lubman <sup>2</sup> and Mark A. Bellgrove <sup>1</sup>



# Cognitive Impulsivity Suite (CIS)



Online

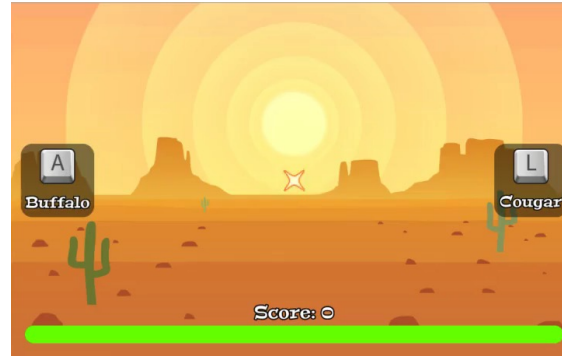
Gamified

Multiplatform

Immediate feedback

Data science

<https://rdcu.be/clrlb>



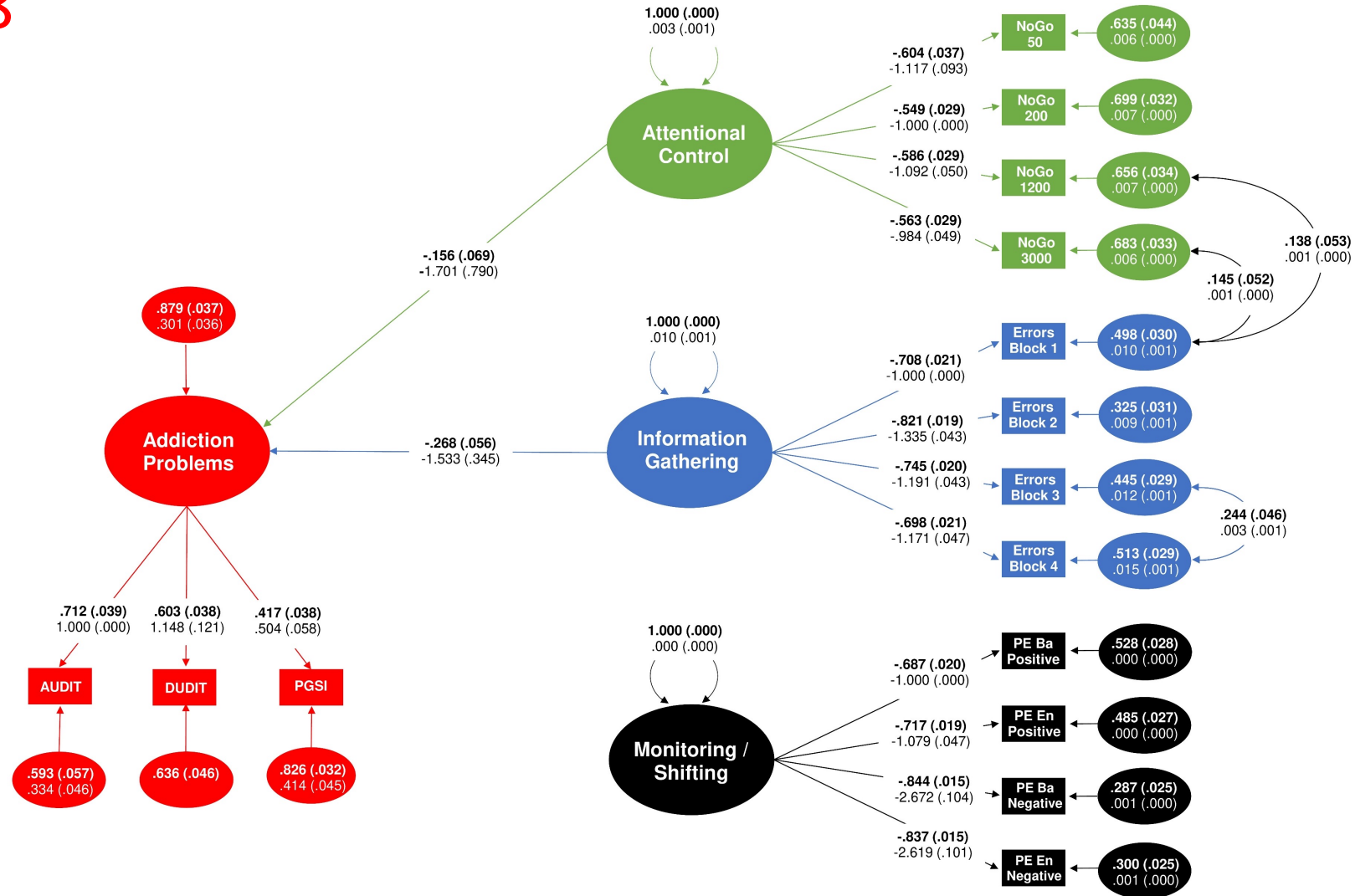
<https://www.youtube.com/playlist?list=PLs-GMH-Foyaz-UkhauX-uSCDBQkAM1sTv>

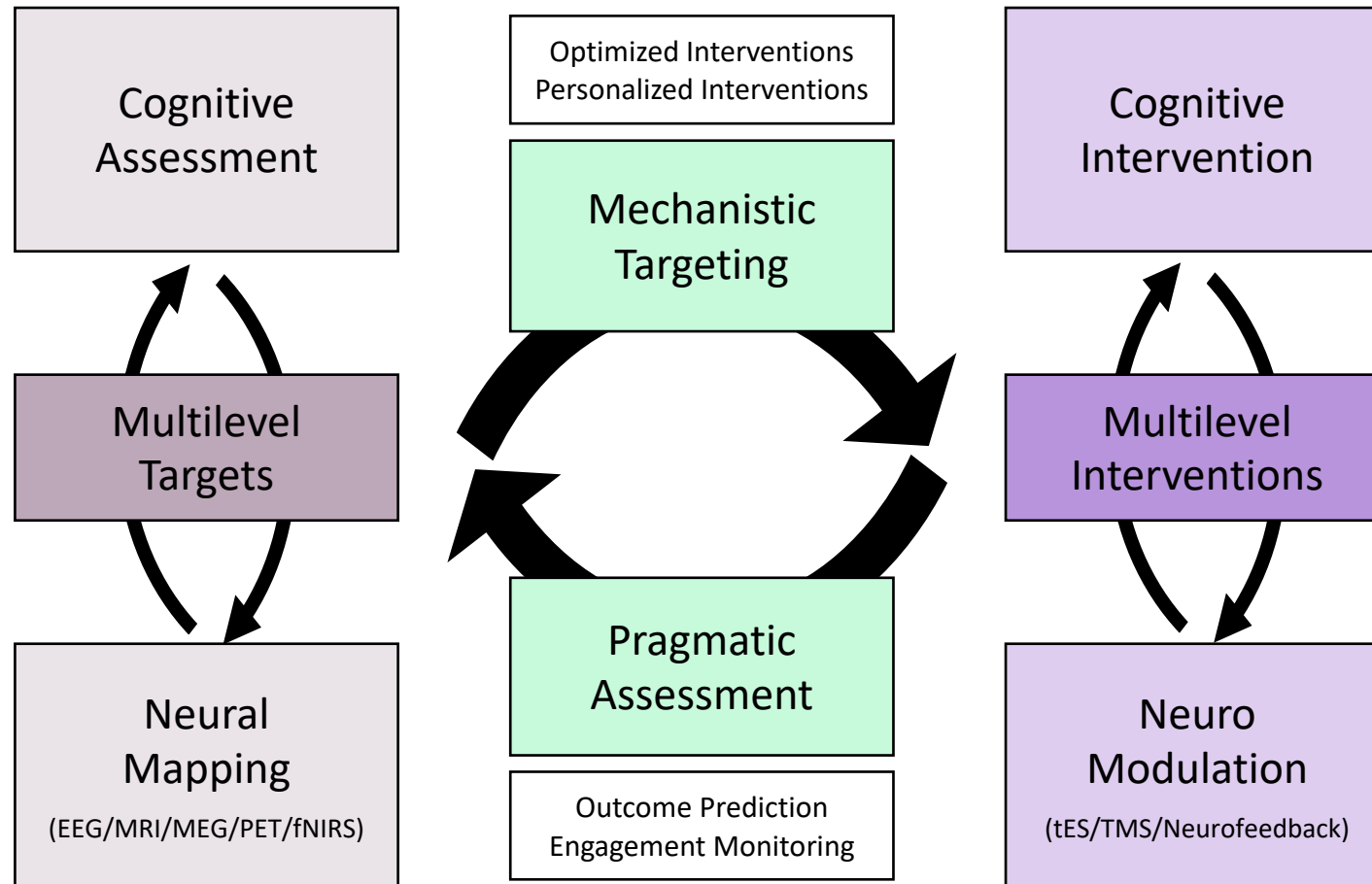


<https://www.counsellingonline.org.au/>



N = 578





# The future

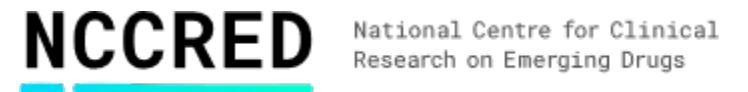
- More research into mechanisms – escalation, development of problems
- Changing the conversation: promote awareness, regulation
- Power of tech: reverse engineer for scientific discovery, health



# Acknowledgements



**Australian Government**  
**Australian Research Council**



# Cognition and Addiction

A Researcher's Guide From Mechanisms Towards Interventions

Edited by  
Antonio Verdejo-García



[elsevier.com/books/cognition and addiction](https://elsevier.com/books/cognition-and-addiction)