DRL intervention effects on an impulsive choice task

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IMPULSIVE CHOICE

High levels of impulsive choice:

ADHD (e.g., Barkley et al., 2001; Kuntsi et al., 2001; Solonto et al., 2001)

Gambling (e.g., Dixon et al., 2003; 2006)

Substance abuse (e.g., Kirby & Petry, 2004; Madden et al. 1997; Mitchell, 1999; Vichinich & Simpson, 1998)

Relapse in smoking cessation treatment programs (Krishnan-Sarin et al., 2007; Yoon et al., 2007)
EASY DECISION: SOONER (S) OR LATER (L)
In 10 minutes or in 30 minutes?
CHOICE - AMOUNT

EASY DECISION: SMALL (S) OR LARGE (L)

One cookie or two?
DELAY VS. AMOUNT

DIFFICULT DECISION:
SMALLER SOONER (SS) OR LARGER LATER (LL)

One cookie in 10 minutes or two cookies in 30 minutes?
IMPULSIVE CHOICE

DIFFICULT DECISION: SS or LL?

One cookie in 10 minutes or two cookies in 30 minutes?

The impulsive choice would be to take the one cookie SS option. Why would people lose self-control?
IMPULSIVE CHOICE

DIFFICULT DECISION: SS or LL?

One cookie in 10 minutes or two cookies in 30 minutes?

Inaccurate delay information may lead to misinformed choice behavior
METHOD

Measure rats percentage LL choice pre-intervention
10 s - 1 pellet vs. 30 s - 2 pellet
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DRL intervention on intervals used in the choice task
10 s , 30 s, or 10 s and 30 s
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DRL intervention on intervals used in the choice task
10 s, 30 s, or 10 s and 30 s

Measure rats percentage LL choice post-intervention
10 s – 1 pellet vs. 30 s – 2 pellet
PERCENTAGE LL CHOICE

Large individual differences
DRL INTERVENTION

RESPONSE PROBABILITY vs LOG INTER-RESPONSE TIME (S)

DRL 10

DRL 10 (30)

DRL 30

DRL (10) 30
PERCENTAGE LL CHOICE

PRE

POST
RESULTS

DRL intervention training led to more accurate timing of delay to choice outcomes.

This resulted in increased LL choice – increased self-control.

This could lead to the development of behavioral interventions to improve self-control.
HOWEVER...

We need to replicate the effect with a control group

Wish us luck!
Thank you

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