

# 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)

# CHOICE - DELAY

**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

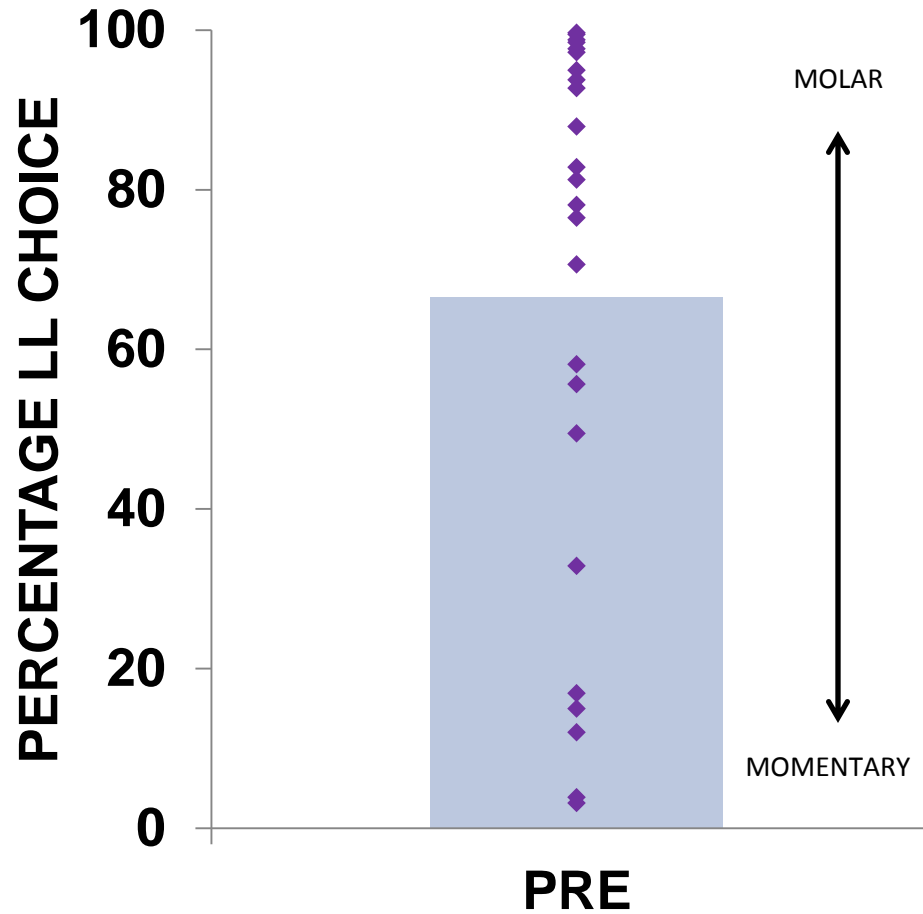
# METHOD

Measure rats percentage LL choice pre-intervention  
10 s - 1 pellet vs. 30 s - 2 pellet

DRL intervention on intervals used in the choice task  
10 s , 30 s, or 10 s and 30 s

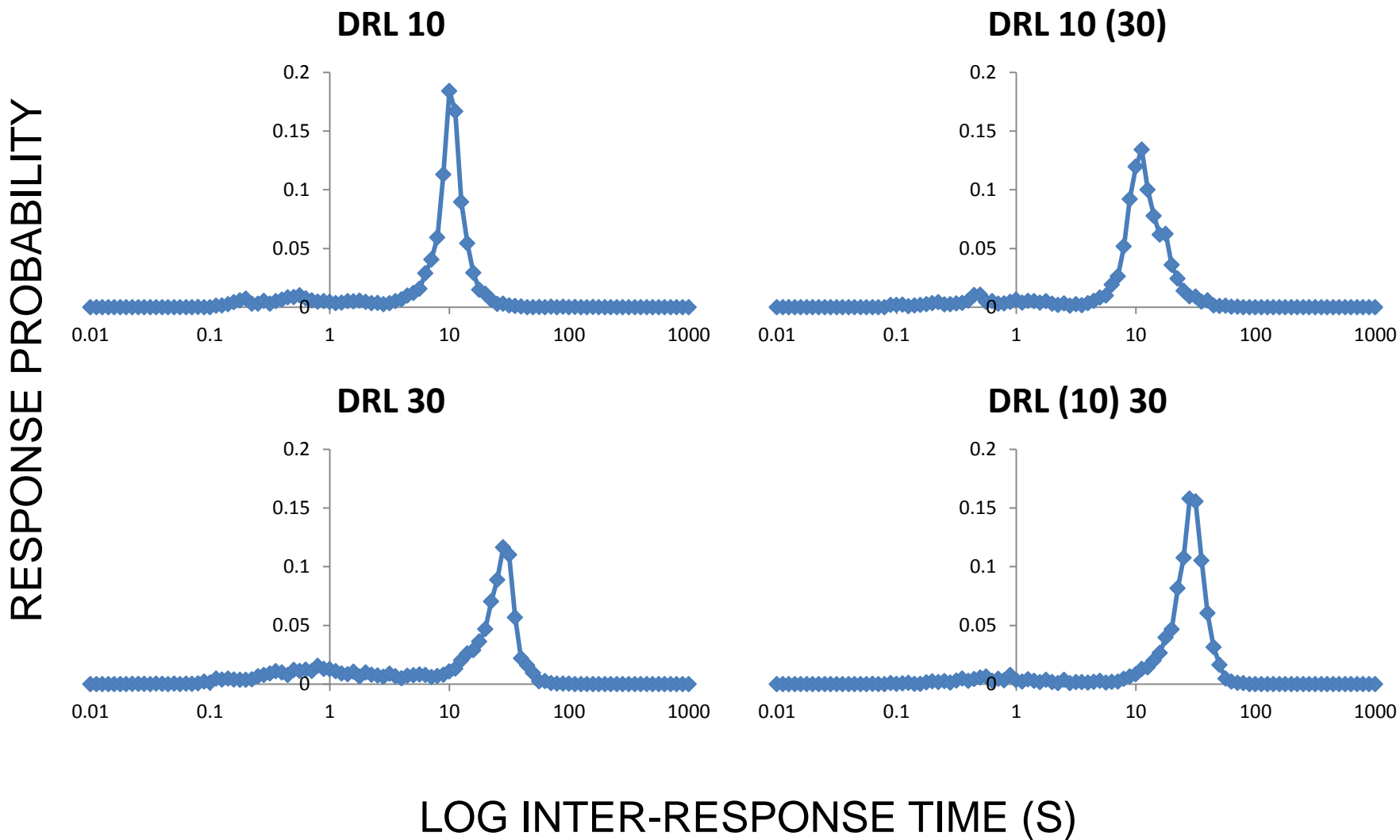
Measure rats percentage LL choice post-intervention  
10 s – 1 pellet vs. 30 s – 2 pellet

# PERCENTAGE LL CHOICE

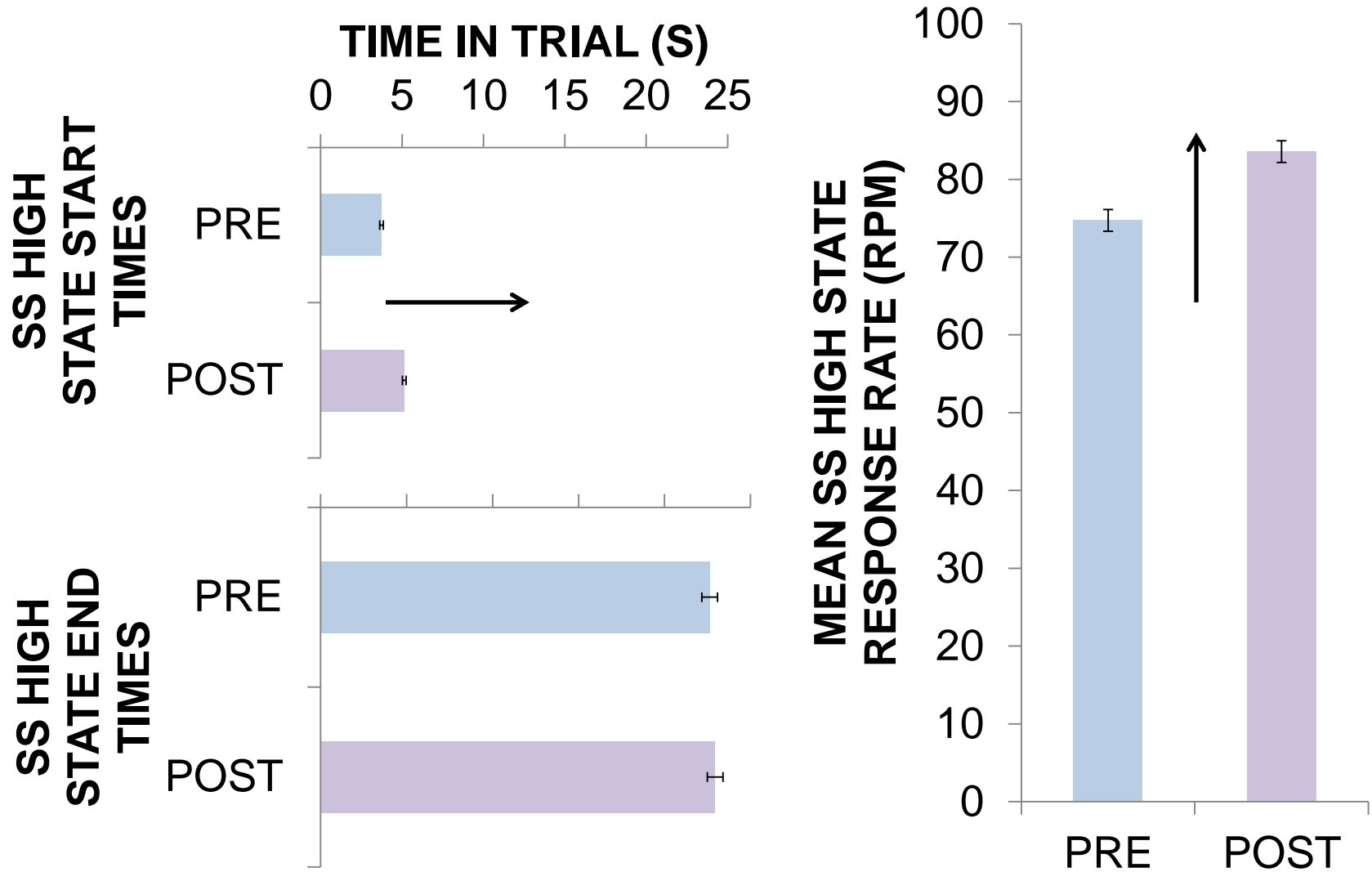


Large individual differences

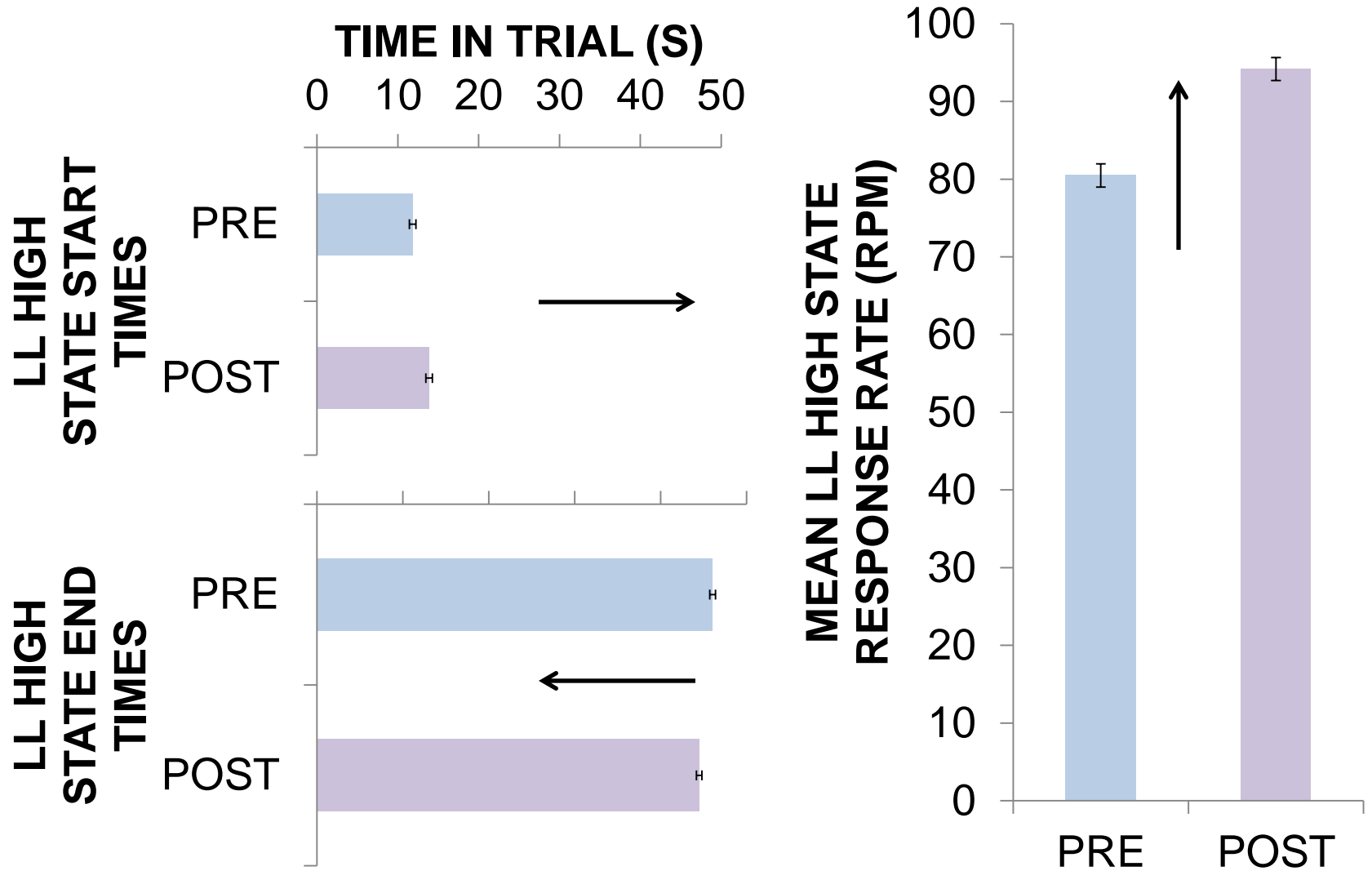
# DRL INTERVENTION



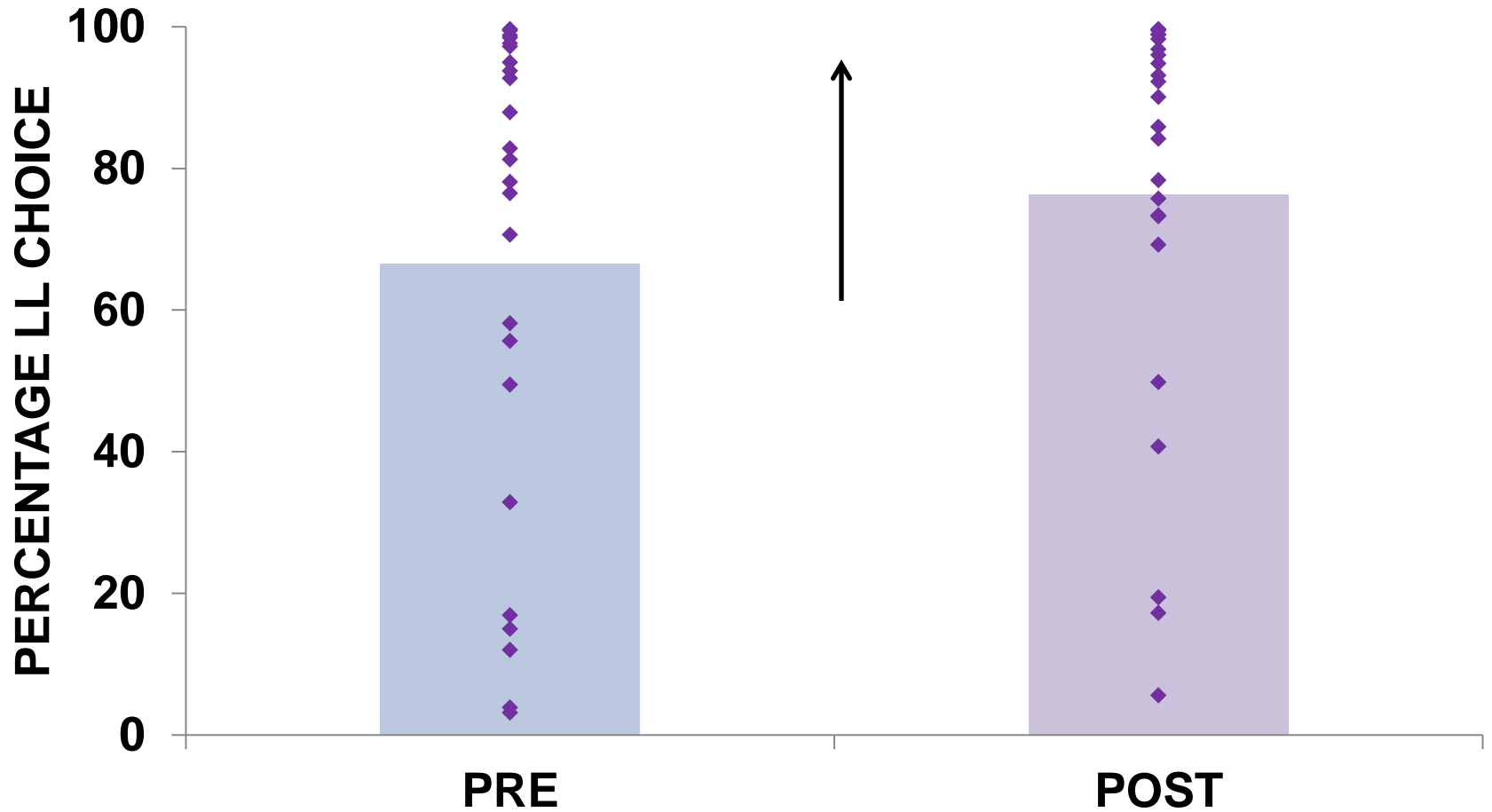
# SS LEVER TIMING



# LL LEVER TIMING



# PERCENTAGE LL CHOICE



# 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

Paul Brungardt

Andrew Marshall

Jon Smith

Marina Vilaro