

Trait impulsivity does not predict the speed-accuracy trade-off in perceptual decision making.

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Background

Impulsivity refers to “actions that are poorly conceived, prematurely expressed, unduly risky, or inappropriate to the situation and that often result in undesirable outcomes” (1).

In drift diffusion models of decision making, impulsivity can be understood as a tendency to decide before accumulating enough evidence (i.e. setting the decision bound too low; see (2) for an application in the ADHD literature).

However, recent findings point to a lack of systematic relationship between self-report measures of impulsivity and evidence-accumulation parameters (3,4).

Our study

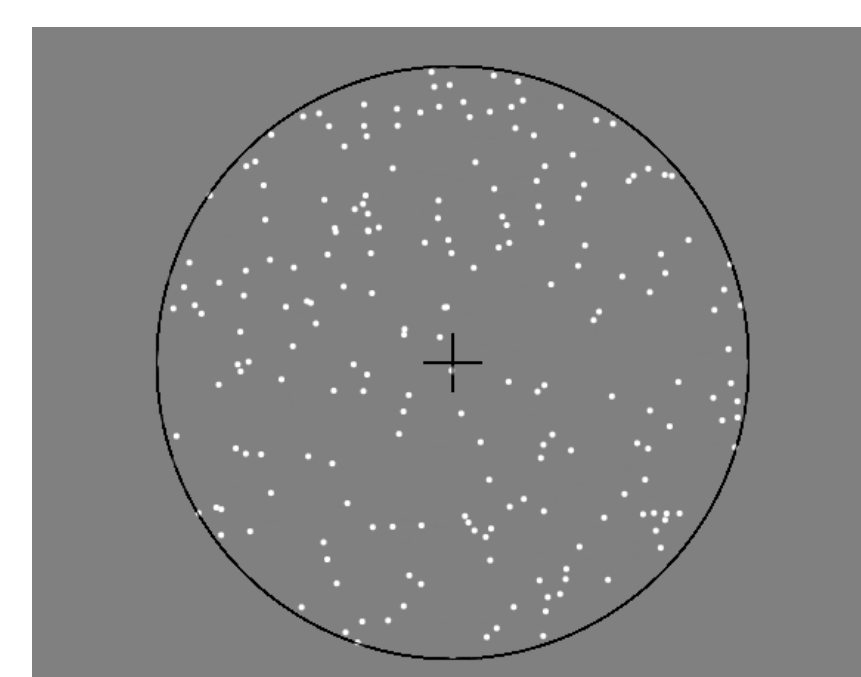
We used hierarchical drift diffusion modeling (HDDM; 5) and the short UPPSP questionnaire (6) to ask: **Does trait impulsivity predict decision strategy in a motion discrimination task?**

We manipulated the **speed-accuracy trade-off** to test whether trait impulsivity predicts the ability to adapt decision strategy to task requirements.

Method

Analysis of 192 participants | Recruited through Prolific online platform | 18-55 years old | British |

Random Dot Motion



Condition 1: Free
Condition 2: Speeded decisions
Condition 3: Accurate decisions

UPPSP

4 questions in each of 5 categories

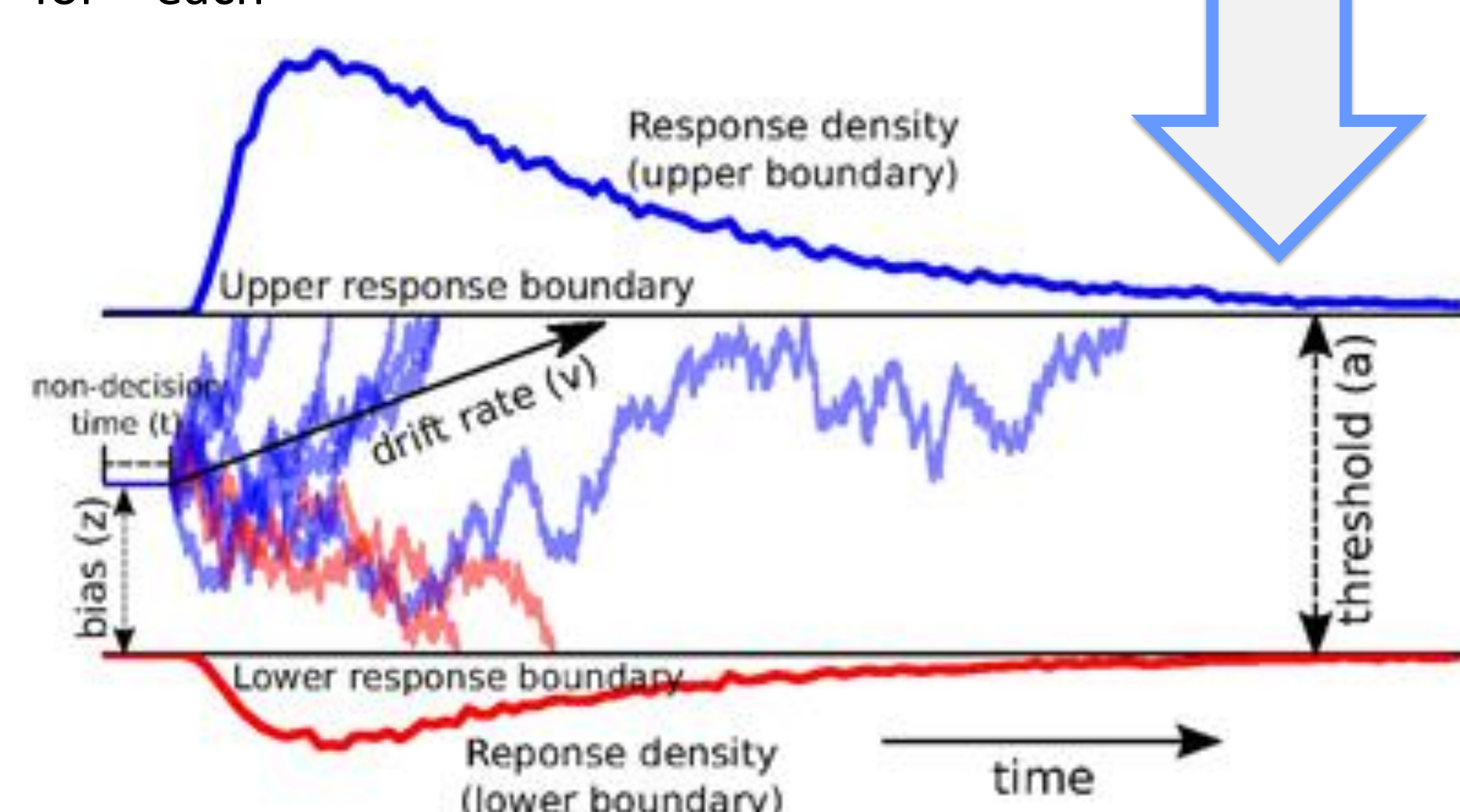
Lack of perseverance
Lack of premeditation
Positive urgency
Negative urgency
Sensation seeking

HDDM

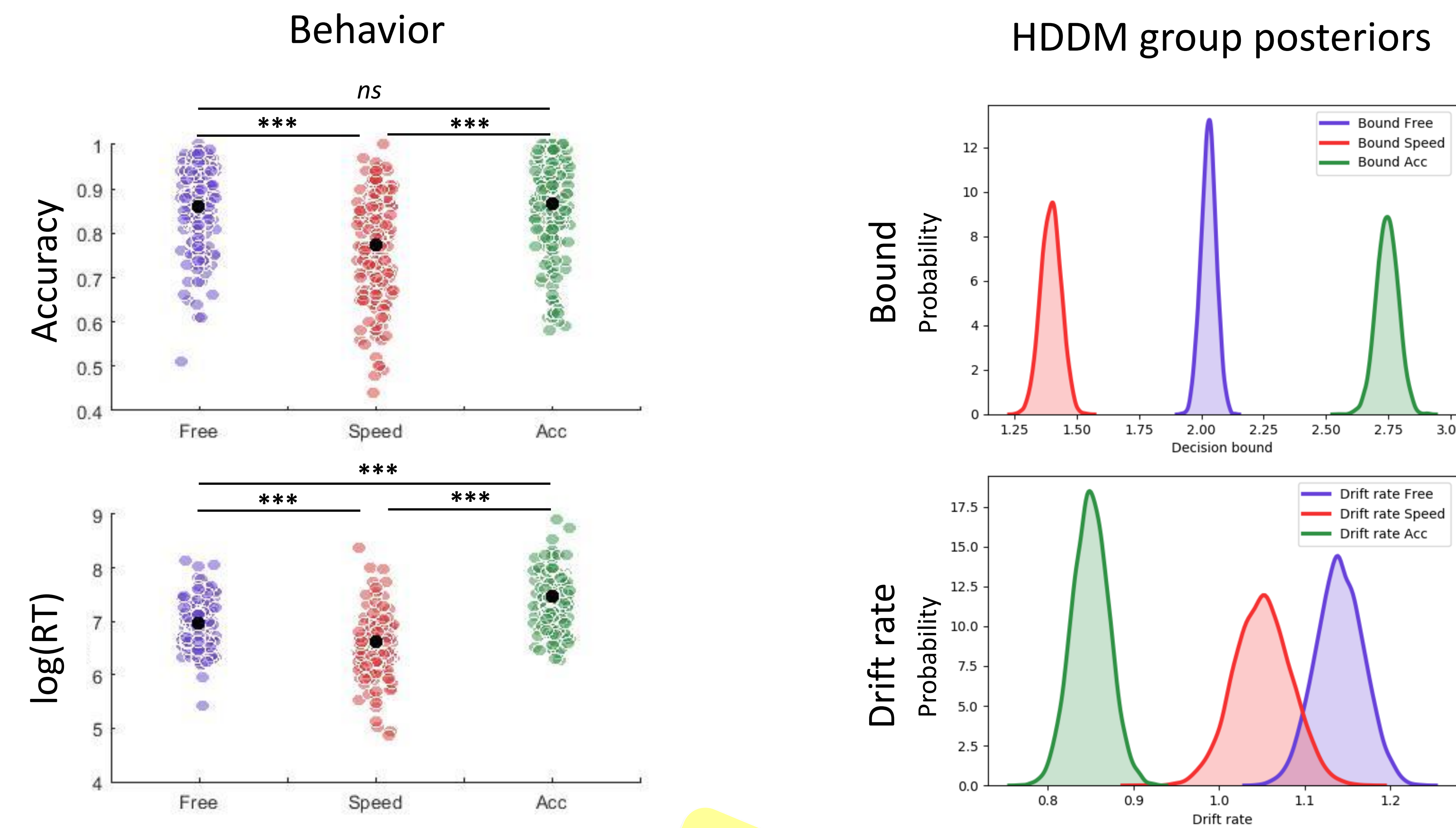
Decision boundary and drift rate estimated for each condition.

Bayesian correlations

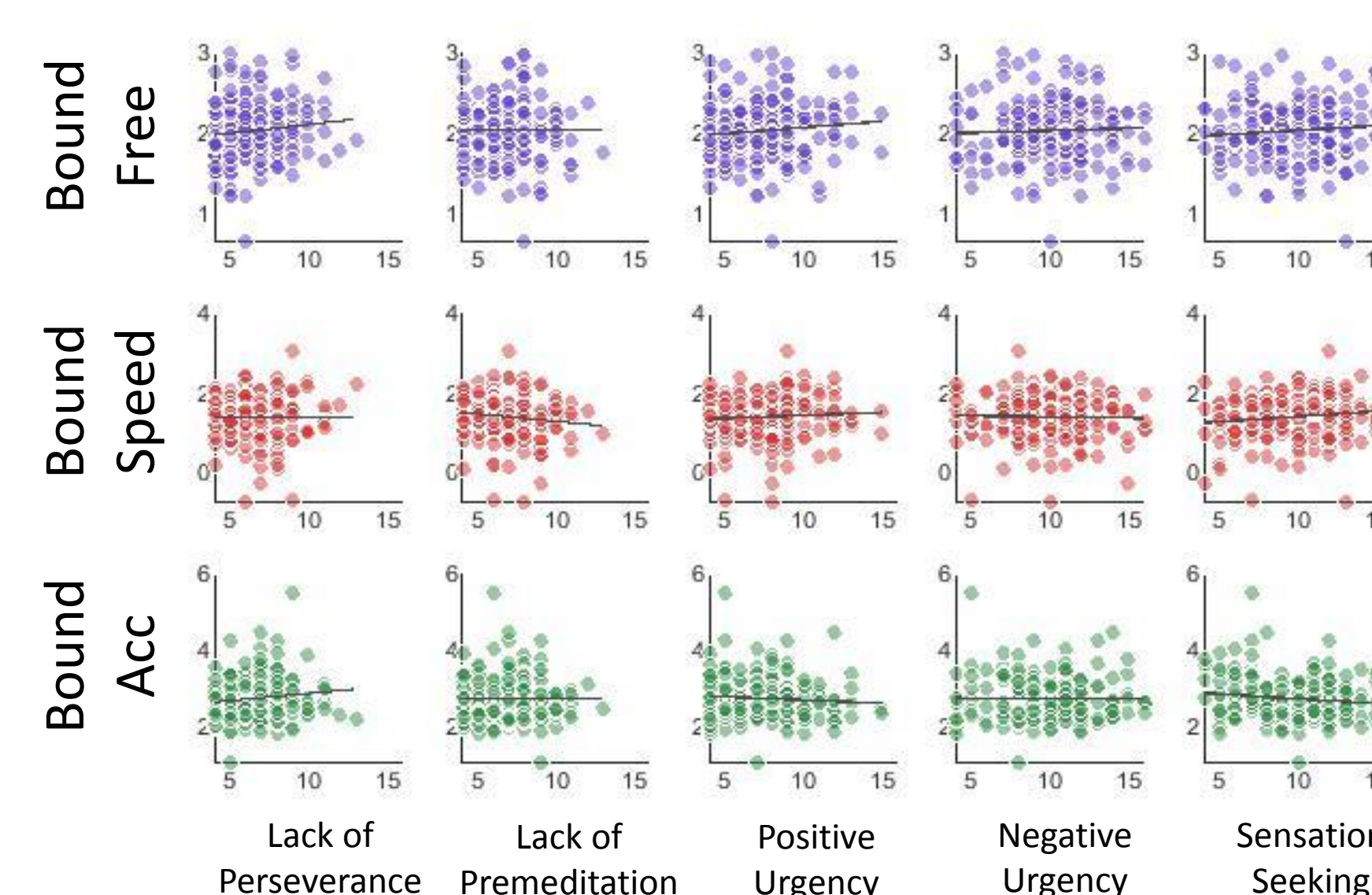
were estimated with the JASP (7) software package.



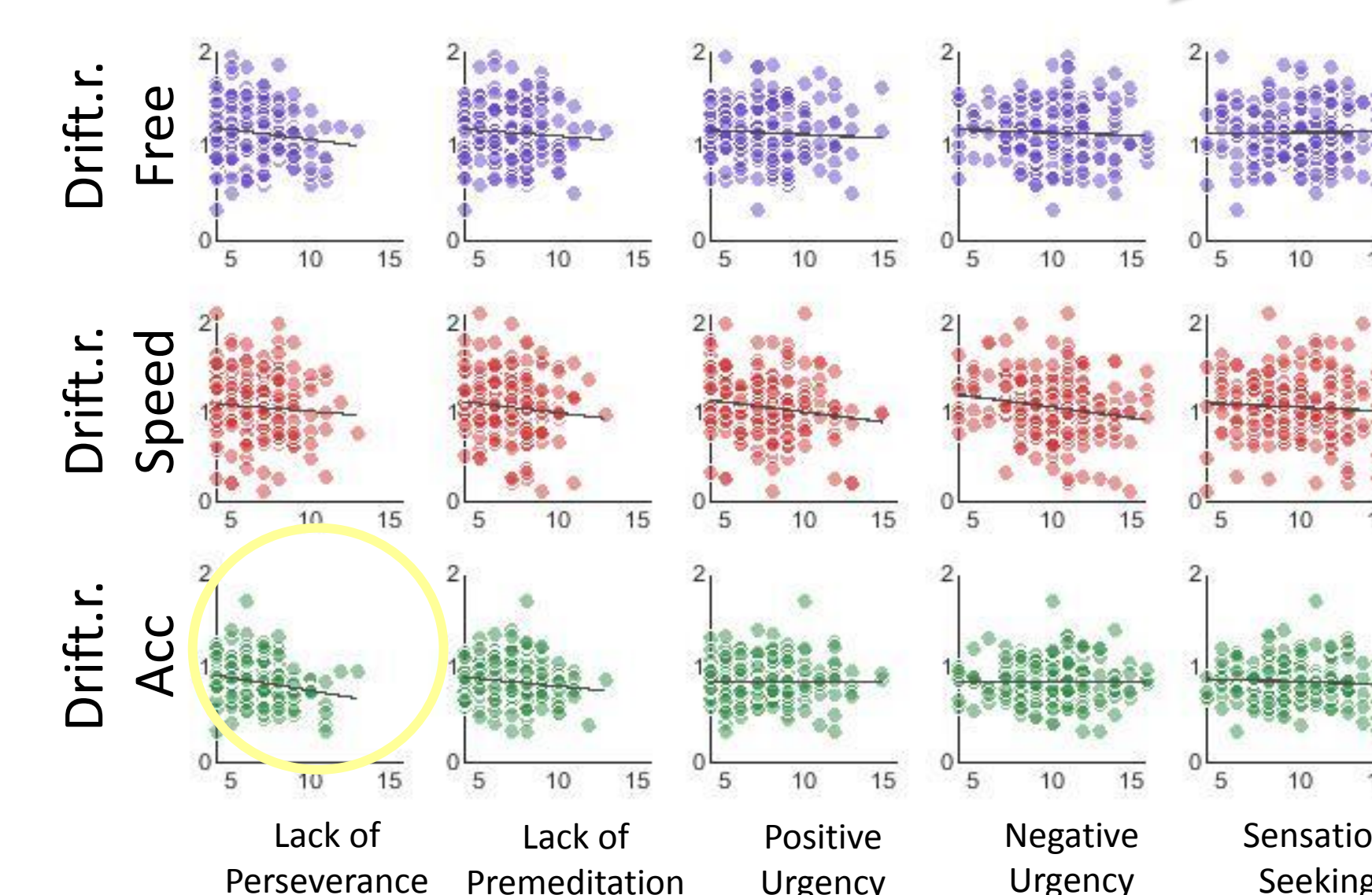
Results



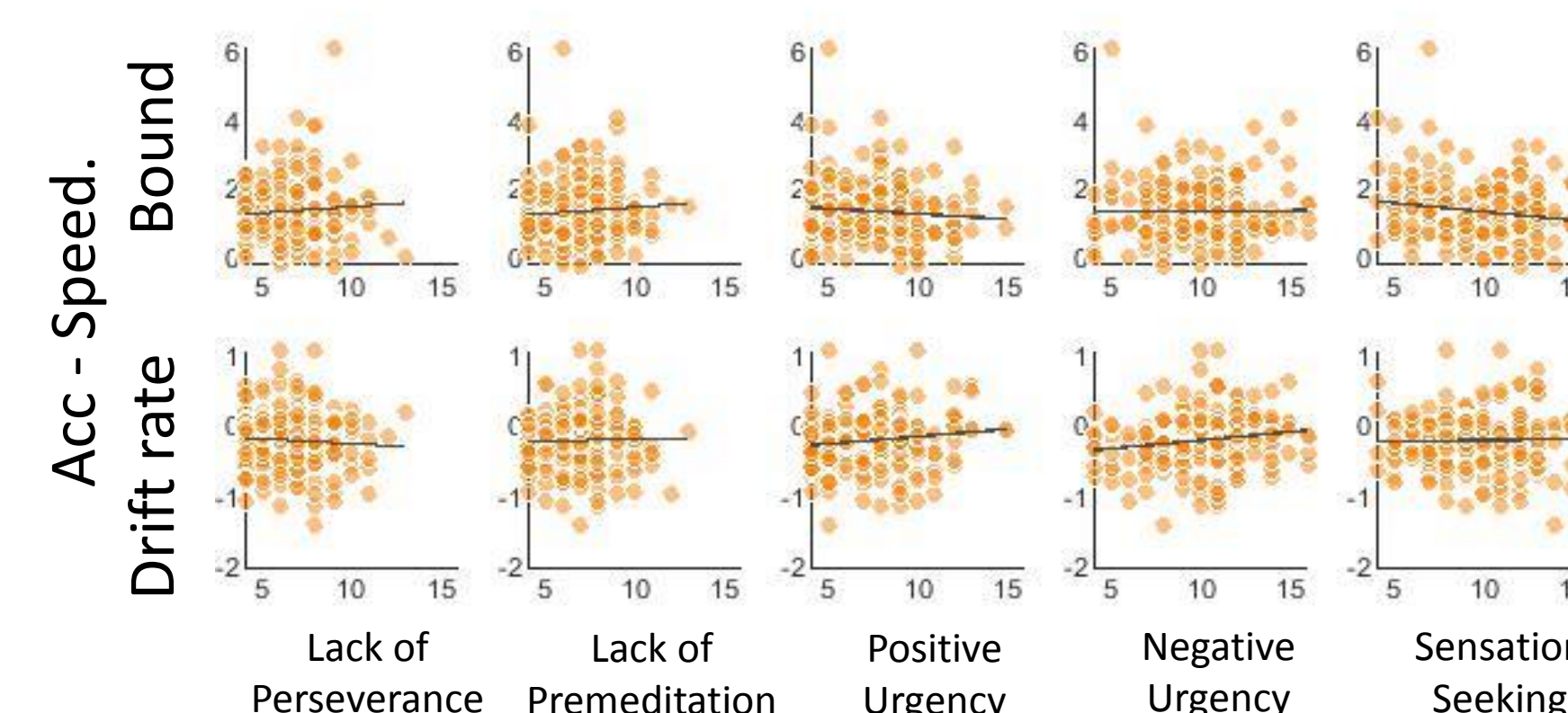
Correlations UPPSP – Decision bound



Correlations UPPSP – Drift rate



Correlations UPPSP – SAT



Bound: No relationship with UPPSP subscales: BF10 between 0.095 and 1.125; inconclusive or moderate evidence for H0.

Drift rate: Only in the accuracy condition, the “lack of perseverance” subscale predicted drift rate (Kendall’s $\tau = -.181$, BF10 = 91). Other BF10 between 0.095 and 1.25; inconclusive or moderate evidence for H0.

Speed-Accuracy trade-off: None of the self-report measures predicted adjustments in decision bound or drift rate between Speed and Accuracy conditions. All BF10 between 0.091 and 1.179; inconclusive or moderate evidence for H0.

Conclusions

We did not find a systematic relationship between self-reported impulsivity and decision parameters in perceptual decision making.

Further evidence is needed to conclude that no relationship exists in the population.

The lack of evidence for a relationship between behavioral and self-reported impulsivity should inspire caution when interpreting lab-based experimental studies on impulsivity.

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