Psychophysical bias to perceived positive associations in schizotypy

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HIGHLIGHTS

- Schizotypy is related with an increased perception that cues are positively associated.
- This effect occurs in the seconds to milliseconds time frame.
- A novel psychophysical instrumental learning contingency task is presented.

INTRODUCTION

- Individual behavioural differences are fundamental to understanding human psychology (Byrom, & Murphy, 2018).
- Schizotypy is a personality dimension underlying psychotic-like experiences (Claridge, 1997), and has been related to risk of psychosis (Lenzenweger, 2018).
- High schizotypal individuals share some genetical overlap (Barrantes-Vidal, et al., 2015), as well as, impairments in episodic memory (Sahakyan, & Kwapil, 2018), attention (Haselgrove, & Evans, 2010), and cognitive biases (Juarez-Ramos, et al., 2014) with people diagnosed with schizophrenia, e.g., apophenia (Fyfe, et al., 2008).

METHODOLOGY

Eighty-three participants completed the short Oxford-Liverpool Inventory of Feelings and Experiences (Mason, et al., 2005) and performed 180 trials (with 9 different conditions) of a contingency learning task on a computer screen (see Figure 1). The conditions were nine contingencies differeing in ΔP = #A / (#A + #B) – #C / (#C + #D); where # is frequency.

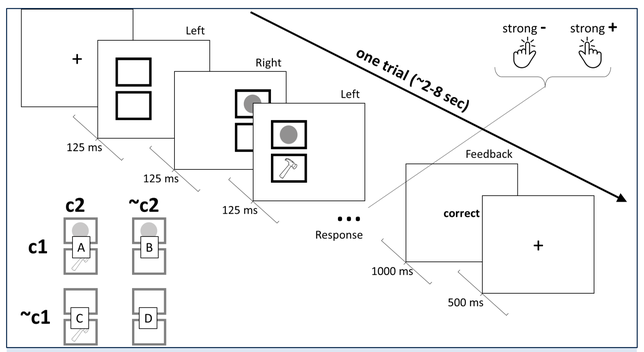

Figure 1. Behavioral task used. Every participant did 180 trials, 20 for each one of the 9 conditions, ΔP of -1, -0.75, -0.5, -0.25, 0, 0.25, 0.5, 0.75, and 1.

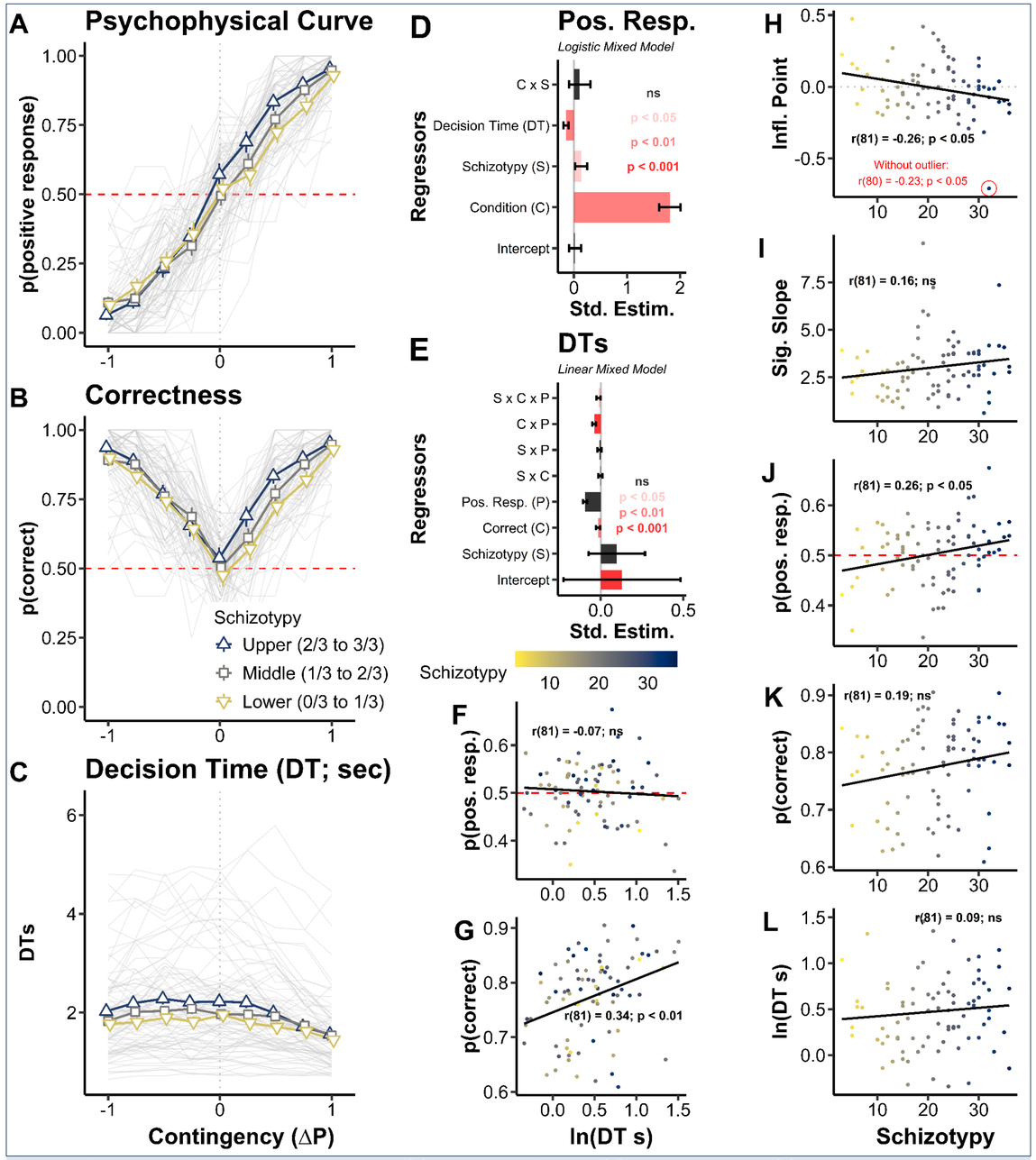

Figure 2. Probability of responding strong positive (A), probability of correct (B), and decision time (C) as a function of contingency. Logistic mixed model used to predict positive response (D). Linear mixed model used to predict the natural logarithm [ln()] of decision time (E). Overall participant probability of positive response (F) and correct (G) as a function of the participant mean ln(decision time). Inflexion point (H) and steepness (I) from a sigmoidal function, probability of positive response (J), correctness (K), and ln(decision time) (L) as a function of schizotypy.

RESULTS

- Participants were sensitive to contingencies (2A), learnt the task (2B), and had a wide range of decision time (DT; 2C).
- Positive association responses were predicted by increases in schizotypy and decreases in DT as a covariate (2D). However, schizotypy did not predict higher DT (2E).
- For individual, positive response are not correlated with DT (2F), but longer DT are positively correlated with accuracy (% of correct; 2G).
- We fit sigmoidal functions for each participant and correlated the inflexion point and steepness with schizotypy. The former was negatively correlated (2H; even excluding the outlier) and the second is not (2I).
- Similarly, schizotypy was positively correlated with overall higher probability of positive responses (Fig 2J); but is not with overall correctness (2K) nor DT (2L).

DISCUSSION

- When participants saw a stream of information with a statistical relationship between two cues, participants with higher schizotypy were more likely to perceive a positive association.
- Some individuals manifest a cognitive bias that predisposed them to respond affirmatively to questions in memory recognition tests (Kanter, & Lindsay, 2012), this is called the "yea-saying bias" (Couch, & Keniston).

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