

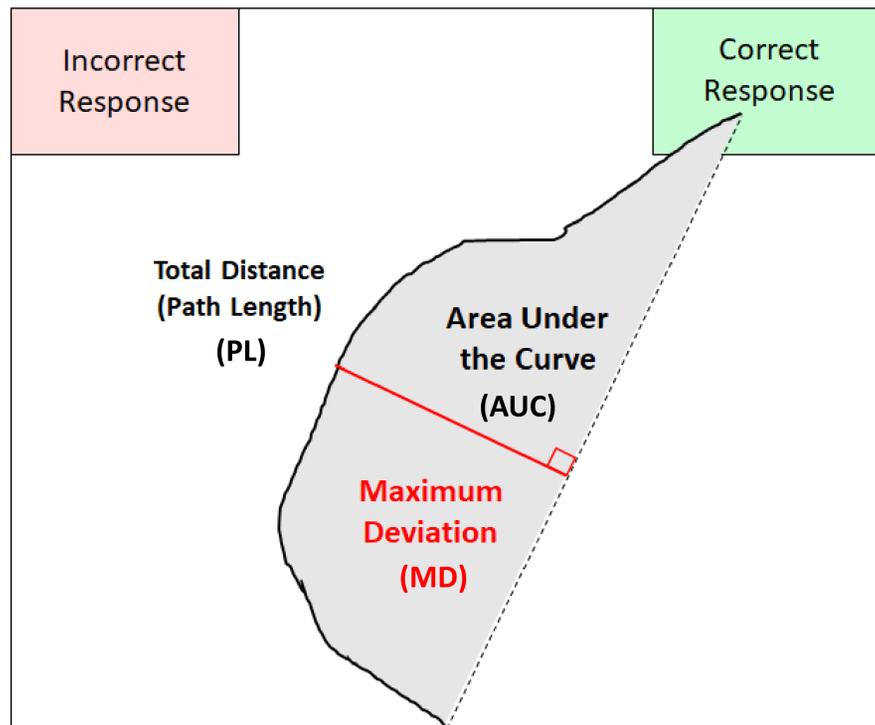


## Background

- Theories of belief processing typically claim that **processing another’s false belief involves inhibiting a bias towards one’s own, salient true belief** (e.g., Sommerville et al., 2013; Wang & Leslie, 2016; Rubio-Fernandez, 2017).
- Attempts to measure egocentric bias in adults during the false belief task (FBT) have produced inconclusive results (e.g., compare: Sommerville et al., 2013 vs. Samuel et al., 2018; Birch & Bloom, 2007 vs. Ryskin & Brown-Schmidt, 2014; Wang & Leslie, 2016 vs. Rubio-Fernandez, 2017).

## Mouse Tracking

- MT offers a novel method for measuring egocentric bias in adults on the FBT.
- In a typical MT task, participants use a computer mouse to select from two on-screen options in response to a question.
- As well as “temporal” measures of the duration of a response (Initiation Time, RT), **MT offers “spatial” measures of the degree of attraction to the incorrect response option** during a correct response (PL, AUC, MD). Larger PL, AUC and MD indicate greater salience of the incorrect option:



## Experiment Design & Methods

Core trial structure:

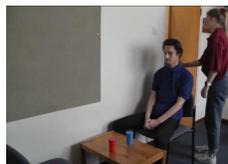
- Participants view short video scenarios in which an object is hidden, and an agent either has a **true belief (TB)** or a **false belief (FB)** as to its location:



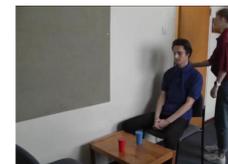
Keys hidden in **BLUE** cup



Agent leaves the scene



Either: agent returns and sees keys moved to **RED** cup (**TB**); or keys moved in her absence to **RED** cup, then she returns (**FB**).



- At the end of each video, participants answer a question, selecting from two possible responses, which are always **RED** or **BLUE**.
- Question types (Experiments 1 & 2):

**Belief:** “Where does she think the keys are?” (16 per scenario)  
**Reality:** “Where are the keys currently hidden?” (16 per scenario)  
 Filler: e.g., “Which cup is nearest to him?” (32 per scenario)

- Accuracy, temporal measures (IT, RT) and spatial measures (PL, AUC, MD) recorded for each trial.

## Predicted Results

- **For FB scenarios, the incorrect response on the belief question reflects the participant’s true belief.** If there is an egocentric bias towards one’s own true belief, then we predict an attraction to the incorrect response on those trials.
- This is **not the case for belief questions for TB scenarios. Neither is it the case for reality questions** for either scenario.
- Therefore predict **greater attraction to the incorrect response, as measured by PL, MD and AUC, for belief questions, relative to reality questions, specifically on FB scenarios:** a 2 x 2 interaction (scenario x question) on a repeated measures ANOVA.

## Planned Experiments

- (E1)** Test for predicted Scenario x Question interaction. **N = 75.**
- (E2)** Same as (E1), but participants instructed to deliberately code agent’s belief while watching videos. If predicted effect in (E1) is the result of online belief processing at time of responding, then instructions to code beliefs *prior* to responding should remove subsequent effect of egocentric bias. **N = 75.**
- (E3)** Introduce memory question (“Where did he first hide the keys?”) to test if any egocentric bias shown in FB scenarios is the result of the enhanced memory demands of those trials. **N = 65.**
- (E4)** Depending on outcome of (E3), either investigate memory demands further OR investigate egocentric bias on past true belief processing. **N = 65.**

**NB:** All experiments and data processing / analysis plans will be preregistered.

## Pilot Data

- 20 participants completed pilot version of E1.
- Spatial measures suggest greater attraction to the incorrect option on belief trials relative to reality trials, **specifically on false belief scenarios:**

