

## Introduction

Atypical perception is a core phenotype of Autism Spectrum Disorder<sup>3,4</sup>

### A prevailing Bayesian view of ASD perception

- Atypical perception in ASD can be due to **attenuated priors** or **enhanced likelihood**<sup>5,6</sup>
- Predicts a reduced effect of prior knowledge in ASD

### Still unknown

- Do individuals with ASD adjust their decision making criterion similarly to NTs ? Do they have metacognitive abilities similar to NTs ?

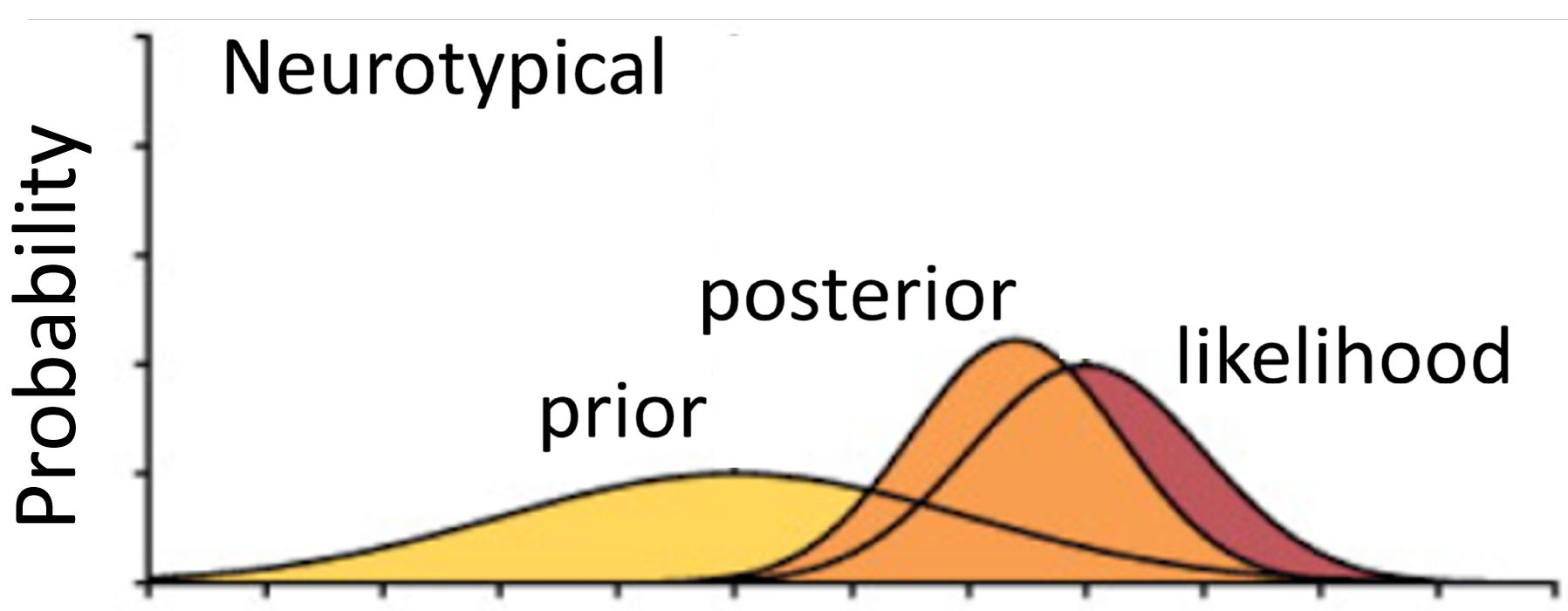
### Aim of the study

- Whether and how individuals with ASD adjust their perceptual criterion in response to changes in prior knowledge, rewards and sensory evidence ?

### Bayesian theory of perception

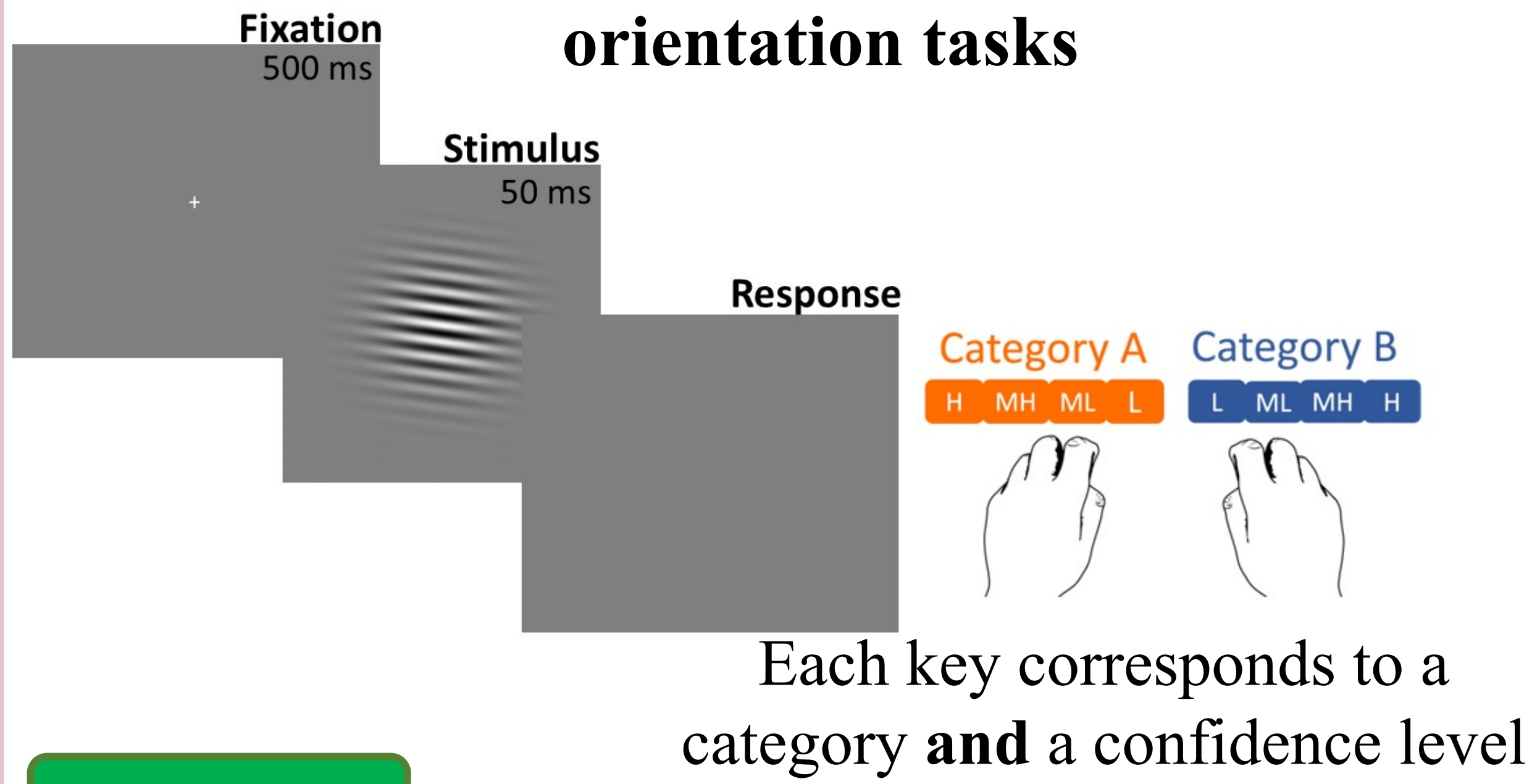
Perception combines<sup>1,2</sup> :

- Prior** (Initial probability for a given stimulus)
- Reward** (Cost associated with a decision)
- Likelihood** (Sensory uncertainty)



## Method

### Trial sequence for the 3 categorization of orientation tasks

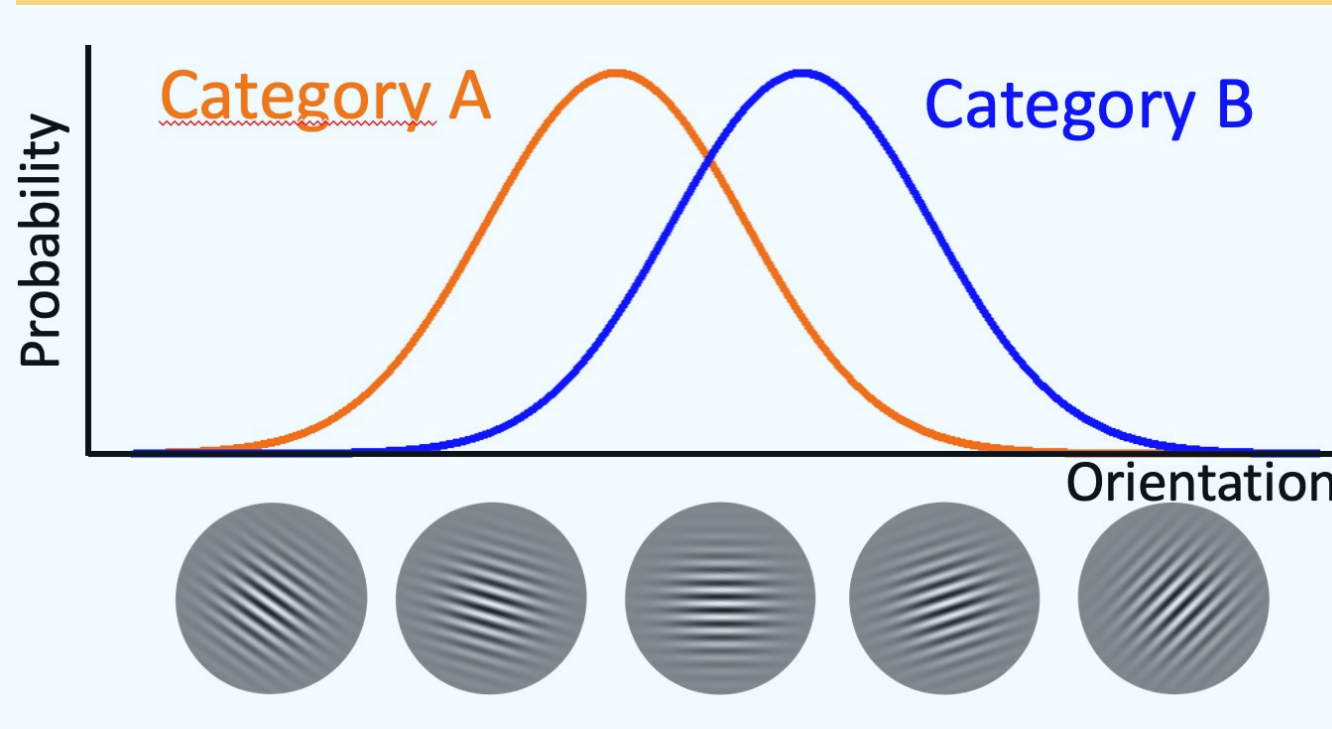


### Population

- 35 Participants with ASD
- 85 Neurotypical participants (NT)
- Measured variables : age, IQ (TONI score), AQ (Autistic quotient), CAPE.

### Prior and reward tasks

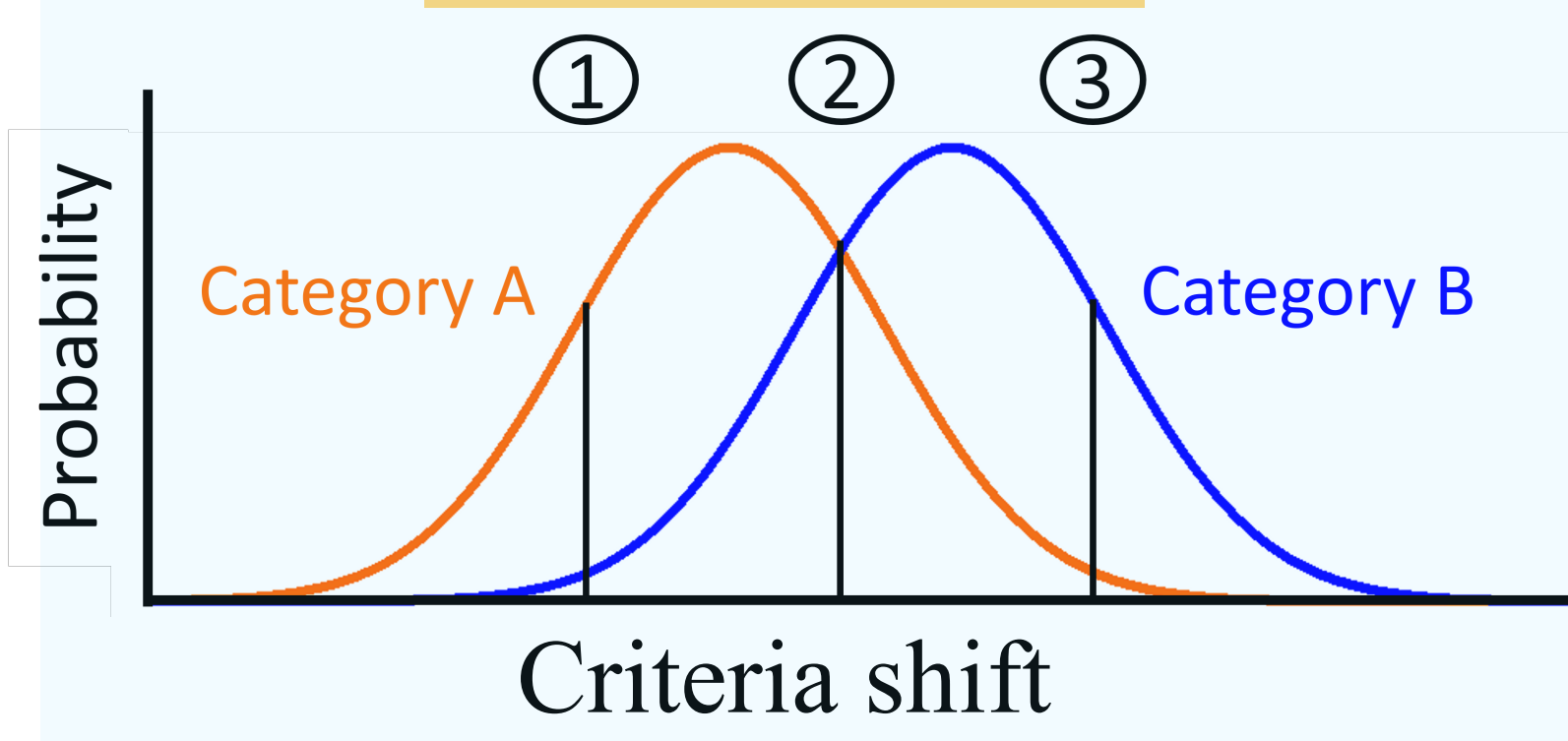
#### Category distributions



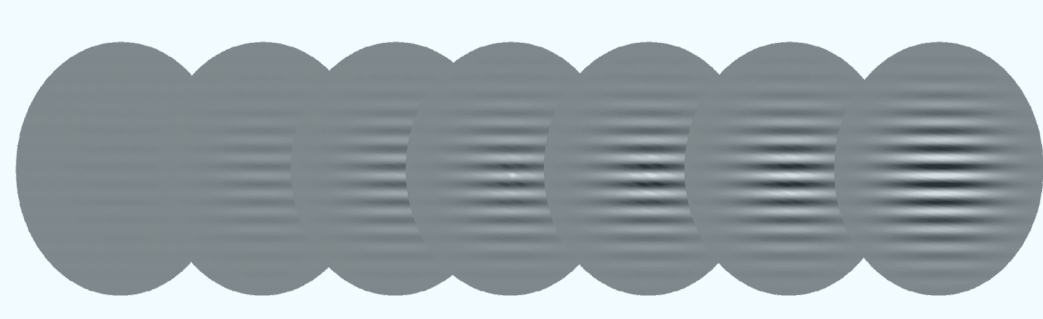
#### Blocked variables

- Prior : Category base rate  
① A = 25% ② A = 50% ③ A = 75%
- Reward : Points/correct answer  
① A = 1 pt ② A = 2 pts ③ A = 3 pts

#### Predictions

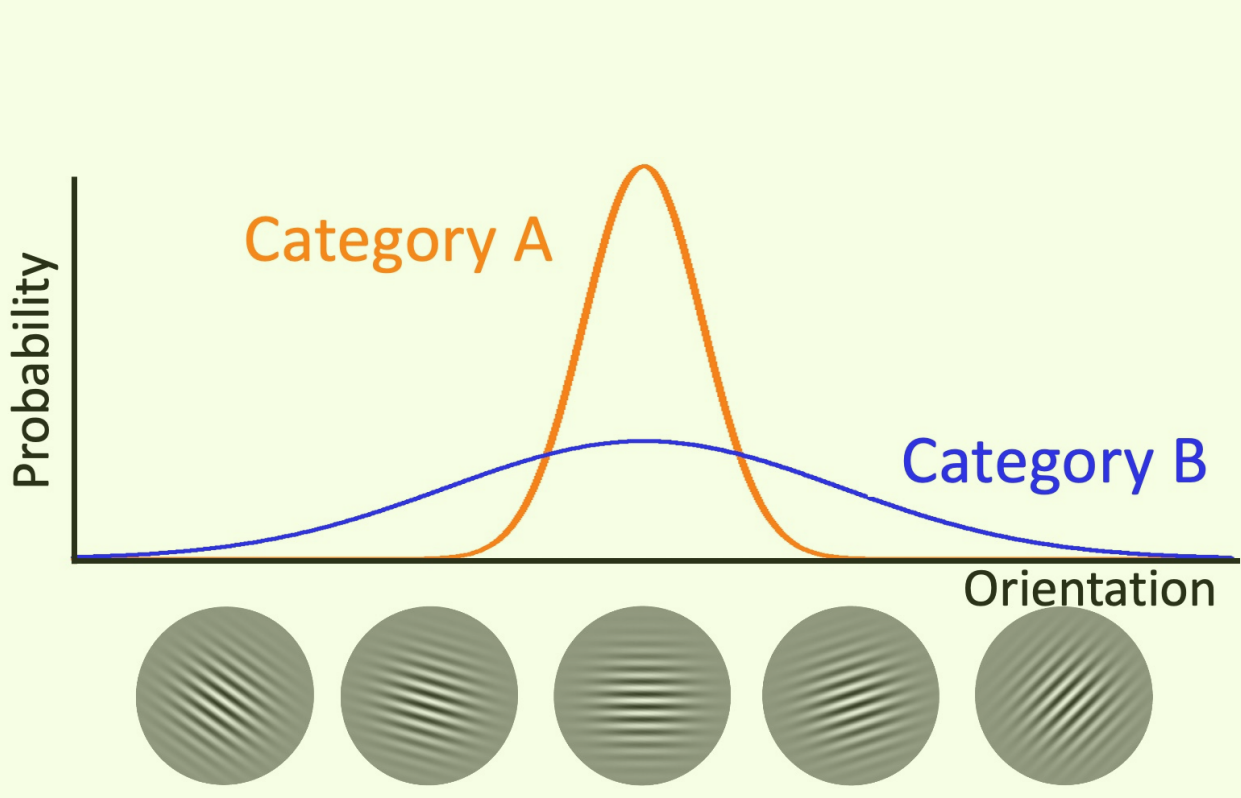


#### Likelihood

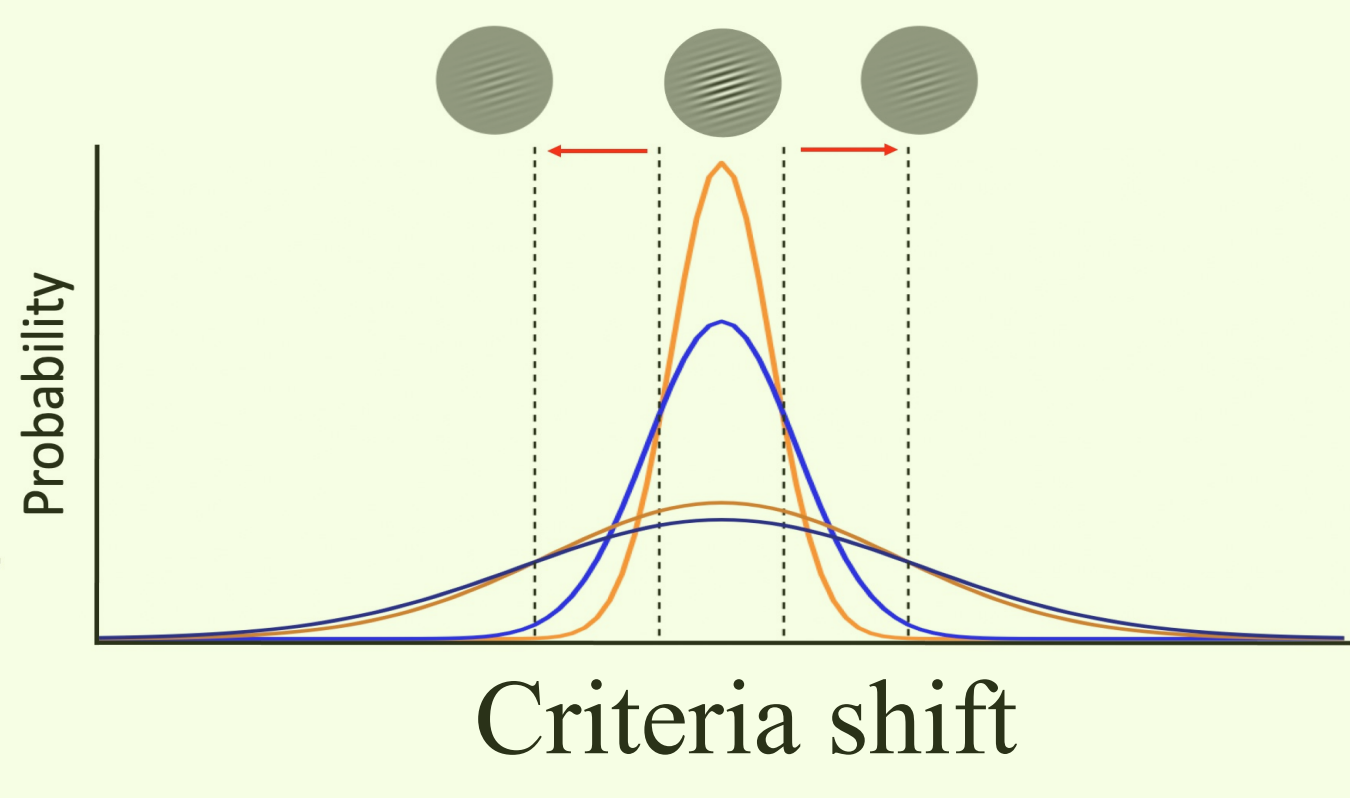


### Likelihood Task

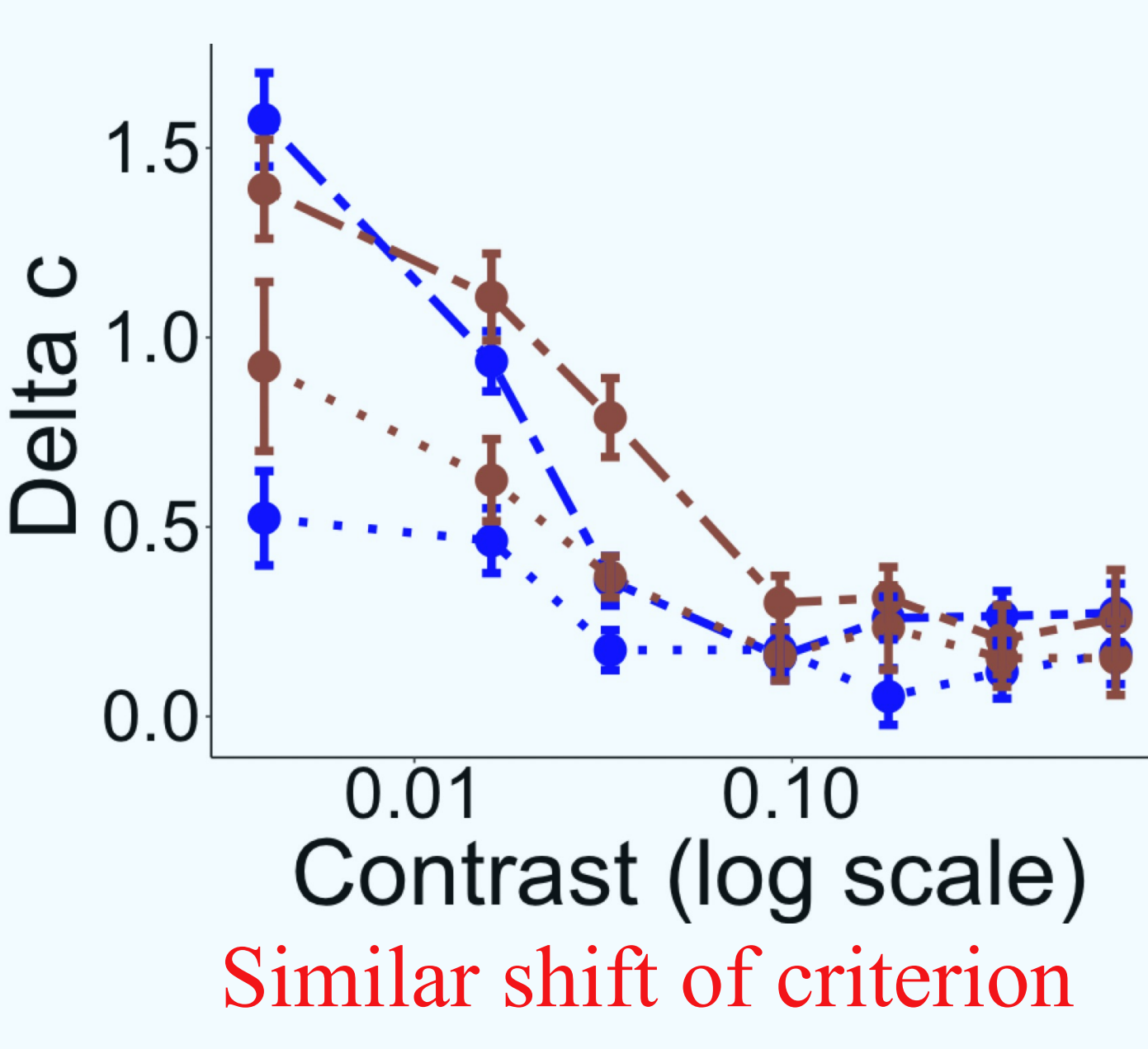
#### Category distributions



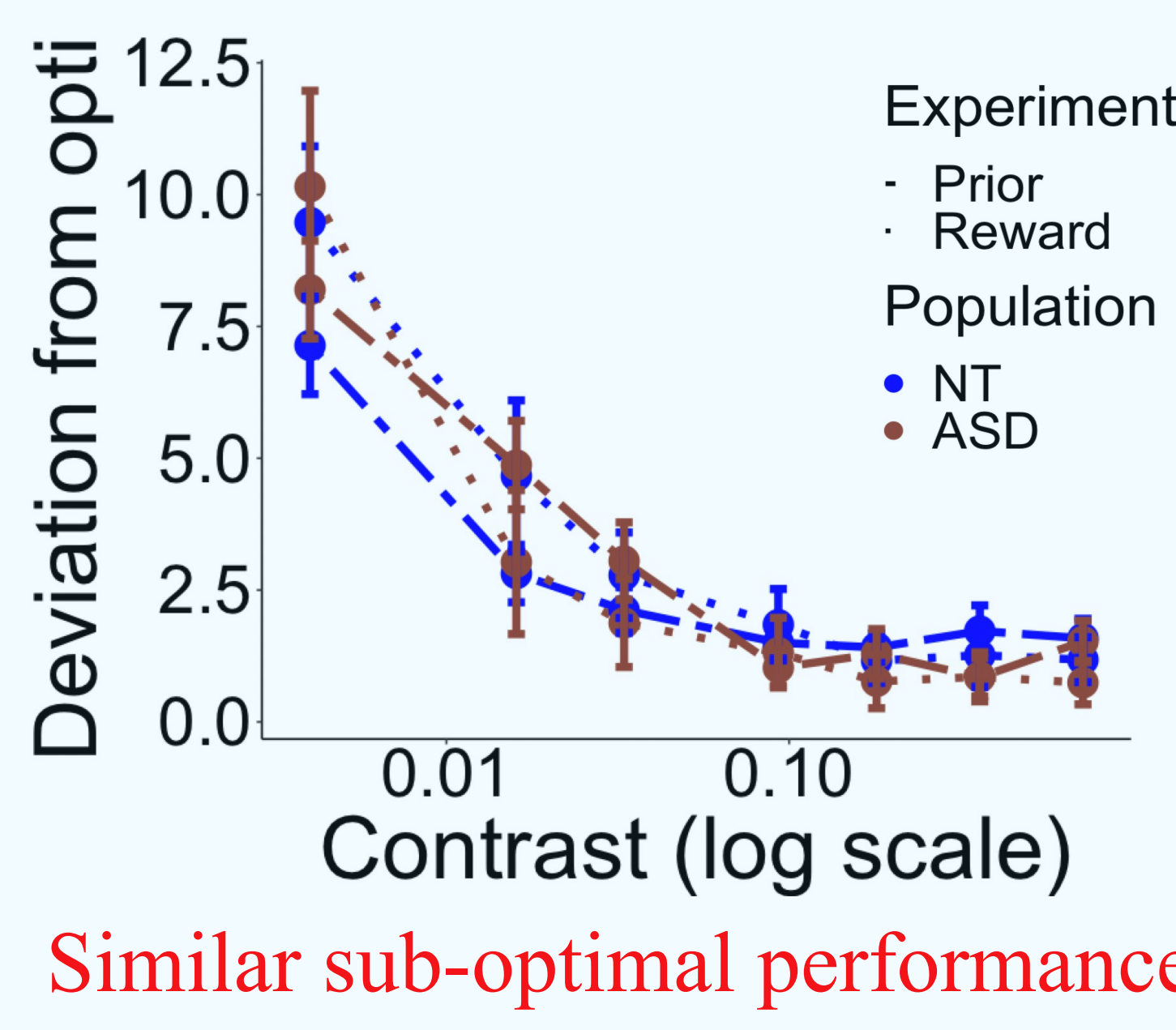
#### Predictions



## Results

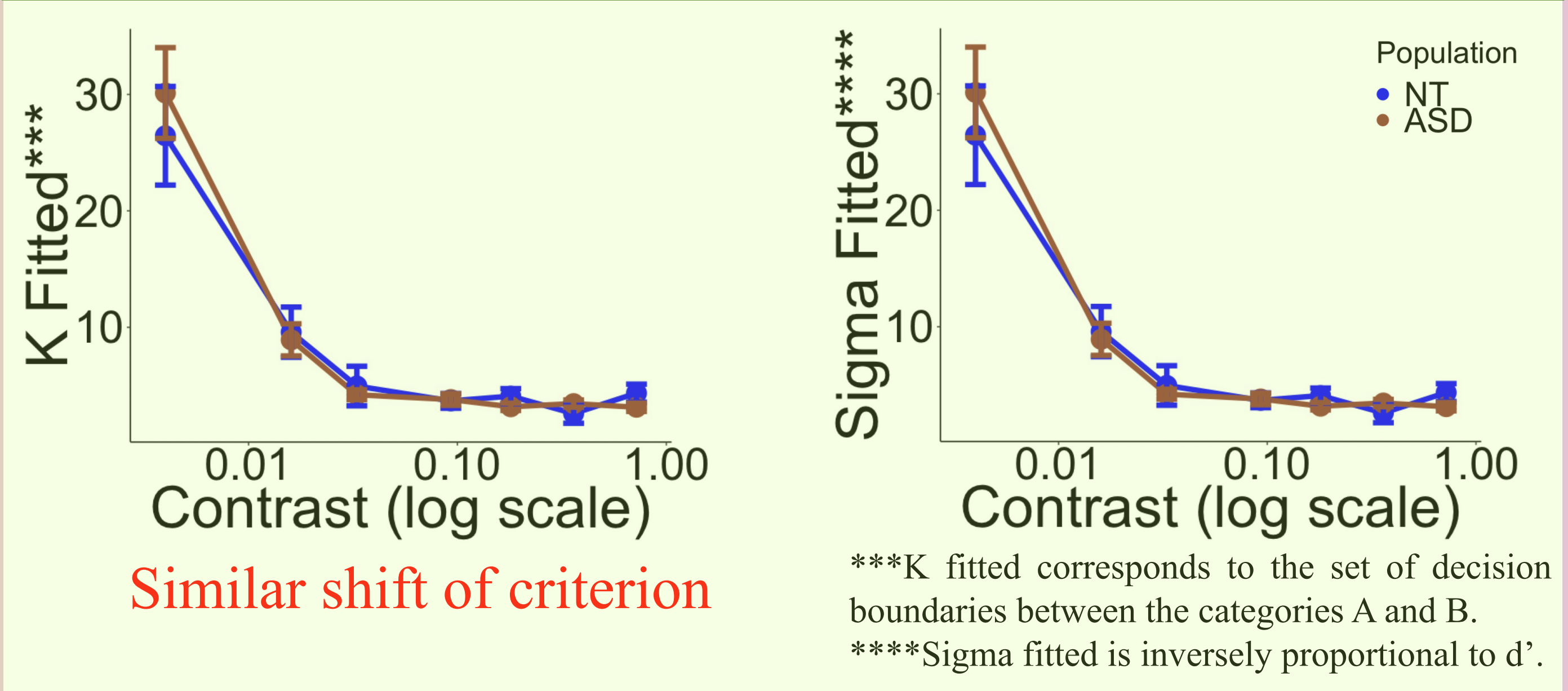


Similar shift of criterion



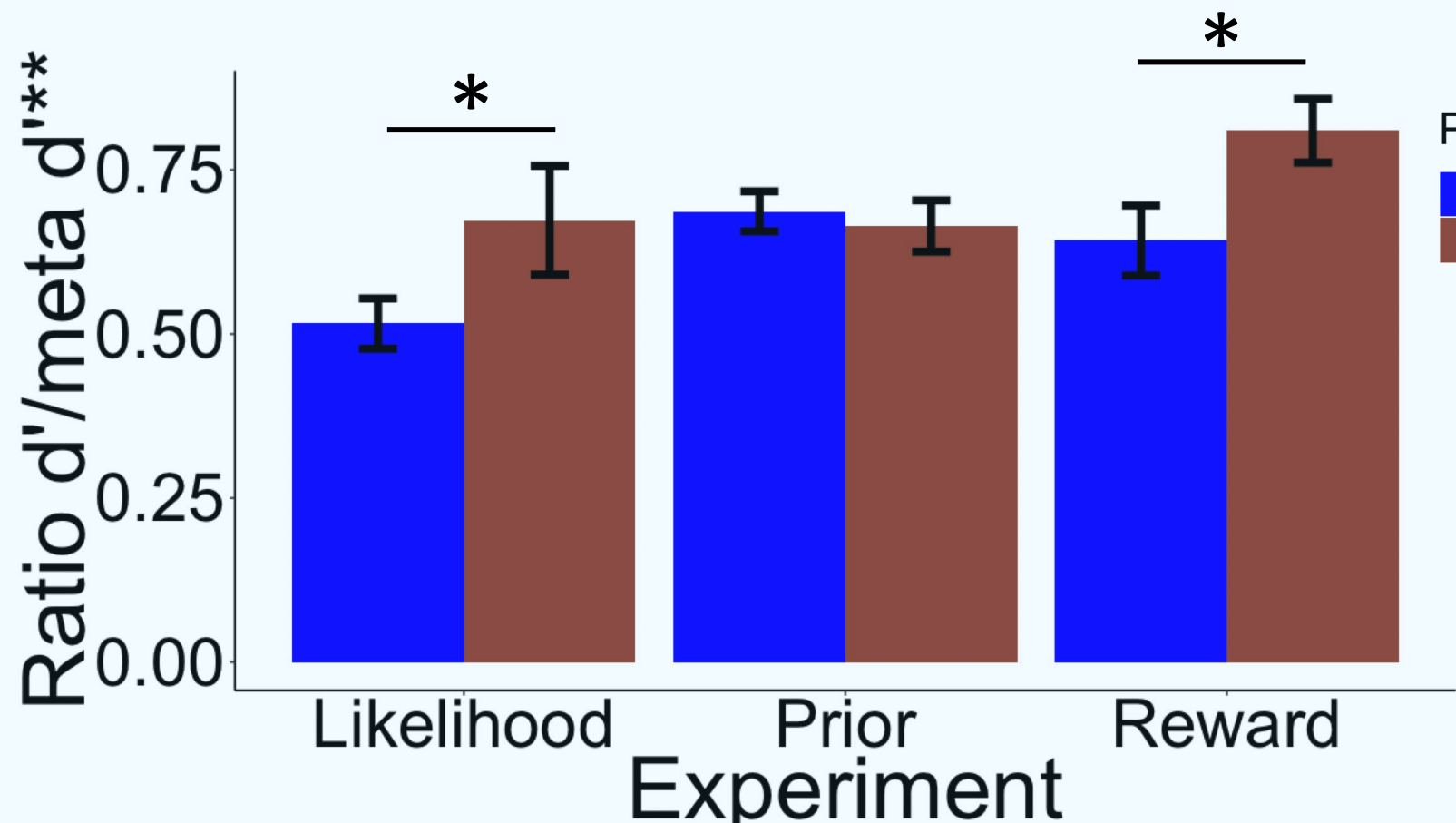
Similar sub-optimal performance

## Results



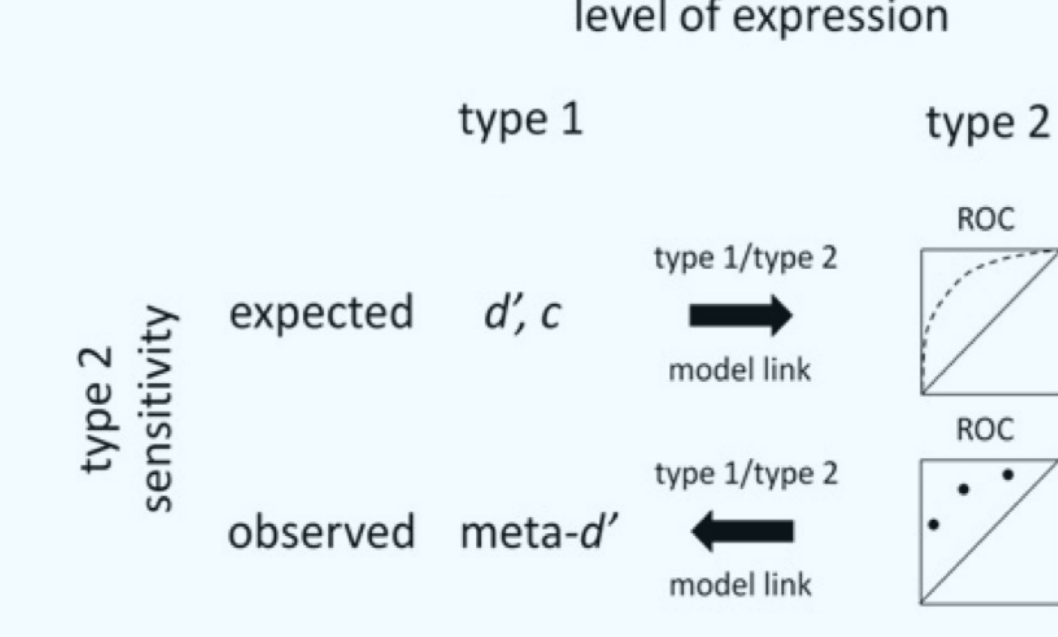
Similar shift of criterion

\*\*\*K fitted corresponds to the set of decision boundaries between the categories A and B.  
\*\*\*\*Sigma fitted is inversely proportional to d'.



Enhanced metacognitive performance in ASD

\*\*Meta d' corresponds to a theoretically value of d' that a metacognitively optimal observer would have required to produce the empirically observed type 2 d' (See the following figure from Maniscalco & Lau, 2012). A ratio close to 1 means "ideal" metacognitive abilities.



## Conclusions

Individuals with ASD adjust their decision criteria similarly to NTs, and in a suboptimal manner. Surprisingly, individuals with ASD have better metacognitive abilities during perceptual decision making.