

INTRODUCTION

Autism Spectrum Disorder (ASD)

- Characterized by:
 - Difficulties in communication and social interaction
 - Atypical cognitive development¹

Learning in Autism

- Difficulties in learning natural contingencies may be a key feature of ASD
- Individuals with ASD appear to learn from social and non-social stimuli and rewards at different rates compared to non-ASD individuals^{2,3}
- Literature suggests individuals with ASD have greater difficulty learning from social stimuli
- Literature using general population samples with high autism-spectrum quotient scores also finds these patterns⁴
- Learning rates in individuals with ASD may depend on the predictability of environmental stimuli²
- Previously assumed that social skill deficits are traits of ASD but it might be instead that social situations are ambiguous (based on social, cultural context)

Limitations to previous research

- Studies have limited sample sizes
- Task difficulty and type of stimulus may confound the interpretation of results
- Rarely use double blind designs

HYPOTHESIS

- If previous research is correct, and individuals high in AQ perform worse under probabilistic contingencies, and high AQ individuals also struggle to learn from social feedback, we should see participants who are high in AQ should perform worse than those who are low in AQ when feedback is both social and highly probabilistic in nature.

METHODS

Participants

- 267 participants were recruited from Western's psychology participant pool
 - High AQ, n = 138 (Female = 97), Age M = 18.85; SD = 3.50
 - Low AQ, n = 135 (Female = 101), Age M = 18.26, SD = 1.01
 - AQ grouping were determined by a median split (AQ < 19).
 - High AQ Score (M = 23.6; SD = 3.6)
 - Low AQ Score (M = 14.2; SD = 2.6),

Questionnaires

- Autism Spectrum Quotient (AQ)
- Behavioral Inhibition/Activation scales (BIS/BAS)

REFERENCES

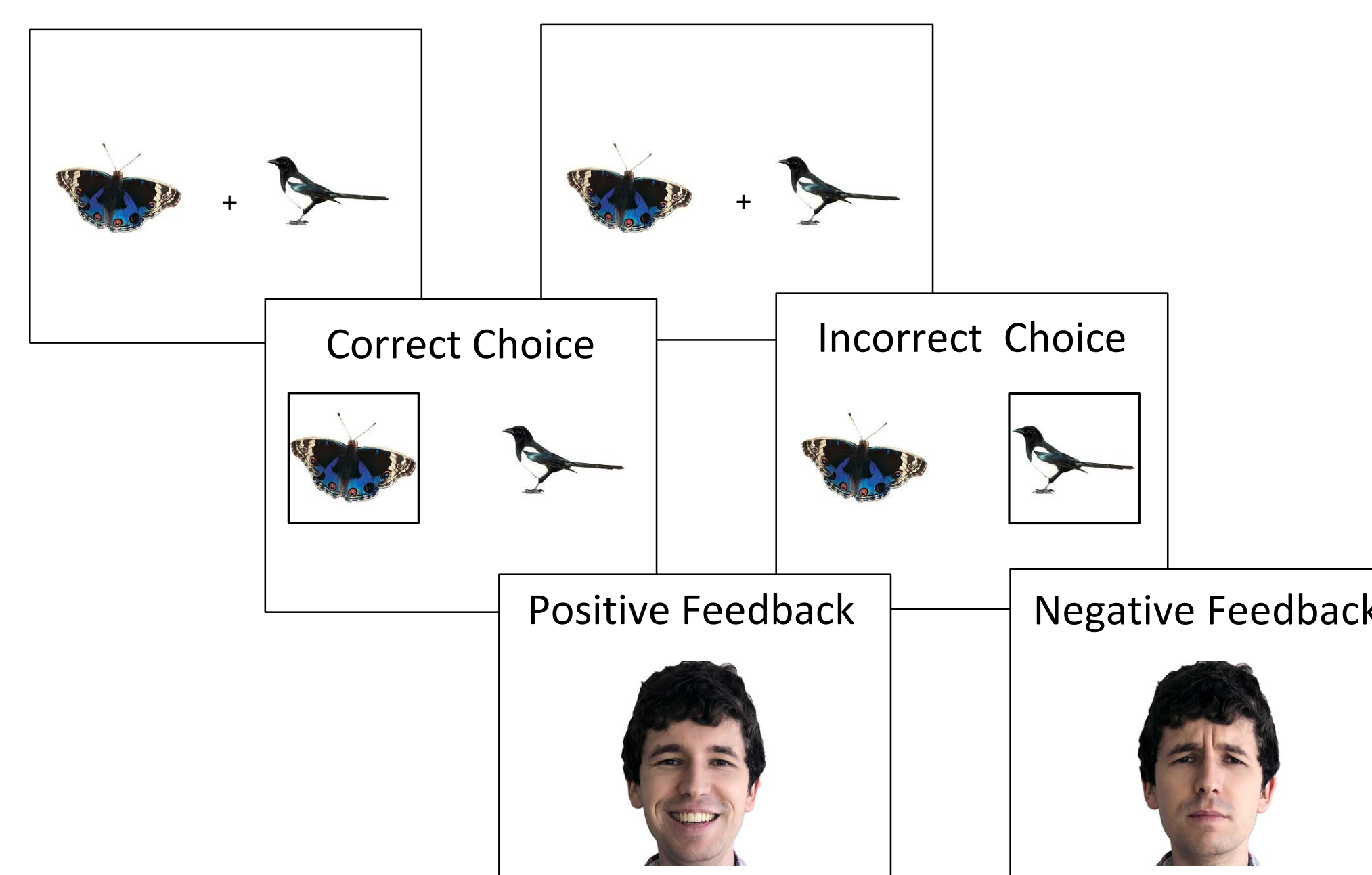
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METHODS

Procedure

- Participants completed a series of questionnaires and a probabilistic selection task to test the ability to learn task contingencies from feedback.
- The probabilistic selection task consisted of learning from several different pairs of images that provided different rates of valid/invalid feedback
- The probabilistic selection task used both social feedback and non-social feedback.
 - We operationalized social feedback as smiles and frowns from the experimenter.
- Feedback order was counterbalanced across participants and the images in each pairing were randomized within participant.

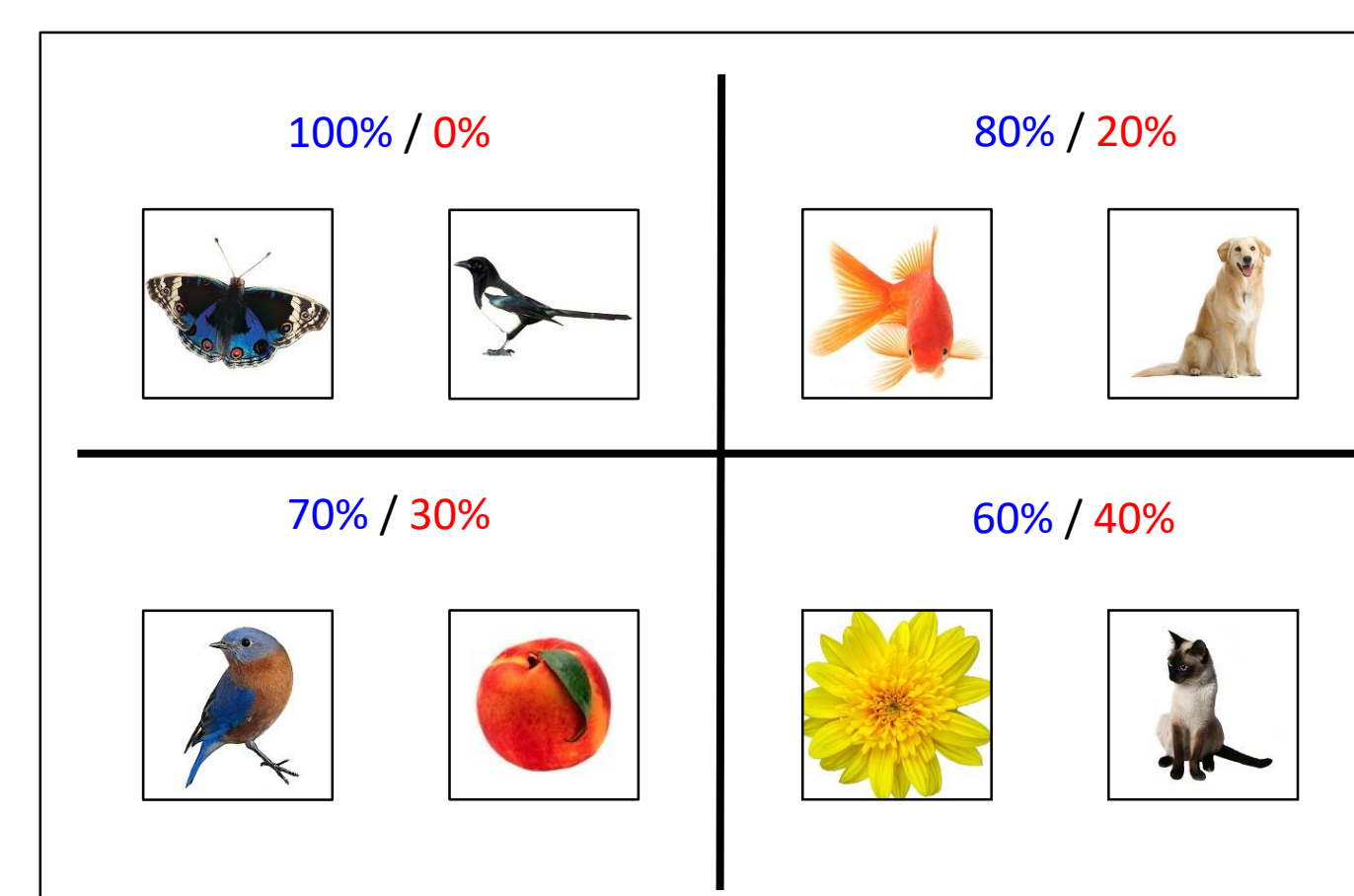
Probabilistic Learning Task



Feedback Conditions



Probability of Valid/Invalid Feedback



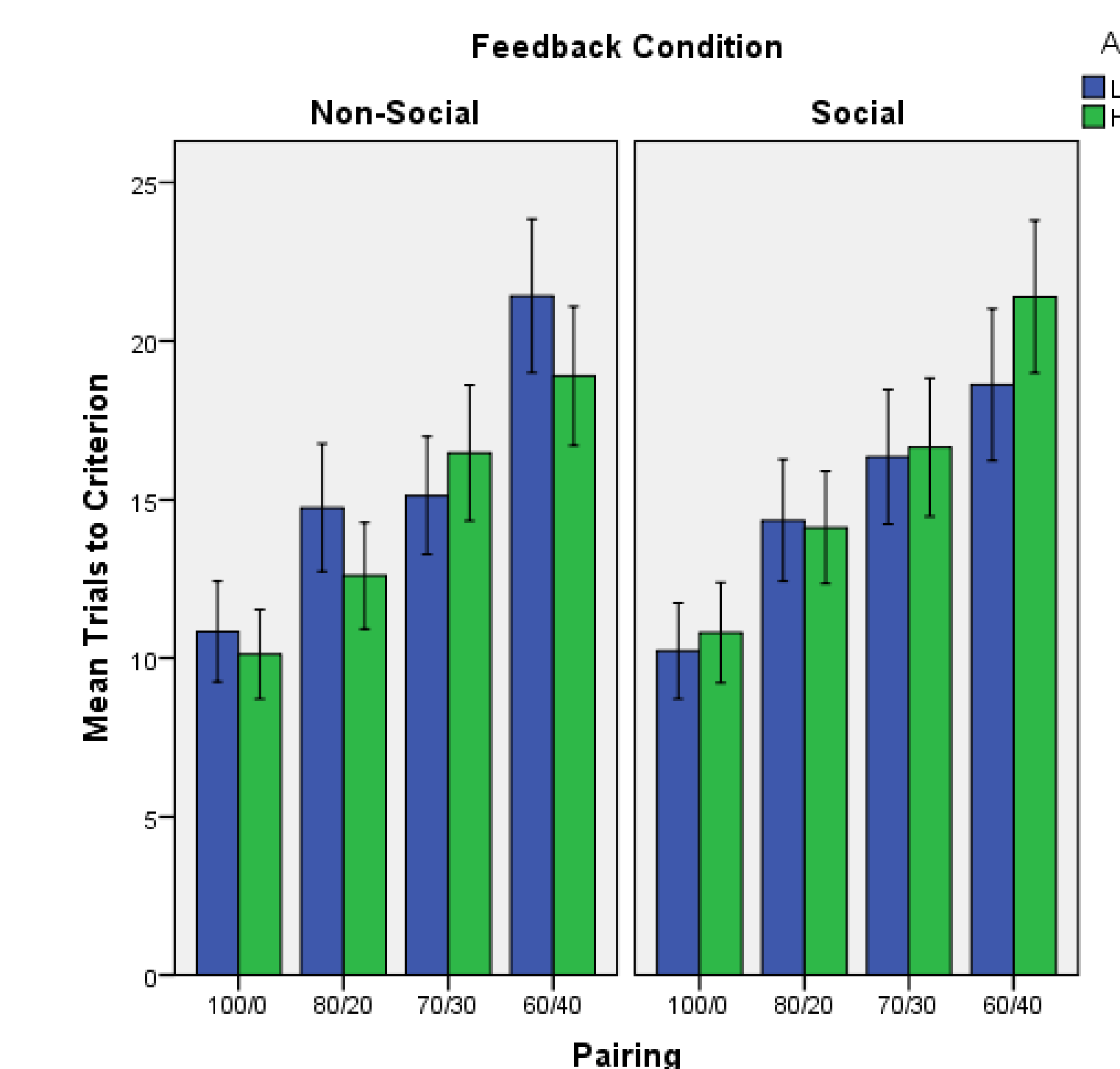
Data Analysis

- To examine how individuals differed in their ability to learn from probabilistic stimuli and different rewards, we examined learning using 'trials to criterion' and overall performance using 'proportion of trials correct'.
 - 'Trials to criterion' is the number of trials participants needed to correctly choose the most frequently rewarded image in a given pair on five consecutive trials.

RESULTS

- Mixed-model ANOVA tested differences in 'trials to criterion' and proportion of correct trials.
- Because many of our findings were null, we additionally conducted Bayesian ANOVAs to find the degree to which the evidence supported our null hypothesis

Trials to Criterion

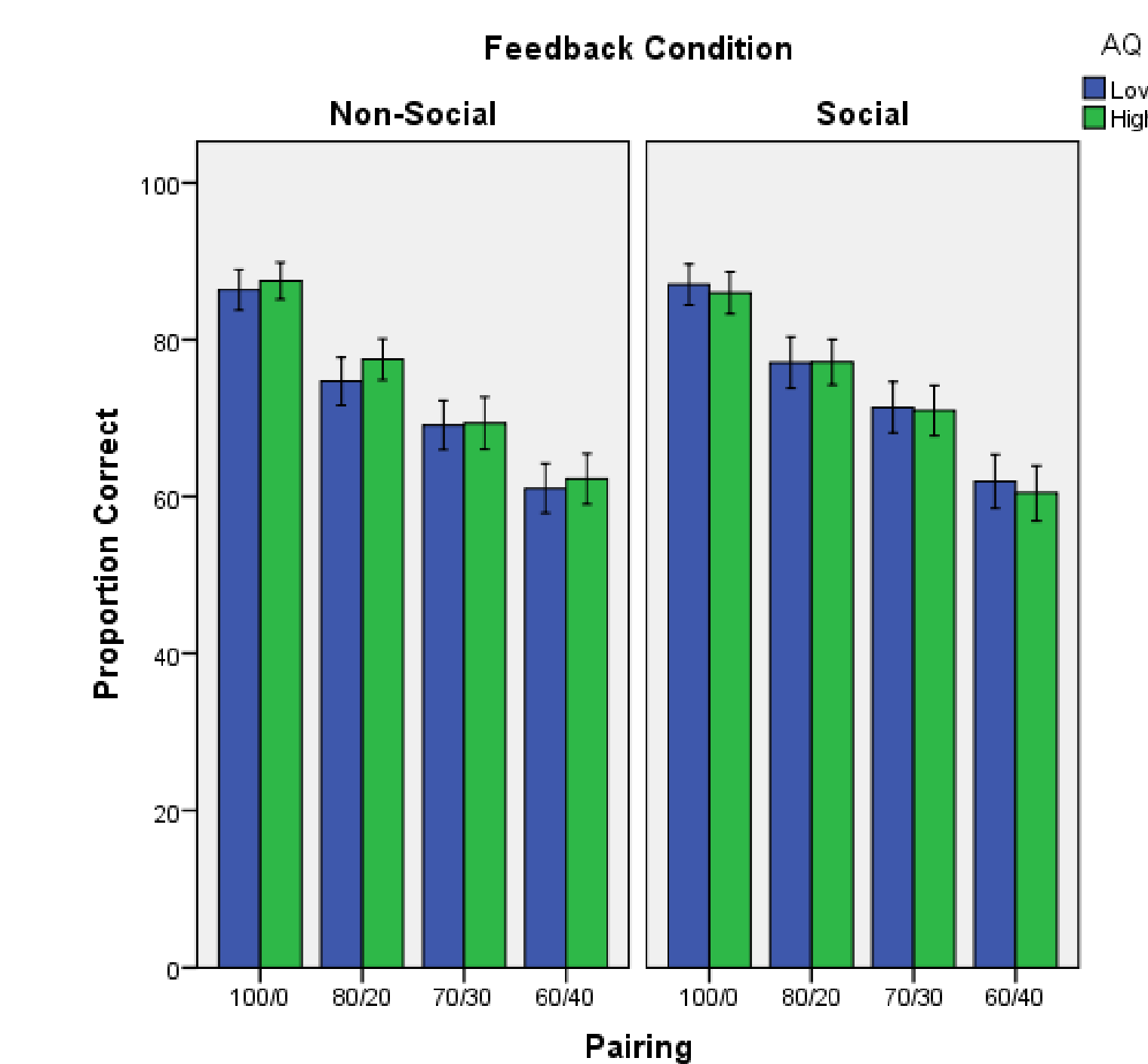


- Contrary to expectations we found no effects of:
 - AQ (p=.914)
 - Feedback type (p=.577)

Bayesian Analysis

- Bayesian analysis suggested positive evidence for the null
 - AQ BF₀₁ = 12.25
 - Feedback BF₀₁ = 15.87

Proportion Correct



- Contrary to expectations we found no effects of:
 - AQ (p=.820)
 - Feedback type (p=.500)

Bayesian Analysis

- Bayesian analysis suggested positive evidence for the null
 - AQ BF₀₁ = 7.66
 - Feedback BF₀₁ = 16.91

DISCUSSION

- Differences from previous literature include:
 - Included social feedback
 - Larger Sample Size
 - Double Blind Study

Implications

- Unlike previous research, no significant effects were found regarding AQ or Feedback, suggesting that participants were able to learn contingencies at similar rates regardless of one's AQ scores or the type of feedback given.
- The ability to engage in probabilistic learning does not appear to significantly differ across the autism spectrum.
- Theories supported by previous findings might be driven by small samples sizes and, potentially poorly double-blinded designs.

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Poster reprints are available at:



<http://psychology.uwo.ca/faculty/socialbehaviourlab/SPSP.html>