Visual Narratives and Inference Generation in Individuals Across the Autism Spectrum

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INTRODUCTION

- Narrative comprehension involves the construction of a "situation model", a mental representation of the story [1]
- Situation models often rely on inference-making abilities
- Research has shown that individuals with autism spectrum disorder (ASD) have difficulties with drawing inferences [2-3]
- Previous research relied on verbal and linguistic material to study inference generation [2-4]
- No studies have used a visual modality

OBJECTIVE

To investigate potential differences in inference-making abilities in adults across the autism spectrum using comic strips

EXPERIMENT 1: Exploring Inferencing Measures Through Panel Deletion Accuracy

Participants

- N=101, mean age = 40.9 years
- AQ score mean (range) = 18.7 (3-35)
- VLFI score mean (range) = 20.8 (2.5-49)

Stimuli and Procedure

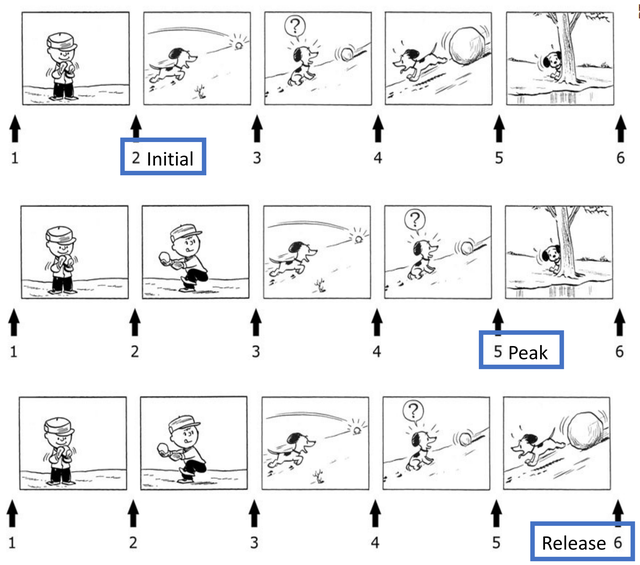
- Online survey
- A panel was removed from either the beginning, story climax or end

Outcome Measures

- Panel selection accuracy (%) and reaction time (ms)

Analytic Plan

- Linear regression models to compare AQ (total score and subscales) and VLFI with outcome variables



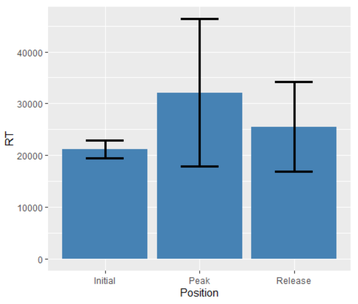


Figure 1. Reaction times for missing panel selections.

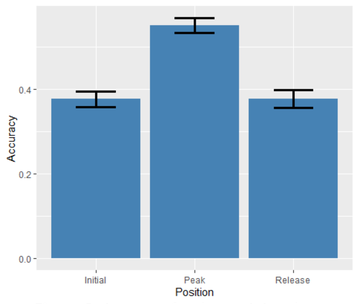


Figure 2. Accuracy for determining the type of panel removed.

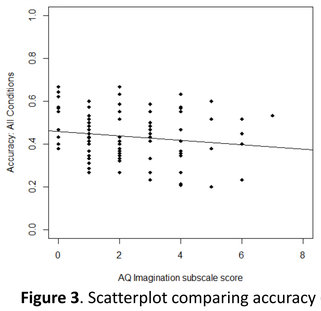


Figure 3. Scatterplot comparing accuracy (all conditions) and AQ Imagination subscale scores. (p= 0.04 [regression model], p= 0.12 [correlation] r=-0.16).

Follow the QR code for a PDF version of the poster!

EXPERIMENT 2: Inferencing Measures Using Self-Paced Viewing

Participants

- N=48, mean age = 27.44 years
- AQ score mean (range) = 20.8 (3-41)
- VLFI score mean (range) = 8.25 (0.1-32)

Stimuli and Procedure

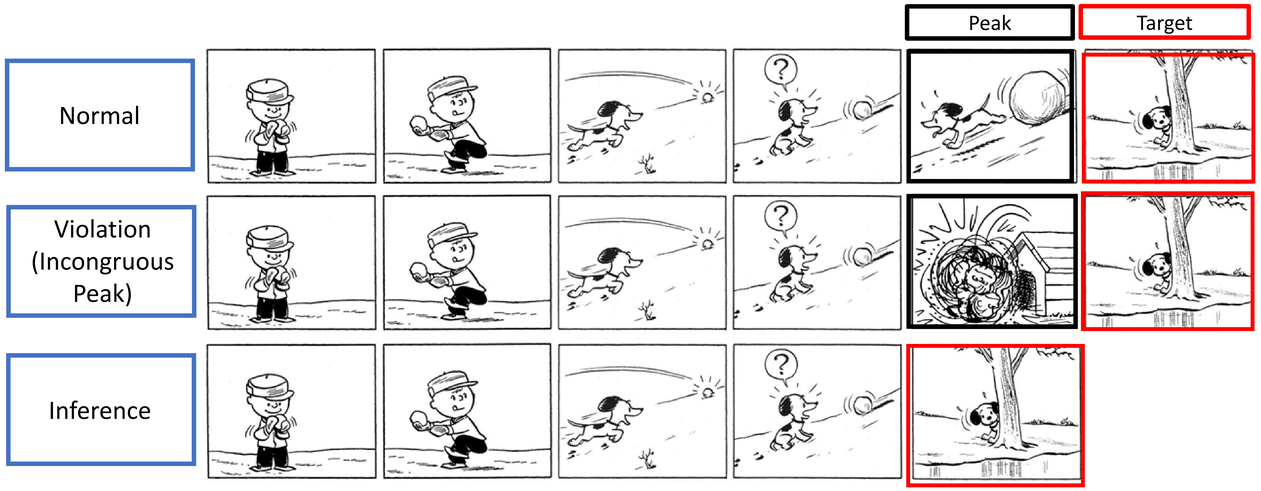
- Comic strips were manipulated to form three conditions (normal, violation, inference)
- Comprehension questions on 40% of the trials

Outcome Measures

- Comprehension question accuracy (%) and reaction time (ms)

Analytic Plan

- Linear regression models to compare AQ (total score and subscales) and VLFI with outcome variables



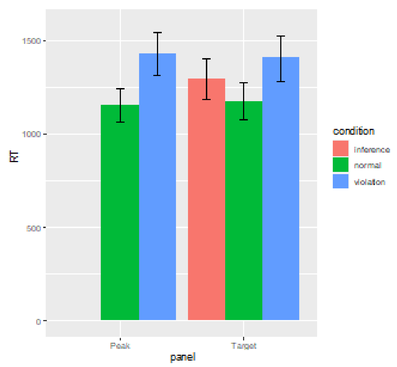


Figure 4. Reaction times for conditions that correspond to the Peak and Target panels.

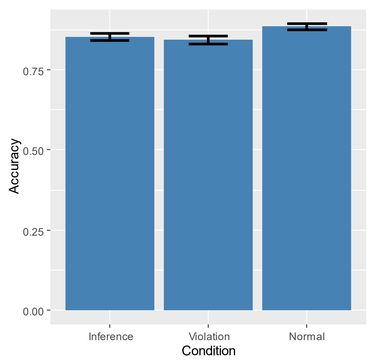


Figure 5. Comprehension question accuracy for all conditions.

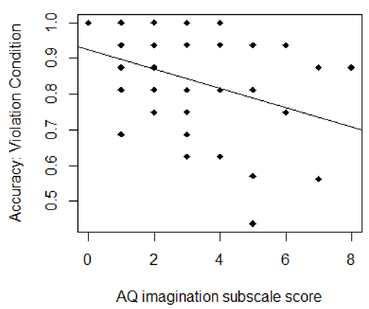


Figure 6. Scatterplot comparing comprehension question accuracy and AQ Imagination subscale scores. (p=0.04 [regression model], p=0.01 [correlation] r=-0.37).

KEY TERMS

AQ = Autism Quotient
VLFI = Visual Language Fluency Index

MAIN FINDING

Difficulties with inferencing may be related to difficulties with imagination in individuals on the autism spectrum

DISCUSSION

- Increased difficulties with imagination (AQ Imagination subscale scores) were associated with lower accuracy for panel location detection (Experiment 1) and lower accuracy on comprehension questions (Experiment 2)
- Difficulties with inferencing may be related to difficulties with imagination in individuals on the autism spectrum

Limitation

- Reaction times and accuracy measures may not the be the best indicators of cognitive processes

Future Direction

- Study additional outcome measures using EEG

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