

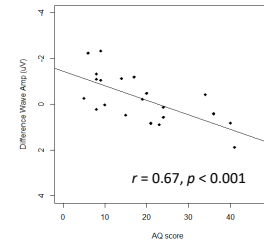
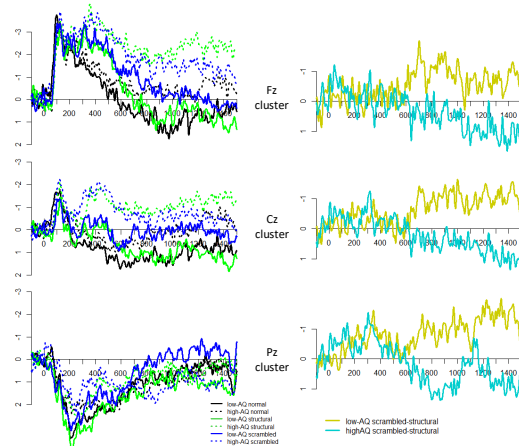
INTRODUCTION

- Understanding the structure, or narrative arc, of a story is critical for narrative comprehension, whether a narrative is presented verbally (e.g., written or spoken stories) or pictorially (e.g., comics) [1]
- Autistic individuals show differences in processing sentence grammar [2] as well as narrative structure in comics [3].
- Parallel differences in narrative processing across modalities contradicts the prevalent *Visual Ease Assumption* (VEA) [4], i.e. the notion that pictures are easier to understand than language.
- In this preliminary EEG study, we manipulated the presence of narrative grammar in comics and written stories to explore how autistic traits modulate structural processing within and between modalities.

RESULTS

VISUAL

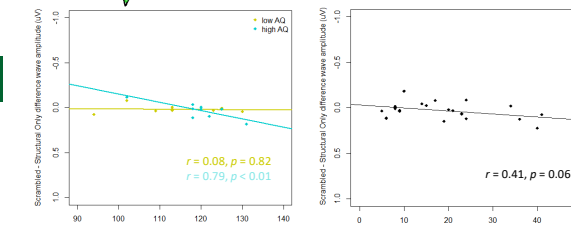
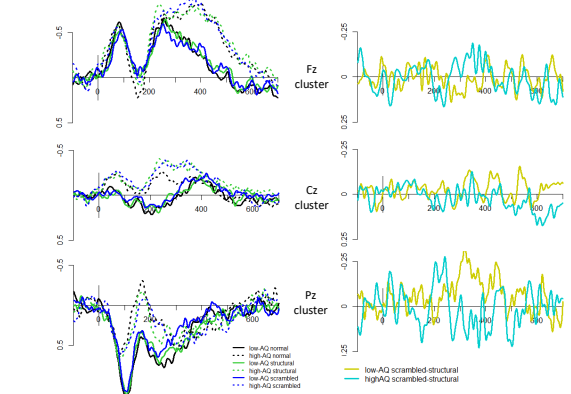
- ERPs analyzed at final panel, -100 ms to 1500 ms



Effects of AQ from 700-1000 ms: greater autistic traits associated with less negative/more positive Scrambled – Structural Only difference waves

LINGUISTIC

- ERPs analyzed at every word in final sentence, -100 to 700 ms



Interactions of AQ and WRAT from 200-300 ms: greater sentence comprehension abilities associated with less negative Scrambled – Structural Only difference waves for high-AQ only

Effect of AQ from 600-700 ms: greater autistic traits associated with less negative Scrambled – Structural Only difference waves

METHODS

Participants

- N = 21, mean age = 24 years, SD = 12, range = 18-65.
- Autistic traits measured by Autism Quotient (AQ) [5]: mean = 19, SD = 11, range = 5-41
- Visual language fluency measured by Visual Language Fluency Index (VLF1) [6]: mean = 8, SD = 5, range = 2.75-23.25.
- Reading ability measured by Wide Range Achievement Test (WRAT) [7] Sentence Comprehension standard score: mean = 117, SD = 9, range = 94-131.

Stimuli and Procedure

- Linguistic experiment**
 - Sentences 1-4 self-paced; sentence 5 in RSVP format (words presented for 400 ms with 400 ms ISI).
- Visual experiment**
 - Panels presented one at a time for 1500 ms with 350 ms ISI.

EEG Procedures

- EEG recorded at 500 Hz using an EGI GES 400, 128-channel Geodesics Sensor nets, and NetStation 5.4.

Normal narratives contained a canonical narrative arc and meaning between sentences/panels

Structural Only narratives contained narrative structure but no comprehensible meaning

Scrambled narratives contained neither structure nor meaning



Jeremy and Fido are sharing a popsicle. Each of them takes a turn taking a lick. But Fido has started biting the popsicle on his turn, instead of licking it. It's Fido's turn, and he takes a giant bite. Jeremy goes to take a lick and realizes the whole popsicle has been eaten.

[Establisher]
[Establisher]
[Initial]
[Peak]
[Release]



It's autumn, so the ground is covered in dry leaves. He gets the milk out of the fridge and pours it onto his cereal. In the afternoon, it starts to rain. Next to the tree, he sees a shiny new bike with a big bow on it. To get to school, Phillip will have to ride his bike, and fast!

[Establisher]
[Establisher/Initial]
[Initial]
[Peak]
[Release]



But he is pretty forgetful. Phillip runs right into Jeremy. The sun is already shining brightly through the blinds. He sees Phillip skateboarding straight towards him. Phillip and Jeremy are playing Frisbee in the backyard.

[Initial]
[Peak]
[Release]
[Initial]
[Establisher]

DISCUSSION

- Autistic traits modulate structural processing in visual and linguistic narratives, with higher autistic traits associated with reduced sensitivity to narrative grammar.
- Interactions of autistic traits and reading abilities occurred surprisingly early (200-300 ms)
- The similar patterns across modalities contradicts the VEA [5] and suggests comprehension is not "easier" in non-linguistic modalities

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