

Investigation of Spatial Interference and Bias in the Visual Periphery in Autism

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Introduction

- Autism involves differences in sensory and perceptual processing^{6,7}.
- Visual periphery may be processed differently^{3,4}.

Crowding Effect

- Difficulty identifying peripheral objects due to nearby clutter^{1,2}.
- Error types:
 - Substitution: flanker mistaken for target².
 - Averaging: features blended^{2,3}.
 - Inner-outer asymmetry: outer flankers disrupt more (non-autistic pattern)^{3,4}.

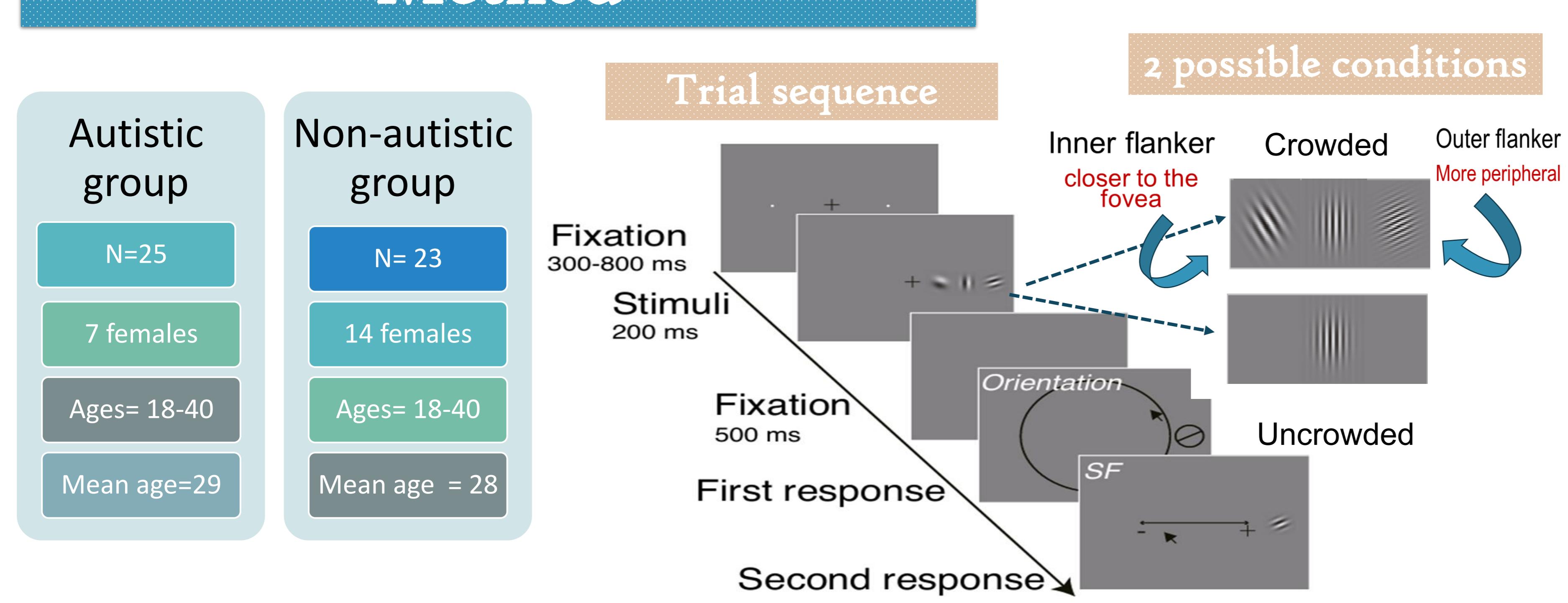
Gap: Autism and crowding

- Previous studies measured accuracy, not specific error types or spatial biases⁵.

Objectives

- Examine whether autistic individuals differ from non-autistic individuals in how they sample and process visual information under crowding.
- Analyze spatial biases and error types in orientation and spatial frequency tasks.
- Test whether responses reflect different sampling weights or model fits.

Method

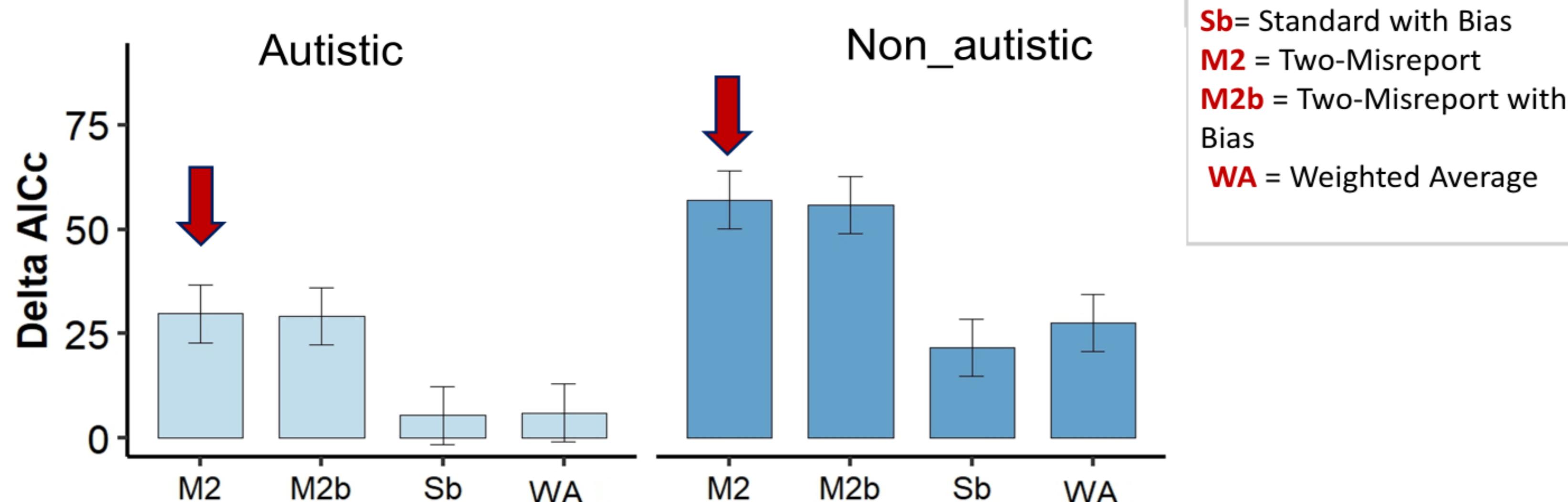


Results

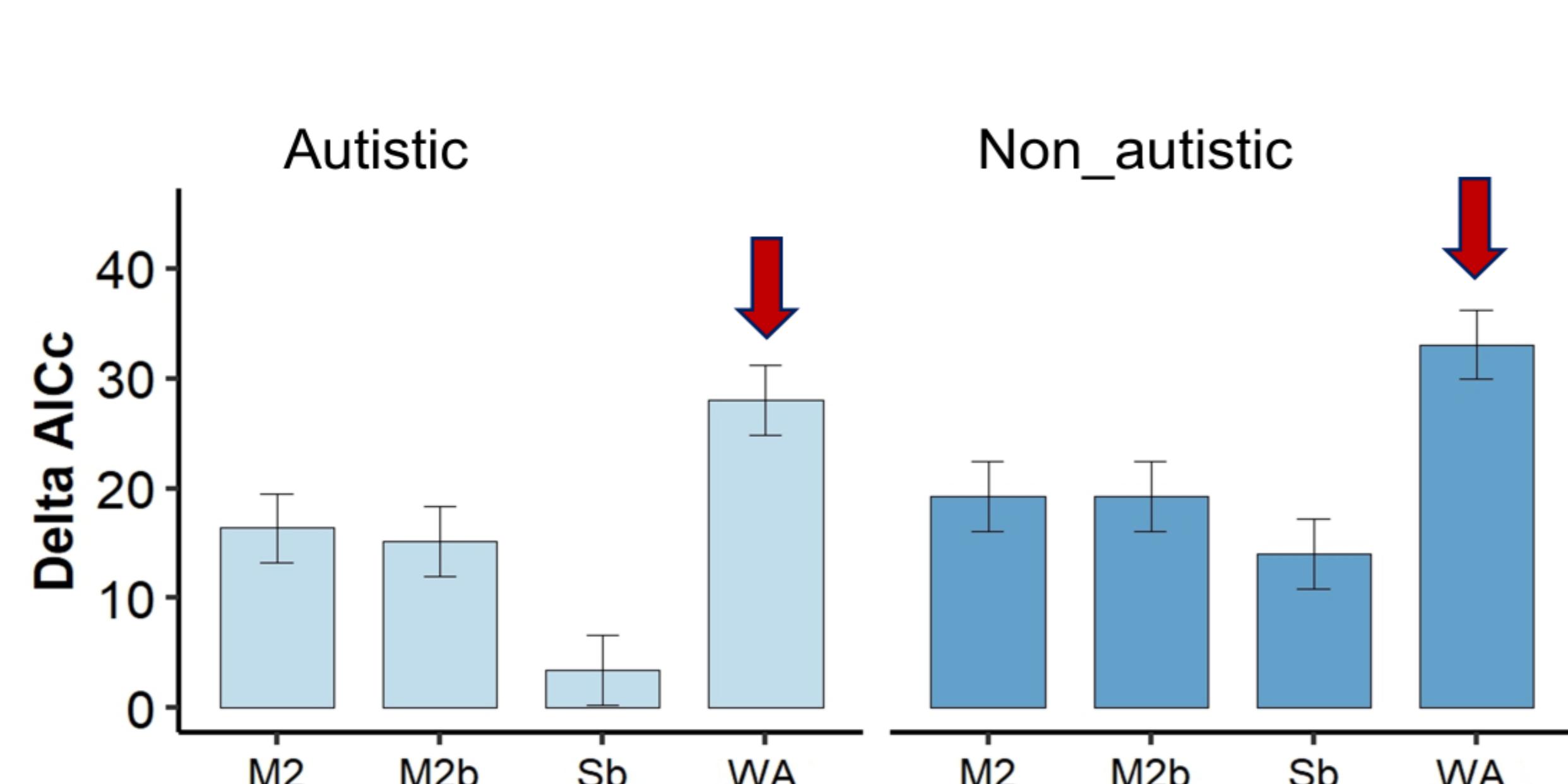
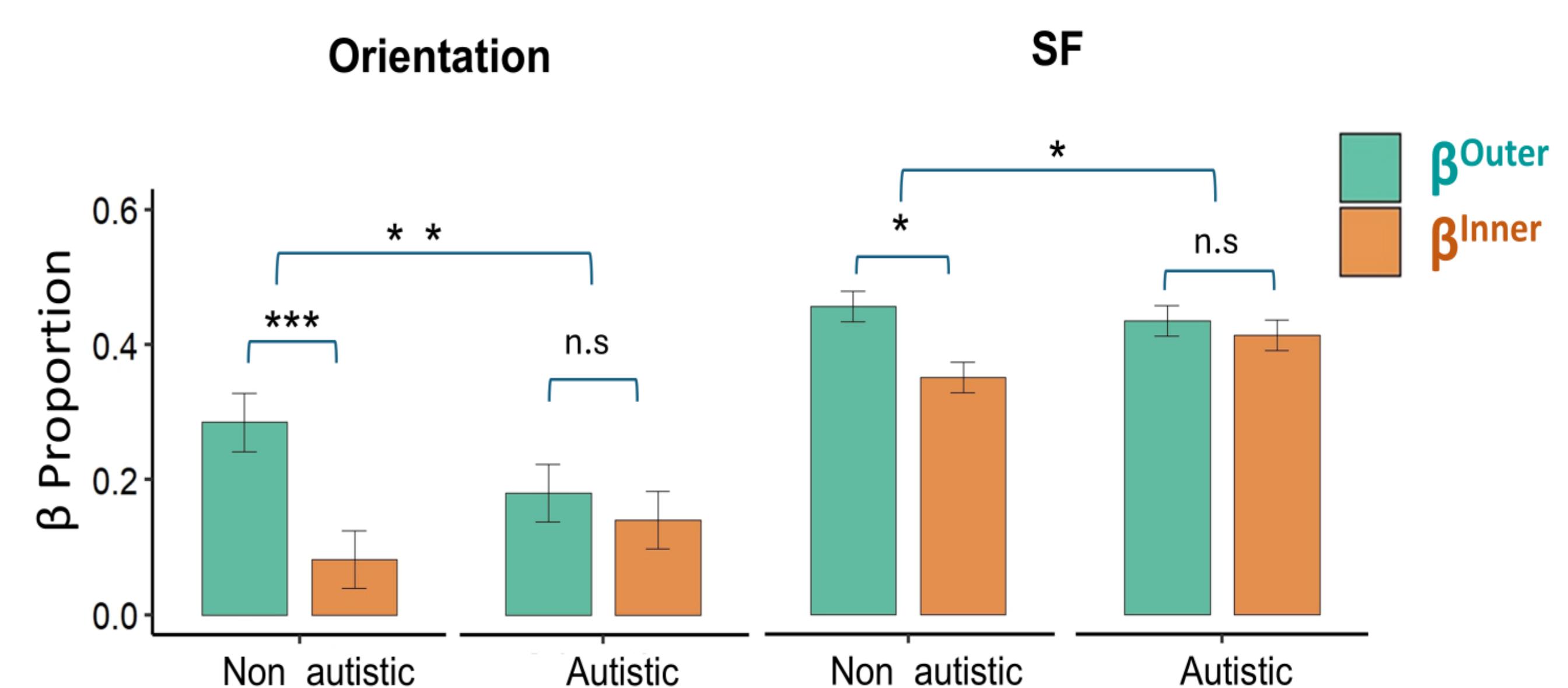
Model comparison

$$\Delta AICc = AICc_{(Standard)} - AICc_{(model)}$$

Orientation



Inner - Outer Asymmetry



Conclusion

- Non-autism: stronger interference by peripheral flanker^{1,3,4}
- Autism: more symmetrical sampling between central and peripheral flankers⁵
- Potential underlying processes:
- Speculation: Differences in How Receptive Field Size Scales with Eccentricity^{3,4,6}
- In autism, receptive field size may scale differently with distance from the center of vision, affecting how peripheral information is integrated⁶.

References

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