Correlating Features from a Tracing Task to Social Responsiveness Scores in Children with Autism Spectrum Disorder

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Background

What is known

Autism has diverse manifestations, making it difficult to identify in childhood

A known characteristic of Autism is social interaction differences [1]

Studies also show high rates of comorbid motor difficulties [2]

What is unknown

How do drawing differences in Autism look in a simple tracing task?

Can these drawing differences correlate to the characteristic social differences?

Objective

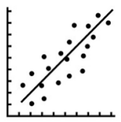
Can drawing features from a tracing task correlate to social responsiveness in children with Autism?

Methods

45 dyads of parent + child drew together on a tablet

SRS questionnaire **scores for social responsiveness** were collected

MATLAB was used to measure 27 static and dynamic **drawing features**



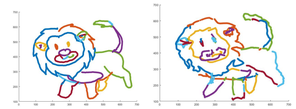
A **linear regression** was performed between SRS scores and drawing features

Drawing features measured from a simple tracing task could help to identify Autism in childhood

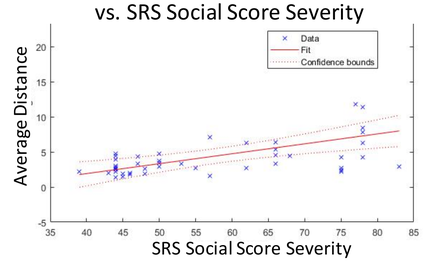
Results

On 50 drawings, 8 measures showed significant correlation to social responsiveness scores

- Average distance from trace
- Average time between strokes
- St. dev. of distance from trace
- Total stroke distance
- Number of strokes
- On paper time
- Mean acceleration
- Mean square error



Average Distance from Trace vs. SRS Social Score Severity



Conclusion

Analysis of a simple collaborative tracing task could be a promising technique for indicating Autism in childhood

Next Steps

- More drawings for better statistical power
- Linear regression with more variables
- Build into a neural network

Relevance

Expands knowledge of how autism manifests

Potential tool to help indicate Autism in childhood

More children may have opportunity to be diagnosed and access essential services

References

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[2] A. N. Bhat, "Motor impairment increases in children with autism spectrum disorder as a function of social communication, cognitive and functional impairment, repetitive behavior severity, and comorbid diagnoses: A spark study report," *Autism research : official journal of the International Society for Autism Research*, Jan-2021. [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8176850/.

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