A Study of Siblings of Individuals with ASD: Comparison of Pragmatic Language Ability

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Background

- Previous studies have found impairment in pragmatic language across individuals with Autism Spectrum Disorder (ASD) (Tager-Flusberg et al., 2005; Baron-Cohen, 1988; Bishop et al., 2006). Impairment in pragmatic language includes overtalkativeness, talking in a stereotyped manner, or being unable to consider others’ viewpoints (Bishop et al., 2006).
- Deficits in pragmatic language are also observed in siblings of individuals with ASD, thus it has been hypothesized that pragmatic language may be part of the broader autism phenotype (RAP) (Bishop, 1997; Baron-Cohen, 1988).

- This study compared the pragmatic language ability between three groups: (1) Typically developing (TD) children whose twin has a diagnosis of ASD (TD twin of ASD), (2) TD children whose twin is also TD (TD twin of TD), and (3) Children with a diagnosis of ASD whose twin also has an ASD diagnosis (ASD twin of ASD). This study also looked at whether children’s pragmatic language ability can be predicted by other social communication measures of their twin.

- We hypothesize that TD children from ASD discordant twin pairs will perform better than children from ASD concordant twin pairs, but not as well as TD children from concordant TD twin pairs. We also hypothesize that the social skills of a twin will significantly predict the pragmatic language ability of his or her other twin.

Methods

Participants: Three groups of individuals participated in this study along with their twin: (1) Typically developing children whose twin has a diagnosis of Autism Spectrum Disorder (TD twin of ASD), (2) Typically developing children whose twin is also typically developing (TD twin of TD) and (3) Children with a diagnosis of ASD whose twin also has an ASD diagnosis (ASD twin of ASD). All groups matched on age and Nonverbal IQ.

- Table 1 Participant profile

Procedure:

Participants completed the Weschler twins revised Scales of Intelligence (WASI) and a 15-20 minute interview from the Autism Diagnostic Observation Schedule Revised (ADOS). The interview from the ADOS was video-recorded, and the videos were later rated by coders blind to diagnosis.

- Coders assessed subjects’ pragmatic language using the Pragmatic Rating Scale-Modified (PRS-M) (Ruser, 2007).

- Table 2 shows three of the four subdomains in the PRS-M.

Table 2 Items and subscales of Pragmatic Rating Scale - Modified (PRS-M) (Ruser, 2007)

Table 3 Participant profile

Table 4 Procedure

Table 5 Data analysis

- Result 1: TD twin of ASD group scored significantly lower (better) than ASD twin of ASD group, p = .02, and did not differ from TD twin of TD group. ASD twin of ASD group scored significantly lower (better) than TD twin of TD, p = .013.

- Result 2: For TD twin of ASD group, PRS Language Subscale Scores were not significantly predicted by other social communication measures of his or her other twin. For ASD twin of ASD group, PRS Language Subscale Scores were predicted by language subscale of PRS, R² = 0.362, p < .05. For TD twin of TD group, PRS Language Subscale Scores were not significantly predicted by other social communication measures of his or her other twin. For TD concordant twin pairs, PRS Language Subscale Scores were predicted by language subscale of PRS, R² = 0.0106, p < .05.

Do the social communication measures of one twin predict the pragmatic language abilities of the other?

Multiple regression analysis was used to test if three different social communication measures of one twin significantly predicted the PRS scores of the other.

Does PRS Sum of Scores for a twin predict PRS Sum of Scores for the other?

Because the results of the previous analysis were negative, this analysis was not pursued.

Does PRS Language Subscale Score for a twin predict PRS Language Subscale Score for the other?

- Result 3: For TD twin of ASD group, PRS Language Subscale Scores were not significantly predicted by other social communication measures of his or her other twin. For ASD twin of ASD group, PRS Language Subscale Scores were predicted by language subscale of PRS, R² = 0.362, p < .05. For TD twin of TD group, PRS Language Subscale Scores were not significantly predicted by other social communication measures of his or her other twin.

Summary and Conclusions

- This study sought to further evaluate the relationship between pragmatic language abilities of TD children with ASD by assessing the social communication measures of their twins.

- The findings suggest that the social communication abilities of TD children with ASD were significantly predicted by the social communication abilities of their twins.

- The results also highlight the importance of considering the role of social communication in the development of pragmatic language abilities in TD children with ASD.

- Future studies should include additional sibling groups to help in teasing apart the influences of genetic and environmental factors.

Limitations and future directions

- Participants were not matched on twin pair gender or zygosity. Future studies should investigate if these trends differ between male, female, and discordant sex twins.

- Considering that fraternal twins share greater amount of environmental factors than non-twin siblings, future studies should include an additional sibling group to help in teasing apart the roles of genetics from the environment.

References


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