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“You’re telling me!” The prevalence and predictors of pronoun reversals in children with autism spectrum disorders and typical development

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ABSTRACT

Social and linguistic explanations have been proposed for pronoun reversals in young typically developing (TD) children and those with autism spectrum disorders (ASD). The current study breaks new ground in investigating *both* explanations, comparing 18 TD toddlers and 15 children with ASD at similar language levels. Spontaneous speech was sampled every four months for six visits. Vocabulary and joint attention were also measured. Both groups produced pronoun reversals at low rates. The ASD group produced somewhat more reversals than the TD group, overall and at multiple visits. In the ASD group, early language and joint attention scores contributed significantly and independently to the incidence of reversal. *Both* linguistic and social factors seem implicated; moreover, reversals seem to occur when children’s language and social abilities develop asynchronously. These findings can help clinicians devise both linguistic and social interventions for the relevant children.

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1. Introduction

Researchers of typical and atypical child development have become increasingly interested in Autism Spectrum Disorders (ASD) over the past 20 years because of this disorder’s intriguing constellation of impairments. Social deficits are the most obvious, and indeed a core of the diagnosis (American Psychiatric Association, 2014), but combinations of motor, cognitive, and language impairments are also attested (Fein, 2011). One language impairment – consistently reported to be “common” in children with ASD – is the phenomenon of pronoun reversals; i.e., using ‘I’ for ‘you’ and/or ‘you’ for ‘I’ (e.g., a child saying ‘You want some more milk’ meaning ‘I want some more milk’). This impairment is mentioned in almost every description of language and communication in children with ASD, from the earliest descriptions targeted for clinical audiences (Kanner, 1946; Fay, 1971; Rutter, 1979) to later (Roberts, 1989, 2014; McCann, Peppe, Gibbon, O’Hare & Rutherford, 2008; McGregor, Nunez, Cebula, & Gomez, 2008; Paul & Wilson, 2009; Klinger, O’Kelley, & Mussey, 2009; Wetherby, 2006; Tager-Flusberg, Paul, & Lord, 2005; Luyster & Lord, 2009), and has emerged recently in textbooks designed for general child development

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audiences (Levine & Munsch, 2014; Rathus, 2014). However, the origins – and indeed, actual prevalence – of this error in children with ASD, are still unclear.

Successful pronominal reference requires the mastery of a sophisticated grammatical paradigm, involving number ('I' vs. 'we'), person ('I' vs. 'you' vs. 'she'), and case ('I' vs. 'me'), amongst other factors. Reversal errors involve the person component, such that 'I' and 'you' become confused. These errors are attested in TD toddlers' spontaneous speech, albeit at varying rates; pronouns typically emerge around 1.5 years of age and reversals are most common before 2.5 years (Chiat, 1982; Clark, 1978; Charney, 1980; Dale & Crain-Thoreson, 1993; Evans & Demuth, 2012; Loveland & Landry, 1986; Oshima-Takane, 1992; Oshima-Takane, Goodz, & Derensky, 1996), and have been hypothesized to derive at least partially, from linguistic immaturity. That is, before children have worked out the paradigm, personal pronouns may be subject to language processing constraints, and/or used as frozen forms within specific discourse contexts (Dale & Crain-Thoreson, 1993; Lee, Hobson & Chiat, 1994). As children develop better language skills, they are able to access the pronoun paradigm with greater facility, and the reversals cease. On this account, a higher rate of pronoun reversals in children with ASD may be attributable to their delayed onset of language (Tager-Flusberg et al., 1990; Tek, Mesite, Fein, & Naigles, 2014), and/or subtle deficits in their use of specific grammatical forms (Eigsti, Bennetto, & Dadlani, 2007; Tager-Flusberg, 2006). Across multiple studies, both TD children and children with ASD have been reported to use more pronoun reversals in imitative contexts (Carpenter, Tomasello & Striano, 2005; Dale & Crain-Thoreson, 1993; Evans & Demuth, 2012; Roberts, 1989; Tager-Flusberg et al., 2005), suggesting that these pronouns were not yet linguistically productive (i.e., integrated into the grammatical system).

Appropriate use of first and second person (personal) pronouns also involves social factors such as perspective-taking, in that speakers use 'I' for self-reference and 'you' for addressee reference, and the actual referents of 'I' and 'you' change with each speaker (Chiat, 1982; Clark, 1978; Hobson, Garcia-Perez, & Lee, 2010; Ricard, Girouard, & Gouin-Decarie, 1999). Because children with ASD frequently have difficulties with perspective-taking (or deixis) (Loveland, 1984), it has often been proposed that the use of pronoun reversals in this population is attributable to their social impairments. However, the pervasiveness of these social impairments in children with ASD sometimes seems at odds with actual pronoun reversal rates in this population. That is, Tager-Flusberg's (1994) analysis of the conversations of six boys with ASD revealed a pronoun reversal rate of about 13%. Tager-Flusberg reported that pronoun reversals were more frequent in these boys than in a language-matched group of children with Down syndrome, but did not present a comparison with typically developing (TD) children. A recent investigation of school-age deaf children with ASD, using ASL as their primary language, reported no reversals at all among the children who used pronouns (Shield, Meier, & Tager-Flusberg, 2015). While elicited production tasks have found that school-age children with ASD produce more pronoun reversals than mental-age-matched TD children, researchers have also reported that the most common error in the ASD group was pronoun avoidance, i.e., using proper names instead. Furthermore, comprehension tasks with this age group have yielded close-to-ceiling performance in differentiating 'you' and 'me' when asked (Jordan, 1989; Lee et al., 1994). In sum, the 'common-ness' of pronoun reversals in the language of children with ASD cannot be assumed, either in absolute terms or in relation to TD children.

A recent case study of two toddlers suggests a somewhat different interpretation on how both social and linguistic factors may be operating in the incidence and characteristics of pronoun reversal (Evans & Demuth, 2012). These toddlers were precocious, beginning word production at 11 months and personal pronoun use at 13–16 months. Notably, both children reversed first and second person pronouns at much higher rates than usually reported for TD children (80–95%, cf. Dale & Crain-Thoreson, 1993), and one was diagnosed with Asperger's Syndrome at 5 years of age. The authors propose that the children's linguistic precocity and high pronoun reversal rate were connected, such that they had begun to acquire the pronominal paradigm before their social capacities grasped its deictic (perspective-taking) nature. On this account, then, more frequent pronoun reversals in children with ASD may be attributed to an asynchrony between their levels of language and social development.

What no one has yet studied is how linguistic and social factors might jointly contribute to pronoun reversal in children with ASD. The current paper, then, has three goals. First, we assess the prevalence of pronoun reversals in a larger sample of children with ASD ($n = 15$) than has previously been studied, and compare this prevalence with that of 18 TD toddlers at similar language levels. Second, we assess the children's levels of social impairment in relation to their general language levels. An early index of these social impairments is the well-documented difficulty that children with ASD have with initiating and sustaining joint attention (JA) during dyadic interactions (Luyster, Kadlec, Connolly, Carter, & Tager-Flusberg, 2008; Mundy, Sigman, & Kasari, 1990; Paul, Chawarska, Cicchetti, & Volkmar, 2008; Rollins & Snow, 1998; Siller & Sigman, 2008). We investigate whether the proposed conditions for pronoun reversal – a developmental asynchrony between social and language development – are found in our sample, such that children with ASD who are matched with TD children on language nonetheless fall below the TD children's levels of JA. Third, we directly assess the relative contributions of children's social/perspective taking (i.e., JA) and language skills to their early vs. later incidence of pronoun reversals.

2. Method

2.1. Participants

The participants for this study included 18 TD children and 15 children diagnosed with ASD, which was confirmed with the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2000). The children with ASD were recruited via service providers in the northeastern U.S.; all were verbal and were receiving at least five hours of Applied Behavioral Analysis

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