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Early intersubjective skills and the understanding of intentionality in young children with Down syndrome

Laura J. Hahn a,*, Deborah J. Fidler b, Susan L. Hepburn c, Sally J. Rogers d

- ^a School of Education, Colorado State University, 314 Behavioral Sciences Building, Campus Delivery 1570, Fort Collins, CO 80523-1570, United States
- ^b Department of Human Development and Family Studies, Colorado State University, 313 Behavioral Sciences Building, Campus Delivery 1570, Fort Collins, CO 80523-1570, United States
- ^c Department of Psychiatry, University of Colorado–Denver Health Sciences Center, 13121 E. 17th Avenue, C234, Aurora, CO 80045, United States
- ^d M.I.N.D. Institute, University of California, Davis, 2825 50th Street, Sacramento, CA 95817, United States

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ABSTRACT

This study examined the relationship between early intersubjective skills (joint attention and affect sharing) and the development of the understanding of intentionality in 16 young children with Down syndrome (DS) and 16 developmentally matched children with other developmental disabilities (DD). The study of intentionality focuses on how children come to understand the goal-directed actions of others and is an important precursor to the development of more complex social cognitive skills, such as theory of mind. Joint attention and affect sharing were examined using the Early Social Communication Scales (Mundy, Sigman, & Kasari, 1990; Seibert, Hogan, & Mundy, 1982). Meltzoff's (1995) behavioral reenactment paradigm was used to examine the understanding of intentionality. For children with DS, higher rates of affect sharing were associated with poorer intention reading abilities. This pattern was not observed in children with other DD. These results suggest that the intersubjective strengths associated with DS may not support the development of intentionality-interpretation skills. Future research is needed to explore if children with DS have the joint attention behaviors needed to be intentional.

1. Introduction

Social cognition encompasses numerous skills (i.e., intersubjectivity, social referencing, social attribution, interpretation of cues, face recognition, and theory of mind) that allow children to think and reason about the social world (Cebula & Wishart, 2008; Tager-Flusberg, Plesa Skwerer, & Joseph, 2006; Trevarthen & Aitken, 2001). The study of intentionality focuses on if and when children are able to understand the intentions of others (Meltzoff, 1995). Understanding intentionality is a key component of social cognitive development, and is critical for navigating complex social dynamics and interactions (Cebula & Wishart, 2008; Kunda, 1999; Tager-Flusberg et al., 2006; Trevarthen & Aitken, 2001; Zinck, 2008). To investigate when young children begin to understand the intentions of others, Meltzoff (1995) developed a research paradigm called the 'behavioral reenactment' procedure.

The behavioral reenactment procedure is a nonverbal task designed to examine whether children will interpret an individual's behavior literally or if they can read through their behavior and identify the intended goal of the individual's

E-mail address: laura.j.hahn@ku.edu (L.J. Hahn).

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^{*} Corresponding author at: Life Span Institute, University of Kansas, 1000 Sunnyside Avenue, Room 1052, Lawrence, KS 66045-7555, United States. Tel.: +1 785 864 4953.

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actions. In Meltzoff's (1995) original study, he concluded that at 18 months, infants could infer intentionality in others. The ability to understand intentionality suggests that infants have begun to differentiate surface behavior (what an individual does) from what an individual is trying to do (Meltzoff, 1995). Subsequent studies using the behavior reenactment procedure have examined whether these skills emerge earlier in development. Together these studies suggest that the ability to interpret an unsuccessful goal-directed action as intentional is still emerging between 12 and 15 months and that the understanding of intentionality improves with age (Bellagamba & Tomasello, 1999; Bellagamba, Camaioni, & Colonnesi, 2006). Because of the complex demands of social-cognitive processing, children with neurogenetic disorders, such as Down syndrome (DS), may be at risk for atypical development in this area.

Based on existing work, it is unclear whether the understanding of intentionality is compromised in children with DS beyond the level of delay that would be anticipated based on their overall developmental level. It has been noted that during cognitively challenging tasks, children with DS have the tendency to overuse their social relatedness skills to compensate for weaknesses in other domains (Cebula & Wishart, 2008; Fidler, 2006; Kasari & Freeman, 2001; Wishart, 1996). It is possible that the combination of early social strengths and the tendency to overuse social relatedness skills are interfering with the development of more complex social cognitive skills, including the understanding of intentionality (Cebula & Wishart, 2008; Fidler, 2006). On the other hand, these early social strengths (Fidler, Most, Booth-LaForce, & Kelly, 2008; Gilmore, Campbell, & Cuskelly, 2003) and the strengths that have been observed in intersubjectivity (i.e., joint attention and affect sharing; Adamson & Bakeman, 1985; Kasari, Freeman, Mundy, & Sigman, 1995; Mundy, Sigman, Kasari, & Yirmiya, 1988; Mundy et al., 1990; Sigman & Ruskin, 1999) may provide young children with DS with the necessary foundational knowledge to be more skilled at more complex social cognitive tasks (Cebula, Moore, & Wishart, 2010), like the understanding of intentionality. To date, intentionality has yet to be examined in children with DS.

Social cognition in DS has not received a large amount of research attention when compared to other areas of the DS behavioral phenotype. This may be because individuals with DS are characterized as demonstrating relative strengths in some aspects of social development, especially social relatedness (Fidler et al., 2008; Gilmore et al., 2003), leading researchers to conclude that social understanding is also relatively intact (Cebula & Wishart, 2008; Cebula et al., 2010; Wishart, 2007). However, research specifically focused on the social cognitive profile associated with DS suggests that social cognition does not seem to be "playing the same supporting role" (Cebula & Wishart, 2008, p. 45) in the overall development of children with DS as it does in typically developing children, and it has been suggested that these skills may actually be compromised in this population (Wishart, 2007). Examining the understanding of intentionality in children with DS may help to bridge the gap between the strengths that have been observed in intersubjectivity (Adamson & Bakeman, 1985; Fidler, 2006; Kasari et al., 1995; Mundy et al., 1988, 1990; Sigman & Ruskin, 1999) and the weaknesses observed on theory of mind tasks in children with DS (Abbeduto et al., 2001; Binnie & Williams, 2002; Yirmiya, Solomonica-Levi, Shulman, & Pilowsky, 1996; Zelazo, Burack, Benedetto, & Frye, 1996).

From a developmental perspective, social cognition depends on interactions between the self and others, and begins in infancy with primary and secondary intersubjectivity (Meltzoff, Gopnik, & Repacholi, 1999). Intersubjectivity is the intuitive recognition and understanding of the impulses and desires of another's mind (Trevarthen, 1978). These early intersubjective skills serve as a foundation for more advanced social cognitive skills (i.e., understanding of intentions, theory of mind, social decision making; Cebula & Wishart, 2008; Meltzoff, 2007; Tager-Flusberg et al., 2006; Trevarthen & Aitken, 2001). The majority of infants with DS achieve the developmental milestones associated with primary intersubjectivity (Fidler, 2006), but with noticeable deviations from the typical trajectory. For example, infants with DS show increased looking behavior at the faces of their social partner in the middle of the first year (Crown, Feldstein, Jasnow, & Beebe, 1992; Gunn, Berry, & Andrews, 1982), a time when typically developing infants are beginning to shift their focus to the world around them as they develop secondary intersubjectivity (i.e., joint attention; Berger & Cunningham, 1981; Carvajal & Iglesias, 2000). Joint attention occurs when individuals engage in a shared interaction around an object or event (Mundy & Newell, 2007). It has been suggested that this longer looking time may lead to difficulties in joint attention because instead of sharing attention between an object or event and a social partner infants with DS are still focused solely on their social partner (Cebula & Wishart, 2008; Legerstee & Weintraub, 1997). However, the majority of research on joint attention suggests relative strengths in this area (Fidler, Philofsky, Hepburn, & Rogers, 2005; Kasari, Mundy, Yirmiya, & Sigman 1990; Kasari, Sigman, Mundy, & Yirmiya, 1990; Kasari et al., 1995; Mundy et al., 1988; Sigman & Ruskin, 1999). To date, only one study of joint attention in DS suggests it to be an area of relative weakness (Legerstee & Weintraub, 1997). Although there are more studies supporting the notion of relative strengths in joint attention, if joint attention is compromised, then it is possible that the development of the understanding of intentionality will also be compromised in children with DS (Trevarthen, 1978; Trevarthen & Aitken, 2001).

Another intersubjective skill that may influence joint attention in children with DS and the development of intentionality is affect sharing (Adamson & Bakeman, 1982; Kasari, Mundy et al., 1990; Kasari, Sigman, et al., 1990). Affect sharing has been conceptualized as the combination of joint attention behaviors and positive emotional signals (Kasari, Sigman, et al., 1990; Mundy et al., 1990; Seibert et al., 1982). The purpose of affect sharing behavior is to share a positive emotional reaction to an event or object with a social partner (Kasari, Sigman, et al., 1990; Mundy et al., 1990; Seibert et al., 1982). Affect sharing is an important precursor to the understanding of others' intentions because through affect sharing infants and young children begin to represent the desires, motivations, and intentional of others (Meltzoff & Moore, 1994, 1998; Trevarthen, 1978, 1979; Trevarthen & Aitken, 2001). During joint attention, affect sharing supports joint attention behavior by helping to indicate the child's interest or the desire to share the experience of an object or event with a social partner (Adamson & Bakeman, 1985;

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