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Deaf and hearing children's development of theory of mind, peer popularity, and leadership during middle childhood

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ABSTRACT

This study had two primary aims. First, we compared deaf and hearing children during middle and late childhood on (a) cognitive understanding of basic and advanced theory of mind (ToM) and (b) social dimensions of peer group relations, including popularity, isolation, leadership, and the disposition to interact positively with peers. Second, using correlational analyses, we examined ToM's connections with these social variables to see whether and how ToM impacts children's social lives. A total of 57 children (36 deaf children of hearing parents and 21 hearing children) 6 to 14 years of age completed a 6-step developmental ToM Scale, and their teachers reported on the social variables. Hearing children outperformed deaf children on ToM and all teacher-rated variables. For deaf children, popularity correlated positively, and social isolation correlated negatively, with ToM even after controlling for age, gender, and language ability. For hearing children, the only ToM link was a weak correlation with leadership. Possible reasons for the differences between deaf and hearing groups are discussed, together with the likelihood of bidirectional causal links and implications for deaf children's social development in school.

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Introduction

Theory of mind (ToM), or the understanding of others' thoughts and feelings and their behavioral consequences, has been extensively studied in hearing typically developing (TD) preschool children over several decades, including research demonstrating the influence of ToM on preschool children's social lives. But much less is known about connections between the ToM and social dispositions of school-age children and in particular children with deafness and other disabilities. Promising emerging research on ToM development with TD youths for these post-preschool periods certainly exists (Devine & Hughes, 2013; Miller, 2009), but studies comparing typical developers and those with delay seem particularly promising and needed. One issue for such research is how to measure later ToM developments and later social proclivities for school-age children. Preschool ToM is prototypically assessed with false belief tests requiring children to infer the behavior, speech, or thoughts of protagonists with false beliefs. Most TD children pass these by 5 years of age (Wellman, Cross, & Watson, 2001), but certain atypical groups, such as deaf children from hearing families (e.g., Peterson & Siegal, 1995; Peterson & Siegal, 1999) and children with autism (Baron-Cohen, 1995), are often substantially delayed, routinely continuing to fail throughout middle childhood and the early teens (see Happé, 1995; Peterson, Slaughter, & Paynter, 2007, and Siegal & Peterson, 2008, for reviews).

Documentation of these false belief delays is abundant and clear, but important theoretical questions remain as to their nature, basis, and later consequences. One view holds that, for deaf children of hearing parents (i.e., non-native signers), restricted social and conversational experience during early childhood in a hearing, non-signing family delays the development of preschool ToM concepts such as false belief. Entry into a community of fluently signing peers and teachers in primary school can subsequently assist the development of ToM understanding, although on a delayed timetable. The fact that natively signing deaf children with deaf parents (a 5% minority of children born deaf) develop ToM on the same early timetable as hearing children (see Peterson, 2009, for a review) is consistent with this theory.

However, another view is equally possible. For example, to explain ToM delays in children with autism, it is often argued (e.g., Leslie & Thaiss, 1992; Scholl & Leslie, 2001) that circumscribed congenital damage to a neurological ToM module limits the extent to which ToM development will ever be possible up to and/or beyond false belief. In this form, this explanation is unlikely to apply to deaf children of hearing parents even though they are often as delayed in ToM achievements as are high-functioning children with autism during late childhood. However, a plausible extension of such related but broader maturational views would be that normatively preschool achievements could exhibit a critical period for ToM (e.g., Morgan & Kegl, 2006) just as for language (e.g., Newport, 1991). In this view, if they are not attained early in life, they might be impossible to achieve later. This could apply to children with autism, but more obviously deaf children provide a special opportunity to address these issues and hypotheses. Doing so requires a means of measuring ToM growth as a continuing developmental process extending beyond false belief mastery. A reliable and valid way in which to measure later ToM development in deaf children, and in TD children as well, would provide an opportunity to address other critical questions as well such as the relationships between later ToM developments and later social proclivities for school-age children, including those with deafness.

To begin to address these issues, we took advantage of a new 6-step ToM Scale (Peterson, Wellman, & Slaughter, 2012) that builds on, and extends developmentally beyond, the 5-step sequential preschool ToM Scale devised by Wellman and Liu (2004). Peterson et al. (2012) found that the new scale contained concepts that continued to challenge hearing children at 7 to 10 years of age and to challenge even those deaf children who had already successfully mastered false belief. One subsidiary focus of the current research, given the increased awareness of the importance of replication in psychological research, is further validation of this scale and its findings with a fresh sample of older deaf and TD children.

More substantively, however, we aimed to go beyond the laboratory assessment of children's ToM understanding to examine some of the possible real-world correlates and consequences of ToM growth. When deaf and hearing children enter primary school, they join a new social world via full-day immersion in a classroom peer group. In this new and challenging social environment, peer

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