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Conversations about mental states and theory of mind development during middle childhood: A training study

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ABSTRACT

Despite 30 years of productive research on theory of mind (ToM), we still know relatively little about variables that influence ToM development during middle childhood. Recent experimental studies have shown that conversations about the mind affect ToM abilities, but they have not explored the mechanisms underlying this developmental effect. In the current study, we examined two potential mechanisms through which conversations about mental states are likely to influence ToM: an increased frequency of references to mental states when explaining behavior and an increased accuracy of mental-state attributions. To this aim, we conducted a training study in which 101 children were assigned to either an intervention condition or a control condition. The conversation-based intervention was made up of four sessions scheduled over 2 weeks. Children completed a battery of assessments before and after the intervention as well as 2 months later. The groups were equivalent at Time 1 (T1) for age, family affluence, vocabulary, and executive functions. The ToM group showed an improvement in ToM skills (as evaluated on both the practiced tasks and a transfer task). Mediation analyses demonstrated that the accuracy of mental-state attributions, but not the mere frequency of mental-state references, mediated the positive effect of conversations about the mind on ToM development. Our results indicate that conversational experience can enhance mental-state

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reasoning not by simply drawing children's attention to mental states but rather by scaffolding a mature understanding of social situations.

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Introduction

Theory of mind (ToM) is defined as the ability to explain and predict social behavior on the basis of mental states (Wimmer & Perner, 1983). Three decades of fruitful research on ToM have clarified the existence of substantial individual differences between children of the same age during early childhood (e.g., Cutting & Dunn, 1999; Hughes et al., 2005) and, more recently, during middle childhood (Banerjee, Watling, & Caputi, 2011; Devine & Hughes, 2013; Lecce, Zocchi, Pagnin, Palladino, & Taumoepeau, 2010). Crucially, these individual differences play a key role in explaining the development of language (Tomasello, 2003), socially competent behaviors (Caputi, Lecce, Pagnin, & Banerjee, 2012), and metacognition (Lecce, Bianco, Demicheli, & Cavallini, 2014). Given this, authors have tried to understand the factors that are responsible for these individual differences.

Conversational approach to ToM development

Several strands of evidence have demonstrated that conversations about the mind are a key factor in determining individual differences in ToM (e.g., de Rosnay & Hughes, 2006; Hughes & Dunn, 1998). According to the *conversational approach*, the understanding of mental phenomena emerges from mental-state conversations because talking about the mind fosters the coordination of different points of view on the same event, stimulates the comparison between one's own and others' mental states, and promotes reflection about social experiences (Carpendale & Lewis, 2004; Nelson, 2005; Symons, 2004; Turnbull & Carpendale, 1999). Support for such a view comes from both longitudinal studies (Ensor & Hughes, 2008; Ruffman, Slade, & Crowe, 2002) and training studies (Ornaghi, Brockmeier, & Grazzani, 2011). This last group of studies has shown that involving children in conversations about mental states (beliefs, desires, and perceptions) improved their ToM (Appleton & Reddy, 1996; Slaughter & Gopnik, 1996). The use of sentential complement constructions (Hale & Tager-Flusberg, 2003; Lohmann & Tomasello, 2003), feedback, and explanations in these conversations seems to be crucial (Clements, Rustin, & McCallum, 2000; Melot & Angeard, 2003).

It should be noted that the great majority of these studies have been conducted on preschoolers. Only recently is research shifting toward investigating the role of conversations about mental states in ToM development during the school years. Here it is important to note that during the school years children not only develop more complex understanding of mental states (for more comments on this issue, see Apperly, 2011, and Miller, 2009) but also become better at *using* their understanding of mental states in a more flexible and appropriate way (Apperly, 2012; Devine & Hughes, 2013) and at comprehending the subtle circumstances and conditions that influence the construction of representations when people interact.

In the current study, we build on these conceptual developments and consider *if* and *how* conversations about mental states affect older children's ToM. Research in this field is encouraging because it shows that taking part in conversations about mental states with peers and adults helps the development of ToM not only in preschoolers but also in primary school-aged children. For example, studies with deaf children have shown that the chance of taking part, at school, in such conversations with numerous and different partners enhances ToM skills (Meristo et al., 2007; Tomasuolo, Valeri, Di Renzo, Pasqualetti, & Volterra, 2013). In a similar vein, a longitudinal study of typically developing children has demonstrated that mothers' mental-state talk at child age 2 years

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