



Theory of mind and specific language impairment in school-age children



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ABSTRACT

Research on the relationship between aspects of language development and Theory of Mind (ToM) in children with language impairments suggests that children with language impairment show a delay in ToM development. This study aimed to examine the relationships of the syntactic, semantic, and pragmatic skills with ToM in school-age children. Twenty children with Specific Language Impairment (SLI) aged 9–12 years and two control groups, one matched for chronological age (CA) and one for language ability (LA) (aged 8–10 years) were compared on a set of language tasks tapping syntactic, semantic, and pragmatic skills and on an advanced test of ToM. Results showed that children with SLI performed poorly on the ToM task compared to the CA matches. Also, analysis showed that language skills and ToM are related and that syntactic and pragmatic abilities contributed significantly to the prediction of ToM performance in the SLI group. It is concluded that the syntax/pragmatic aspects of the language impact on ToM understanding in children with SLI.

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1. Introduction

Oral language and communication develop naturally and effortlessly. A typically developing five-year old child has already acquired a large part of phonological, grammatical, semantic and pragmatic abilities in his/her native language, thus being able to communicate smoothly with his/her environment. However, not all children follow this course. It is expected that about 6% of children will present language difficulties or impairments affecting negatively their educational and psychosocial adjustment (Law, Boyle, Harris, Harkness, & Nye, 2000).

The term 'Specific Language Impairment' (SLI) refers to a developmental language disorder that is diagnosed on the basis of delays and deficits in language development. Clinically, SLI defined as a failure to develop normal language at an appropriate age is a condition associated with poorer academic achievement, verbal working memory and executive functioning difficulties and variable linguistic deficits. By definition, children with SLI have a normal non-verbal intelligence and do not present any hearing or articulation impairment, or oral-motor abnormality, or emotional adjustment, or neurological deficits (Leonard, 1998).

English has been the most thoroughly studied language in this field. Intensive research in the past decades showed that children with SLI constitute a heterogeneous group of children with problems that may relate to one or more language levels or functions, i.e. phonology, semantics, morphosyntax, pragmatics or any combination of them (Marinis, 2011). Despite the heterogeneity of the impairment, research indicated that some deficits dominate. These are the phonological (Munson,

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Kurtz, & Windsor, 2005), morphosyntactic (Rice, 2000; Rice, Tomblin, Hoffman, Richman, & Marquis, 2004), lexical (Moyle, Newman, Reilly, & Capone, 2007) and pragmatic deficits (Katsos, Roqueta, Estevan, & Cummins, 2011).

SLI has been extensively studied in several Indo-European languages, but only a limited number of studies involved the Greek language. These studies indicated that preschool children with SLI face difficulties in understanding thematic roles in relative clauses (Stavrakaki, 2001), and producing and understanding pronouns (Petinou & Terzi, 2002; Stavrakaki & van der Lely, 2010). Also, there is evidence suggesting that school-age children with SLI have difficulties in understanding the semantic and pragmatic functions of mental state verbs and working memory (Spanoudis, Natsopoulos, & Panayiotou et al., 2007). In general, research on the Greek language indicates that children with SLI encounter difficulties in semantics, morphosyntax, and pragmatics but not necessarily in phonology (see also Spanoudis, Papadopoulos, & Spyrou et al., 2016). Studies conducted in Greek-speaking children with SLI are mainly focused on specific domains of linguistic or cognitive difficulties and lack complex designs and depth and breadth of analysis.

1.1. Pragmatic deficits and SLI

Pragmatic deficits are recently debated as central (Bishop, 2000) in a distinct subgroup characterized by language difficulties that extend beyond the distinctive symptoms of SLI. The newly published DSM-5 (American Psychiatric Association, 2013) includes a new category, the social (pragmatic) communication disorder (SCD). SCD demonstrates persistent difficulties in the social uses of verbal and nonverbal communication. These affect the development of social relationships and discourse comprehension and cannot be explained by low abilities in the domains of word structure and grammar or general cognitive ability. In the past SCD has been called semantic-pragmatic or pragmatic disorder (see Bishop, 2000; Conti-Ramsden & Botting, 1999). Bishop (2000) proposed that this disorder may share properties with SLI and autism.

Research on pragmatic impairments of children with SLI followed two different approaches. The first approach takes pragmatics as a domain of linguistic behavior and focuses on the interaction of pragmatic abilities with grammatical, semantic, and discourse skills (Norbury, 2014). The second takes a wider view of pragmatics as social communication and stresses the importance of social interaction (Adams, 2002). Both approaches propose that children with SLI present several pragmatic difficulties relative to typically developing peers (Fujiki & Brinton, 2009). These difficulties are linked with problems in using contextual information to solve lexical ambiguities and figurative language comprehension (Norbury, 2005a, 2005b), pragmatic inferences (Katsos et al., 2011), narrative discourse (Norbury, Gemmell, & Paul, 2014), and poor turn taking (Bishop, 2000).

An important hypothesis tested in many of these studies was the role of structural language abilities on pragmatic difficulties and social communication. Research findings suggest that some children with SLI present pragmatic difficulties that partly stem from problems with semantics or syntax (Fujiki & Brinton, 2009). One of the reasons for this vagueness may be the limited ways of measuring structural and pragmatic abilities. Adams (2002) proposed that assessments for older children should include conversational and narrative abilities, understanding of implicature and intent as well as the child's ability to employ contextual cues to understanding.

Children with SLI have been considered a promising group for studying the interactions of language with social-cognitive skills such as the theory of mind. This view was based on the hypothesis that problems of this group of children originate from structural linguistic abilities. Nowadays, the existing literature suggests that SLI is a heterogeneous disorder including a subtype with reduced pragmatic abilities. In a recent study, Andres-Roqueta, Adrian, Clemente, and Katsos (2013) examined preschool children with SLI whether linguistic (semantic-pragmatic) or cognitive (executing functioning) measures were the best predictors of ToM performance. They found that a grammatical measure was actually the best predictor of ToM.

1.2. Theory of mind and language

The term 'Theory of Mind' (ToM) refers to our ability to represent mental states, such as beliefs, intentions and desires, and use these representations to guide actions and behavior. ToM enables humans to attribute mental states to others and understand that others may have and act upon different beliefs, intentions, and desires of their own mental states (Wellman, 1990). ToM emerges from many individual abilities which enable us to communicate efficiently with other people and act as social beings (de Villiers, 2007).

Language development is tightly intertwined with ToM from very early in life (Astington & Jenkins, 1999). ToM and language develop rapidly over the first five years of life, enabling children both to represent successfully the mental state of others and express effectively their thoughts and desires. The relations of the two abilities continues to adolescence (Tager-Flusberg, 2000). Successful communication presupposes understanding the interlocutor's mental state and language, whereas language, on the other hand, is an important carrier of understanding unobservable mental phenomena that are the substance of ToM. Provided that ToM is a sociocognitive ability, it is assumed that individuals with a selective ToM impairment also face serious social and communication difficulties. Indeed, selective ToM impairment appears in individuals in the autism spectrum and in individuals with other communication/language disorders (Miller, 2006; Spanoudis & Natsopoulos, 2011). However, research findings on selective ToM impairment in children with SLI are sparse. This study aims to contribute to a better understanding of the relationship between language and ToM in children with language difficulties.

Over the past two decades, important research has been conducted on the relations between language and ToM (see Miller, 2006). Although most of these studies are correlational, they may highlight the complex relations between these

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