



Why do children with language impairment have difficulties with narrative macrostructure?



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ABSTRACT

Background: Research has produced conflicting findings about the effects of language impairment (LI) on narrative macrostructure outcomes.

Aims: The present study investigated if children with LI perform weaker than typically developing (TD) controls on narrative macrostructure in different tasks, whether this changes over time and if between-group differences stem from linguistic or cognitive factors.

Methods and procedures: A group of monolingual Dutch children with LI ($n = 84$) and a TD control group ($n = 45$) were tested with a story comprehension and a story generation task. All children were five or six at wave 1 and six or seven at wave 2. Information was collected on vocabulary, grammar, verbal memory and sustained attention.

Outcomes and results: At wave 1, the LI group performed weaker than the TD group in both tasks. At wave 2, the groups performed similarly on story comprehension. On story generation, the TD group still outperformed the LI group. Sustained attention mediated the relationship between group and story generation.

Conclusions and implications: Effects of LI on narrative macrostructure are moderated by age and task and may stem from sustained attention weaknesses. These findings have implications for using narrative tasks in educational and diagnostic settings and may direct future interventions.

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What this paper adds?

This paper provides, first, insight into why LI may not always impact narrative macrostructure and, second, pinpoints possible causes of the effect of LI on narrative macrostructure. It is shown that the gap between TD and LI becomes smaller as the children grow older. These findings suggest that the different findings across studies may be an effect of age and type of narrative task. This paper adds furthermore to our understanding of the mechanisms that underlie the weak narrative macrostructure performance of children with LI by performing a mediation analysis on a sufficiently large sample. This paper shows that sustained attention contributes significantly to the lower performance of children with LI in a story generation task.

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1. Introduction

Language Impairment (LI) is a frequently occurring disorder that affects between 5 and 7% of the population (Bishop, 2010; Tomblin et al., 1997). Children with LI have difficulties learning language without a clearly discernible cause (Leonard, 2014). Much research on LI has focused on grammar, which tends to be severely affected by the impairment, but less is known about the narrative skills of children with LI. Narrative skills comprise the ability to sequence events, understand why one event may cause another, and structure events and descriptions in such a way that a listener can comprehend the story. A good narrator uses precise vocabulary, is able to create cohesiveness through the use of linguistic markers and conveys ideas without extra-linguistic support (Paul & Smith, 1993). It is therefore not surprising that children with LI score low on narrative measures (cf. Epstein & Philips, 2009; Botting, 2002).

Yet, there are also studies that do not observe an effect of LI, in particular on narrative macrostructure measures (Iluz-Cohen & Walters, 2012; Liles, Duffy, Merritt, & Purcell, 1995; Merritt & Liles, 1987; Norbury & Bishop, 2003). Narrative macrostructure refers to the global organization of a narrative beyond the utterance level. This structure can be analyzed using a story grammar, which identifies components such as the setting and a logical event structure (e.g., initiating event, internal response, plan, action, consequence, reaction) (Stein & Glenn, 1979). Narrative macrostructure abilities allow children to generate coherent and age-appropriate extended discourse (Heilmann, Miller, Nockerts, & Dunaway, 2010), influence their academic achievements (Bishop & Adams, 1992; Bishop & Edmundson, 1987; Boudreau, 2008; Boudreau & Hedberg, 1999; Gillam & Johnston, 1992; O'Neill, Pearce, & Pick, 2004; Tabors, Snow, & Dickinson, 2001), and are a key component of social communication (Norbury, Gemmel, & Paul, 2014). They continue to develop until at least age 9 or 10 (Norbury & Bishop, 2003), and require world knowledge, genre-specific knowledge, linguistic knowledge as well as sufficient cognitive resources to coordinate and integrate these different kinds of knowledge in real-time (Colozzo, Gillam, Wood, Schnell, & Johnston, 2011; Liles, 1993; Owens, 1996).

The first aim of the study was to investigate age effects by comparing narrative macrostructure performance of children with TD and LI across two time points. The children in this study were tested at the beginning of elementary school when narrative skills are still developing. Both narrative comprehension and generation were tested. Investigating two time points and comparing comprehension and generation are relevant for determining if effects of LI are dependent on age and type of narrative task. The second goal of the study was to determine if effects of LI on narrative macrostructure are caused by linguistic impairment, cognitive delays or both. This issue is relevant in light of the different abilities that are needed for performing well on tasks testing narrative macrostructure and findings showing that children with LI do not only have linguistic but also cognitive weaknesses (Ebert & Kohnert, 2011; Montgomery, Magimairaj, & Finney, 2010).

1.1. Narrative abilities of children with LI

Several studies have found that children with LI perform less well than children with TD on tasks testing narrative macrostructure (Bishop & Edmundson, 1987; Bishop & Donlan, 2005; Botting, 2002; Cleave, Girolametto, Chen, & Johnson, 2010; Epstein & Philips, 2009; Soodla & Kikas, 2010; Wetherell, Botting, & Conti-Ramsden, 2007). They use fewer complete episodes that consist of a logical sequence of events (such as goal-attempt-outcome) (Bishop & Donlan, 2005; Gillam & Carlile, 1997; Merritt & Liles, 1987; Miranda, McCabe, & Bliss, 1998; Wright & Newhoff, 2001) and evaluative statements that refer to the internal states of the protagonists (Bishop & Donlan, 2005; Manhardt & Rescorla, 2002; Reilly, Losh, Bellugi, & Wulfeck, 2004). Studies that investigated story comprehension observe that children with LI have difficulties with questions that assess the understanding of causal relationships between events in the narrative (Merritt & Liles, 1987) and inferencing questions, but not with factual or literal questions (Bishop & Adams, 1992; Dodwell & Bavin, 2008; Merritt & Liles, 1987).

Not all studies on narrative macrostructure observe a negative effect of LI (Iluz-Cohen & Walters, 2012; Liles et al., 1995; Merritt & Liles, 1987; Norbury & Bishop, 2003). The reasons for this are manifold. Well-structured narratives require (non-linguistic) skills that are not always impaired in children with LI (Liles et al., 1995; Norbury & Bishop, 2003). Furthermore, studies have used different inclusion criteria for LI, coding systems to analyze the plot structure may not always be sufficiently fine-grained to detect effects of LI (Duinmeijer, de Jong, & Scheper, 2012) and some components of narrative macrostructure (e.g., the ability to provide an adequate story ending) develop late in children with TD resulting in overall floor performance (Norbury & Bishop, 2003). The type of narrative task may also influence the effect of LI (Andreu, Sanz-Torrent, Guardia Olmos, & MacWhinney, 2011; Duinmeijer et al., 2012; Merritt & Liles, 1989). For instance, Merritt and Liles (1989) conclude that story retelling may provide more possibilities to detect effects of LI than story generation because it elicits more story components. Another possibility, which is relatively underresearched, is that the effects of LI emerge or fade as an effect of development.

The first aim of the study was to investigate age effects by comparing narrative macrostructure performance of children with TD and LI across two time points. A model story was used to assess narrative comprehension and generation. The model story presented children with an example without burdening their verbal short-term memory. In so doing, it could be a more reliable test of children's ability to generate a story than a retelling task (Duinmeijer et al., 2012) and may elicit more story components than a generation task without an example (Merritt & Liles, 1989). The study builds on recent research by Boerma, Leseman, Timmermeister, Wijnen and Blom (2016). For the purpose of the present study, data from more children were analyzed and data from the same children were analyzed at two time points.

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