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# Profiles of young readers: Evidence from thinking aloud while reading narrative and expository texts

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ABSTRACT

This study aimed to identify reading behavior profiles in nine-to-eleven year old children based on their think-aloud responses while reading narrative and expository texts. Three profiles emerged while reading narratives: Literal Readers, who stay close to the literal text by predominantly repeating it; Paraphrasing Readers, who extract meaning from the text by paraphrasing it; and Elaborating Readers, who use background knowledge to explain the text by generating inferences. The three profiles also emerged while reading expository text. Children generally exhibited the same profiles across the two text genres, however, expository texts elicited fewer correct inferences but more invalid inferences than did narratives, suggesting that children are influenced by text demands. Elaborating Readers had better word decoding skills, reading comprehension ability, and non-verbal reasoning ability than readers of the two other profiles, indicating a positive relation between inference generation and language abilities and cognitive resources.

## 1. Introduction

Readers engage in various reading processes to understand a text. Importantly, readers need to go beyond the literal text and draw upon background knowledge to make inferences to understand the meaning of the text (e.g., Kintsch, 1988; van den Broek, 1990). Young readers differ in their ability to go beyond the text and generate necessary inferences (Cain & Oakhill, 1999; Kendeou, van den Broek, Helder, & Karlsson, 2014; Nation & Snowling, 1997). Such differences may result in children approaching texts in different ways. Studies using think-aloud procedures during reading of narratives revealed contrasting profiles in poor or good comprehending readers; readers in one profile stay close to the literal text, and readers in the other profile generate elaborative inferences that go beyond the text (Carlson, Seipel, & McMaster, 2014; Kraal, Koornneef, Saab, & van den Broek, 2017; McMaster et al., 2012; Rapp, van den Broek, McMaster, Kendeou, & Espin, 2007; Seipel, Carlson, & Clinton, 2017). The identification of such reading profiles has led to the development of targeted reading interventions for poor comprehenders (McMaster et al., 2012). However, because reading comprehension is a multidimensional ability, it is important to consider reading profiles in developing readers across the whole range of reading comprehension ability, not only in poor *or* good comprehenders. Furthermore, because narrative and expository texts differ in text demands, it is important to compare readers' profiles for narrative texts to their profiles for expository texts. Considering reading profiles in different text genres may provide useful perspectives for theoretical questions. For example, whether children have a certain stable set of reading abilities with which they process text in a similar way across different situations, or whether they are influenced by conditions such as different text demands. Furthermore, such expansions allow important insights for evidence-based reading instructions across a larger group of developing readers and across different text genres.

### 1.1. Comprehension processes

A reader can attain different levels of comprehension for a text, ranging from basic to deep understanding. A well-known distinction between such comprehension levels has been proposed in the construction-integration model (Kintsch, 1988, 1994; van Dijk & Kintsch, 1983). In this model three different levels are discussed: the *surface* level, where the reader encodes literal words and phrases, the *textbase*,

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where the reader understands referential relations within the text, and the *situation model*, where the reader enriches the mental representation of the text by elaborating on it and integrating background knowledge. Although various models on inference generation have been proposed, a consensus has emerged that inferences are important for building a situation model of the text (for a recent overview see, O'Brien, Cook, & Lorch Jr., 2015). A reader that uses appropriate and global level inferences is more likely to reach beyond the surface level understanding and gains a textbase and situation model understanding of the text (e.g., Goldman, McCarthy, & Burkett, 2015; Graesser, Singer, & Trabasso, 1994; Kintsch, 1994). In developing readers, the ability to make adequate inferences during reading is causally connected to good reading comprehension (Bowyer-Crane & Snowling, 2005; Cain & Oakhill, 1999; Lynch et al., 2008; McGee & Johnson, 2003). Relevant for the current paper, there are three broad types of inferences that contribute to an extended understanding of texts. First, *text-connecting inferences* enable readers to connect a focal event with an event previously mentioned in the text. Text-connecting inferences tend to be routinized in good readers (e.g., McKoon & Ratcliff, 1992; Olson, 1985), and are facilitated by large vocabulary and large working memory (WM) capacity (Singer, Andrusiak, Reisdorf, & Black, 1992). Second, *elaborative inferences* enable readers to connect the text with relevant background knowledge. Elaborative inferences allow for causal connections and are important to create a rich and coherent mental representation of the text (e.g., Graesser et al., 1994; Lynch et al., 2008). Sufficient word reading abilities and world knowledge are some reader characteristics that facilitate the production of valid elaborative inferences (McNamara & Kintsch, 1996; Rapp et al., 2007). Although poor comprehenders also may generate elaborative inferences, these inferences are more often invalid than those of good comprehenders (McMaster et al., 2012). Third, *predictive inferences* are produced when readers predict upcoming events. Predictive inferences are not as routine or critical as the two previously mentioned inferences but rather depend on the text being constraining enough (Cook, Limber, & O'Brien, 2001; Kaakinen & Hyönä, 2005; Klin, Guzmán, & Levine, 1999; van den Broek, 1990). Furthermore, the likelihood of making predictive inferences depends on the interaction of reader characteristics, such as WM capacity, and text characteristics, such as high causality between text parts (e.g., Linderholm, 2002). These three types of inferences may contribute differentially to young readers' ability to process text beyond the literal level and build an enriched mental representation.

Given the positive effects that inference processes have on reading comprehension, it is important to identify whether some children consistently process the text on a basic level whereas others are better able to enrich their mental representation using elaborative inferences. Although much research indicates that good readers generate more inferences than poor readers (e.g., McNamara & Kintsch, 1996), differences have also been found within poor comprehending readers (Rapp et al., 2007). Using a think-aloud procedure, two subgroups of nine-to-ten year old poor comprehenders have emerged (Carlson et al., 2014; McMaster et al., 2012; Seipel et al., 2017). One subgroup of children stayed close to the basic meaning of the text, mainly repeating or paraphrasing the text (Paraphrasers). The other subgroup of children used background knowledge to make inferences, albeit sometimes erroneously (Elaborators). Similar reading profiles have been found in a younger group of Dutch poor comprehending readers, and in their good comprehending peers (Kraal et al., 2017), indicating promising generalizability of reading profiles. Continuing research of reading profiles may help to better understand whether children have a certain approach to process text and whether that approach relates to different levels of text comprehension as described by influential reading models (e.g., Johnson-Laird, 1983; van Dijk & Kintsch, 1983). In the current study we make no a priori distinction between good and poor comprehenders, but aim to identify homogenous subgroups, characterized by their reading behavior, within a heterogeneous population spanning from poor to good comprehension abilities.

### 1.2. Text genres

Expository texts are often more difficult than narratives for developing readers (e.g., Best, Floyd, & McNamara, 2008), and several reasons may explain differences in text demands (e.g. Eason, Goldberg, Young, Geist, & Cutting, 2012). First, topics and hence familiarity of words may differ between the two text genres. Narratives often include everyday language whereas expository texts often introduce new words and terminology (Medina & Pilonieta, 2006). Therefore, expository texts often have a higher information density. Second, compared to narratives, expository texts are often more varied with regard to their structure (e.g. Lorch, 2015). Narratives often follow a more or less similar structure with similar elements and timelines (such as the protagonists initiating goal, actions, reactions, and outcomes; e.g. Mandler & Johnson, 1977). Expository texts come in different formats and require the reader to apply more varied reading strategies (Lorch, 2015). For example, there is not necessarily a timeline to follow but readers need to understand several subordinate ideas in relation to a main idea (Meyer, 1987). Hence, it is important to understand whether children approach the two text genres differently. Young readers are likely to lack in knowledge of both topic (e.g., Samuelstuen & Bråten, 2005) and text structure (e.g., Williams, Hall, & Lauer, 2004), making it difficult to effortlessly comprehend expository texts. For these reasons, expository texts poses difficulties in making inferences using background knowledge, especially for readers who already lag behind in comprehension skills. Indeed, children with poor inferencing skills experience comprehension difficulties when reading expository text (e.g., Best et al., 2008; Eason et al., 2012; Kraal et al., 2017; Schellings, Aarnoutse, & van Leeuwe, 2006). In adolescents, poor readers generate fewer inferences while reading expository compared to narrative texts (Denton et al., 2015). However, strategically elaborating on expository texts, if anything, *facilitates* in-depth comprehension of expository texts and, therefore, an *increase* in inference making would be desirable (Lorch, 2015; Mayer, 1996). By comparing inference skills in reading profiles of elementary school children across narrative- and expository texts we may examine whether developing readers recognize different text demands, and identify whether children with a certain reading profile could benefit from more practice with inference generation while reading expository texts.

### 1.3. Reader characteristics

Because text comprehension is a multidimensional ability, different reading profiles may be related to individual differences in other language abilities and cognitive resources. Individual differences predict reading comprehension in both adult and developing readers (e.g., Hannon, 2012; Language and Reading Research Consortium, & Logan, 2016). In particular, and as mentioned above, good word decoding, reading comprehension skills (e.g. Carlson et al., 2014; Olson, 1985; Rapp et al., 2007), large WM capacity, and vocabulary promotes the ability to make different types of inferences while reading (Linderholm, 2002; Linderholm & van den Broek, 2002; Singer et al., 1992). However, some children's inference problems may be caused by a limited vocabulary (Nation & Snowling, 1998, 1999), whereas others struggling with inference generation may possess enough lexical knowledge but not know how to draw on this knowledge (Bowyer-Crane & Snowling, 2005; Cain & Oakhill, 1999), possibly due to an immature reasoning ability (de Leeuw, Segers, & Verhoeven, 2016; Naglieri, 2001). When tracing the heterogeneity in developing readers back to a number of underlying homogeneous reading profiles, it is important to also map out whether these profiles differ in word decoding, reading comprehension skills, vocabulary, non-verbal reasoning skills, and WM capacity to better understand underlying competences.