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Fiction reading experience predicts narrative production skills in 9- to 12-year-old children

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BACKGROUND

Producing fictional narratives draws on a host of advanced linguistic, cognitive and social cognitive skills (Hudson & Shapiro, 1993). Previous research indicates that by the age of 9 years, nearly all typically developing children can provide an adult-like global structure for narratives (Berman & Slinden, 1994); however, substantial individual differences remain in the linguistic complexity, cohesion, and evaluative desirability (e.g., references to characters’ mental states) utilized in narrative production (Barnberg & Durand-Fry, 1991; Nordh & Bishop, 2003). Narrative competence has been linked to the development of oral and written communication (Marshall & Reucroft, 2002; mentalizing skills (Accorti Gammaranto & Pinto, 2014; Riggs & Casadewall, 2009) and reading comprehension (Cari, 2003). Recreational reading (i.e., reading outside the school curriculum or work) has been associated with a range of positive developmental outcomes, most notably gains in vocabulary (Sullivan & Brown, 2015). The direction of causation has been suggested to be reciprocal, such that children with more advanced verbal skills are more likely to use reading as a pleasure, which in turn facilitates the growth of language skills (Mid & Buis, 2015). However, a recent study using data from a large sample of 7-year-old twins tested a number of explanatory models for the correlation between print exposure and reading competence, finding that reading skills predicted print exposure but not vice versa (Van Bergen et al., 2018). Thus, recreational reading should not be viewed as a pure measure of “environment,” but is likely to reflect underlying gene-environment correlation mechanisms (Hugiu, Hulme, Hamill, & Snowling, 2017).

In addition to links with language and reading skills, recreational reading (and particularly engagement with fiction) has been associated with mentalising skills (e.g., the ability to infer others’ thoughts, beliefs, desires and emotions; Boerma, Mid & Jolles, 2017; Mar, Tackett, & Mosse, 2010). Oakley (2016) argues that fiction provides a unique simulation of the complex social world, allowing readers to practise mentalising skills as they interpret and the behaviours of characters. Experience of interacting mental states of fictional characters while reading may also facilitate children’s sophisticated narrative skills (e.g., the use of mental state terms).

OBJECTIVES

The current study aimed to examine the relationship between 9- to 12-year-old children’s experience of reading fiction and a range of narrative production skills, using concurrent data from Phase 1 of an ongoing longitudinal study. The study addressed two key research questions:

• How can individual differences in narrative production skills be explained?
  • It is possible that linguistic, discourse, and social cognitive aspects of narrative production cluster together as a single factor, or these skills may be dissociable.
• Do children who have more experience of fiction reading show more sophisticated narrative skills?
  • If fiction reading experience predicts narrative production, this is expected explained by individual differences in vocabulary, word reading, and metatalking.

MATERIALS AND METHODS

125 children (49% males; mean age 10.6 (± 2.12 months) completed a battery of tests assessing aspects of language, reading, and metatalking ability.

Fiction Reading Experience

Participants comprised a list of authors of children’s fiction interviewed with foils. Children check the names of authors that they recognize, marks deduced for foils checked. Book rejection test: children presented with series of key illustrations from classic and recent bestseller children’s fiction books. Two points awarded for each book title name; 1 point for other information about the book (e.g., details of story).

Reading habits questionnaire – four self-report items relating to fiction reading (e.g., “How often do you read fiction books?”)

Principal component analysis indicated that the measures of fiction reading experience loaded onto a single factor explaining 59% of the variance in the data (eigenvalue = 2.36; KMO = .77; Bartlett’s χ² = 125.45, p < .001).

Controlled variables

• Receptive Vocabulary (British Picture Vocabulary Scale III; Dunn, Dunn, & Lloyd, 2000)
• Mentalising (Strange Stories short-form; Happé, 1994)
• Word Reading (Single Word Reading Test; Hulme et al., 2010)

Narrative Production Skills

Children’s narratives were elicited from a wireless picture book (Frog, where are you?; Mayer, 1969). Narratives were audio-recorded and all-on-task utterances were coded for eight variables tapping different aspects of narrative skill.

RESULTS

Table 1: Narrative production coding scheme

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
<th>Cohen’s δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>Number of words produced</td>
<td>.64</td>
</tr>
<tr>
<td>Linguistic complexity</td>
<td>Proportion of complex (multi-clause) sentences</td>
<td>.81</td>
</tr>
<tr>
<td>Linguistic coherence</td>
<td>Mean length of utterance (morphemes)</td>
<td>.97</td>
</tr>
<tr>
<td>Semantic detail</td>
<td>Number of propositions recounted, of all indicated by illustrations (Norbury &amp; Bishop, 2003)</td>
<td>.80</td>
</tr>
<tr>
<td>Narrative coherence</td>
<td>Number of causal, temporal or adversative inter-clausal connections per proposition</td>
<td>.77</td>
</tr>
<tr>
<td>Mental-state language use</td>
<td>Score on bespoke scale (inclusive of event nurture, references to uncertainty, narrative)</td>
<td>.78</td>
</tr>
<tr>
<td>False belief narration</td>
<td>Sophistication of narration of false scenes (Berman &amp; Slinden, 1994)</td>
<td>.87</td>
</tr>
</tbody>
</table>

Table 2: Linear regression predicting scale scores from narrative production

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measure</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictors</td>
<td>R</td>
<td>R²</td>
<td>Δ R²</td>
</tr>
<tr>
<td>Productivity</td>
<td>.30</td>
<td>.09</td>
<td>.08</td>
</tr>
<tr>
<td>Linguistic complexity</td>
<td>.27</td>
<td>.08</td>
<td>.05</td>
</tr>
<tr>
<td>Linguistic coherence</td>
<td>.24</td>
<td>.06</td>
<td>.04</td>
</tr>
<tr>
<td>Semantic detail</td>
<td>.23</td>
<td>.05</td>
<td>.04</td>
</tr>
<tr>
<td>False belief narration</td>
<td>.22</td>
<td>.05</td>
<td>.04</td>
</tr>
</tbody>
</table>

Figure 1: Factor structure of narrative production variables

PCA indicated two narrative production factors explaining 77.53% of the variance in the data (KMO = .70; Bartlett’s χ² = 449.41, p < .001): narrative coherence and false belief narration. The two factors were significantly inter-correlated (r = .48, p < .001). PCA of false belief narration scores.

Figure 2: Scatterplots showing correlations between fiction reading experience factor and narrative variables

An ordinal regression model predicting false belief episode narration using fiction reading experience and the three covariates was a significant improvement on the intercept only model (χ² (4) = 10.71, p = .002; Pearson χ² (4) = 381.18, p = .000; Nagelkerke R² = .46). Fiction reading experience was the only significant predictor of false belief narrative scores.

CONCLUSIONS

Analysis of 125 narratives produced by 9- to 12-year-old children yielded two latent factors, relating to the levels of linguistic complexity and semantic detail present in the narratives respectively. Measures of narrative coherence and false belief narration were significant predictors of these factors. Children’s experience of fiction reading was a significant predictor of unique variance in two dimensions of narrative skill (level of semantic detail and false belief narrative).

These findings suggest that children who read more fiction are able to produce more sophisticated narratives when elicited from a wordless picture book. Specifically, fiction reading experience is associated with the ability to infer narrative detail from illustrations, including information about characters’ false beliefs, a common plot device. The fact that fiction reading experience continued to predict a small amount of unique variance in aspects of narrative production after the control variables were entered into the regression models indicates that the association is not explained by vocabulary, reading or metatalking skills. It is possible therefore that reading fiction plays a causal role in the development of sophisticated narrative production, by allowing children the opportunity to become familiar with story conventions (as well as complex vocabulary and grammatical structures; e.g., Montag & McDaid, 2015). However, longitudinal data are required to test this hypothesis.

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