STORYBOOK-READING INTERACTIONS AND THEIR ROLE IN PRESCHOOL-AGE CHILDREN’S LANGUAGE DEVELOPMENT

A thesis submitted to The University of Manchester for the degree of Doctor of Philosophy in the Faculty of Biology, Medicine and Health

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<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>4</td>
</tr>
<tr>
<td>List of Figures</td>
<td>5</td>
</tr>
<tr>
<td>List of Appendices</td>
<td>5</td>
</tr>
<tr>
<td>Thesis Abstract</td>
<td>6</td>
</tr>
<tr>
<td>Declaration</td>
<td>7</td>
</tr>
<tr>
<td>Copyright Statement</td>
<td>7</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>9</td>
</tr>
<tr>
<td>About the Author</td>
<td>10</td>
</tr>
<tr>
<td>Thesis Format</td>
<td>11</td>
</tr>
<tr>
<td>1. Chapter One: Introduction</td>
<td>12</td>
</tr>
<tr>
<td>1.1 Background</td>
<td>12</td>
</tr>
<tr>
<td>1.2 Overview of thesis structure</td>
<td>14</td>
</tr>
<tr>
<td>1.3 Theoretical framework</td>
<td>16</td>
</tr>
<tr>
<td>2. Chapter Two: Literature Review</td>
<td>20</td>
</tr>
<tr>
<td>2.1 Shared reading and language and literacy development</td>
<td>20</td>
</tr>
<tr>
<td>2.2 The role of abstract talk during shared reading in language and early literacy development</td>
<td>24</td>
</tr>
<tr>
<td>2.3 The role of parent and child factors in abstract talk during shared reading</td>
<td>44</td>
</tr>
<tr>
<td>2.4 The role of book type in abstract talk and language development</td>
<td>48</td>
</tr>
<tr>
<td>2.5 Literature gaps and research aims</td>
<td>56</td>
</tr>
<tr>
<td>3. Chapter Three: Two Predictors of Caregivers’ Abstract Language Use: Story Complexity and Child Engagement (Study 1)</td>
<td>59</td>
</tr>
<tr>
<td>3.1 Abstract</td>
<td>59</td>
</tr>
<tr>
<td>3.2 Introduction</td>
<td>60</td>
</tr>
<tr>
<td>3.3 Method</td>
<td>68</td>
</tr>
<tr>
<td>3.4 Results</td>
<td>76</td>
</tr>
<tr>
<td>3.5 Discussion</td>
<td>82</td>
</tr>
<tr>
<td>3.6 References</td>
<td>91</td>
</tr>
<tr>
<td>3.7 Appendices</td>
<td>97</td>
</tr>
<tr>
<td>4. Chapter Four: Story Choice Matters for Caregiver Extrapetual Talk During Shared Reading With Preschoolers (Study 2)</td>
<td>98</td>
</tr>
<tr>
<td>4.1 Abstract</td>
<td>98</td>
</tr>
</tbody>
</table>
List of Tables
Table 1 (Study 1): Home Reading Frequency, Socioeconomic Status, and Child Engagement .................................................................69
Table 2 (Study 1): Coding Scheme for Maternal Extratextual Talk ..................72
Table 3 (Study 1): Mean Percentages (Frequencies) of Maternal Extratextual Utterances Across Conditions, Divided by Utterance Type .........................77
Table 4 (Study 1): Spearman’s Correlations (ρ) Between Maternal and Child Variables and the Maternal Talk Variables of Interest ........................................78
Table 5 (Study 1): Estimated Fixed-Effects Coefficients, t-values, and p-values from the LMMs Fitted to all DVs .............................................80
Table 1 (Study 2): Home Reading Frequency and Socioeconomic Status ........106
Table 2 (Study 2): Text Complexity by Title ........................................108
Table 3 (Study 2): Coding Scheme for Maternal Level of Abstraction ..........115
Table 4 (Study 2): Coding Scheme for Maternal Follow Ups ......................116
Table 5 (Study 2): Descriptive Statistics (Proportions) for Maternal Extratextual Talk Variables by Story Context ............................................119
Table 6 (Study 2): Spearman’s Correlations (ρ) Between the Extratextual Talk Variables and Child Age and IMD Scores ..................................................120
Table 7 (Study 2): Estimated Fixed-Effects Coefficients, t-values, and p-values from the LMMs Predicting Maternal Extratextual Talk From Book Type ..........................122
Table 1 (Study 3): Children’s Sex Distribution, Mean Age, and Initial Vocabulary by Book Condition .................................................................148
Table 2 (Study 3): Examples of the Scripted Extratextual Utterances From Two Stories .................................................................................149
Table 3 (Study 3): Pretest and Posttest Means (Standard Deviations) by Language Measure and Reading Condition ..................................................152
Table 4 (Study 3): (G)LMMs Predicting Children’s Language Skills by Condition and Initial Language Skill .........................................................153
Table 5 (Study 3): Descriptive Statistics for Children’s Language Use by Story Condition .................................................................................156
Table 6 (Study 3): (G)LMMs Testing Effects of Condition and Class on Children’s Language Use During Shared-Book Reading .........................................156
Table 1 (Study 4): Home Reading Frequency and Socioeconomic Status ........179
Table 2 (Study 4): Descriptive Statistics for Children's Later Language Scores ....183
Table 3 (Study 4): Descriptive Statistics for Maternal Extratextual Talk Variables (Proportions) ..................................................................188
Table 4 (Study 4): Correlation Matrix for Maternal Extratextual Talk Variables and Initial BPVS Scores ................................................................. 194

Table 5 (Study 4): Correlation Matrix for Composite Extratextual Talk Variables, Child Language Skills, Child Age, and Maternal SES ............................................. 194

Table 6 (Study 4): Separate Hierarchical Regression Models Predicting Children’s Language Skills With Relevant Controls ........................................................... 195

Table 7 (Study 4): Overall Hierarchical Regression Models Predicting Children’s Language Skills With Relevant Controls ........................................................... 196

List of Figures


List of Appendices

Appendix 1 (Study 1): Complex and simple books ................................................................. 97
Appendix 1 (Study 3): Titles of the ten stories used ............................................................... 168
Appendix 2 (Study 3): Wordlist examples ............................................................................. 169
Appendix 1 (Study 4): Coding scheme for maternal level of abstraction ......................... 210
Appendix 2 (Study 4): Coding scheme for maternal follow ups ........................................... 211
Main appendix 1: Power considerations ............................................................................. 2532
Main appendix 2: Child Development peer reviews on Study 1 (“Two predictors of caregivers’ abstract language use: Story complexity and child engagement”) .... 253
Main appendix 3: Coding scheme for maternal extratextual talk ..................................... 258

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Thesis Abstract
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STORYBOOK-READING INTERACTIONS AND THEIR ROLE IN PRESCHOOL-AGE CHILDREN’S LANGUAGE DEVELOPMENT

Shared reading is widely considered beneficial for children’s language development. A key finding of the shared-reading literature to date is that variation in the quality of caregiver-child interactions during shared reading, and in particular caregiver abstract talk, is linked to preschool-age children’s language and early literacy skills. The purpose of this thesis was to address gaps in our knowledge about the quality of storybook-reading interactions with preschool-age children, and the influence of these interactions on language development.

Study 1 ($N=53$) investigated the influence of child engagement and story genre on caregiver abstract talk during shared reading, while also considering the role of socioeconomic status and other factors. Story genre was an important factor in influencing abstract talk, and child engagement was also highlighted as a potentially important factor. In Study 2, a re-analysis of the data showed effects of story genre on broader aspects of the caregiver interaction. Given these robust genre effects, Study 3 ($N=34$) tested whether exposure to two story genres and their associated levels of abstract talk leads to differential gains in children’s language skills. There were no effects of story condition on the post-test measures, but exploratory post hoc analyses showed an effect of story condition on children’s production of complex language.

To shed light on these findings and to understand better the role of caregiver interactions in children’s language development, Study 4 ($N=35$) investigated the relative contributions of caregiver abstraction and elaboration to children’s language skills. Results showed that only elaboration was positively associated with children’s concurrent vocabulary skills. In addition, there were few significant associations with children’s later skills. However, the pattern of results suggested that these two aspects of the shared-reading interaction may relate to different domains of children’s language development.

The above findings contribute to our knowledge about storybook-reading interactions and their role in preschool-age children’s language development. Recommendations are made for those designing and implementing shared-reading interventions.
Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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I am grateful to Prof Carol M. Connor (Associate Editor at Child Development), and three anonymous reviewers for valuable and constructive feedback on Study 1 of this thesis. I am also grateful to members of The Rowe Lab and others present at my talk for helpful feedback on Studies 2 and 3 of this thesis.

Special thanks to the participating families and schools.
About the Author

Amber is a qualified speech and language therapist. She assisted on several research projects prior to starting her PhD, and is currently a research assistant on the Trial of Healthy Relationship Initiatives for the Very Early-years (THRIVE) at the University of Manchester.

During her PhD, Amber received the Student Poster Award at the Economic and Social Research Council (ESRC) Research Methods Festival in 2016, and the Best Student Poster Award at the International Association for the Study of Child Language and the University’s Mabel Mansfield Cooper Prize in 2017. She also received the ESRC Overseas Institutional Visit Award in 2018 to conduct research on parent-infant book reading at Harvard Graduate School of Education in collaboration with Professor Meredith Rowe. She recently presented this work in a symposium at the Society for Research in Child Development (SRCD) Biennial Meeting in Baltimore MD, and has also submitted a paper for publication based on this work.
Thesis Format

This thesis is presented in journal (alternative) format. Four studies are presented as chapters in a format suitable for publication in a peer reviewed journal, and the Introduction and Discussion chapters are presented in the traditional thesis format. As acknowledged by the University’s presentation of theses policy guidelines, there may be some repeated information across sections of the thesis because of the journal format of this thesis. Details on power calculations are presented in main Appendix 1.

Additional notes:
Study 1 received valuable and constructive feedback from Prof Carol M Connor (Associate Editor at Child Development) and three anonymous reviewers (see main Appendix 2). On the basis of their comments, the decision was made to re-analyse the data in Study 2 to provide a fuller picture of caregiver interactions, and thus there is some overlap in the content of these two studies. Study 2 has now been submitted for publication in Journal of Child Language and is under review.

Study 2 was completed after Study 3, but it is presented as the second study to aid the overall cohesiveness of the thesis.

The thesis supervisors contributed to the thesis through discussions and by commenting on drafts of each chapter.
1. Chapter One: Introduction

1.1 Background

Over a quarter of children in England do not meet the expected level for language development on school entry (Department for Education, 2018), and reports show that language skills are on average lower among children experiencing social disadvantage (Law, McBean, & Rush, 2011; Letts, Edwards, Sinka, Schaefer, & Gibbons, 2013; Locke, Ginsborg, & Peers, 2002; Waldfogel & Washbrook, 2010). The negative consequences of low language skills are far reaching. Children’s early language skills relate to school readiness and later language and literacy, which in turn, affect later academic outcomes (Dickinson, Golinkoff, & Hirsh-Pasek, 2010; Duff, Reen, Plunkett, & Nation, 2015; Duncan et al., 2007; Hulme, Nash, Gooch, Lervåg, & Snowling, 2015; Lee, 2011; NICHD, 2005; Rowe, Raudenbush, & Goldin-Meadow, 2012; Walker, Greenwood, Hart, & Carta, 1994). Thus, interventions aimed at improving children’s language skills before school entry are crucial.

Parent-child book reading (often known as shared reading or shared-book reading, when the parent reads one-on-one to the child) is considered one context with potential for improving young children’s language skills. Over the past four decades, a large body of work has accumulated on shared reading and its relation to language and early literacy development (e.g., Bus, van IJzendoorn, & Pellegrini, 1995; Demir-Lira, Applebaum, Goldin-Meadow, & Levine, 2018; Hindman, Connor, Jewkes, & Morrison, 2008; Hindman, Wasik, & Erhart, 2012; Mol, Bus, de Jong, & Smeets, 2008; Mol & Bus, 2011; Payne, Whitehurst, & Angell, 1994; Senechal & LeFerve, 2002; Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013). Two key findings emerge from this work. First, the provision of a home literacy environment
(often measured by the frequency of home shared reading) is linked to preschool-age children’s oral language and early literacy skills (e.g., Bus et al., 1995; Mol & Bus, 2011; Payne et al., 1994; Sénéchal & LeFevre, 2002). Second, the benefits of shared reading for preschool-age children’s oral language and early literacy skills may at least in part depend on the quality of parent-child interactions in this context, often measured by the degree to which adults engage in interactions about the story rather than simply reading the text (e.g., Demir-Lira et al., 2018; Hindman et al., 2008; Hindman et al., 2012; Mol et al., 2008; Zucker et al., 2013). One aspect of these shared-reading interactions shown to be especially important for children’s language development is caregiver use of abstract talk, i.e., talk beyond the here and now, such as explanations and predictions about the story (Demir-Lira et al., 2018; Hindman et al., 2008; Hindman et al., 2012; van Kleeck, 2008; Zucker et al., 2013).

Yet although there is a relatively large body of research on abstract talk during shared reading and its relation to preschool-age children’s language and early literacy development, important gaps remain in the literature. Storybooks are the predominant genre shared with preschoolers both at home and in educational and childcare settings (Baldwin, 2015; Pentimonti, Zucker, & Justice, 2011; Price, van Kleeck, & Huberty, 2009; Robertson & Reese, 2017; Yopp & Yopp, 2006). However, very little is known about the role of different kinds of stories in abstract talk and in other potentially important aspects of the shared-reading interaction. Research is needed to inform us about the kinds of storybooks that might promote better quality interactions. Similarly, research is needed to assess the relative contributions of caregiver and child factors (such as socioeconomic status, and the child’s engagement, age and language abilities) to variation in these interactions. Studies 1 and 2 of this thesis aim to address these gaps.
Importantly, a growing body of work has shown that book genre more broadly (e.g., the informational genre vs. the story genre) can affect the quantity and nature of shared-reading interactions (e.g., Anderson, Anderson, Lynch, & Shapiro, 2004; Anderson, Anderson, Lynch, Shapiro, & Eun Kim, 2012; Price et al., 2009; Torr & Clugston, 1999). However, it is not yet known whether exposing children to certain genres and types of books (and their associated types of interaction) can lead to measurable gains in their language skills. Study 3 is an experimental study aimed at testing this. Finally, although positive relations are documented between variation in the quality of caregiver talk during shared reading (as indexed by the amount of caregiver abstract talk) and children’s language development (e.g., Demir-Lira et al., 2018; Hindman et al., 2008; Hindman et al., 2014; van Kleeck, Gillam, Hamilton, & McGrath, 1997), work is still needed to examine how various aspects of storybook-reading interactions relate to one another, and to tease apart which specific aspects are most beneficial for children’s developing language skills. Study 4 aims to address these gaps.

In summary, this thesis contributes to the research literature on shared reading and language development through four original studies addressing the gaps outlined. The findings presented here have implications for our understanding of shared reading as a context for language development, and for the design of shared-reading interventions.

1.2 Overview of thesis structure

The remainder of Chapter 1 introduces the theoretical framework for the thesis research, which has also served as the theoretical framework for much of the research contained in the literature review. Chapter 2 provides a literature review and a summary of the knowledge gaps before introducing the specific aims of the thesis.
The literature review provides a broad summary of the evidence on the role of shared reading in preschool-age children’s language and early literacy development (in Section 2.1). This is followed by a more detailed review of the existing literature in three main sections. Section 2.2 reviews the existing research on the role of abstract talk during shared reading in preschoolers’ language and literacy development. Section 2.3 summarizes what is known about the role of parent and child factors in the quality of shared-reading interactions, with a specific focus on abstract talk during shared reading. Section 2.4 reviews the existing research on the role of book type in abstract talk and language development. Gaps and directions for future research are outlined in each section. The final section of Chapter 2 (Section 2.5) concludes the literature review by summarizing the literature gaps and presenting the thesis research aims.

Chapters 3–6 contain the empirical research conducted as part of this thesis (presented as four studies in journal format). Chapter 3 presents an observational study investigating the influence of child engagement and story genre on caregiver abstract talk during shared reading, while also considering the role of socioeconomic status and other factors (Study 1). Story genre was identified as an important factor influencing abstract talk, and child engagement was also identified as a potentially important factor. Chapter 4 provides a more detailed examination of the same data, showing effects of story genre on broader aspects of the caregiver interaction (Study 2). Chapter 5 presents an experimental study that tested whether exposure to the two story genres and their associated levels of abstract talk leads to differential gains in children’s language skills (Study 3). There were no effects of story condition on the post-test measures, although exploratory post hoc analyses showed an effect of story condition on children’s language use. Chapter 6 presents an observational study
designed to increase our understanding of the role of caregiver interactions during shared reading in children’s language development by investigating the relative contributions of caregiver abstraction and elaboration to children’s concurrent and later language skills (Study 4). Results showed that only caregiver elaboration (and not abstraction) was positively associated with children’s concurrent vocabulary skills. In addition, there were few significant associations with children’s later skills. However, the pattern of results suggested that these two aspects of the shared-reading interaction may relate to specific domains of children’s language development.

Chapter 7 summarizes the main findings of the thesis, and discusses their implications for our knowledge about storybook interactions and their role in preschool-age children’s language development. Recommendations are made for those designing and implementing shared-reading interventions. Limitations are discussed and directions outlined for future research.

1.3 Theoretical framework

1.3.1 Social interactionist theory

Much of the empirical work reviewed here was conducted within a social-interactionist theoretical framework (e.g., Vygotsky, 1978; Wood, Bruner, & Ross, 1976), which posits that parent-child interactions shape children’s language development. Importantly, previous work has shown that differences in parent speech to children (e.g., hearing fewer words) predict their language development, and may mediate the influence of socioeconomic status (SES) on language development (see Hoff, 2006 for a review). For example, children from low-SES backgrounds are shown on average to be exposed to a smaller amount of linguistic input, less diverse vocabulary, less complex syntax, and more directive utterances
(Hart & Risley, 1999; Hoff, 2003; Hoff, Laursen, & Tardif, 2002; Hoff & Tian, 2005; Huttenlocher, Vasilyeva, Waterfall, Vevea, & Hedges, 2007; Walker et al., 1994). Such differences in input are found to predict children’s lexical and syntactic growth, and to mediate the effects of SES on vocabulary development in toddlers (Hoff, 2003, 2006; Huttenlocher et al., 2010; but see Sperry, Sperry, & Miller, 2019 for an alternative account of SES-related differences in child-directed speech).

Although the vast majority of such studies have been conducted in the United States, studies from the British context have also shown that aspects of adult speech such as responsiveness (e.g., utterances contingent on infants’ vocalisations) and lexical diversity predict children’s expressive language skills, controlling for the overall amount of parent speech and parent SES (e.g., d’Appice, Latham, & von Stumm, 2019; McGillion, Herbert, Pine, Keren-Portnoy, Vihman, & Matthews, 2013). These findings are encouraging for early language interventionists because they suggest that improving the linguistic environment will positively affect the language development of children from low-SES backgrounds whose language delay is thought to be linked to a less than optimal input (Hoff, 2013; McGillion, Pine, Herbert, & Matthews, 2017; Warren & Walker, 2005). An important consideration based on the findings of these studies is that it is not only the amount of input children hear that may play a role in their language development, but that it is also (and perhaps more importantly) the quality of that input (e.g., Peterson & McCabe, 1994; Rowe, 2012). A social interactionist framework is adopted in this thesis to examine the nature of storybook interactions and their role in children's language development.
1.3.2 Transactional framework of shared reading

A transactional framework of shared reading is also adopted in this thesis. Such a framework allows us to examine the role of caregiver and child factors, and the role of the story itself, in the quality of shared-reading interactions. Within this framework, the quality of shared reading depends on characteristics of the adult, child, and book (Fletcher & Reese, 2005; Pellegrini & Galda, 2003; Roser & Martinez, 1985; Sulzby & Teale, 1987; van Kleeck, 2003), and “the ‘match’ among the[se] three components” (Fletcher & Reese, 2005, p. 37). The quality of shared reading with young children is conceptualized by Fletcher and Reese (2005) as shown in Figure 1. The main advantage of using the transactional framework of shared-reading quality is that it encourages the consideration of adult, child, and book characteristics, and their influence on the quality of interaction over time (Fletcher & Reese, 2005; van Kleeck, 2003). Importantly, although relations between the amount and quality of the input and children’s language development (such as those described in the previous section) have been observed in US and British contexts, it is important to note that these findings may not be generalizeable to cultural and linguistic groups outside of those studied. For example, in the shared-reading literature, associations between specific aspects of parent reading styles and preschoolers’ language skills are shown to differ between American and Latino cultural groups (e.g., Caspe, 2009; Escobar, Melzi, & Tamis-LeMonda, 2017).
2. Chapter Two: Literature Review

2.1 Shared reading and language and literacy development

Shared reading is widely considered an important activity for children’s language and literacy development (Blake & Maiese, 2008; Dickinson, Griffith, Golinkoff, & Hirsh-Pasek, 2012; Dickinson & Tabors, 2001; Neumann & Neumann, 2009; Rhyner, 2009; van Kleeck, Stahl, & Bauer, 2003). Several meta-analyses support this view, suggesting that young children’s exposure to shared reading at home accounts for an estimated 8%–12% of variance in their later vocabulary skills (Bus et al., 1995; Mol & Bus, 2011; Scarborough & Dobrich, 1994). On the other hand, some researchers have argued that shared reading may play a less important role than factors such as socioeconomic status, especially when considering the effects of the frequency of shared reading as opposed to the more qualitative aspects of parental and child behaviours during shared reading (Scarborough & Dobrich, 1994).

Indeed, much research has shown that the quality of shared reading, especially in terms of the parent-child interaction, plays a role in children’s language development (Fletcher & Reese, 2005). From infancy, shared reading serves as a context for joint attention (i.e., where the adult and child simultaneously attend to the same referent) and labelling routines (e.g., the parent asks “what’s that?” and then labels the picture in the book), both of which are considered mechanisms for early vocabulary acquisition (e.g., Ninio & Bruner, 1978). Observational work shows that parents often engage in interaction with their young children during shared reading, providing labels and using simplification strategies (e.g., omitting and substituting difficult words and sentences, and repeating words) rather than directly reading book text with toddlers (e.g., Broen, 1972; DeLoache & Peralta de Mendoza, 1987;
Martin, 1998; Martin & Reutzel, 1999; Ninio & Bruner, 1978; Ninio, 1983; Sulzby & Teale, 1987), and using more challenging book-related talk such as prediction, print-focused talk (albeit to a small degree), explanations, and relating text-to-life with older, preschool-age children (e.g., Bus & van Ijzendoorn, 1988; Danis, Bernard, & Leproux, 2000; Martin, 1998; Martin & Reutzel, 1999). Importantly, the degree to which parents engage in such “extratextual” talk during shared reading is found to predict children’s later language abilities (e.g., Hindman et al., 2008; Hindman et al., 2014; van Kleeck, et al., 1997), even controlling for the amount of parent talk in other everyday contexts (Demir-Lira et al., 2018). Similarly, the degree to which teachers use extratextual talk during shared reading with young children is shown to predict preschoolers’ language and literacy skills into the early school years (controlling for reading frequency), whereas reading frequency is only associated with earlier, preschool language outcomes (Zucker et al., 2013). Thus investigating the nature of caregivers’ extratextual talk and its influence on children’s language development is a key focus of shared-reading research.

In line with the observational work, a relatively large body of experimental (intervention) work has shown greater gains for toddlers’ and preschoolers’ language skills when caregivers are trained to use specific reading styles that involve interactions beyond the reading of the text during shared reading. The most well-known of these shared-reading interventions is the dialogic reading approach (e.g., Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Falco, et al., 1988; Zevenbergen & Whitehurst, 2003). Developed by Whitehurst, Falco, et al. (1988) as a language intervention for preschoolers, in dialogic reading, rather than simply reading the text, caregivers are trained to use specific strategies to engage children in relatively concrete discussions about the story (i.e., talk about what is on the page) that are
expected to promote their language development (Zevenberg & Whitehurst, 2003). Such strategies include asking wh-questions (e.g., “what’s that?”) and open-ended questions (e.g., “what is happening on this page?”), and providing feedback (e.g., by expanding on what the child has just said and giving praise). Over the course of several dialogic reading sessions, demand on the child increases, and the storytelling role shifts from the adult to the child (Arnold, Lonigan, Whitehurst, & Epstein, 1994). During dialogic reading, there is a strong focus on supporting the child’s verbal participation, and on demonstrating sensitivity to the child’s interests (e.g., by following their lead) and to the child’s current level of ability (Whitehurst, Falco, et al., 1988). A meta-analysis of 16 experimental studies showed a moderate effect of dialogic reading over and above the effect of untrained (i.e., non-interactive) shared reading on the oral language skills of typically developing 2- and 3-year-olds, although this effect was much smaller for older preschool-age children and those from lower-SES backgrounds (Mol et al., 2008; also see Manz, Hughes, Barnabas, Bracaliello, & Ginsburg-Block, 2010 for another meta-analysis reporting similar findings).

One particular aspect of the adult-child shared-reading interaction argued to be especially important for vocabulary and early literacy development in older preschoolers is caregiver use of abstract talk, i.e., talk beyond the here and now, such as explanations and predictions about the story (van Kleeck, 2008). In her seminal ethnographic study, Heath (1982) investigated children’s early socialization to literacy at home in three American samples, which she described as a mainstream middle-class community and two working-class communities. Heath observed that caregivers in the middle-class community engaged in many decontextualized discussions, such as linking events from books to real life events and discussing
similarities and differences. By contrast, such decontextualized discussions were lacking in the two working-class communities. She also observed that, in contrast to the children from the middle-class community, those from the two working-class communities experienced difficulty engaging in similar types of classroom-based interactions once they started school, and then attained only limited academic success in the early school years. Heath theorized that the patterns of language used in these communities differentiated these three groups of children both in terms of their abilities to engage in decontextualized discussions in the classroom, and in terms of their later academic success. Heath’s early theoretical claims are supported by later empirical work documenting positive relations between variation in caregivers’ use of abstract or decontextualized language during shared reading and young children’s language skills (e.g., Hindman et al., 2008; Hindman et al., 2014; van Kleeck, et al., 1997). It is now argued that through such interactions, shared reading can help prepare preschool-age children for the demands of classroom interactions and lay the foundation for their later literacy skills, and in particular their story comprehension skills (van Kleeck, 2003, 2008).

Although there is now a relatively large body of research on abstract talk during shared reading and its relation to preschool-age children’s language and early literacy development, important gaps remain in the literature. The remainder of this chapter serves to provide an up-to-date picture of our knowledge on: the nature of abstract talk during shared reading and its role in preschool-age children’s language development (Section 2.2); the role of parent and child factors in abstract talk during shared reading (Section 2.3); and what is known about the role of book genre in abstract talk during shared reading and in children’s subsequent language learning.
(Section 2.4). The chapter ends with a critical summary of the gaps and the thesis research aims (Section 2.5).

2.2 The role of abstract talk during shared reading in language and early literacy development

One aspect of the extratextual talk considered important during shared reading is abstract representational language (henceforth abstract language), also referred to in the literature as *decontextualized language, non-immediate talk, inferential talk, high demand talk, challenging talk, complex language,* and *extended discourse* (Blank, Rose, & Berlin, 1978; Demir-Lira et al., 2018; DeTemple & Snow, 2003; Massey, 2004; Snow, 1991; Sorsby & Martlew, 1991; Tompkins, Bengochea, Nicol, & Justice, 2017; van Kleeck, 2003; van Kleeck et al., 1997). Abstract language is used by speakers to refer to characters, objects, experiences, and events beyond the immediate context. This contrasts with *concrete language* (also known as *contextualized language, immediate talk, literal talk, low demand talk, non-challenging talk, simple language,* and *non-extended discourse*), which is used to refer to the immediate, perceptible context (Blank et al., 1978; Demir-Lira et al., 2018; DeTemple & Snow, 2003; Massey, 2004; Snow, 1991; Sorsby & Martlew, 1991; Tompkins et al., 2017; van Kleeck, 2003; van Kleeck et al., 1997). Examples of abstract language include narrative, prediction, inference, explanations, and evaluations. Importantly, abstract language tends to require more sophisticated cognitive and linguistic skills than those needed to convey more concrete ideas, such as labelling or describing an object in the here and now (DeTemple & Snow, 2003). Whereas contextualized ideas can often be conveyed through pointing and short and simple utterances (e.g., “look at that”, “there’s a dog”), decontextualized talk often involves the use of more complex language, involving more sophisticated
vocabulary and grammar (e.g., “what did you do yesterday?”, “we left early because it was my birthday”, “did you think he was telling a fib?”), including “literate language features”, such as adverbs, conjunctions, and linguistic and mental state verbs (Curenton & Justice, 2004; Greenhalgh & Strong, 2001). In this sense, the “abstractness” of language can be viewed a multi-dimensional construct, as it refers to both the type of talk (e.g., inferences, predictions) and to the literate features of the language used (Curenton, Craig, & Flanigan, 2008).

Children’s ability to engage in abstract conversations is considered a prerequisite and an important predictor of their later literacy skills (Beals, 2001; Dickinson & Tabors, 2001; Peterson & McCabe, 1994; Snow, 1991), and a necessary skill for classroom-based interactions (van Kleeck, 2003). Importantly, children’s exposure to abstract language is found to predict their later expressive and receptive vocabulary and narrative skills (Beals, 2001; Demir-Lira et al., 2018; DeTemple, 2001; Dickinson & Porche, 2011; Dickinson & Smith, 2004; Peterson & McCabe, 1994; Rowe, 2012).

It is possible that abstract talk may be beneficial for children’s language skills because it provides a fertile ground for rich vocabulary and complex syntactic constructions (e.g., Curenton et al., 2008; Demir et al., 2015). However, one reason why abstract talk is focused on in the literature, and especially in research on parent-focused interventions, is that it may be easier and more effective to teach and encourage parents (and through parents, also their children) to use abstract language (e.g., discuss past activities and events) as compared to instructing them to use longer utterances, more complex syntactic constructions, and richer vocabulary. Thus in the present thesis, the primary variable of interest when assessing parent talk to children is their use of abstract language, and the primary outcome variable when
assessing the relation between parent talk and child language skill is children’s vocabulary skill (as this provides a general index of children’s language development).

**Abstract talk in shared-reading contexts**

Abstract talk as it occurs during shared reading is usually measured in terms of the total frequency of abstract utterances or as a proportion (i.e., the number of abstract utterances relative to the total number of extratextual utterances). Extratextual utterances are typically classified according to their level of abstraction in a mutually exclusive manner (i.e., only one classification per utterance), and based on the representational language scheme originally developed by Blank, Rose, and Berlin in 1978, which was later adapted to classify book-reading interactions (e.g., Danis et al., 2001; Sorsby & Martlew, 1991; Tompkins et al., 2017; van Kleeck, 2003; van Kleeck et al., 1997). Level 1 utterances involve matching perception (e.g., labelling and describing pictures in the book). Level 2 utterances involve selective analysis of perception (e.g., describing specific characteristics of objects or characters rather than the whole). Level 3 utterances involve reordering of representations (e.g., comparing different characteristics, referring to characters’ psychological states and making judgments, and linking text to life). Level 4 utterances involve reasoning about representations (e.g., making predictions and providing explanations). Of these four levels, Levels 1 and 2 are considered “concrete”, whereas Levels 3 and 4 are considered “abstract” (e.g., Sorsby & Martlew, 1991; Tompkins et al., 2017; van Kleeck, 2003; van Kleeck et al., 1997).

An example of this coding scheme with specific examples at each level of representational talk as adapted for the present thesis is shown in Appendix 3.
The amount and type of abstract talk used by caregivers is found to vary widely. For example, during a 90-minute observation of mother-child (3;6 years) interaction in a variety of contexts (mealtimes, book reading, toy play), one mother produced no explanation utterances, whereas another mother produced 46 (Rowe, 2012). Similarly large variation is reported from the shared-reading context specifically (e.g., Muhinyi & Hesketh, 2017; Nyhout & O’Neill, 2013; Price et al., 2009). Despite such wide individual variation, average differences are observed between interactional contexts. For example, shared reading has been found to facilitate higher levels of abstract talk by mothers than other activities, such as play-doh modeling (Sorsby & Martlew, 1991) and looking at a family photograph album (Korat, 2009).

In addition, caregivers are found to use abstract language during shared reading in a way that is particularly facilitative of children’s own participation in abstract conversations (Danis et al., 2001; Sorsby & Martlew, 1991). In an early study comparing mothers’ use of abstract talk during shared reading and a play-doh modelling activity with their children (3;7–4;6 years), Sorsby and Martlew (1991) found that not only did mothers use more abstract language (i.e., at Levels 3 and 4) during shared reading as compared to during the modelling task, but also that children’s responses to mothers’ higher demand requests (i.e., at Levels 3 and 4) during the shared-reading activity were on average more accurate than during the play-doh modelling activity. Furthermore, in a sequential analysis of shared-reading interactions, Danis et al. (2001) found that mothers increased the level of abstraction more often than did their preschool-age children, and that the level of abstraction of children’s utterances often depended on that of the mother’s previous utterance, and vice versa (e.g., the child’s utterance was more likely to be abstract if the mother’s
preceding utterance was abstract). Similar sequential patterns of interaction involving abstract talk (i.e., where adults’ abstract utterances are often followed by children’s talk at the same level of abstraction) are reported to occur in teacher-child shared reading in a group setting (Zucker et al., 2010).

Thus shared reading is considered a special context where adults stimulate children’s representational language abilities through the use of abstract talk, “creating a zone of proximal development” in which the child is led and supported by the adult to participate in such conversations (Danis et al., 2001, p.1). Given that abstract talk during shared reading is regarded as largely adult-led, in observational studies of shared reading it is often the case that only the caregivers’ extratextual talk is coded, and as might be expected, when both caregiver and child abstract talk are coded these are strongly positively correlated (e.g., Hindman et al., 2008). Interestingly, Blank et al. (1978) have suggested that caregiver use of abstract talk at a 1:3 ratio (abstract to concrete) may provide a suitable challenge for preschool-age children, but there is as yet no strong empirical evidence to support this recommendation.

2.2.1 Observational studies

Since Heath’s early seminal work theorizing a role for children’s early socialization in the use of decontextualized language in their academic success, a relatively large body of empirical work has accumulated that documents positive relations between variation in caregivers’ use of abstract language during shared reading and young children’s language skills. Observational research on the role of abstract talk in preschool-age children’s language and early literacy development can be divided into studies of parent-child shared reading and studies of preschool
shared reading (i.e., in the nursery classroom). These studies are reviewed below to provide an up-to-date picture of the literature and identify gaps for future research.

**Parent-child studies**

Haden, Reese, and Fivush (1996) used cluster analyses to identify reading styles in a sample of middle-class mothers during shared reading with their 3–5 year olds. They found that some mothers were predominantly *describers*, focusing on labelling and describing the pictures, whereas others were *comprehenders* or *collaborators*, who engaged in more decontextualized discussions about the story. They found that children of *comprehenders* and *collaborators* were more advanced in their receptive vocabulary, word recognition, and story comprehension skills on school entry, as compared to the children of *describers*.

Van Kleeck et al. (1997) investigated relations between parents’ language use during shared reading with their children (3;6–4;1 years) and children’s subsequent abstract language skills. Families were of middle and upper-middle SES. Parents’ extratextual talk was coded according to the four levels of abstraction described earlier in this section. Children’s abstract language skills were measured in the same session as the shared reading (at Time 1) by using a formal test of children’s use of abstract language (the Preschool Language Assessment Instrument; PLAI; Blank, Rose, & Berlin, 1978). Children’s language skills were again assessed one year later (at Time 2) using the same assessment. The authors reported that the frequency of parents’ utterances at Levels 1, 2, and 4 were significantly and positively correlated with children’s gains in the highest level of abstraction one year later (Level 3 utterances were positively correlated but this did not reach significance). These correlations ranged from moderate to large in size. The authors interpreted these findings within a Vygotskian framework, wherein adults scaffold their children’s
development of abstract language during shared reading through their own representational talk (particularly at the highest level of abstraction but also involving lower levels that the child may have already mastered). A limitation of this study is that the correlations observed might simply reflect the overall amount of language used during shared reading, rather than the importance of abstract input (i.e., because the overall amount of extratextual talk was not controlled in their simple correlation analyses).

In the Home-School Study of Language and Literacy Development (Dickinson & Tabors, 2001), DeTemple (2001) examined relations between adults’ different types of talk during shared reading and children’s later language and literacy skills in a low-income sample of 54 families. Mother-child dyads were observed several times during shared reading when children were aged 3–5 years old, and children’s language skills were assessed at kindergarten age (i.e., at 6 years) by using the School-Home Early Language and Literacy Battery-Kindergarten (SHELL-K; Snow, Tabors, Nicholson, & Kurland, 1995). In this sample, the frequency of “immediate” talk was not significantly related to children’s later skills, but the percentage of such talk was significantly negatively related to children’s later language and literacy skills (i.e., their picture description, emergent literacy, and receptive vocabulary skills). By contrast, mothers’ use of “non-immediate” talk (both frequency and percentage) was significantly positively related to children’s later language and literacy skills (i.e., superordinates, story comprehension, emergent literacy, and receptive vocabulary). Correlations varied from moderate to large in size.

In a large sample of middle- and working-class families (N = 134), Hindman et al. (2008) found that both caregiver (parent and teacher) and child
“decontextualized” talk during shared reading at the start of the preschool year predicted children’s expressive vocabulary scores at the end of the year, and that this relation was stronger for children with lower initial vocabulary skills. By contrast, “contextualized” talk was not associated with vocabulary scores for children with lower initial skill, and was negatively associated with later vocabulary scores for children with higher initial skill. Code-related talk occurred only infrequently and was not associated with children’s language skills. In an even larger study of approximately 700 families of diverse SES, Hindman et al. (2014) found that mothers who were more highly educated used more “meaning-related” talk (i.e., contextualized and decontextualized talk about the story) during shared reading with their children aged 44–62 months, and that the use of such talk, and the use of a wider variety of such talk, predicted children’s concurrent receptive vocabulary skills. Interestingly, when different aspects of meaning-related talk were analysed separately, talk relating the story to the child's own life predicted receptive vocabulary skills, whereas talk recalling and summarizing parts of the story negatively predicted receptive vocabulary skills. As in Hindman et al. (2008), code related talk (e.g., about the printed text) occurred only infrequently and was not associated with children’s language skills.

Recently, Tompkins et al. (2017) investigated mothers’ use of extratextual talk during shared reading with their 3–5 year old children. In contrast to previous research on this topic, they coded maternal utterances by their function (i.e., wh-questions, yes/no questions, and statements) as well as by their level of abstraction (i.e., “literal” vs. “inferential”), and examined their relation to children’s receptive vocabulary skills 6 months later. They found that mothers’ inferential yes/no questions and inferential statements predicted children’s vocabulary skills.
(controlling for their earlier vocabulary skills, frequency of reading, and maternal education), whereas inferential wh-questions and literal utterances of any function did not. The authors suggested that one possible reason for the lack of a relation between inferential wh-questions and children’s vocabulary skills is that inferential wh-questions (as opposed to inferential statements) request information from the child, but do not provide the requested information. Given their findings, they also suggested that examining abstract extratextual talk without consideration of utterance function might not provide a clear picture of its role in children’s developing language abilities.

**Preschool-setting studies**

Similar findings of a relation between adults’ abstract talk during shared reading and children’s language skills are reported from observational studies of shared reading in preschool contexts. As part of the Home-School Study of Language and Literacy Development (Dickinson & Tabors, 2001), Dickinson and Smith (1994) found that teachers’ use of child-involved “analytic talk” in low-income preschool classrooms predicted children’s receptive vocabulary and story comprehension one year later, controlling for the amount of talk and book reading frequency. In a recent re-analysis of the same data, Dickinson and Porche (2011) reported that this same analytic talk observed during shared reading in preschool classrooms predicted children’s receptive vocabulary into the fourth grade, and that this relation was mediated by children’s earlier receptive vocabulary. Thus, the level of abstraction is an important predictor of preschool-age children’s language and emergent literacy across different SES groups.

Hindman et al. (2012) investigated the relations between different types of extratextual talk used by Head Start teachers from 15 classrooms with preschoolers
from low-SES backgrounds \( (N = 153) \). They found that both contextualized and decontextualized talk (respectively) used during shared reading at the start of the school year predicted children’s receptive vocabulary skills at the end of the school year, controlling for children’s earlier receptive vocabulary skills. However, they found that the positive relation between contextualized talk and vocabulary skills was stronger for children with lower initial language skills.

Zucker et al. (2010) investigated the role of teachers’ inferential and literal questions during classroom based shared reading on preschool-age children’s vocabulary growth. One hundred and fifty nine children (across 25 classrooms) were observed during whole-class shared reading. Children’s receptive and expressive vocabulary skills were assessed at the start and end of the school year. Contrary to the authors’ expectations, neither inferential nor literal questions were significant predictors of children’s expressive and receptive vocabulary skills at the end of the school year controlling for children’s earlier skills, although there was a non-significant interaction that suggested a possible trend toward inferential questions being beneficial for children with higher initial skill. The authors suggested that caregiver follow ups to children’s responses to inferential questions (not coded in their study) should be studied in future research, as these may be more important than inferential questions alone.

2.2.2 Experimental studies

In addition to the growing body of observational work documenting a relation between caregiver abstract talk during shared reading and children’s language development, some researchers have sought to test effects of reading styles that involve the use of abstract talk on children’s language skills. These studies fall into three main categories: 1) those mainly focused on training caregivers to use
more abstract talk but where the effects of this on children’s language skills or language production is also examined; 2) those focused on assessing the effects of a reading style characterized by a certain degree of abstract extratextual talk on children’s language skills as assessed by standardized measures; and 3) those focused on assessing the effects of abstract vs. concrete extratextual utterances on children’s word-learning (of specific target words) in the context of tightly controlled experiments. These studies are reviewed below in turn.

**Training studies**

Using a multiple-baseline design, Morgan and Goldstein (2004) conducted a study in which they trained five mothers of low-SES backgrounds to use decontextualized language with their preschool-age children during shared reading. They investigated the effects of their training on mothers’ and children’s use of decontextualized language during shared reading, and on children’s decontextualized language skills as measured by a published measure of literal and inferential language use (the PLAI). After baseline, caregivers received multiple training sessions, each of which involved teaching on how to use a specific decontextualized language strategy (i.e., text-to-life utterances, explanatory talk, and interpretation). In their study, explanatory talk referred to the provision of definitions and “categorical descriptions” (e.g., describing similarities and differences), whereas interpretations referred to talk involving predictions, references to characters’ psychological states, and explanations about characters’ motivations. Mothers received training in the use of each strategy in counterbalanced order. Following a baseline reading session, the training procedure involved explaining the strategy, watching a videotape of the strategy being used, modelling from the researcher, supported practice (using scripts in storybooks), and practice in reading to child without the supportive scripts. The
training phase ended once the mother had demonstrated six instances of the target behavior during the unsupported reading phase. The main dependent variables were the frequency of use for each of the three decontextualized strategies trained (which were measured both during and one month after the intervention). Results showed that at baseline the five dyads used very little or no decontextualized language. During the intervention, mothers increased in their use of the specific decontextualized strategies, and this was also followed by an increase in children’s use of the same decontextualized strategies. Descriptive statistics of children’s pre-to post-test PLAI scores suggested possible gains in aspects of children’s abstract language skills after the intervention (although the sample size was too small for any conclusions to be drawn). Interestingly, the decontextualized language strategy of using text-to-life utterances was used more frequently than the other two strategies (i.e., explanatory talk and interpretation) by both mothers and children in this study, which may suggest that this particular strategy is easier to teach and incorporate during shared reading. In support of this interpretation, an earlier and similarly small-scale study reported similar findings of mothers successfully incorporating text-to-life utterances in their shared-reading interactions, and more verbalizations from children as a result (Hockenberger, Goldstein, & Sirianni Haas, 1999).

More recently, Rezzonicco et al. (2015) investigated the effects of individualized coaching alongside standard workshop training sessions for educators to increase their use of complex language during shared reading with preschool-age children. The coaching programme involved a speech and language therapist providing individualized feedback on teachers’ use of interactive strategies during five video-recorded shared-reading sessions, which occurred after the workshop sessions. Compared to a workshop-only control group, both educators and children
in the coaching programme group demonstrated greater gains in their linguistic complexity during shared reading at the end of the 6-month program. Specifically, in the individualized coaching group, educators produced more inferential reasoning questions (e.g., inferences, predictions, and explanations) and children produced more experiential reasoning responses (i.e., text-to-life references) and had longer mean length of utterance. The authors did not measure the effects of the intervention on children’s vocabulary or narrative skills.

**Studies on the effects of an abstract reading style**

Another set of studies has shown that adults engaging in scripted interactions based on caregivers’ distinct naturally occurring reading styles (e.g., styles characterized by describing the pictures vs. those using higher level talk and focused on story meaning) can lead to differential gains in children’s language outcomes. Based on earlier correlational work by Haden et al. (1996) in which several reading styles were identified (e.g., describer, comprehender), Reese and Cox (1999) conducted a six-week intervention to investigate the relative benefits of three different styles of extratextual talk during shared reading on children’s language development. Preschoolers were randomly assigned to one of three intervention groups, in which they participated in one-to-one shared reading with an adult who used: 1) a *describer style* (highly contextualized, focused on the describing the pictures; 2) a *comprehender style* (focused on the meaning of the story, and thus more abstract or decontextualized); or 3) a *performance-oriented style* (similar to the comprehender style but with discussion occurring after the story had been shared). During the intervention, trained adults read in each of the styles using scripted storybooks. Children’s vocabulary, print, and story comprehension skills were assessed at pre- and post-test. Interestingly, the authors found that the describer style
(i.e., highly contextualized language use) was most beneficial for children’s vocabulary and print skills. However, once children’s initial vocabulary skills were taken into account, the describer style led to greater vocabulary gains for children with lower initial skills, whereas a performance-oriented style led to greater gains for children with higher initial skills.

Van Kleeck, Vander Woude, and Price (2006) investigated the effects of abstract language during shared reading on children’s vocabulary and narrative skills. Specifically, they assessed whether preschoolers with low language skills (aged 3;10–5;0 years) benefitted from an eight-week shared-reading intervention in which they were exposed to stories that contained scripted questions read by adults. These authors used a randomized pre-posttest control group design, and tested the effects of the intervention on children’s receptive vocabulary (scores on the Peabody Picture Vocabulary Test, PPVT; Dunn & Dunn, 1997) and on their language use (as assessed by the PLAI). Children’s language abilities were assessed at two-weeks pre-and post-test. Children in the intervention group participated in one-on-one shared reading for 15-minutes twice weekly, whereas children in the control group did not participate in shared reading as part of the study (and did not receive an attention-control activity). Approximately 30% of the scripted questions were inferential (i.e., Levels 3 and 4), and the remaining questions were literal (i.e., Levels 1 and 2). Three different versions of the scripts were created for each of the two books used during the eight-week intervention. Adults provided prompts and expansions on children’s responses to questions during the reading sessions. Significant differences (moderate-to-large in size) were found between the intervention and control group children on their receptive vocabulary scores and on their language use (both literal and inferential). The authors concluded that exposing children to literal and
inferential questions for a relatively short shared-reading intervention can lead to gains in their literal and inferential language skills. A major limitation of this study is that greater gains in the intervention group may have resulted from exposure to shared reading and/or one-to-one attention and interactions with an adult, rather than from exposure to the scripted inferential and literal questions (and prompts and expansions) used during the story readings. Inclusion of a reading control group, where children were exposed to a more concrete overall level of extratextual talk, would be necessary to attribute these effects to the abstract extratextual talk to which children were exposed.

**Studies comparing effects of abstract vs. concrete talk**

In addition to the above reviewed intervention studies, several researchers have sought to investigate the benefits of abstract extratextual talk relative to concrete extratextual talk for preschool-age children’s word-learning using more tightly controlled experimental designs. Using a within-subjects design, Justice (2002) compared the effects of trained adults’ use of “perceptual” vs. “conceptual” questions (i.e., concrete vs. abstract respectively) about novel words in storybooks on children’s expressive and receptive vocabulary learning, while also comparing the effects of labelling vs. questioning in a second experimental condition. Twenty-three preschool-age children were twice exposed to shared reading with a trained adult during a one-week period. The results showed that children learnt the meaning of a greater number of novel words from the labelling condition as compared to the questioning condition (although no such differential effects were reported for expressive vocabulary skills). Interestingly, children’s novel vocabulary learning did not differ depending on the level of abstraction of the questioning.
More recently, Blewitt, Rump, Shealy, and Cook (2009) conducted a series of experiments to investigate the effect of cognitive demand (i.e., low vs. high) questions, the placement of questions (i.e., interrupting the story vs. at the end of the story), and “an approximation to scaffolding” in question use on preschool-age children’s word learning from storybooks. In a between-subjects design, trained adults read stories one-to-one to children in four shared-reading sessions over a six-week period. Children were assigned to conditions and their vocabulary development was measured by a word-definition task at post-test. Interestingly, the first experiment showed that neither the demand (high vs. low) nor the placement of questions had a differential effect on children’s learning of unfamiliar words (although children exposed to either the high-demand or low-demand question condition learnt more words than children in a control condition who were exposed to stories and extratextual talk that did not involve any of the target words). The second experiment showed that children in a scaffolding condition, in which children were asked low- and then high-demand questions (in a “scaffolding-like procedure”), demonstrated greater word learning than those in the high- or low-demand conditions (and all three groups outperformed the control group). These results highlight the role of both high- and low-demand questions in children’s vocabulary development, and especially when these occur together in a way that shows sensitivity to children’s abilities in children’s word-learning (i.e., in the mixed condition).

2.2.3 Summary and critical discussion

The observational studies reviewed here support the claim that preschool-age children’s exposure to more abstract talk during shared reading is beneficial for their vocabulary and narrative skills (e.g., DeTemple, 2001; Dickinson & Porsche, 2011;
Dickinson & Smith, 1994; Haden et al., 1996; Hindman et al., 2008; Hindman et al., 2012). There is also evidence that a more abstract reading style may be of greater benefit for children with higher levels of initial language skills (Zucker et al., 2010), whereas a more concrete style may be of greater benefit for children with lower initial language skills (Hindman et al., 2012; Zucker et al., 2010).

By contrast, the experimental literature is less clear on the effects of abstract vs. concrete talk on children’s language skills. Experimental studies that have compared the effects of exposure to only abstract or only concrete utterances have not found one to be more beneficial than the other (Blewitt et al., 2009; Justice, 2002). However, those that have tested the effects of a mixture of both abstract and concrete talk (e.g., based on scripts in the storybooks) on children’s vocabulary skills have found effects above those from exposure to only abstract or only concrete questions (Blewitt et al., 2009), and above the effects of no intervention (van Kleeck et al., 2006). An exception to this finding comes from Reese and Cox’s study, which showed that for children with higher initial vocabulary gains, a style characterized by only abstract utterances which occurred at the end of the story (i.e., “a performance-oriented style”) led to greater gains in vocabulary skills than a style characterized by only concrete talk (i.e., “a describer style”). Interestingly, a similar interaction was not observed for the “comprehender style” (also characterized by abstract talk but occurring during the story rather than at the end).

Together, these studies seem to suggest that although abstract talk is important for children’s developing language abilities (and more is better), a mixture of both abstract and concrete talk is needed for children to learn most effectively from the shared-reading context. In addition, both the observational and experimental studies suggest that an abstract reading style may be more beneficial
for children with higher levels of initial vocabulary skill (Reese & Cox, 1999; Zucker et al., 2010; but see Hindman et al., 2008 for an exception), whereas a more concrete style may be of greater benefit for children with lower initial language skills (Hindman et al., 2012; Reese & Cox, 1999; Zucker et al., 2010). More experimental work is needed to better understand the role of abstract talk during shared reading in preschool-age children’s vocabulary and broader language development.

Another important issue arising from the literature reviewed here is the role of utterance function. Most of the previous observational research on the role of abstract talk during shared reading has focused on the overall level or amount of abstract talk and its relation to children’s language development, as opposed to also considering individual utterance functions (e.g., questions, comments) or the overall style of the abstract talk (e.g., an elaborative style that invites the child’s participation vs. providing a commentary on the text). By contrast, the experimental literature has tended to focus on the role of abstract vs. concrete questions, as opposed to different utterances types (Blewitt et al., 2009; Justice, 2002). In the broader research literature, studies have shown that questions, and in particular wh-questions (e.g., what, why, how questions), are beneficial for toddlers’ and preschool-age children’s language development (e.g., Cristofaro & Tamis LeMonda, 2012; Hoff-Ginsberg, 1985; Rowe, Leech, & Cabrera, 2017; Rowland, Pine, Lieven, & Theakston, 2003). Furthermore, encouraging “what” questions during shared reading, as in the dialogic reading approach, is shown to lead to greater gains in children’s vocabulary than untrained shared reading (Lonigan & Whitehurst, 1998; Lonigan et al., 1999; Valdez-Menchaca & Whitehurst, 1992; Whitehurst et al., 1994). Given such findings, some researchers reason that more challenging “abstract” questions might be of special benefit for the language development of
older preschool children (Massey, 2004; Massey, Pence, Justice, & Bowles, 2008; Zucker et al., 2010). However, there is only limited evidence from the observational literature for one specific function (e.g., questions) being especially beneficial (Tompkins et al., 2017; Zucker et al., 2010). Similarly, the experimental literature does not provide any consensus on whether abstract questions are likely to be more beneficial than comments during shared reading, although several studies are based on the assumption that abstract questions are especially important (e.g., Blewitt et al., 2009; van Kleeck et al., 2006; Zucker et al., 2010).

Perhaps more important than one particular function of abstract utterance is the style of the caregiver extratextual talk. For example, a style characterized by questions and follow ups that both appraise and elaborate on children’s responses might provide a context for discussions on abstract topics to unfold and may predict children’s language outcomes over and above the effects of the sheer amount or overall level of abstraction. Indeed, qualitative work on abstract or extended talk has documented that abstract talk (e.g., explanations and narrative) often extends over multiple speaker turns, and often involves the caregiver asking questions and following up on children’s responses to extend the interaction (e.g., Gosen, Berenst, & de Glopper, 2013; Snow & Beals, 2006). Furthermore, in a study with school-age children, Mascareño, Snow, Deunk, and Bosker (2016) examined the relation between teachers’ talk during classroom read-alouds in Chilean kindergarten classrooms (serving children from low-SES backgrounds) and children’s concurrent receptive vocabulary and symbolic understanding skills. In addition to coding abstract talk by utterance (i.e., inferential vs. literal), they also coded the interaction at discourse level by identifying interactional patterns (i.e., recurring patterns of different types of utterances). They found that both the proportion of teachers’
inferential talk and the occurrence of “mixed patterns” (i.e., a series of teacher-child turns involving both concrete and abstract utterances) predicted children’s concurrent vocabulary knowledge and symbolic understanding.

These studies suggest that abstract discussions occur over multiple turns and often involve talk at different levels of abstraction, and that such discussions are facilitated by adults asking questions and responding in sensitive ways to children’s responses. Thus, it might be expected that a more elaborative style of caregiver extratextual talk (i.e., one characterized by the use of more questions and follow ups on child responses) provides a context for abstract talk to occur, and that such an elaborative style could be a stronger predictor than the sheer level of abstraction for children’s language outcomes. In addition, experimental research has shown that caregiver use of an elaborative style (outside of the shared reading context) can benefit toddlers’ and preschool-age children’s oral language skills (e.g., Levickis, Reilly, Girolametto, Ukoumunne, & Wake, 2014; Reese, Leyva, Sparks, & Grolnick, 2010). Given these findings, research is needed to examine more closely the role of different aspects of the extratextual talk in preschool-age children’s language development (and possible interactions with children’s initial skill levels). Such research can better inform shared-reading interventions for preschool-age children.

A final important conclusion of the studies reviewed here is that caregivers can be taught to use more abstract talk during shared reading, although there is some suggestion that certain types of abstract talk may be used less readily than others (e.g., explanatory and inferential talk as compared to text-to-life). Thus, future research could focus on identifying ways to support the use of specific types of abstract talk (e.g., higher level reasoning, such as predictions and explanations). Future research could also investigate the relative benefits of different types of
abstract talk (e.g., a style involving higher vs. lower level abstract talk) for children with different levels of skill.

2.3 The role of parent and child factors in abstract talk during shared reading

This section reviews the existing literature and provides a critical discussion on what is known about the role of parent and child factors in abstract talk during shared reading. The section is divided into research on the role of SES and caregiver factors, the role of child age and language abilities, and the role of child engagement in abstract talk during shared reading.

2.3.1 Socioeconomic status and related parent factors

As in the broader literature on contextual influences on child language development (see Hoff, 2006 for a review), shared-reading research has focused on the role of SES in adult-child interactions during shared reading. Socioeconomic status is often measured by maternal education (by itself or as one of a number of indices such as income and occupation), as education is considered the key aspect of SES that relates to the quality of the parent-child interaction (see Hoff, Laursen, & Bridges, 2012 for a review). In line with the broader literature, observational studies of shared reading have found that compared to caregivers from mid- and high-SES backgrounds, those from lower-SES backgrounds use on average fewer text-to-life utterances and other types of distancing strategies. Korat, Klein, and Segal-Drori (2007) observed mid- and low-SES groups of mothers and their 5-year-old children sharing books (N = 84). They coded maternal talk according to its level of mediation (levels corresponding to low- to high-abstraction). They found that compared to the mid-SES group, mothers in the low-SES group engaged in fewer high-mediation strategies (e.g., print references and connections to real life), and paraphrased the
text more often (which, in their study, was considered a low-level mediation strategy). They concluded that mothers in the low-SES group were less sensitive to the developing abilities of their 5-year-old children. Similarly, Vandermaas-Peeler, Nelson, Bumpass, and Sassine (2009) found that compared to mothers from low-SES backgrounds, mothers from mid-SES backgrounds in their study used more teaching behaviours (such as asking questions and providing feedback) and made more text-to-life references during shared reading. Similar findings of less abstract talk by caregivers in low- vs. higher-SES groups have been reported in other studies (e.g., Baker, Mackler, Sonnenschein, & Serpell, 2001; Bus & van Ijzendoorn, 1995; Korat, 2009; Peralta de Mendoza, 1995; Peralta de Mendoza & Salsa, 2001), suggesting that, similar to in other interactional contexts, SES-related differences exist in caregiver input to children during shared reading. Interestingly, lower language and emergent literacy abilities among children of low-SES backgrounds have been attributed to such SES-related differences in caregiver input (e.g., Heath, 1982; Korat et al., 2007; Ninio, 1980). In sum, these studies suggest an important role for SES in caregiver use of abstract language during shared reading.

### 2.3.2 Child age and language abilities

Existing research suggests a role for the child in their exposure to abstract language during shared reading. Caregivers are found to use largely concrete and attention-maintaining strategies during shared reading with infants, in contrast to more abstract language in their extratextual talk to children during the preschool years (Martin, 1998; Martin & Reutzell, 1999; Sénéchal, Cornell, & Broda, 1995). This suggests that caregivers are sensitive to the age and/or developmental stage of the child in their use of abstract language. Empirical research also suggests that caregivers may increase the proportion of their extratextual talk that is abstract
across the preschool years, i.e., from ages 3- to 4- to 5-years of age (DeTemple, 2001; van Kleeck et al., 1997). There is also some evidence to suggest that the child’s current language abilities influence how much abstract language caregivers use. Children with language disabilities compared to their typically developing peers are found to be exposed to more concrete language on average during shared reading and in other activities (see van Kleeck & Vander Woude, 2003 for a review). However, research examining the influence of typically developing preschool children’s age and/or language abilities on caregiver use of abstract language is scarce.

2.3.3 Child engagement

Children’s engagement is also suggested to play a role in caregiver use of abstract language. It is likely that an attentive child will be more easily engaged in extended discourse and may themselves request explanations from the caregiver (Rowe, 2012). In support of this idea, recent studies have reported moderate-to-strong relationships between toddlers’ engagement and caregiver use of beneficial interactive behaviours such as prompts, recasts, and labelling (Deckner, Adamson, & Bakeman, 2006; Fletcher et al., 2008; Malin, Cabrera, & Rowe, 2014; but for an exception see Crain-Thoreson & Dale, 1992). Although child and adult behaviours are likely to exert bidirectional effects on one another (e.g., Curby, Downer, & Booren, 2014; Gros-Louis, West, & King, 2016), these studies suggest that young children’s opportunities for learning from the extratextual talk during shared reading may in part be driven by their own engagement skills, as greater engagement is associated with a richer quality of input. However, evidence is lacking about the role of child engagement in caregiver use of abstract language with preschool-age children during shared reading. Importantly, recent experimental work has shown
that child engagement in shared reading is malleable to change, in that it can be promoted in relatively simple ways such as by choosing books with bright or interesting illustrations, letting the child turn the pages, and reading at a time when the child is motivated to engage (Ortiz, Stowe, & Arnold, 2001). Thus, in addition to more stable factors such as the child’s age and level of abilities and parent SES, it is important to consider the role of child engagement in caregiver abstract talk during shared reading. Importantly, child engagement could be a potential target for interventions aimed at increasing the use of abstract talk during shared reading.

2.3.4 Summary and critical discussion

In line with the broader literature, observational studies of shared reading have found that compared to caregivers from mid- and high-SES backgrounds, those from lower-SES backgrounds use on average fewer text-to-life utterances and other types of abstract talk (Baker et al., 2001; Bus & van Ijzendoorn, 1995; Korat, 2009; Korat et al., 2008; Peralta de Mendoza & Salsa, 2001; Vandermaas-Peler et al., 2009), suggesting an important role for SES in the use of abstract language during shared reading. Importantly, these studies examining the role of caregiver SES on abstract talk during shared reading have typically used a grouping design and statistical approach (i.e., comparing groups from differing SES backgrounds using t-tests or analysis of variance), which does not allow adequate consideration of the role for other potentially important factors (e.g., child factors). Thus, although these studies are informative about the need for shared-reading interventions targeting children at developmental risk because of low SES, they do not inform us about the role of child factors such as language abilities, age, and engagement in caregiver use of abstract language during shared reading. Understanding the role of each of these factors could inform us about how to encourage abstract language use during shared...
reading among low-SES populations. For example, if child engagement influences how much caregivers use extratextual talk involving abstract language, then child engagement could be an important initial target in shared-reading interventions.

2.4 **The role of book type in abstract talk and language development**

A wide choice of books exists for children, parents, interventionists, and educators, having potential implications for shared-reading interventions designed to promote preschoolers’ language and literacy skills. The choice of book may be important for several reasons. First, from a practical standpoint, child interest in the book is clearly important, as whether the book appeals to the child is likely to affect their engagement in the shared-reading session (Fletcher & Reese, 2005). Some kinds of books may be more appealing to children (Kucirkova, Messer, & Whitelock, 2012; Robertson & Reese, 2017; Wagner, 2017), and thus may affect child engagement. For example, Kucirkova et al. (2012) found that compared to non-personalized books, personalized books (e.g., containing pictures of the participants) facilitated greater nonverbal engagement from children (and more frequent affective behaviours from parents). Second, according to the transactional model of shared reading, the adult-child linguistic interaction could also be affected by features of the specific book shared (Fletcher & Reese, 2005). Thus, crucially, if some books are better than others at facilitating interaction in general and specific types of interaction, these books could be used in interventions to support different aspects of children’s developing linguistic and cognitive abilities. Finally, the book text itself may be important as a source of linguistic input. For example, recent work has shown that books often contain more complex constructions and lexically sophisticated and diverse vocabulary than everyday child-directed speech (Cameron-
Until recently, the role of book genre in parent–child interactions had received little research attention (Aram, 2008; Pellegrini & Galda, 2003; van Kleeck, 2003). However, a growing body of empirical work over the past 10 years now shows that the type of book shared can affect the linguistic interaction that occurs between adults and preschoolers. This section reviews the literature to date on the role of print book genres and characteristics on interaction during shared reading with young children, with a particular focus on abstract talk with preschoolers when sharing commercially available picturebooks.

Before moving on, it is worth pointing out that some researchers have recently begun investigating the role and possible benefits of e-books for children’s language and literacy development (see special issue on ‘Reading in the 21st Century’, Rvachew & Kurcivoca, 2017). Yet interestingly, although tablets and touch-screen devices are used at home by an estimated three quarters of 3–4 year old children in the UK (Ofcom, 2015), parents still report a strong preference for print books over e-books (Strause & Ganea, 2017; Scholastic, 2015), as well as reporting higher rates of enjoyment from their children with print over e-books books (Strause & Ganea, 2017). In a similar vein, parents from a large scale nationally representative study in the US report that their children spend far less time using e-books as compared to print books (Rideout, 2013), with parents reporting approximately 30 minutes spent using print books compared to just 5 minutes spent using e-books on average per day by their children aged 2–10 years (Rideout, 2014). Thus, although reading e-books with young children is an important and fruitful area of research, print books remain the main source of many young children’s shared-
reading experiences, and the quality of shared reading with print books remains a relevant topic.

2.4.1 Genre comparisons with preschoolers

Several research groups have conducted experimental studies comparing adult-child shared-reading interaction (in particular, maternal mediation behaviours) with different types of books. Within-subjects designs have often been used, with book type as an independent variable. Effects of book type on functional, structural, and affective aspects of the interaction have been investigated. The bulk of this research has compared informational vs. storybooks with young children and mothers of mid-SES backgrounds (Anderson et al., 2004; Anderson et al., 2012; Pellegrini, Perlmutter, Galda, & Brody, 1990; Potter & Haynes, 2003; Price et al., 2009; Torr & Clugston, 1999). These studies have shown that compared to storybooks, informational books tend to facilitate more extratextual discussions, higher rates of abstract language use, more diverse and sophisticated vocabulary, and more grammatically complex talk among parents and their preschool- and school-age children (Anderson et al., 2004; Anderson et al., 2012; Pellegrini et al., 1990; Potter & Haynes, 2003; Price et al., 2009; Torr & Clugston, 1999). An exception to these studies, which all reported more challenging extratextual discourse when sharing informational vs. storybooks, is a study conducted by Nyhout and O’Neill (2013). They investigated mothers’ extratextual talk to toddlers as they shared these two genres. In contrast to previous studies, they found that compared to informational books, when sharing storybooks, mothers produced more extratextual talk, a higher proportion of decontextualized talk (termed “complex talk”), and more grammatically complex talk (significantly longer mean length of utterance).
Two possible reasons may explain the conflict between the results of Nyhout and O’Neill and the results of previous research. First, the children in their study were younger than in previous research. As suggested by the authors, mothers may have engaged in more frequent contextualized discussions with the informational book because they may consider that the intended purpose of such books for toddlers is to teach new words (e.g., through labelling routines). Second, the study used more experimental control than previous studies; books were matched on several variables (e.g., referents, number of words and pages, style of pictures) and differed only by whether a story or informational narrative was present. Both explanations are plausible and have important implications. An age-genre interaction in shared-reading behaviours would suggest a need for research to consider children’s developmental stages when comparing the effects of different book genres on interaction. If the authors’ careful matching of several book variables accounted for or contributed to their conflicting results, this would suggest that future studies should pay attention to other book features (e.g., the amount of text and number of pages) in addition to book genre, adopting a similar approach to improve internal validity and the interpretability of the results.

Comparisons within the story genre

Although the above reviewed findings highlight the potential benefits of sharing informational books, storybooks remain the most popular genre for preschool-age children both in the preschool setting and at home (Baldwin, 2016; Pentimonti et al., 2011; Price et al., 2009; Robertson & Reese, 2017; Yopp & Yopp, 2006). The storybook genre is also the most commonly used genre in shared-reading intervention studies for young children, such as those employing the dialogic reading approach (e.g., Arnold et al., 1994; Lonigan et al., 1999; Wasik & Bond, 2001;
The continued use of storybooks in interventions may be because storybooks are more commonly found in families’ homes, but it may also be because in dialogic reading interventions the child is encouraged to “tell the story” themselves after repeated exposure to a storybook. However, despite the ubiquity of the storybook genre at home and in preschools, and in everyday reading and interventions, very little research attention has been paid to the variety of storybooks shared and to the quality of extratextual talk different types of story may facilitate. The kinds of picturebook stories available and to which children may be exposed can vary greatly. For example, some contain more text than others, some have manipulative features and/or contain rhyming text whereas others do not, and some have a greater conceptual demand than others.

A small body of work investigating the role of specific characteristics of stories has shown that not all types of story picturebooks are equal in their ability to facilitate caregiver extratextual talk (Greenhoot, Beyer, & Curtis, 2015; Muhinyi & Hesketh, 2017; Pellegrini, Galda, Jones, & Perlmutter, 1995). For example, stories with less text (versus those with more text) are shown to facilitate more extratextual talk per minute (Muhinyi & Hesketh, 2017), and those with illustrations (versus no illustrations) are shown to facilitate more interactive readings (Greenhoot et al., 2014). In addition, studies have shown that the format of picturebooks can affect the extratextual talk. For example, Pellegrini et al. (1995) found that familiar format books (labelled toy advertisements from newspapers) yielded more interaction from both mothers and children than did traditional format (commercially available informational books) during shared reading with mothers and their 4-year-old children from low-income backgrounds. Similarly, Peralta de Mendoza (1995) found that wordless informational books with complex (dynamic) vs. simple (static)
pictures complex book yielded longer utterances, and more labels and elaborations, whereas simple books yielded more maternal questions across mid- and low-SES groups.

The role of the story’s inferential demand

One important story characteristic that might encourage beneficial caregiver extratextual talk when sharing books with preschoolers is the complexity or conceptual demand of the story (Fletcher & Reese, 2005; van Kleeck, 2003). In line with social interactionist theory (e.g., Vygotsky, 1978), sharing a more complex story might encourage rich caregiver extratextual talk, as the caregiver seeks to support the child’s understanding about challenging aspects of the story through discussion. By contrast, when sharing a simple story, fewer and less demanding caregiver verbalizations might be expected, as less support is needed to support the child’s understanding of the story. In this thesis, a more complex story is defined as one with content that is likely to be conceptually demanding for preschoolers. As such, stories containing a false belief can be considered complex because preschool-age children show difficulties in understanding false belief, both as measured in experimental tasks (Wellman, Cross, & Watson, 2001) and during shared reading with picturebooks (Riggio & Cassidy, 2009). Books containing false belief have already been studied as a context for maternal mental state talk and children’s theory of mind development (e.g., Adrián, Clemente, & Villanueva, 2007; Adrián, Clemente, Villanueva, & Rieffe, 2005; Peskin & Astington, 2004; Tompkins, 2015). However, to our knowledge, no research has investigated the amount and quality of caregiver extratextual talk afforded by these stories as compared similar picturebooks that are less conceptually demanding (i.e., matched in other and
perhaps more salient features, such as the amount of text, but containing no false belief).

2.4.2 The role of genre in children’s language development

If, as is now becoming clear, some kinds of books are better at promoting beneficial kinds of input, then the choice of book used (both in everyday reading and in shared-reading interventions) may be an important factor in determining the quality of language children hear during shared reading. Both the variety of books available to children and the kinds of books frequently shared may play a role in children’s language development through their exposure to high quality extratextual talk. Indeed, experimental work has shown that children’s controlled exposure to shared reading that utilizes specific reading styles can lead to differential outcomes in children’s expressive and receptive vocabulary, narrative, and print skills (e.g., Lever & Sénéchal, 2011; Reese & Cox, 1999; Whitehurst et al., 1994).

A few studies have assessed whether repeated exposure to specific kinds of books leads to differential effects on children’s language development. In a recent study, Greenhoot et al. (2014) showed that illustrated vs. non-illustrated storybooks differentially affected parent-child interaction (with illustrated stories leading to more interactive reading). In turn, children exposed to the illustrated story were better able to recall that same story one week later, and differences in children’s recall were partially accounted for by observed differences in parent-child interaction. Other studies have shown that specific features of picturebooks, such as the number of pictures per page (Flack & Horst, 2017) and the location of rhyming target words in the text (Read, Macauley, & Furay, 2014) can lead to differences in children’s word learning from picturebooks. Importantly, these studies have used carefully controlled experimentally-designed books and have involved an adult
reading verbatim from the story text to assess the role of book features in children’s incidental word learning (Rice, 1990). To our knowledge, research has not yet shown whether repeated exposure to specific kinds of commercially available books and their associated extratextual talk can lead to differential effects on children’s developing language skills. In addition, research has not yet demonstrated a positive relation between the specific types of genres frequently shared and children’s language skills, although positive relations are found between children’s book access (e.g., how many children’s books are available in the home) and their linguistic and cognitive outcomes in low-income families (Baydar et al., 2014; Farver, Xu, Lonigan, & Eppe, 2013; Lugo-Gil & Tamis-LeMonda, 2008; Rodriguez et al., 2009).

2.4.3 Summary and critical discussion

In summary, the bulk of this research has compared informational vs. storybooks with preschoolers and mothers of mid-SES backgrounds, finding that informational books yield more challenging and rich extratextual talk on average (Anderson et al., 2004; Anderson et al., 2012; Pellegrini, et al., 1990; Potter & Haynes, 2003; Price et al., 2009; Torr & Clugston, 1999). In addition, a handful of studies comparing interaction as dyads share books with contrasting book features (e.g., presence of words and pictures, varying amounts of text) have found that such within-genre features may also influence the linguistic interaction during shared reading with storybooks (Greenhoot et al., 2014; Muhinyi & Hesketh, 2017; Pellegrini et al., 1995). However, research is lacking on the role of the specific kind of story in the interaction, and in particular to test the hypothesis that complex stories (as indexed by their inferential demand) will lead to higher quality interactions. In addition, only a few studies have simultaneously considered the influence of caregiver and child variables (e.g., SES, child language abilities, age, and
engagement) along with book type on linguistic interaction. Thus, there is a need for simultaneous investigation of the effects of caregiver and child variables, as well as the type of story, on parents’ extratextual talk. Research is also needed to test whether there is a link between children’s exposure to particular genres or specific types of stories (and their associated extratextual talk) and children’s language development in specific domains. The findings of such studies can be used to inform interventionists, caregivers, and practitioners about the kinds of books that might be useful to promote the types of interaction facilitative of children’s language growth at different developmental stages.

2.5 Literature gaps and research aims

Shared reading with preschoolers and its relation to language and literacy development has been the focus of much previous research. However, many questions remain. A key finding of the shared reading literature to date is that variation in caregiver-child interaction during shared reading, and in particular caregiver abstract talk, is linked to preschool-age children’s language and early literacy skills. Another key finding of the shared-reading literature, and of the caregiver-child interaction literature more broadly, is that different contexts can shape the kinds of interactions children to which children are exposed. Shared reading is found to promote richer and more challenging interactions than some toy play contexts. Furthermore, in the shared-reading context, informational books have been found to promote richer and more challenging interactions than storybooks. However, research to date has largely ignored different kinds of stories within the story genre. The present thesis provides a closer examination of the nature of storybook-reading interactions and their role in children’s language development.
As reviewed, given that storybooks are the predominant genre for preschool-age children both at home and in the school setting, it is important to consider whether some kinds of stories may be more useful than others in promoting abstract talk. It is also important to understand how the kind of story relates to caregiver use of abstract language in the context of caregiver and child factors. Study 1 aims to address this gap in the literature by investigating the influence of child engagement and story genre on caregiver abstract talk during shared reading, while also considering the role of caregiver SES, child age, and child language abilities. Study 2 provides a closer examination of the influence of story genre on caregiver language use.

In addition, given that certain kinds of books facilitate more abstract talk, we might also expect that exposure to certain kinds of books would have greater effects on children’s language development. Indeed, experimental work has shown that caregivers’ naturally occurring reading styles can lead to differential outcomes (e.g., Reese & Cox, 1999; Whitehurst et al., 1994). However, to our knowledge, research has not yet demonstrated effects of exposure to different genres over time on children’s language outcomes, or whether some kinds of books are more or less beneficial for the language development of children with certain characteristics (e.g., higher or lower than average language abilities). In an attempt to move the literature on the role of genre in shared-reading interactions another step forward, Study 3 tests whether exposure to the two story genres and their associated levels of abstract talk leads to differential gains in children’s language skills.

Finally, this literature review highlights the need to understand better the role of different aspects of shared-reading interactions in children’s language development. Although previous work has consistently found that caregiver use of
abstract talk during shared reading is beneficial for preschool children’s language skills, the research to date has largely focused on the overall level of abstraction without consideration of the style of caregiver talk. A more elaborative style (i.e., one characterized by questions and follow ups on children’s responses) may provide a context for children’s supported participation in discussions involving abstract talk, and thus the style of extratextual talk may be more important than the overall level of abstraction for children’s language skills. Study 4 aims to test both these hypotheses in investigating the relative contributions of caregiver abstraction and elaboration during shared reading to children’s language skills. Based on the literature view, we note that in assessing the role of aspects of parents’ extratextual talk in children’s language development, it is important to control for the overall amount of extratextual talk and parent SES, so that observed relations between aspects of the extratextual talk and child language skill cannot be explained by these potential confounding factors.

The four studies presented in the following chapters each aim to address specific gaps in our knowledge about the quality of storybook-reading interactions with preschool-age children, and the influence of these interactions on language development. Such knowledge is needed to inform our theoretical understanding of how shared reading relates to children’s language and literacy skills, and can also be used to inform shared-reading interventions and practical recommendations.
3. Chapter Three: Two Predictors of Caregivers’ Abstract Language Use: Story Complexity and Child Engagement (Study 1)

3.1 Abstract

This study investigated the influence of child engagement and story complexity on caregiver abstract language during book reading, while also considering the role of caregiver socioeconomic status, child language abilities, and child age. Fifty-three mother-child dyads (3;00–4;11 year olds) were video-recorded sharing two stories of differing complexity (as operationalized by their inferential demand). Results showed that 1) child engagement predicted abstract language use, driven by the percentage of lower level abstract utterances (e.g., evaluations and inferences); and 2) story complexity predicted the level of abstraction, driven by the percentage of utterances at the highest level of abstraction (i.e., involving cause-effect reasoning). The findings highlight the importance of contextual factors in language development and have strong implications for parent-focused interventions.
3.2 **Introduction**

Preschool-age children’s exposure to abstract language (i.e., talk beyond the here and now) predicts their language development (Demir, Rowe, Heller, Goldin-Meadow, & Levine, 2015; DeTemple, 2001; Dickinson & Porche, 2011; Hindman, Connor, Jewkes, & Morrison, 2008; Peterson & McCabe, 1994; Rowe, 2012). As such, fostering adult-child conversations involving abstract language has become a recent focus in speech and language therapy research (van Kleeck & Vander Woude, 2003). Encouraging such discourse is also important to educational researchers and practitioners, since the language skills stimulated through exposure to abstract language are precursors to the development of children’s critical-analytic abilities (Murphy, Rowe, Ramani, & Silverman, 2014; Sorsby & Martlew, 1991). Thus, it is important to know more about what kinds of interactional contexts promote the use of abstract language. One promising context is shared reading, which is particularly facilitative of abstract language use both in caregivers and their preschool-age children (Korat, 2009; Sorsby & Martlew, 1991). However, little is known about what specific factors promote the use of abstract language in the shared-reading context or more generally.

Previous research has identified several factors that may play a role in promoting or suppressing caregiver abstract language use during shared reading. Here, as in the broader literature on the effects of the linguistic environment on children’s language development (for a review see Hoff, 2006), caregiver socioeconomic status (SES) has been shown to play a role in caregiver input. Studies have shown that caregivers from lower-SES backgrounds engage their children in fewer abstract discussions on average compared to those from higher-SES backgrounds (e.g., Korat, 2009; VanderMaas-Peeler, Nelson, Bumpass, & Sassine,
2009). However, although informative, these studies provide very little insight into child factors that might play a role in caregiver use of abstract language.

Importantly, children’s language abilities and their engagement in shared reading are positively associated with SES, as well as varying considerably within SES groups (Crain-Thoreson & Dale, 1992; Deckner, Adamson, & Bakeman, 2006; Fenson et al., 1994; Fletcher, Cross, Tanney, Schneider, & Finch, 2008; VanderMaas-Peeler, et al., 2009). Perhaps more importantly, individual differences in certain child characteristics may play a crucial role in determining how much abstract language caregivers use.

One important child characteristic that may facilitate caregiver use of abstract language is child engagement in shared reading. The child’s engagement and interest during shared reading, in principle, not only affords talk about what is immediately perceptible in the pictures (e.g., “look at that cat”), but also oral discourse extending beyond the here and now to involve reasoning and explanations (e.g., “why do you think he went home?”). Another critical factor likely to affect caregiver use of abstract language use is the type of book being shared. Stories that require greater inference to be understood are likely to provide a platform for abstract talk, as the caregiver seeks to bridge the plot to the child using a degree of inferential language not afforded in stories with simpler plots. Both child engagement and story complexity are of interest because they are dynamic (and thus potentially malleable in interventions), in contrast to more stable factors such as caregiver SES and developmental characteristics of the child. However, evidence is lacking about the influence of these two factors on caregiver language use.

The current study was designed to address this gap in the literature by identifying factors that might promote caregiver use of abstract language during
shared reading. We investigated two key factors that may play a role in promoting or suppressing caregiver abstract language use: child engagement and story complexity. We examined the influence of these two potentially malleable factors within the context of more stable variables already known to influence the nature of caregiver-child verbal interactions, i.e., caregiver SES, child language abilities, and child age.

**Effects of Abstract Language on Preschoolers’ Language Abilities**

Shared reading is widely considered beneficial for preschoolers’ language and literacy development (DeTemple, 2001; Dickinson, Griffith, Golinkoff, & Hirsh-Pasek, 2012; van Kleeck & Vander Woude, 2003). This is important, given that variability in children’s language skills predicts school readiness, later language, literacy, and academic outcomes (Duff, Reen, Plunkett, & Nation, 2015; Duncan et al., 2007; NICHD Early Care Research Network, 2005; Rowe, Raudenbush, & Goldin-Meadow, 2012). One often-cited meta-analysis of 41 studies found that reading frequency accounted for 8% of the variance in preschoolers’ oral language, emergent literacy, and later reading skills (Bus, van Ijzendoorn, & Pellegrini, 1995). However, the quality of shared reading is also important for children’s language development, and in particular the presence of “extratextual” caregiver verbal interactions and input beyond simply reading the text (Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013). In a recent study, caregiver extratextual talk predicted preschoolers’ language and literacy skills into the early school years, whereas reading frequency was associated only with earlier, preschool outcomes (Zucker, et al., 2013). One specific feature of caregiver talk shown to be especially beneficial for children’s language development across different contexts is its level of abstraction (Demir et al., 2015; DeTemple, 2001; Dickinson & Porche, 2011; Hindman, et al., 2012).
Abstract language contrasts with concrete language (also known as *contextualized, literal, low demand, and immediate language*), which refers to the here and now, such as labelling referents and describing pictures during shared reading (Sorsby & Martlew, 1991). On the same continuum, abstract language (also known as *decontextualized, inferential, analytic, high demand, cognitively challenging, and non-immediate language*), includes devices such as inferences, predictions, and explanations, and moves the conversation beyond the here and now (Sorsby & Martlew, 1991). In a recent study ($N=130$), Hindman et al. (2008) found that both caregiver and child “decontextualized” talk during shared reading at the start of the preschool year predicted children’s expressive vocabulary scores at the end of the year. By contrast, “contextualized” talk was negatively related to children’s expressive vocabulary. Similarly, Dickinson and Porche (2011) found that “analytic talk” during shared reading in preschool classrooms predicted children’s fourth grade receptive vocabulary. Thus, children’s exposure to abstract language has been found to be beneficial to children’s language development, in particular when children are around 3–4 years of age (see also Rowe, 2012).

**Stable Factors Associated with Abstract Language Use**

Several factors are associated with how often caregivers use abstract language in book-reading contexts. As in the broader literature on environmental influences on child language development (see Hoff, 2006 for a review), there is an effect of SES in adult-child interactions during shared reading. Of particular interest has been the quality of caregiver “teaching strategies” during shared reading, as indexed by their use of abstract language (e.g., text-to-life references, explanations). Observational studies have found that, compared to caregivers from mid- and high-SES backgrounds, those from lower-SES backgrounds use on average fewer text-to-
life utterances and other such utterances beyond the here and now (e.g., Korat, 2009; Vandermaas-Peler et al., 2009), suggesting that SES plays an important role in caregivers’ use of abstract language during shared reading.

However, such studies have typically used a grouping design and statistical approach (i.e., comparing groups from differing SES backgrounds using t-tests or analysis of variance), which does not allow adequate consideration of child characteristics that may be associated with caregiver language use. Developmental characteristics of the child have been found to be associated with caregivers’ use of abstract language. Caregivers have been found to use largely concrete and attention-maintaining strategies during shared reading with infants, but more abstract language in their extratextual talk to children during the preschool years (Martin, 1998), suggesting that caregivers are sensitive to the age and developmental stage of the child in their use of abstract language. Similarly, caregivers may increase the proportion of their extratextual talk that is abstract as children age across the preschool years (DeTemple, 2001). There is also evidence that the child’s current language abilities are associated with how much abstract language caregivers use; children with developmental language disorders tend to be exposed to more concrete language on average during shared reading and in other activities (see van Kleeck & Vander Woude, 2003 for a review).

Thus, although the aforementioned studies are informative about the need for shared-reading interventions targeting children at developmental risk because of low SES, they do not inform us about the potential explanatory role of relatively stable child characteristics (e.g., child language abilities) in the relation between SES and caregiver use of abstract language. More importantly when it comes to designing interventions, such studies do not inform us about the role of dynamic, and thus
potentially more malleable, child characteristics that may explain relations between SES and caregiver use of abstract language, such as the child’s engagement in the task at hand. Evidence is needed about factors that can be targeted in interventions to encourage abstract language use during shared reading among low-SES populations, and more broadly.

The Role of Malleable Factors: Child Engagement and Story Complexity

Importantly, recent experimental work has shown that child engagement in shared reading is malleable to change, in that it can be promoted in relatively simple ways such as by choosing books with bright or interesting illustrations, letting the child turn the pages, and reading at a time when the child is motivated to engage (Ortiz, Stowe, & Arnold, 2001). Here, we posit that child engagement is likely to exert a strong influence on caregiver use of abstract language, as the attentive child is likely to be more easily engaged in extended discourse and may themselves request explanations from the caregiver (Harris, Bartz, & Rowe, 2017). Recent studies have reported moderate-to-strong correlations between toddlers’ engagement in shared reading and caregiver use of beneficial interactive behaviours such as prompts, recasts, and labelling (Deckner et al., 2006; Fletcher et al., 2008; Malin, Cabrera, & Rowe, 2014; but for an exception see Crain-Thoreson & Dale, 1992). Although child and adult behaviours are likely to exert bidirectional effects on each other (Sameroff, 2009), these studies suggest that young children’s opportunities for learning in the shared-reading context may in part be driven by their own engagement. However, evidence is lacking about the role of child engagement in caregiver use of abstract language.

The type of book shared is clearly a malleable factor, and although often ignored in research on shared reading (van Kleeck, 2003), it may play an important
role in children’s linguistic outcomes. A growing number of studies suggest that book genre affects quantitative and qualitative features of the extratextual talk. For example, informational books (compared to stories) have generally been found to facilitate more extratextual talk, a greater level of abstract language use, more diverse and sophisticated vocabulary, and more syntactically complex talk from parents sharing books with their preschool- and school-age children (e.g., (Price, Kleeck, & Huberty, 2009). However, despite storybooks being the most common genre for preschool-age children in the preschool setting and at home (van Kleeck, 2003), only a small amount of research has investigated effects of story characteristics (e.g., the amount of text and presence of pictures) on caregiver-child interaction. These studies have reported that such story characteristics can influence aspects of the caregiver-child interaction. For example, stories with less text may facilitate a greater rate of caregiver-child interaction per minute (Muhinyi & Hesketh, 2017). Of interest in the present study are story characteristics that might promote the use of abstract language.

Stories can vary in their theory of mind content (Cassidy et al., 1998), and thus in the level of inference required to be comprehended. The present study focuses on this story characteristic (henceforth referred to as story complexity). If caregivers are sensitive to the context and the developmental level of the child (Bruner, 1986), then a more complex story should lead to extratextual talk at higher levels of abstraction during shared reading with preschool-age children, as the caregiver will bridge the plot to the child by discussing the story, asking questions, and providing explanations. To date, this hypothesis lacks empirical support.

In sum, although it is well established that children’s exposure to abstract language is beneficial for their language development, gaps exist in our knowledge
about specific factors to promote caregiver use of abstract language. To date, no study has addressed the influence of two potentially malleable factors, child engagement in shared reading and story complexity, on caregiver use of abstract language. Evidence about the role of these two factors will increase our understanding of how shared reading contributes to language development and will directly inform parent-focused interventions.

**The Present Study**

This study investigated the influence of child engagement and story complexity on caregiver abstract language during shared reading, along with several relatively stable factors known to influence caregiver language use: caregiver SES, child language abilities, and child age. Fifty-three caregiver-child dyads (3;00–4;11) of diverse SES were visited once at home and video-recorded sharing a simple story and an ostensibly similar complex story. We hypothesized that child engagement and story complexity would both uniquely predict caregiver use of abstract language, with greater child engagement and more complex stories both facilitating more extratextual talk at a higher level of abstraction (i.e., a greater percentage of abstract utterances). Based on previous research, we also hypothesized that caregiver SES would be positively associated with both child language abilities and child engagement, and that caregiver SES and child language abilities would also account for unique variance in caregiver use of abstract language. No hypotheses were made about interactions among predictors, but additional analyses were conducted to explore these.

**Specific research questions:**

1. Does greater child engagement predict caregivers’ abstract language use?
2. Does story complexity predict caregivers’ abstract language use?
3. Do caregiver SES, child language abilities, and child age contribute to unique variance in caregiver use of abstract language?

3.3 Method

Participants

Fifty-six children and their primary caregivers (all mothers) participated in this study. Ethical approval was obtained from The University of Manchester Research Ethics Committee (Ref. 16003). Participants from the Greater Manchester area (UK) were recruited via flyers distributed in nurseries, children’s centres, and community spaces, and advertisements placed on relevant websites from April to November 2016. All participants provided informed consent. Data collection was incomplete for three participants (the child refused to share one or both books). Although mixed-effects models used can flexibly handle missing data, these three cases were excluded because data were not considered missing at random (i.e., their unwillingness to engage in shared reading relate to other factors such as engagement and caregiver reading style). Thus the final sample included 53 dyads. Children were typically developing, monolingual English-speaking children (22 boys and 31 girls). Children ranged in age from 36 to 59 months \( (M = 45.7, SD = 6.4) \) and their vocabulary raw scores ranged from 21 to 80 \( (M = 49.7, SD = 12.2) \), as measured by the British Picture Vocabulary Scale (BPVS). Standard scores on the BPVS ranged from 84 to 138 \( (M = 112.0, SD = 11.4) \), indicating that children had language abilities ranging from low-average to above-average. Forty-three of the children were White, 6 Mixed-race, 2 Asian, and 2 Black. Forty-three mothers had at least an undergraduate degree or equivalent (81%), five had at least A levels or equivalent (9%), three had at least 5 GCSEs (6%), and two had less than 5 GCSEs (4%). English was reported as the only home language. Most mothers reported that their
children were read to frequently at home (see Table 1). Each participant received a gift of a children’s book and £10 as compensation for their time.

Table 1.
**Home Reading Frequency, Socioeconomic Status, and Child Engagement**

<table>
<thead>
<tr>
<th>Variable</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home reading frequency (per week)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Once</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Twice</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Three times</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Four times</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Five times</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Six times</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seven times</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>More than seven times</td>
<td>60</td>
<td>32</td>
</tr>
<tr>
<td>IMD scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>7&lt;sup&gt;th&lt;/sup&gt;</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>9&lt;sup&gt;th&lt;/sup&gt;</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>10&lt;sup&gt;th&lt;/sup&gt;</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>COB scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>77</td>
<td>41</td>
</tr>
</tbody>
</table>

*Note. N = 53. IMD = Indices of Multiple Deprivation (Education, Skills, and Training Deprivation deciles; 10 = least deprived). Percentages may not equal 100 because of rounding. COB = Children’s Orientation to Book reading rating scale (adapted and modified); average score across conditions presented. A score of 4 represents the highest level of engagement.*

**Procedure and Transcription**

On a single visit to participants’ homes, the researcher explained that the purpose of the study was to investigate “how parents and children read different books together”, because “reading books with children may help their language
development, such as their talking and understanding”. Demographic information was collected using a questionnaire. The researcher first played the Pop up Pirate game with the child in a familiarisation session, and then conducted the language assessment. Next, the mother-child dyad was videoed sharing two of four possible books (one simple and one complex). The order in which books were read was counterbalanced across dyads to control for order effects (e.g., loss of interest). All dyads confirmed that they were unfamiliar with the books. Dyads were video-recorded as they read the books using a small digital camcorder (Samsung VP-MX20/ZEU) placed unobtrusively on a tripod approximately 2 m from the dyad at a 45° angle. The zoom function was used to capture the interaction more closely. The dyad was asked to sit in a place where they were comfortable or would normally read together, and the mother was instructed to “look at the two books with your child as you normally would”. During the recording, televisions were switched off and the researcher sat away from the dyad. Video-recordings were transcribed from when dyads began to share the story to the end of the book sharing interaction. In transcripts, names of real places and people were replaced by pseudonyms. Nonverbal behaviours (e.g., gazing, pointing, page turning) were transcribed to aid coding.

**Measures and Coding**

**Story complexity.** Story complexity was operationalized by the inferential demand of the story. Complex books involved a false belief central to the plot (i.e., involving a character holding a belief that contrasts with reality). By contrast, simple books involved no instances of false belief. Simple and complex books were identified and selected from high-street bookstores and libraries by the researcher on the basis of previous work classifying children’s picturebooks by their theory of
mind content (Cassidy et al., 1998). Four narrative picturebooks were used: two simple and two complex. The books were appropriate for 3- and 4-year olds (publishers’ recommended age: 3–6 years), gender neutral, contemporary in style (all published post 2000), and as closely matched as possible to avoid effects of potentially confounding variables. All four books contained text and colourful and vivid illustrations on every page, and were similar in their physical dimensions (paperback format, size, and length in pages and words). In all four stories, characters were animals. Books were amended (pages and words removed as necessary) so that they were identical in length. Consequently, each book contained 22 pages and 310 words (on average 14 words per page). For more details about the stories see Appendix 1.

**Child language abilities.** The British Picture Vocabulary Test 2nd edition (BPVS-II; Dunn, Dunn, Whetton, & Burley, 1997) was used to measure children’s receptive vocabulary skill. This assessment involves the examiner saying a word, and the child pointing to the corresponding picture from a set of four on a page. The assessment comprises two practice trials and 14 sets of pictures each containing 12 test items (a total of 168 test items). Testing begins at the set indicated in the manual for the child’s age (usually their basal level), and ends when the child reaches their ceiling level (eight or more errors in a set). Raw scores are calculated and converted to standardized (UK-normed) scores and percentile ranks. Administration time was approximately 10–15 minutes. One child had a missing BPVS score because she did not complete the language assessment. This score was replaced by the sample mean, as it was considered missing at random (Enders, 2013), i.e., the reason for missingness was unrelated to the child’s probable language score given that the incomplete score was already in the typical range. The BPVS was selected for its
ease of administration and because it is similar to the (American) Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 1997), which is used widely in research.

Table 2.

**Coding Scheme for Maternal Extratextual Talk**

<table>
<thead>
<tr>
<th>Level of abstraction</th>
<th>Subtype of talk</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: Matching Perception and Selective Analysis of Perception</td>
<td>Description (DES). Refers to what is on the page (e.g., events, referents). Includes rote counting. Meaning (MEA). Provides an explicit definition of a word, asks if child knows meaning, or comments on a word.</td>
<td>There’s a seal there! What’s it made of?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2: Reordering Perception</td>
<td>Inferences, bridging, or recalling (BRI). Connects what is in the story with the child’s own experience, recalls the parts of the story, talks about similarities and differences, make simple inferences. Psychological states (PSY). Refers to characters’ mental state. Reflections or evaluations (REF). Makes a moral judgement or evaluation about an event or character.</td>
<td>Can you do squiggling? It must be night-time. Oh no, is he sad? Is that naughty?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3: Reasoning about Perception</td>
<td>Predictions and explanations (PRE). Refers to cause-effect relations in the past (i.e., explaining why something happened) or in the future (i.e., predicting what will happen in the story).</td>
<td>His mummy would be cross with him (be)cause he didn’t catch the chicken. I bet she was coming in to get a nice cup of tea.</td>
</tr>
<tr>
<td>Transactional talk</td>
<td>Utterances that were transactional (TRA). For example: Provide feedback, direct the child’s attention, manage the child’s behaviour, or referred to aspects of the book context that were not linked to the storyline.</td>
<td>Sit down and listen. Did you like that story?</td>
</tr>
</tbody>
</table>

*Note.* Coding scheme based on the Coding Categories for Levels of Abstraction (van Kleeck, 2003)

**Child engagement.** Child engagement during shared reading was measured using an adapted version of the Children’s Orientation to Book reading (COB) scale
(Kaderavek, Guo, & Justice, 2014), which has demonstrated validity and reliability (Kaderavek et al., 2014). We adapted the COB for one-to-one shared reading. From the video-recordings, children’s behaviour was rated across eight domains: Overall impression, Persistence, Proximity, Positive affect, Eye gaze, Distractibility, Active participation, and Response to adult redirection (scores 1–4; low to high, respectively). The COB scale demonstrated good internal consistency (α = .87). Average scores were calculated to index children’s engagement during shared reading. To ensure reliability of COB ratings, 20% of the data was rated by a trained second coder. Training involved the second coder rating one of the videos, and then discussing their rating for each domain with the first coder (who had previously rated the same video). No disagreements were observed between coders on the initial video during training. Percent agreement for average COB scores was 81%. Weighted Kappa was calculated to estimate inter-coder reliability with corrections made for chance, and accounting for different degrees of disagreement for the ordinal scale. Kappa was .71, indicating excellent reliability (Fleiss, 1981).

**Level of abstraction.** All maternal extratextual utterances (i.e., beyond reading of the book text) were coded for level of abstraction according to the coding scheme in Table 2. This coding scheme was based on Coding Categories for Levels of Abstraction during book reading (van Kleeck, 2003). Utterances that were not linked to the plot but related to the context or the child’s behaviour were coded as transactional (Sorsby & Martlew, 1991). If an utterance contained elements from more than one category (e.g., an explanation might involve a lower level inference), the higher level was coded. The level of abstraction was defined as the percentage of talk that was not bound to the here and now (i.e., utterances at Level 2 and Level 3) relative to the total amount of extratextual talk. This index of abstraction corresponds
to that used in previous work to index the level of “decontextualized” talk across contexts while controlling for the total amount of talk (e.g., Rowe, 2012). To ensure reliability for abstract language coding, 20% of the transcripts were coded by a second coder. Disagreements were discussed and resolved after an initial transcript. Coding agreement for the level of abstraction was 79%. Weighted kappa (k) with corrections made for chance was .76, indicating excellent reliability (Fleiss, 1981).

**Socioeconomic status.** Caregiver SES was indexed by postcode using the Education Skills and Training Deprivation deciles of the English Indices of Multiple Deprivation (IMD, 2015). Participants lived in areas ranging from the most to the least deprived (see Table 1).

**Statistical Approach**

The objective of the present study was to investigate the influence of child engagement and story complexity on maternal use of abstract language during shared reading, while also considering the role of caregiver SES, child language abilities, and age. We hypothesized that child engagement and story complexity would each uniquely predict mothers’ abstract language use. We also hypothesized that caregiver SES, child language abilities, and child age would also uniquely predict maternal abstract language use, and that there would be positive associations among caregiver SES, child language abilities, and child engagement. Linear Mixed-Effects Models (LMMs) were used to address the study hypotheses, primarily because this approach accounts for non-independent observations (i.e., dyads shared both kinds of book in the present study) by modelling between- and within-subject variation separately (Raudenbush & Bryk, 2002).

Models were fitted in R (version 3.3.1) using the lmer function of Package *lme4* version 1.1-12 (Bates, Mächler, Bolker, & Walker, 2015).
multiple regression analyses were used to check for multicollinearity among variables and the presence of univariate and multivariate outliers, and residuals were plotted against fitted values to check for normality and homogeneity (Raudenbush & Bryk, 2002). Then a series of LMMs were fitted to assess the influence of story complexity and each of the caregiver and child variables (including child engagement) on both the overall level of abstraction and on the percentages of Level 2 and Level 3 utterances separately (i.e., three dependent variables). To assess the influence of story complexity, we followed a step-up model building approach (i.e., comparing increasingly complex models and accepting the model of best fit). Model fit (i.e., assessing whether the addition of Story Complexity significantly increased model fit) was compared using the Likelihood Ratio Test (LRT). More conservative Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values were also assessed, but for brevity these are not presented here. Subsequent models were compared to assess for effect of Order (fixed factor: simple book first, complex book first) and possible two-way interactions (i.e., Order and Story Complexity, Story Complexity and the caregiver and child variables, and among caregiver and child variables). Models with predictors that did not significantly increase model fit were rejected. The traditional alpha value cut off was used ($p < .05$). However, we report actual $p$-values (both as associated with the LRTs and as obtained using the car package for each model coefficient).

For each dependent variable, an initial LMM was fitted with the random effects structure (varying intercepts for dyad and book title), and each of the caregiver and child fixed factors (child engagement, child language abilities, child age, and maternal education). The random effects structure consisted of dyad and book title as random factors to account for variation within dyads and across specific
book titles by allowing intercepts to vary across dyads and book titles. This initial model served as a baseline for subsequent model comparison. Then, to assess whether story complexity had a significant effect on the dependent variable, a second model was fitted which added Story Complexity as a fixed factor (simple, complex) while retaining the random and fixed factors of the initial model. Note that child engagement and the other child and caregiver predictors were included in all models, as these were preselected on the basis of previous research.

Much debate exists on whether frequency or proportional measures of input are most appropriate, arising from the theoretical question of whether language acquisition is sensitive to the overall amount or relative frequencies of specific features in the input (Bornstein et al., 1992). In the present study, our focus was not on identifying features of the input important for language acquisition but rather on the quality of caregiver talk, and therefore, we used proportions (converted into percentages) but raw frequencies are also presented and analyses were also run on frequencies (although not presented as the results did not differ). Arcsine transformations were performed on percentages.

3.4 Results

Descriptive Statistics

Extratextual talk and level of abstraction by story complexity. All mothers produced extratextual talk (i.e., utterances beyond the reading of the printed text) during shared reading of the simple and complex books. Reading durations (seconds) were similar for the simple and complex books ($M = 255$ s, $SD = 75$, range $= 135–472$ and $M = 257$ s, $SD = 84$, range $= 140–552$, respectively). However, mothers produced significantly more extratextual utterances during complex book sharing than during simple book sharing ($M = 32.81$, $SD = 25.70$, range $= 3–123$, and
$M = 25.28$, $SD = 22.75$, range = 1–103, respectively, $Z = -4.817$, $p < .001$). Table 3 shows descriptive statistics (percentages and frequencies) for each type of maternal utterance during the two book readings. Large standard deviations and ranges indicate considerable variability between mothers. All maternal talk variables were positively skewed, indicating that most mothers did not produce utterances at the high end of the ranges shown in Table 3. The level of abstraction (i.e., Level 2 and Level 3 utterances) relative to the total amount of talk by mothers was 22.16% ($SD = 17.03$) when reading the simple books, and 30.52% ($SD = 16.77$) when reading the complex books. Spearman’s correlation showed that the level of abstraction between the simple and complex books were positively correlated, suggesting consistency in maternal reading styles ($\rho = .377$, $p < .01$).

Table 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Simple</th>
<th></th>
<th>Complex</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>Range</td>
<td>$M$</td>
</tr>
<tr>
<td>Level 1 utterances</td>
<td>26.42</td>
<td>(7.51)</td>
<td>19.32</td>
<td>(7.91)</td>
</tr>
<tr>
<td>Level 2 utterances</td>
<td>19.65</td>
<td>(5.15)</td>
<td>15.26</td>
<td>(4.82)</td>
</tr>
<tr>
<td>Level 3 utterances</td>
<td>2.51</td>
<td>(0.68)</td>
<td>4.69</td>
<td>(1.22)</td>
</tr>
<tr>
<td>Transactional</td>
<td>51.42</td>
<td>(11.96)</td>
<td>25.89</td>
<td>(15.36)</td>
</tr>
</tbody>
</table>

Note. $N = 53$.

Child engagement. Child engagement was indexed by COB scores. Wilcoxon signed-rank test revealed no significant differences in COB scores between the simple ($Mdn = 3.63$, range = 2.00–4.00) and complex book condition ($Mdn = 3.63$, range = 2.25–4.00), $z = -0.396$, $p = .692$. Therefore, subsequent analyses were conducted using average scores across conditions. As shown in Table 1, the majority of children were rated as highly engaged. Because of the small and zero cell frequencies of the lower ranks, this variable was collapsed to two levels:
high engagement (originally level 4) and moderate engagement (originally levels 2–3). Thus 41 children (77%) were rated as highly engaged, and the remaining 12 as moderately engaged (23%).

Table 4. Spearman’s Correlations (ρ) Between Maternal and Child Variables and the Maternal Talk Variables of Interest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Simple books</th>
<th></th>
<th>Complex books</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age</td>
<td>COB</td>
<td>BPVS</td>
<td>IMD</td>
</tr>
<tr>
<td>Level of abstraction (%)</td>
<td>-0.058</td>
<td>0.361**</td>
<td>0.178</td>
<td>0.330*</td>
</tr>
<tr>
<td>Level 2 utterances (%)</td>
<td>-0.051</td>
<td>0.345*</td>
<td>0.172</td>
<td>0.314*</td>
</tr>
<tr>
<td>Level 3 utterances (%)</td>
<td>-0.117</td>
<td>0.120</td>
<td>0.161</td>
<td>0.304*</td>
</tr>
</tbody>
</table>

*Note. N = 53. COB = Children’s Orientation to Book reading scale (adapted and modified to two levels; Level 1 = moderate engagement, Level 2 = high engagement). BPVS = British Picture Vocabulary Scale. IMD = Indices of Multiple Deprivation (IMD) Education Skills and Training deciles. ** = p < .001, * = p < .05 (two-tailed).

Bivariate relations among caregiver and child variables and book type.

Spearman’s correlations were conducted to assess relations among caregiver and child variables and between caregiver and child variables and maternal language use before entering these into LMMs. BPVS raw scores were strongly correlated with age (r = .565, p < .001). Therefore, we considered raw scores redundant and used standardized scores to provide an age-controlled index of language abilities. Table 4 shows bivariate correlations between the caregiver and child variables and the maternal talk variables in each book condition. As predicted, caregiver SES correlated positively with language abilities and engagement (ρ = .389, p < .01 and ρ = .293, p < .05, respectively), and engagement correlated positively with language abilities (ρ = .295, p < .05) and age (ρ = .230, p < .10). However, the relation between maternal SES, child engagement and maternal level of abstraction differed according to book type. In the simple book condition, maternal SES and child
engagement were significantly and positively correlated with maternal level of abstraction. Similarly, maternal SES was significantly and positively correlated with the percentage of Level 2 and Level 3 utterances, and child engagement was significantly and positively correlated with the percentage of Level 2 utterances in the simple book condition. However, there were no significant relations between any of the caregiver and child variables and the maternal talk variables in the complex book condition (\( p < .10 \)). All mothers and child variables were included in the subsequent models as planned.

**The Role of Child Engagement and Other Caregiver and Child Variables**

Table 5 shows the fixed-effects parameter estimates of the final LMMs for each dependent variable. As shown in Table 5, child engagement was the only significant caregiver or child variable to predict of any of the maternal talk measures. Child engagement was associated with both the overall level of abstraction by mothers and their percentage of Level 2 but not Level 3 utterances (although the coefficient was in the hypothesized direction). In line with our hypothesis, for children rated as highly engaged, maternal extratextual talk was higher in terms of the level of abstraction when other factors were held constant. This result was driven by a greater percentage of Level 2 utterances. Contrary to our hypotheses, none of the other caregiver or child predictors accounted for additional variance in any of the three measures of abstract language use (i.e., the overall level of abstraction, or Level 2 or Level 3 abstract utterances separately). The IMD scores were in the hypothesized direction (i.e., positive) but this was not significant. By contrast, BPVS scores and child age were small, non-significant predictors, and in the opposite direction to that hypothesized (i.e., negative rather than positive). There were no significant interactions between caregiver and child variables (all \( p < .10 \)).
Table 5. *Estimated Fixed-Effects Coefficients, t-values, and p-values from the LMMs Fitted to all DVs*

<table>
<thead>
<tr>
<th>Outcome measure/predictor variable</th>
<th>β</th>
<th>SE</th>
<th>T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall level of abstraction (% level 2 + 3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Intercept)</td>
<td>43.27</td>
<td>19.40</td>
<td>2.23</td>
<td>.001**</td>
</tr>
<tr>
<td><strong>Story</strong></td>
<td>7.34</td>
<td>2.24</td>
<td>3.27</td>
<td>.011*</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.19</td>
<td>0.24</td>
<td>-0.79</td>
<td>.432</td>
</tr>
<tr>
<td>BPVS</td>
<td>-0.13</td>
<td>0.15</td>
<td>-0.86</td>
<td>.389</td>
</tr>
<tr>
<td><strong>COB</strong></td>
<td>10.17</td>
<td>4.00</td>
<td>2.54</td>
<td>.011*</td>
</tr>
<tr>
<td>IMD score</td>
<td>0.70</td>
<td>0.53</td>
<td>1.32</td>
<td>.186</td>
</tr>
<tr>
<td><strong>Book order</strong></td>
<td>-5.66</td>
<td>3.03</td>
<td>-1.87</td>
<td>.061†</td>
</tr>
<tr>
<td>% Level 2 utterances</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Intercept)</td>
<td>39.77</td>
<td>15.65</td>
<td>2.54</td>
<td></td>
</tr>
<tr>
<td><strong>Story</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.20</td>
<td>0.19</td>
<td>-1.05</td>
<td>.294</td>
</tr>
<tr>
<td>BPVS</td>
<td>-0.13</td>
<td>0.12</td>
<td>-1.08</td>
<td>.278</td>
</tr>
<tr>
<td><strong>COB</strong></td>
<td>9.08</td>
<td>3.23</td>
<td>2.81</td>
<td>.005*</td>
</tr>
<tr>
<td>IMD score</td>
<td>0.56</td>
<td>0.43</td>
<td>1.30</td>
<td>.193</td>
</tr>
<tr>
<td><strong>Book order</strong></td>
<td>-6.24</td>
<td>2.44</td>
<td>-2.56</td>
<td>.011*</td>
</tr>
<tr>
<td>% Level 3 utterances</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Intercept)</td>
<td>16.70</td>
<td>14.90</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td><strong>Story</strong></td>
<td>13.62</td>
<td>1.76</td>
<td>7.75</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.16</td>
<td>0.18</td>
<td>-0.88</td>
<td>.379</td>
</tr>
<tr>
<td>BPVS</td>
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<td>-0.11</td>
<td>.911</td>
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<tr>
<td>COB</td>
<td>3.84</td>
<td>2.97</td>
<td>1.29</td>
<td>.197</td>
</tr>
<tr>
<td>IMD score</td>
<td>0.41</td>
<td>0.41</td>
<td>1.00</td>
<td>.317</td>
</tr>
<tr>
<td>Book order</td>
<td></td>
<td></td>
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</table>

Note. N = 53. LMMs = Linear Mixed-Effects Models. DVs = dependent variables. BPVS = British Picture Vocabulary Scale. COB = Children's Orientation to Book reading scale (adapted and modified to two levels; Level 1 = moderate engagement, Level 2 = high engagement). IMD = Indices of Multiple Deprivation (Education, Skills, and Training Deprivation deciles; 10 = least deprived). Random effects structures consist of random intercepts for dyad and book title. Model fit (i.e., assessing whether the addition of Story Complexity significantly increased model fit) was compared using the Likelihood Ratio Test (LRT). Subsequent models were compared to explore possible two-way interactions between Order and Book, among caregiver and child variables, and between Story Complexity and the caregiver and child variables; none were significant.

** = p < .001, * = p < .05, † = p < .10
The Influence of Story Complexity

**Overall level of abstraction.** A LRT indicated that the addition of Story Complexity significantly increased the model fit for the overall percentage of abstract utterances, $\chi^2(1) = 6.67, p < .01$. Similarly, the addition of Order significantly increased the model fit, $\chi^2(1) = 3.80, p = .051$. Order was retained in the model as the borderline p-value provided some evidence for an effect on the level of abstraction. There were no significant interactions between Story Complexity and Order, Story Complexity and any of the caregiver and child variables, or among caregiver and child variables (all $p$s > .10). As shown in Table 5, story complexity affected the level of abstraction, with complex books facilitating an increase in the level of abstraction when compared to simple books with other factors held constant. The effect of Order was of a similar magnitude, with the level of abstraction on average lower when dyads were exposed to the complex book first. Next we examined the effect of book on the percentage of Level 2 and Level 3 utterances (of which abstract talk was comprised) separately.

**Level 2 utterances (Reordering Perception).** The LRT indicated that the addition of Story Complexity did not significantly increase the model fit on the percentage of Level 2 utterances, $\chi^2(1) = 0.11, p = .75$. The addition of Order significantly increased the model fit, $\chi^2(1) = 6.89, p = .009$, with a lower percentage of abstract utterances when dyads were exposed to the complex book first. There were no significant interactions between Story Complexity and Order, or Story Complexity and any of the caregiver and child variables. Thus, story complexity did not affect the percentage of Level 2 utterances.

**Level 3 utterances (Reasoning About Perception).** The LRT indicated increased model fit for the addition of Story Complexity on the percentage of Level
3 utterances ($X^2(1) = 12.99, p = < .001$). There were no order effects and no significant interactions between Story Complexity and Order, and Story Complexity and any of the caregiver and child variables (all $ps > .10$). Thus, as shown in Table 5, story complexity affected the level of abstraction, with complex books (compared to simple books) facilitating an increase in the percentage of Level 3 utterances (approximately 4 utterances) when other factors were held constant.

3.5 Discussion

Although it is well established that preschool children’s exposure to abstract language predicts their language outcomes, gaps exist in our knowledge of ways to promote caregiver abstract language use during shared reading and in other activities. Previous work has identified a role for several stable characteristics in caregiver language use (i.e., caregiver SES, child language abilities, and child age), but has not yet considered the role of child engagement and story characteristics, which are potentially malleable and thus may serve as factors to promote abstract language use in interventions. Thus, evidence to inform practice is lacking. In a sample of 53 mothers and their 3- and 4-year old children, we investigated whether child engagement in reading and story complexity predicted caregiver use of abstract language, while also considering the role of caregiver SES, child language abilities, and child age. Story complexity was operationalized by the level of inference required to understand the story. Child engagement in book reading was reliably rated using an adapted version of a validated tool. Results from the Linear Mixed-Effects Models showed that child engagement predicted mothers’ concurrent abstract language use (driven by utterances involving lower level inferences about the story), whereas SES, child language abilities, and child age did not. Furthermore, story complexity predicted maternal abstract language use, with complex stories
facilitating a greater level of abstraction, which was driven by an increase in abstract talk at the highest level (i.e., Level 3 utterances – Reasoning about Perception). These results highlight the need to consider opportunities for language learning in light of child engagement and specific features of the context at different stages of children’s development. The results also have important implications for the design of parent-focused interventions, particularly those utilizing book reading contexts.

Child engagement predicted mothers’ concurrent abstract language use. In our study, when children were more engaged, mothers were more inclined toward (or successful at) engaging them in lower level abstract talk. Our model (see Table 5) showed that children rated as highly engaged heard on average more Level 2 utterances, which is comparable to the effect of story complexity on maternal Level 3 utterances. Interestingly however, child engagement did not predict Level 3 utterances. Our interpretation of these results is that caregivers provide explanations to support children’s understanding of the complex story (as discussed below), but children who are more highly engaged elicit more discussions about subtle inferential aspects of the text, which involve lower level abstract utterances such as those about characters’ mental states. Previous work has also reported positive associations between toddlers’ engagement and caregiver use of beneficial language behaviours, such as recasts and labelling during shared reading (Deckner et al., 2006; Fletcher et al., 2008; Malin et al., 2014). Collectively, these studies suggest that child engagement increases children’s opportunities for learning by facilitating a rich language environment during shared reading. It is important to note, however, that this interpretation is not mutually exclusive of the idea that caregiver use of beneficial language serves to maintain the child’s engagement, or indeed that a third variable mediates this relation, such as affective reading style. Indeed, bidirectional
relations of this nature are predicted by transactional theories of child development (Sameroff, 2009).

Story complexity also predicted the level of abstraction in maternal extratextual talk, with more complex stories facilitating greater levels of abstraction. Interestingly, this result was driven by talk at the highest level of abstraction (i.e., Level 3 utterances). Interestingly, these higher level utterances often formed part of a sequence including lower level utterances such as inferences and descriptions, which may have scaffolded children’s comprehension of the plot. This is consistent with previous research on the structure of explanatory discourse during shared reading with preschoolers (Gosen, Berenst, & de Glopper, 2013). By contrast, the percentage of Level 2 utterances (i.e., Reordering Perception) was not predicted by story complexity. Thus, although both simple and complex stories provided equal opportunities for abstract utterances involving text-to-life references, recalling, and inferences, only the complex stories facilitated maternal language at the highest level of abstraction. Together, these results show that complex and simple stories facilitate qualitatively different extratextual talk during shared reading with preschool-age children. Furthermore, the models showed no evidence for relations between Level 3 talk and caregiver SES, child language abilities, child engagement, or child age (or interactions between any of these variables and story complexity), suggesting that story complexity was the main factor in determining whether mothers in our sample used higher level abstract language when sharing stories with their preschool-age children.

Previous research comparing the effect of book characteristics on extratextual talk has mostly focused on differences between different genres, finding that informational books facilitate more abstract language use than stories (e.g., Price et
One possible reason for this finding is that caregivers are biased by the genre of the book and adopt their reading style accordingly (i.e., informational books may be seen as intended for teaching the child). The present findings are novel in demonstrating that caregivers are sensitive to the level of inference required to understand the text in the absence of obvious features that might bias the caregiver to adopt a particular (i.e., more challenging) reading style. In the present study, although stories were ostensibly similar, when a greater degree of inferential understanding was required for the story to be comprehended, mothers engaged in more extratextual talk and used higher level abstract language to support children’s comprehension of the plot. Thus, mothers appear to be sensitive to the complexity of the story. The lack of evidence for the hypothesized relations between the overall level of abstraction and child language abilities or child age suggests that the increased level of abstraction in response to the story overrode individual differences in these child factors in our sample.

The finding that mothers show sensitivity to the complexity of the story in their use of abstract language has important implications for understanding the benefits of shared reading, as it suggests that the choice of book at different developmental stages may play an important role in children’s language outcomes. Complex stories, as defined in our study, may be optimal for older preschool-age children’s language development, as they facilitate more extratextual talk and higher levels of abstraction, which have both been found to promote children’s vocabulary at this age (Demir et al., 2015; Dickinson & Porsche, 2011; Rowe, 2012; Zucker et al., 2013). Simple stories, however, might be more beneficial for slightly younger children or those with lower than average language abilities, as they promote beneficial discourse that does not involve higher level abstract language, which
might be too challenging for these children to participate in or understand. More broadly, our findings provide a clear example of how SES-related differences in book access might translate to children’s language outcomes. Socioeconomic status has been linked to children’s book access (Raikes et al., 2006), which is one aspect of the home environment that contributes to linguistic and cognitive outcomes in children at developmental risk because of low SES (Baydar et al., 2014; Farver, Xu, Lonigan, & Eppe, 2013; Lugo-Gil & Tamis-LeMonda, 2008; Rodriguez et al., 2009). One reason that may contribute to the link between book access and children’s outcomes is that children with limited book access are likely to be exposed to a less diverse set of books, and are thus less likely to encounter those that provide special opportunities for beneficial kinds of language input at given stages in their development.

This study has several important practical implications. First, parent-focused interventions, and in particular shared-reading interventions, should consider child engagement, which in our study was predictive of maternal use of lower level abstract language. Based on this finding, we suggest that child engagement should be an initial target in such interventions. Strategies such as letting the child choose the book and showing enthusiasm toward reading can be used to promote child engagement (Ortiz et al., 2001), which in turn may facilitate more abstract language from the caregiver. Second, our data suggest that such interventions must consider the opportunities for abstract language afforded by the story characteristics. Both the simple and complex stories used in our study provided opportunities for abstract language use that is likely to facilitate preschool-age children’s language development, but only the complex stories provided opportunities for the use of higher level abstract language. Therefore, complex stories are likely to be more
beneficial for shared-reading interventions where the aim is to stimulate preschool-age children’s vocabulary, narrative, and critical-analytic thinking skills through abstract interactions with the caregiver. By contrast, for preschool-age children whose language abilities are limited, simple stories, which provide opportunities for rich extratextual talk but without the more demanding, explanatory discourse, may be more beneficial. In the light of these recommendations, the provision of resources in low-SES populations is particularly needful, as exposure to a wide repertoire of stories should increase opportunities for these children’s exposure to both simple and complex stories.

One caveat to these recommendations is that large individual differences in maternal reading styles were present in our data and robust across the two story conditions (see Table 3). Notably, even when sharing complex stories and when children had high engagement, some mothers in our study missed opportunities to engage their children in abstract conversations about the story. Wide variation in parent reading styles is consistent with previous research (Muhinyi & Hesketh, 2017; Price, van Kleek, & Huberty, 2009). Thus there is a clear need for interventions that teach caregivers the importance of using abstract language during shared reading with preschool-age children.

This study has several limitations. First, although we aimed to recruit a socioeconomically diverse sample, more than half of families lived in areas within the top three deciles. This lack of variation may have prevented us from identifying SES as a significant predictor of maternal abstract language use. Notably, the model coefficients (albeit small) were in the hypothesized direction, and $t$-values were 1 or greater. Thus, in a larger and more socioeconomically diverse sample, SES may have been found to predict caregiver use of abstract language. Related to this issue,
although our measure of SES (IMD scores) reflected greater variability in SES than the self-report of maternal education (which was limited to four levels), the use of IMD scores as a measure of SES also has limitations as it is based on geographical averages rather than on individual families’ characteristics. For example, some families may have a higher or lower income and educational attainment than is average in their local area. A more sensitive and direct measure of SES (e.g., a composite measure of income and educational attainment based on participant reports) may result in a significant effect of SES, even in sample with similar characteristics to the present one.

Another limitation to our study is that low variability in child engagement may have led to an underestimation of the relation between child engagement and maternal abstract language use. We measured child engagement using the COB, a global measure of child engagement that considers multiple domains of the child’s behaviour during shared reading. This scale demonstrated good internal reliability in our study, and has elsewhere shown predictive validity for children’s early literacy skills (Kaderavek et al., 2014). Therefore, we believe that this measure was sensitive to the variability that existed in our data, and this is also attested to by the fact that we observed a significant relation between child engagement and maternal Level 2 utterances. However, given the low variability in child engagement within our sample (which was further reduced by the need to dichotomize this variable), we expect that a larger effect would be detected in a sample that included more children who displayed low or very low engagement. Thus, it is important that future research examines relations among these same variables in a more diverse sample (both in terms of SES and child engagement).
A final limitation is that not all possible sources of variation in caregiver use of abstract language were considered in our study. Other factors have been identified by previous research as playing a role in caregiver input, such as birth order and the age of the caregiver (Hoff, 2006). We did not collect information on these variables in the present study. However, additional variation in the use of abstract language might be accounted for by the inclusion of these factors in a larger, more diverse sample.

To our knowledge, this is the first study to investigate the influence of child engagement and story complexity on caregivers’ abstract language use, while also considering the role of more stable characteristics (i.e., caregiver socioeconomic status, child age, and child language abilities). Story complexity and child engagement were identified as two key factors that promote different kinds of abstract language. In our study, higher level abstract talk was facilitated only by the stories with complex storylines, and lower level abstract talk was better facilitated when the child displayed greater engagement regardless of story complexity. In the light of these findings, we suggested that complex stories may be particularly useful for shared-reading interventions that aim to promote child language development through exposure to abstract language use, and that child engagement may be a key initial target for such interventions. An important next step is to test whether systematic exposure to complex versus simple stories, and their associated reading styles, differentially affects the language outcomes of preschool-age children. Based on the present findings, we hypothesize that exposure to complex stories and their associated reading styles would lead to children’s greater linguistic outcomes. Support for this hypothesis would provide more direct evidence on the benefits of complex stories for language development.
3.6 References


3.7 Appendices

Appendix 1: Complex and simple books

Complex Books:

In *Pond Goose* (Church, 2004; published by Oxford University Press, Oxford), a goose (the protagonist) deceived a fox by camouflaging his feathers against the hillside so that the fox could not see him. The fox falsely believed that the goose was not there. In *Don’t Cry Sly Fox* (Barkow, 2002; published by Mantra Lingua, London), the protagonist, Sly the fox, and his friend, a hen, deceived Sly’s mother by making a chicken from vegetables and fruit. Sly’s mother falsely believed that the pretend chicken was real. The false belief was not explicitly stated in the text in either story, but was evident in characters’ behaviours as depicted by the illustrations and text. In both books, the false belief occurred when the protagonist deceived another character.

Simple Books:

*Stop Monkeying Around* (Swift, 2013; published by Cupcake Books, London) was about a monkey who was bored. He tried to play with a sequence of other animals in the jungle, but only succeeded in annoying them. Eventually, he unexpectedly found another monkey, and they played together happily. *The Polar Bear Paddle* (Bedford, 2009; published by QED Publishing, London) was about a polar bear who wanted to swim in the sea, but could only paddle. He observed various different creatures, and tried to copy them. In the end, he could still only paddle, but the other animals were impressed by it, and he taught them his technique.

Although these books did not contain false belief, both contained references to characters’ mental states (e.g., mental-state verbs such as “think”, “like”, and “want” and adjectives such as “sad”).
4. Chapter Four: Story Choice Matters for Caregiver Extratextual Talk During Shared Reading With Preschoolers (Study 2)

4.1 Abstract

This study aimed to examine the influence of the conceptual demand of the storybook on caregiver extratextual talk (i.e., interactions beyond the text reading) during shared reading with preschool-age children. Fifty-three mother-child dyads (3;00–4;11) were video-recorded sharing two ostensibly similar picturebooks: a simple story (containing no false belief) and a complex story (containing a false belief central to the plot). Book-reading interactions were transcribed and coded. Results showed that the complex stories facilitated more extratextual talk from mothers, and a higher quality of extratextual talk (as indexed by linguistic richness and level of abstraction). Although the type of story did not affect the number of questions mothers posed, more elaborative follow ups on children’s responses were provided by mothers when sharing complex stories. Stories that are more complex may facilitate more and linguistically richer caregiver extratextual talk, having implications for children’s developing language abilities.
4.2 Introduction

How often parents engage in shared-book reading with their preschool-age children is estimated to account for approximately 8% of the variance in children’s oral language, emergent literacy, and later reading skills (Bus, van Ijzendoorn, & Pellegrini, 1995). Given that variability in children’s language skills predicts school readiness, later language, literacy, and academic outcomes (National Institute of Child Health and Human Development [NICHD], 2005; Rowe, Raudenbush, & Goldin-Meadow, 2012; Walker, Greenwood, Hart, & Carta, 1994), shared reading is considered an important tool for promoting preschool children’s language skills (Dickinson, Griffith, Golinkoff, & Hirsh-Pasek, 2012.). Importantly, the quality of shared reading, as indexed by the presence of caregiver verbal interactions beyond simply reading the print in books, has been posited as a key mechanism through which shared reading influences language development (Fletcher & Reese, 2005). A recent study showed that although reading frequency in preschool predicted children’s vocabulary outcomes at the end of the preschool year, only caregiver extratextual talk predicted language and literacy outcomes in kindergarten (Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013). One reason for this is that although frequent shared reading exposes children to a potentially rich linguistic input (e.g., Cameron-Faulkner & Noble, 2013; Demir-Lira, Applebaum, Goldin-Meadow, & Levine, 2018; Montag, Jones, & Smith, 2015), caregiver extratextual talk has the potential to support children’s understanding and participation in discourse about the book in a way that is tailored to the child’s current abilities. Other strong evidence for the role of caregiver extratextual talk in children’s language development comes from a meta-analysis of experimental shared-reading studies, which found that interactive reading (i.e., where caregivers were trained to
engage in extratextual discussions about the book) as compared to non-interactive reading had stronger benefits for toddlers and preschool-age children’s vocabulary development (Mol, Bus, de Jong, & Smeets, 2008). Thus, the benefits of shared reading for young children’s language learning are greater when caregivers engage in extratextual talk and support children’s verbal participation in discussions about the book.

As children enter the preschool years, extratextual talk that is linguistically rich and cognitively challenging becomes particularly beneficial for language learning. Specifically, abstract talk (also known as decontextualized, inferential, analytic, high demand, cognitively challenging, and non-immediate talk) has been shown to benefit preschoolers’ language skills. During shared reading, abstract talk involves linking the story to the child’s life, inferences, predictions, and explanations, which move the conversation beyond what is perceptually available in the book. By contrast, concrete talk (also known as contextualized, literal, low demand, and immediate talk) often involves labelling and describing pictures (Sorsby & Martlew, 1991). In a recent study, Hindman, Connor, Jewkes, and Morrison (2008) found that both caregiver and child “decontextualized” talk during shared reading at the start of the preschool year predicted children’s expressive vocabulary scores at the end of the year, whereas “contextualized” talk was negatively related to children's expressive vocabulary. Similarly, Dickinson and Porche (2011) found that teachers’ “analytic talk” during shared reading in low-income preschool classrooms predicted children’s receptive vocabulary into the fourth grade. More broadly, a relatively large body of research shows that caregiver speech that engages children in challenging, decontextualized conversations (e.g., talk about the past or future, and talk involving explanations) in different everyday
contexts supports preschool-age children’s vocabulary, syntax, and narrative development (e.g., Demir, Rowe, Heller, Goldin-Meadow, & Levine, 2015; DeTemple, 2001; Dickinson & Smith, 1994; Hindman, et al., 2008; Peterson & McCabe, 1994; Rowe, 2012).

The above reviewed research findings have motivated the design of language-boosting interventions, where caregivers are trained to engage their preschool-age children in rich and abstract conversations, both during shared reading (e.g., Morgan & Goldstein, 2004) and, more recently, in other everyday contexts (Leech, Wei, Harring, & Rowe, 2018). Separately, those interested in the benefits of shared reading for language development have called for research on the role of book genre in the quality of caregiver extratextual talk (e.g., Aram, 2008; Fletcher & Reese, 2005). To date, the main focus of this work has been on the amount and quality of caregiver extratextual talk when sharing informational books versus stories. A consistent finding here is that when sharing informational books as compared to stories, caregivers have been shown to adopt a more “tutorial” style, involving more extratextual talk, more questions, and a greater level of abstract language use with their preschool- and school-age children (e.g., Anderson, Anderson, Lynch, & Shapiro, 2004; Potter & Haynes, 2000; Price, van Kleeck & Huberty, 2009; Torr & Clugston, 1999; but see Nyhout & O’Neill, 2013 for a conflicting finding with toddlers). Likewise, perhaps reflecting the greater degree of abstraction, informational books have also been found to facilitate extratextual talk that is linguistically richer as indexed by lexical diversity and syntactic complexity (Price et al., 2009), which in the broader literature on child-directed speech, has been found to predict preschool-age children’s language development (see Hoff, 2006 for a review). Thus, informational books are recommended as a special tool for
supporting preschool- and school-age children’s language and literacy development (Yopp & Yopp, 2006).

However, much less is known about the possible role of different kinds of stories in promoting beneficial extratextual talk. A closer examination of the story genre is needful for several reasons. Stories are the predominant genre found in nurseries and at home for preschool-age children (e.g., Yopp & Yopp, 2006). Furthermore, many shared-reading interventions, such as the well-known dialogic reading approach (Whitehurst et al., 1988), have used stories as the intervention context. However, the kinds of picturebook stories available and to which children may be exposed can vary greatly. For example, some contain more text than others, some have manipulative features and contain rhyming text, and some have a greater conceptual demand than others (Wagner, 2013). A recent small body of work on the role of specific characteristics of stories has shown that not all types of story picturebooks are equal in their ability to facilitate caregiver extratextual talk (e.g., Greenhoot, Beyer, & Curtis, 2014; Muhinyi & Hesketh, 2017). For example, stories with less text (versus those with more text) may facilitate more extratextual talk per minute (Muhinyi & Hesketh, 2017), and those with illustrations (versus no illustrations) may facilitate more interactive readings (Greenhoot et al., 2014). Of interest in the present study are story characteristics that might promote linguistically rich and abstract caregiver extratextual talk, and importantly, caregiver verbalizations that support preschool children’s verbal participation in such discourse.

One story characteristic that might encourage beneficial caregiver extratextual talk when sharing books with preschoolers is the complexity or conceptual demand of the story (Fletcher & Reese, 2005). In line with social
interactionist theory (e.g., Vygotsky, 1978), sharing a more complex story might encourage rich caregiver extratextual talk, as the caregiver seeks to support the child’s understanding about challenging aspects of the story through discussion. By contrast, when sharing a simple story, fewer and less demanding caregiver verbalizations are expected, as less support is needed to facilitate the child’s understanding of the story. The present study investigates the hypothesis that more complex stories will facilitate more beneficial caregiver extratextual talk with preschoolers.

In the present study, a more complex story is defined as one with content that conceptually demanding for preschoolers, and thus is likely to encourage parents to produce more (and more complex) language. Stories containing a false belief are considered to be particularly complex because preschool-age children show difficulties in understanding false belief, both as measured in experimental tasks (Wellman, Cross, & Watson, 2001) and as they occur in picturebooks (Riggio & Cassidy, 2009). Books containing a false belief have been studied extensively as a context for maternal mental state talk and children’s theory of mind development (e.g., Adrián, Clemente, Villanueva, & Rieffe, 2005; Adrián, Clemente, & Villanueva, 2007; Peskin & Astington, 2004). However, to our knowledge, no previous study has investigated the amount and quality of caregiver extratextual talk afforded by these stories as compared to their less conceptually demanding counterparts (i.e., similar picturebooks containing no false belief).

The Present Study

The present study investigated the influence of story complexity on the amount and quality of caregiver extratextual talk during shared reading with preschool-age children. Fifty-three caregiver-child dyads (3;00–4;11) were visited
once at home and video-recorded sharing a complex story (i.e., containing a false belief central to the plot) and an ostensibly similar story (i.e., containing no false-belief). Two key methodological considerations were made to support the interpretation and generalizability of the results. First, we used books that were commercially available and thus representative of those likely to be encountered by preschoolers. Second, we matched the stories on several salient characteristics (e.g., length of the story, style of the narrative and pictures, the gender of the main protagonist, whether protagonists were humans or animals) so that effects observed could be attributed to the variable of interest as opposed to features of the stories.

The quality of caregiver extratextual talk was coded for linguistic richness and level of abstraction, as in previous book genre comparison studies. In addition, caregiver extratextual talk was coded for questions and elaborative follow ups on children’s responses to questions (e.g., hints and requests for more information). Thus, the coding aimed to capture both the linguistic and cognitive demand of the extratextual talk, as well as the degree to which caregivers scaffolded children’s verbal participation in challenging discussions about the plot. The main study hypothesis was that complex stories would facilitate more and higher quality caregiver extratextual talk. Based on previous research, we also hypothesized that there would be great variability across caregivers in their extratextual talk, but that there would be some consistency in individuals’ reading styles across genres. Possible interactions of genre with child age and SES were tested, although no specific hypotheses were made about these. In addition, we investigated whether children asked more challenging questions (e.g., why, and how questions) when sharing the complex books, as such questions could serve as a mechanism in the provision of linguistically rich and abstract caregiver extratextual talk when sharing these books.
The specific research questions were:

RQ1. How much variation exists in the amount and quality of extratextual talk within and across mothers?

RQ2. Do complex books facilitate more and higher quality extratextual talk?

RQ3. Do complex books facilitate more child questions requiring caregiver explanations (e.g., why and how questions)?

4.3 Method

Participants

Fifty-six children and their primary caregivers (all mothers) participated in this study. Ethical approval was obtained from The University of Manchester Research Ethics Committee (Ref. 16003). Participants from the Greater Manchester area (UK) were recruited via flyers distributed in nurseries, children’s centres, and community spaces, and advertisements placed on relevant websites from April to November 2016. All participants provided informed consent. Data collection was incomplete for three participants (the child refused to share one or both books). Thus the final sample included 53 dyads. Caregiver SES was indexed by postcode using the Education Skills and Training Deprivation deciles of the English Indices of Multiple Deprivation (IMD, 2015), which is a national measure of neighbourhood SES based on indicators from seven domains (income, housing, employment, health, crime, education and access to services). Participants lived in areas ranging from the most to the least deprived (see Table 1). Children were typically developing, monolingual English-speaking children (22 boys and 31 girls). Children ranged in age from 3;00 to 4;11 (M = 45.7 months, SD = 6.4 months) and their vocabulary raw scores ranged from 21 to 80 (M = 49.7, SD = 12.2), as measured by the British Picture Vocabulary Scale (BPVS-II Dunn, Dunn, Whetten, & Burley, 1997).
Standard scores on the BPVS ranged from 84 to 138 ($M = 112.0$, $SD = 11.4$), indicating that children had language abilities ranging from low-average to above-average. Forty-three of the children were White, 6 Mixed-race, 2 Asian, and 2 Black. Forty-three mothers had at least an undergraduate degree or equivalent (81%), five had at least A levels or equivalent (9%), three had at least 5 GCSEs (6%), and two had less than 5 GCSEs (4%). English was reported as the only home language. Most mothers reported that their children were read to frequently at home (see Table 1).

Each participant received a gift of a children’s book and £10 as compensation for their time.

Table 1. 
Home Reading Frequency and Socioeconomic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home reading frequency (per week)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Once</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Twice</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Three times</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Four times</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Five times</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Six times</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seven times</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>More than seven times</td>
<td>60</td>
<td>32</td>
</tr>
<tr>
<td>IMD scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>2nd</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4th</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>5th</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>6th</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>7th</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>8th</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>9th</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>10th</td>
<td>32</td>
<td>17</td>
</tr>
</tbody>
</table>

Notes. $N = 53$. IMD = Indices of Multiple Deprivation (Education, Skills, and Training Deprivation deciles; 10 = least deprived). Percentages may not equal 100 because of rounding.
Materials

Story complexity was operationalized by the inferential demands of the story. Complex books involved a false belief central to the plot, which we predicted would elicit more conversation from the mother. By contrast, simple books involved no instances of false belief. Simple and complex books were identified and selected from high-street bookstores and libraries by the researcher on the basis of previous work classifying children’s picturebooks by their theory of mind content (Cassidy et al., 1998). Four narrative picturebooks were used (all published post 2000): two simple and two complex. These books were chosen as they were considered by the study authors to be representative of contemporary titles, and were as closely matched as possible to avoid effects of potentially confounding variables. Specifically, all four books contained text and colourful and vivid illustrations on every page, and were similar in their physical dimensions (paperback format, size, and length in pages and words). The books were gender neutral and appropriate for three- and four-year-olds (publishers’ recommended age: 3–6 years), and were amended (pages and words removed as necessary) so that they were identical in length. Consequently, each book contained 22 pages and 310 words (on average 14 words per page). In all four stories, characters were animals and the main protagonist was male. All four stories were in the third person and each contained instances of direct speech. Table 2 shows an analysis of text complexity across the four picturebook stories.

Simple books. Stop Monkeying Around (Swift, 2013; published by Cupcake Books, London) is about a monkey who was bored. He tried to play with a sequence of other animals in the jungle, but only succeeded in annoying them. Eventually, he unexpectedly found another monkey, and they played together happily. The Polar
*Bear Paddle* (Bedford, 2009; published by QED Publishing, London) is about a polar bear who wanted to swim in the sea, but could only paddle. He observed various different creatures, and tried to copy them. In the end, he could still only paddle, but the other animals were impressed by it, and he taught them his technique. Although these books did not contain false belief, both contained references to characters’ mental states (e.g., mental-state verbs such as “think”, “like”, and “want” and adjectives such as “sad”).

**Complex books.** In *Pond Goose* (Church, 2004; published by Oxford University Press, Oxford), a goose (the protagonist) deceived a fox by camouflaging his feathers against the hillside so that the fox could not see him. The fox falsely believed that the goose was not there. In *Don’t Cry Sly Fox* (Barkow, 2002; published by Mantra Lingua, London), the protagonist, Sly the fox, and his friend, a hen, deceived Sly’s mother by making a chicken from vegetables and fruit. Sly’s mother falsely believed that the pretend chicken was real. The false belief was not explicitly stated in the text in either story, but was evident in characters’ behaviours as depicted by the illustrations and text. In both books, the false belief occurred when the protagonist deceived another character.

Table 2. *Text Complexity by Title*

<table>
<thead>
<tr>
<th>Linguistic variable / Title</th>
<th>Stop monkeying around</th>
<th>Polar bear paddle</th>
<th>Don’t cry Sly</th>
<th>Pond Goose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean sentence length (words)</td>
<td>10.3</td>
<td>5.4</td>
<td>8.2</td>
<td>8.2</td>
</tr>
<tr>
<td>Number of unique words</td>
<td>154</td>
<td>141</td>
<td>156</td>
<td>139</td>
</tr>
<tr>
<td>Number of multiclause sentences</td>
<td>22</td>
<td>14</td>
<td>16</td>
<td>9</td>
</tr>
</tbody>
</table>

**Notes.** The relatively high number of multiclause utterances in *Stop monkeying around* was affected by the use of one particular construction (the gerund clause from the story title “stop monkeying around”), which occurred several times in the story.
Procedure and Transcription

On a single visit to participants’ homes, the researcher explained that the purpose of the study was to investigate “how parents and children read different books together”, because “reading books with children may help their language development, such as their talking and understanding”. Demographic information was collected using a questionnaire. The researcher then played the Pop up Pirate game with the child in a familiarisation session, before conducting the language assessment. After this, the mother-child dyad was videoed sharing two of four possible books (one simple and one complex). All mothers confirmed that they and their children were unfamiliar with the specified books before the video-recording. The order in which books were read was counterbalanced across dyads to control for order effects (e.g., loss of interest). All dyads confirmed that they were unfamiliar with the books. Dyads were video-recorded as they read the books using a small digital camcorder (Samsung VP-MX20/ZEU) placed unobtrusively on a tripod approximately 2 m from the dyad at a 45° angle. The zoom function was used to capture the interaction more closely. The dyad was asked to sit in a place where they were comfortable or would normally read together, and the mother was instructed to “look at the two books with your child as you normally would”. If a television was on, the mother was asked to turn it off beforehand. During the video-recording, the researcher sat away from the dyad and scored a language assessment.

Video-recordings were transcribed by the researcher in CHAT format (from the CHILDES programs; MacWhinney, 2012). Two transcripts (.cha files) were created for each participant: one for each book shared. Transcription started when the mother opened the book and began to read or engage in book-related talk, and ended when they closed the book and/or their book-related talk ended. Real names
(places or people) used by participants during the recordings were replaced by pseudonyms. Unintelligible words were transcribed as “xxx” or phonetically transcribed if sounds were clearly distinguishable. Nonverbal behaviours (e.g., gazing, pointing, page turning) were transcribed where relevant to aid coding. Utterance boundaries were defined as outlined by Ratner and Brundage (2013), when two or more of the following cues were present: silence for two seconds or longer, terminal intonation, or a complete syntactic unit or pragmatically complete contribution (e.g., mother: what’s that?; child: a lizard). Repetitions of the same word (e.g., no no no, she runs very very very fast) and rote counting (e.g. one, two three, four) were transcribed as single words. Character names (e.g., Little Red, Little Monkey, Sly Fox) were transcribed as single words (e.g., “Little_red”). To establish reliability, a second researcher transcribed a separate video until 95% agreement was obtained on utterance boundaries. The remaining transcripts were then verified by a second researcher, and CHECK and FREQ were then run in CLAN to identify and fix any misspelled words.

Measures

Word tokens. The amount of extratextual talk during shared reading was indexed by the number of word tokens (i.e., the total number of words including repetitions of the same word). Number of word tokens was computed in the CLAN program (Computerized Language ANalysis).

Linguistic richness. Two measures of linguistic richness were also used: syntactic complexity and lexical diversity. Syntactic complexity was indexed by the mean length of utterances in words (MLUw), which is a measure of global structural complexity. Lexical diversity was indexed by the number of unique words (types).
Both measures are widely used measures in previous research. Both were computed in CLAN.

**Level of abstraction.** All maternal extratextual utterances (i.e., beyond reading of the book text) were coded for level of abstraction according to the coding scheme in Table 3. This coding scheme was based on Coding Categories for Levels of Abstraction during shared reading (Price et al., 2009). Utterances that were not linked to the plot but related to the context or the child’s behaviour were coded as transactional (Sorsby & Martlew, 1991). If an utterance contained elements from more than one category (e.g., an explanation might involve a lower level inference), the higher level was coded. The level of abstraction was defined as the proportion of talk that was not bound to the here and now (i.e., utterances at Level 2 and Level 3) relative to the total amount of extratextual talk. This index of abstraction corresponds to that used in previous work to index the level of “decontextualized” talk across contexts while controlling for the total amount of talk (e.g., Rowe, 2012). To ensure reliability for abstract language coding, 20% of the transcripts were coded by a second coder. Disagreements were discussed and resolved after an initial transcript. Coding agreement for the level of abstraction was 79%. Weighted kappa (κ) with corrections made for chance was .76, indicating excellent reliability (Fleiss, 1981).

**Number of questions.** The number of questions was computed in CLAN by identifying all maternal utterances ending in a question mark. The output list was then hand-checked. All question types were counted.

**Elaborative follow ups.** Children’s responses to maternal questions were identified and marked in CLAN. Maternal utterances that followed up on the child’s response to a question were then identified in CLAN, and hand-coded as simple or elaborative (see Table 4 for examples). This coding scheme was based on work by
Mehan (1979) on the structure of social interaction in classrooms, and on more recent work on read-aloud interactions (Mascareño, Snow, Deunk, & Bosker, 2016). The coding scheme provided an index of the degree to which caregivers followed up on their children’s responses to questions, thus creating a collaborative interaction about topics in the story. Simple follow ups were those that evaluated or provided basic feedback on the child’s response (e.g., “okay”, “yes”), whereas elaborative follow ups extended the child’s response by asking for or providing more information on the same topic. If the mother followed up a child response with a simple and an elaborative follow up (i.e., in the same turn), the follow up was coded as elaborative. The degree of elaboration was calculated by dividing the number of elaborative follow ups by the total number of follow ups (i.e., both simple and elaborative). This index provided a measure of the extent to which caregiver verbalizations supported child-involved extended discussions. To ensure reliability for degree of elaboration, 20% of the transcripts were coded by a second coder. Disagreements were discussed and resolved after an initial transcript. Coding agreement for the degree of elaboration was 87.5%. Kappa (κ) with corrections made for chance was .76, indicating excellent reliability (Fleiss, 1981).

**Child questions.** Children’s challenging questions were defined as those that required an explanation from the caregiver (e.g., “how” and “why” questions, such as “why did he want to do that?”). Challenging questions were identified by using the kwal function in CLAN to identify all child questions (i.e., utterances ending in a question mark). Hits were hand-searched and coded.

**Child engagement.** Child engagement during shared reading was measured using an adapted version of the Children’s Orientation to Book reading (COB) scale (Kaderavek, Guo, & Justice, 2014), which has demonstrated validity and reliability.
This scale was adapted the COB for one-to-one shared reading. From the video-recordings, children’s behaviour was rated across eight domains: Overall impression, Persistence, Proximity, Positive affect, Eye gaze, Distractibility, Active participation, and Response to adult redirection (scores 1–4; low to high, respectively). The COB scale demonstrated good internal consistency ($\alpha = .87$). Average scores were calculated to index children’s engagement during shared reading. To ensure reliability of COB ratings, 20% of the data was rated by a trained second coder. Training involved the second coder rating one of the videos, and then discussing their rating for each domain with the first coder (who had previously rated the same video). No disagreements were observed between coders on the initial video during training. Percent agreement for average COB scores was 81%. Weighted Kappa was calculated to estimate inter-coder reliability with corrections made for chance, and accounting for different degrees of disagreement for the ordinal scale. Kappa was .71, indicating excellent reliability (Fleiss, 1981). Note that children’s engagement levels were not considered in the analysis because of the lack of variation in overall engagement scores (nearly all children had high or moderately high engagement).

**Child language abilities.** The British Picture Vocabulary Test 2nd edition (BPVS-II; Dunn, Dunn, Whetton, & Burley, 1997) was used to measure children’s receptive vocabulary skill. This assessment involves the examiner saying a word, and the child pointing to the corresponding picture from a set of four on a page. The assessment comprises two practice trials and 14 sets of pictures each containing 12 test items (a total of 168 test items). Testing begins at the set indicated in the manual for the child’s age (usually their basal level), and ends when the child reaches their ceiling level (eight or more errors in a set). Raw scores are calculated and converted
to standardized (UK-normed) scores and percentile ranks. Administration time was approximately 10–15 minutes. One child had a missing BPVS score because she did not complete the language assessment. This score was replaced by the sample mean, as it was considered missing at random, i.e., the reason for missingness was unrelated to the child’s probable language score given that the incomplete score was already in the typical range. The BPVS was selected for its ease of administration.
### Table 3.

**Coding Scheme for Maternal Level of Abstraction**

<table>
<thead>
<tr>
<th>Level of abstraction</th>
<th>Subtype of talk</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1:</strong> Matching Perception and Selective Analysis of Perception</td>
<td><strong>Description (DES).</strong> Refers to what is on the page (e.g., events, referents). Includes rote counting. <strong>Meaning (MEA).</strong> Provides an explicit definition of a word, asks if child knows meaning, or comments on a word.</td>
<td>There’s a seal there! What’s it made of?</td>
</tr>
<tr>
<td><strong>Level 2:</strong> Reordering Perception</td>
<td><strong>Inferences, bridging, or recalling (BRI).</strong> Connects what is in the story with the child’s own experience, recalls the parts of the story, talks about similarities and differences, makes simple inferences. <strong>Psychological states (PSY).</strong> Refers to characters’ mental state. <strong>Reflections or evaluations (REF).</strong> Makes a moral judgement or evaluation about an event or character.</td>
<td>Can you do squiggling? It must be night-time. Oh no, is he sad? Is that naughty?</td>
</tr>
<tr>
<td><strong>Level 3:</strong> Reasoning about Perception</td>
<td><strong>Predictions and explanations (PRE).</strong> Refers to cause-effect relations in the past (i.e., explaining why something happened) or in the future (i.e., predicting what will happen in the story).</td>
<td>His mummy would be cross with him (be)cause he didn’t catch the chicken. I bet she was coming in to get a nice cup of tea.</td>
</tr>
<tr>
<td><strong>Transactional talk</strong></td>
<td><strong>Utterances that were transactional (TRA).</strong> For example: Provide feedback, direct the child’s attention, manage the child’s behaviour, or referred to aspects of the book context that were not linked to the storyline.</td>
<td>Sit down and listen. Did you like that story?</td>
</tr>
</tbody>
</table>

*Note.* Coding scheme based on the Coding Categories for Levels of Abstraction (Price et al., 2009).
### Table 4. Coding Scheme for Maternal Follow Ups

<table>
<thead>
<tr>
<th>Follow up category</th>
<th>Subtype of follow up</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Confirmation (CON). Validates or confirms the child’s response.</td>
<td>Yeh / Okay / Mmm</td>
</tr>
<tr>
<td></td>
<td>Evaluation (EVA). Positively or negatively evaluates the child’s response.</td>
<td>Well done</td>
</tr>
<tr>
<td></td>
<td>Falsification (FAL). Falsifies or repeats the child’s inadequate response.</td>
<td>No, it’s not called that</td>
</tr>
<tr>
<td></td>
<td>Answering (ANS). Provides the correct answer.</td>
<td>He looks happy</td>
</tr>
<tr>
<td></td>
<td>Simple reformulation (REF). Reformulates some or all of the child’s utterance, but adds no new semantic information.</td>
<td>Child: Those are gooses  Mother: Yes, they are geese</td>
</tr>
<tr>
<td>Elaborative</td>
<td>Elaboration (ELA). Adds new information that complements the child’s response.</td>
<td>Child: because he’s not like them  Mother: those ones are all dirty so you can see them near the snow.</td>
</tr>
<tr>
<td></td>
<td>Hint (HIN). Requests extra information to stimulate a further response from the child (this may occur after the child has failed to answer the question adequately).</td>
<td>Well have a look, what do you think? / And what colour is the snow?</td>
</tr>
</tbody>
</table>

Note. Table adapted and modified from Mascareño et al. 2016.

### Statistical Approach

Linear Mixed-Effects Models (LMMs) were used to assess the main research question about the effects of story type on maternal and child speech. This approach has several advantages over *t*-tests or mixed factorial ANOVA in addressing the present research questions. Mixed modelling allows us to assess the effect of story type on each of the maternal outcomes while also accounting for variation across specific book titles by allowing the intercept to vary across book titles. This
approach also eliminates the need to dichotomize continuous variables when testing for interactions among continuous variables (i.e., in this case IMD scores, BPVS scores, and child age) and the experimental factor (i.e., in this case story type).

Unlike traditional regression, the LMM accounts for non-independent observations (i.e., dyads sharing both kinds of book in the present study) by modelling between- and within-subject variation separately (Raudenbush & Bryk, 2002). For each dependent variable, an initial LMM was fitted with the random effects structure (varying intercepts for dyad and book title), and the fixed factor of story type. The random effects structure consisted of dyad and book title as random factors to account for variation within dyads and across specific book titles by allowing intercepts to vary across dyads and book titles. Initial multiple regression analyses were used to check for multicollinearity among variables and the presence of univariate and multivariate outliers, and residuals were plotted against fitted values to check for normality and homogeneity (Raudenbush & Bryk, 2002). Then LMMs were fitted to assess the effect of story type on each of the maternal and child speech variables. To explore possible two-way interactions of child age, BPVS scores, and IMD scores with book type, subsequent models were fitted in a step-down manner (i.e., with and then without the interaction term) and Likelihood Ratio Tests (LRTs) were used to compare the model with and without the interaction term. In testing interactions, variables were first scaled and centred to aid interpretation. Models with interaction terms that did not significantly increase model fit were rejected. Models were fitted in R (version 3.5.2) using the lmer function of Package lme4 version 1.1-19 (Bates, Mächler, Bolker, & Walker, 2015). The traditional alpha value cut off was used ($p < .05$). We report $t$-values for each model, as well as $p$-values as obtained.
using the car package (Fox & Weisberg, 2011). Residuals were plotted against fitted values to check for normality and homogeneity (Raudenbush & Bryk, 2002).

Models were run on proportional measures for level of abstraction, questions, and the degree of elaborativeness, indexing quality while also controlling for the quantity of extratextual talk (i.e., showing whether the composition of mothers’ extratextual talk was of greater quality, as opposed to reflecting whether mothers simply produced more speech overall). The results for raw frequencies are also presented. However, inferential statistics on the raw frequencies for these measures are presented only when the pattern of results differed.

4.4 Results

Descriptive Statistics

All mothers produced extratextual talk when sharing both the simple and complex books. Reading durations (seconds) were similar for the simple and complex books ($M = 255$ s, $SD = 75$, range = 135–472 and $M = 257$ s, $SD = 84$, range = 140–552, respectively). Table 5 shows descriptive statistics for the book reading variables of interest. Both frequencies and proportions are presented for the amount of abstract talk and elaborative follow ups.

Variation in the Amount and Quality of Extratextual Talk

As shown in Table 5, large standard deviations and ranges indicated large variability in the different aspects of maternal speech across mothers. Mothers’ word tokens during shared reading of both book types were positively skewed, indicating that the majority of mothers did not produce the number of word tokens at the higher end of the ranges in Table 5. Spearman’s correlations (not presented) showed significant positive associations for the maternal speech variables of interest across the two story types ($\rho s = .301$–.801, $ps < .05$), with the exception of the proportion of
elaborative follow ups ($\rho = -0.069, p > .05$). This indicates strong consistency in mothers’ individual reading styles in general. The lack of a relation for elaborative follow ups across book types could reflect the relatively low frequency of elaborative follow ups in the simple condition, or it could suggest that the use of elaborative follow ups serves a different function depending on book type. Specifically, elaborative follow ups could function to support children’s participation in extended discussions involving explanations when sharing the complex book, but not in the simple book where such discourse is extremely rare (see Table 5).

Table 5.
Descriptive Statistics (Proportions) for Maternal Extratextual Talk Variables By Story Context

<table>
<thead>
<tr>
<th>Variable</th>
<th>Simple</th>
<th></th>
<th>Complex</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>Range</td>
<td>$M$</td>
</tr>
<tr>
<td><strong>Maternal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word tokens</td>
<td>120.98</td>
<td>109.70</td>
<td>2–524</td>
<td>177.02</td>
</tr>
<tr>
<td>Word types</td>
<td>65.13</td>
<td>42.21</td>
<td>2–168</td>
<td>81.09</td>
</tr>
<tr>
<td>MLUw</td>
<td>4.59</td>
<td>1.17</td>
<td>2.00–7.50</td>
<td>5.11</td>
</tr>
<tr>
<td>Abstract utterances</td>
<td>(.23)</td>
<td>(.18)</td>
<td>(.00–.67)</td>
<td>(.31)</td>
</tr>
<tr>
<td>(Inferences and bridging)</td>
<td>(.21)</td>
<td>(.16)</td>
<td>(.00–.67)</td>
<td>(.17)</td>
</tr>
<tr>
<td>(Explanation and predictions)</td>
<td>.068</td>
<td>1.22</td>
<td>0–5</td>
<td>4.60</td>
</tr>
<tr>
<td>Questions</td>
<td>10.98</td>
<td>10.38</td>
<td>0–49</td>
<td>14.70</td>
</tr>
<tr>
<td>Elaborative follow ups</td>
<td>1.38</td>
<td>1.99</td>
<td>0–9</td>
<td>3.42</td>
</tr>
</tbody>
</table>

Notes. $N = 53$. MLUw = mean length of utterance in words. Proportion of abstract utterances was relative to the total number of utterances. Proportion of elaborative follow ups was relative to the total number of follow ups (this measure was calculated for $n = 38$, as the denominator was the total number of follow ups rather than the total number of utterances).

Before addressing the next research question, we explored possible sources of the variation in extratextual talk by examining relations between the demographic variables (i.e., child age, child BPVS scores, and maternal SES) and the extratextual talk variables across the two story types. As shown in Table 6, mothers tended to use
less extratextual talk with older children across book types. However, mothers asked more questions to children with more advanced language skills on average when sharing the complex books. Maternal SES (as indexed by IMD scores) tended to be positively related to all of the extratextual talk measures (although it was only significantly related to MLUw and abstract talk in the simple book and MLUw in the complex book), indicating that on average mothers of higher SES tended to engage in more and higher quality extratextual talk.

Table 6. Spearman’s Correlations ($\rho$) Between the Extratextual Talk Variables and Child Age and IMD Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Simple</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Child age</td>
<td>BPVS scores</td>
</tr>
<tr>
<td>Word types</td>
<td>−.296*</td>
<td>.004</td>
</tr>
<tr>
<td>Word tokens</td>
<td>−.302*</td>
<td>−.024</td>
</tr>
<tr>
<td>MLUw</td>
<td>−.092</td>
<td>.102</td>
</tr>
<tr>
<td>Abstract utterances</td>
<td>−.126</td>
<td>.217</td>
</tr>
<tr>
<td>Questions</td>
<td>−.006</td>
<td>.233</td>
</tr>
<tr>
<td>Elaborative follow ups</td>
<td>−.173</td>
<td>−.167</td>
</tr>
</tbody>
</table>


Effect of Story Type on the Amount and Quality of Extratextual Talk

Table 7 shows the LMMs for effect of the type of story on each maternal speech variable. As shown in Table 7, the complex stories as compared to the simple ones facilitated a significantly greater number of word tokens and word types, significantly longer MLUw, a significantly greater proportion of abstract utterances and elaborative follow ups, but not questions. Accounting for variation across book titles, mothers produced on average 57 more word tokens, 16 more word types, 7% more abstract talk, and 21% more elaborate follow ups (relative to simple follow
ups) on child responses, and MLUw that was 0.5 longer when sharing the complex stories as compared to the simple stories. Thus, on average mothers used more extratextual talk and had a greater quality of extratextual talk when sharing the complex book as compared to the simple book, as indexed by each of the variables of interest excluding questions. Note that when the model was run on the raw frequency measures, the number of questions mothers posed was significantly greater when sharing the complex stories (as compared to the simple stories) ($B = -3.72$, $SE = 1.35$, $t = -2.755$, $p = .006$), perhaps reflecting the greater overall amount of talk when sharing the complex stories. This was the only result that differed depending on whether the raw or proportional data were used.

Next, we explored whether caregivers’ greater level of abstraction in the complex books reflected a general increase in abstract talk or was driven by one particular level of abstract talk. Table 7 shows the LMM for the effect of story on lower level abstract talk (i.e., inferences and bridging) and higher level abstract talk (i.e., explanations and predictions). As shown in Table 7, LMMs indicated that complex stories facilitated a greater proportion of higher level abstract talk (i.e., predictions and explanations), but not lower level abstract talk (i.e., inferences and bridging). Accounting for variation across book titles, mothers produced on average 11% more talk involving explanations and predictions when sharing the complex as compared to the simple stories. Thus, the increased level of abstraction was driven by extratextual talk involving predictions and explanations.

Finally, we explored possible interactions of child age, BPVS scores, and SES with book type using LRT tests (as described above). There were no significant interactions of book type with age, BPVS scores, or SES for any of the maternal extratextual talk variables.
Table 7.
Estimated Fixed-Effects Coefficients, t-values, and p-values from the LMMs Predicting Maternal Extratextual Talk From Book Type

<table>
<thead>
<tr>
<th>DVs</th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word tokens</td>
<td>-56.66</td>
<td>21.96</td>
<td>-2.580</td>
<td>.010*</td>
</tr>
<tr>
<td>Word types</td>
<td>-16.23</td>
<td>7.58</td>
<td>-2.142</td>
<td>.032*</td>
</tr>
<tr>
<td>MLUw</td>
<td>-0.53</td>
<td>0.19</td>
<td>-2.785</td>
<td>.005*</td>
</tr>
<tr>
<td>Level of abstraction</td>
<td>-0.07</td>
<td>0.03</td>
<td>-2.467</td>
<td>.014*</td>
</tr>
<tr>
<td>(Inferences and bridging)</td>
<td>0.04</td>
<td>0.02</td>
<td>1.785</td>
<td>.074</td>
</tr>
<tr>
<td>(Explanations and predictions)</td>
<td>-0.11</td>
<td>0.02</td>
<td>-6.625</td>
<td>&lt;.001†</td>
</tr>
<tr>
<td>Questions</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.588</td>
<td>.556</td>
</tr>
<tr>
<td>Elaborative follow ups</td>
<td>-0.21</td>
<td>0.07</td>
<td>-2.920</td>
<td>.004*</td>
</tr>
</tbody>
</table>

Notes. N = 53. LMMs = Linear Mixed-Effects Models. DVs = dependent variables. Effect of story type in bold. MLUw = Mean length of utterances in words. Random effects structures for each model consist of random intercepts for dyad and book title. Interactions between story type and each demographic variable (child age, child language abilities, and SES) were assessed by using Likelihood Ratio Test (LRT) procedures, but these are not presented as none were significant.
* = p < .05. † = p < .0001.

Effect of Story Type on Child Questions Requiring Caregiver Explanations

Only four children posed challenging questions when sharing the simple book, and eleven children asked challenging questions when sharing the complex book. The same children who posed challenging questions when sharing the simple books, also posed them when sharing the complex books. Among the subset of children who asked questions when sharing either book (n = 11), the mean number of challenging questions posed when sharing the simple vs. the complex books was 0.82 (SD = 1.54, range = 0–5) and 2.3 (SD = 1.62, range = 1–6), respectively. These descriptive data show that the complex stories tended to facilitate more challenging questions from some children, but that these occurred very rarely in the sample. Inferential statistics were not used to address this question given the small number of children who posed questions.
4.5 Discussion

It is well established that caregiver extratextual talk during shared reading is beneficial for preschool-age children’s language development. However, knowledge is lacking about the role of different book characteristics in promoting caregiver extratextual talk. Here, we investigated the amount and quality of caregiver extratextual talk as facilitated by stories that differed in their conceptual demand. Complex stories were defined as those containing a false belief central to the plot, whereas simple stories had no false belief. Fifty-three mothers and their three- and four-year-old children shared both a simple and a complex story. To support the interpretation and generalizability of the results, 1) books were used that were commercially available and thus representative of those likely to be encountered by preschoolers, and 2) books were matched on key characteristics so that they were ostensibly very similar. Results from the Linear Mixed-Effects Models showed that the complex books encouraged more and higher quality caregiver extratextual talk, as hypothesized. Specifically, the complex books facilitated more extratextual talk, more syntactically complex and lexically diverse extratextual talk, and a greater level of abstraction (driven by explanations and predictions). In addition, although on average mothers posed similar proportions of questions when sharing simple and complex books, they elaborated more on children’s responses to questions when sharing the complex books. Importantly, these effects on caregiver extratextual talk were robust across mothers and book titles, despite great variability among individual mothers in their reading styles.

The present findings support the hypothesis that complex stories, as compared to their simpler counterparts, provide increased opportunities for challenging and beneficial caregiver extratextual talk with preschoolers (Fletcher &
Reese, 2005). We used books with a false-belief central to the story to represent complex stories in the present study, as such stories are known to be challenging for preschool-age children. As hypothesized, these books encouraged caregiver extratextual talk that was linguistically richer and more abstract. Interestingly, the greater level of abstraction and linguistic complexity in caregiver extratextual talk when sharing the complex stories was driven by extratextual talk at the highest level of abstraction (i.e., explanations and predictions). This higher level of abstraction was accompanied by a more elaborative style, where the caregiver followed up on children’s responses to questions, scaffolding their verbal participation in discussions about the plot. The finding of this more elaborative style and the presence of explanatory utterances with the complex books is consistent with previous research on how challenging, explanatory discourse with preschoolers unfolds as part of a sequence characterized by elaborations on children’s responses during shared reading and in other contexts (Gosen, Berenst, & de Glopper, 2013; Snow & Kurland, 1996). Although ostensibly similar to the complex stories, the simple stories in our study provided only limited opportunities for such extratextual talk. Importantly, children’s exposure to kinds of co-constructed abstract discourse that we observed with the complex books in our study has been found to predict language development (e.g., Dickinson & Porche, 2011; Dickinson & Smith, 1994). Thus, complex stories as conceptualized in this study may be a particularly beneficial context for language learning.

These findings add to a significant body of work investigating the role of the book in caregiver extratextual talk. Previous research on the role of the book on extratextual talk has focused largely on informational books vs. stories, finding that informational books facilitate more abstract language use than stories (e.g.,
Anderson et al., 2004; Potter & Haynes, 2000; Price et al., 2009; Torr & Clugston, 1999). One possible reason for this consistent finding is that caregivers are biased toward using a more tutorial style by the genre of the book (i.e., informational books may be seen as intended for teaching the child). However, the results presented here suggest that even when books do not explicitly bias caregivers to use a more tutorial style, caregivers may increase the complexity of their extratextual talk to reflect the demands of the content of the book in line with their children’s developing abilities. Interestingly, we did not observe interactions between book type and child age or abilities in the present study. One interpretation of this is that the caregivers in this study were skilled at supporting children’s participation in the more demanding discourse about the complex story in ways appropriate given the specific child. Support for this interpretation comes from the finding that mothers extratextual talk when sharing the complex books was characterized by the use of elaborative follow ups (i.e., which build on and thus are individualized and sensitive to children’s contributions).

A key implication of the present study is the importance of choosing stories in the light of children’s developing abilities. As shown in our study, stories can be carefully selected to promote caregiver extratextual talk that supports children’s verbal participation in extended discussions about the plot (e.g., involving reasoning about characters’ motivations). Based on the present study findings, it is recommended that stories be selected with consideration of the kinds of opportunities they afford for extratextual talk, as different kinds of stories will offer different opportunities for children’s learning depending on the age of the child. In the preschool years, children benefit from more challenging interactions, such as those involving explanatory discourse (Rowe, 2012). Therefore, complex books such...
as those containing a false-belief are likely to be particularly beneficial in the preschool years, and may serve to prepare them for the extended discourse that will be encountered in the classroom. As well as selecting books based on the opportunities they afford for beneficial extratextual talk, it is also important to consider the child’s own preferences. Letting the child choose the book for sharing can promote their engagement during shared reading (Ortiz et al., 2001), which, in turn, may encourage more meaningful and beneficial extratextual discussions about the book (e.g., Malin, Cabrera, & Rowe, 2014).

The choice of story is an especially important consideration for those conducting shared-reading interventions. Complex stories, as defined in our study, may be particularly useful in shared-reading interventions targeting preschool children’s language skills through training caregivers to engage in rich and abstract discussions about the story (e.g., Morgan & Goldstein, 2004). By contrast, younger children or those with language delays (who may not be developmentally ready for the more challenging kinds of discussions surrounding false-belief books), may benefit more from the less demanding extratextual talk associated with simple stories. In addition to the complexity of the story in terms of its conceptual demand, those designing shared-reading interventions for younger child should consider other book characteristics. For example, a recent study showed that simple (i.e., non false-belief) stories with low amounts of text were particularly useful at promoting high rates of extratextual talk with three-year-olds, as compared to their higher text, simple (i.e., also non false-belief) counterparts (Muhinyi & Hesketh, 2017). Thus, these kinds of stories may be appropriate for younger children and those with lower language and engagement skills.
In the light of these recommendations, the provision of resources in low-SES populations is also important. Children’s book access has been linked to linguistic and cognitive outcomes in children at developmental risk because of low SES (Baydar et al., 2014; Farver, Xu, Lonigan, & Eppe, 2013; Lugo-Gil & Tamis-LeMonda, 2008). Thus, the provision of a wide repertoire of books should increase opportunities for preschool-age children’s exposure to those books that are likely to be developmentally appropriate and promote optimal caregiver extratextual talk to support language development.

A second key implication of this study is the need for interventions that teach caregivers both the importance of using abstract language during shared reading with preschool-age children, and importantly, how to engage children in discussions involving abstract talk. Importantly, when engaging children in more abstract discussions, some of the mothers in our study used questions and elaborative follow ups, which build on the child’s response and extend the conversation. However, consistent with previous research (e.g., Muhinyi & Hesketh, 2017; Nyhout & O’Neill, 2013; Price et al., 2009), there was wide variation in mothers’ reading styles, and some mothers missed opportunities to engage their children in abstract conversations, even when sharing the complex stories. Parent-focused intervention studies may need to provide specific training on how to involve children in abstract talk through questioning and following up on children’s responses in ways that extend the discussion. This is likely to be more beneficial than simply commenting or posing challenging questions which the child may not yet be ready to answer without support.

More broadly, the findings of this study contribute to our understanding of the influence of context on caregiver-child interaction. Context-related differences
have been explored across broad domains, such as mealtimes, book reading, and toy play (Hoff, 2006). Adding to a growing body of work investigating the influence of specific characteristics within given contexts (e.g., different types of toys and books), the present study highlights the importance of micro-level features of the context in child-directed speech. Such micro-level analyses of context contribute to our understanding of how particular contexts may relate to children’s language development, having implications both for practice and transactional theories of development (Sameroff, 2009).

There are several limitations to the present study, and some clear directions for future work. First, although relatively large, our sample was fairly homogenous in terms of several characteristics (i.e., reading frequency, desire to participate in research, and level of child engagement). Thus, it could be important for future research to examine the role of story subgenre in a more diverse sample, including one with greater variation in SES, reading frequency, and children’s engagement/interest in book reading. One way of achieving this might be to observe naturalistic shared reading in preschool classrooms across the SES continuum.

Second, we used a small pool of books in the present study (two stories that contained a false-belief, and two that did not). Both of the complex stories had a false-belief that was central to the plot, and in both books the false-belief was depicted through the behaviours of the protagonists (as depicted in the pictures and described in the text), rather than being explicitly stated in the text. Future research should consider different variations of false-belief stories, and whether manipulating specific features of the stories (e.g., whether or not the false-belief is explicitly stated in the text) affects the extratextual talk. One possibility is that stories where the false belief is explicitly stated in the text would not yield the same degree of challenging
extratextual talk as observed in the present study, because caregivers may perceive less of a need to explore children’s understanding of complex aspects of the plot in extratextual discussions when it is stated in the text.

Finally, we did not examine possible effects of genre on children’s contributions in this study. This was because we would expect that effects of book complexity on children’s contributions would be more evident in later readings, reflecting the influence of caregiver scaffolding on the false-belief book reading on children’s skills over time, in line with social interactionist theory (e.g., Peterson & McCabe, 1994). Future research should investigate the role of book genre and complexity on children’s productions over time (e.g., across repeated readings), and on children’s subsequent language development.

To our knowledge, this study is the first to investigate the role of the conceptual demand of stories on caregiver on extratextual talk. We found that stories that were more complex encouraged more abstract and linguistically complex extratextual talk, as well as a more elaborative conversational style. Thus, the choice of story matters for those seeking to promote preschool children’s language learning through shared reading.
4.6 References


5. Chapter Five: Effects of Simple and Complex Stories and Their Associated Extratextual Talk on Preschoolers’ Vocabulary and Narrative Skills (Study 3)

5.1 Abstract

A recent study (see paper 1 of this thesis) showed that caregivers used more abstract language with preschoolers when sharing complex vs. simple stories (as defined by the inferential demand of the story). Preschool-age children’s exposure to abstract language (i.e., talk beyond the here and now) has been shown to be beneficial for their language development. Thus, the present study aimed to test whether preschoolers’ repeated exposure to simple and complex stories, and their associated types of abstract extratextual talk, would lead to differential gains in their language skills. Specifically, it was hypothesized that complex stories would lead to greater gains in children’s vocabulary and narrative skills. Thirty-four children were assigned to one of two story conditions (simple or complex), and participated in twice-weekly shared reading sessions in small groups for six weeks. An experimenter read the stories and engaged in scripted extratextual talk (comments and questions) in both conditions. Contrary to the hypotheses, no between-condition differences were found in children’s vocabulary or narrative skills on the post-test measures. However, exploratory post hoc analyses of the reading sessions showed that children in the complex story condition used more complex language, as indexed by their mean length of utterance, use of mental and linguistic verbs, and use of subordinate clauses. Results and directions for future research are discussed.
5.2 Introduction

Research shows that exposure to abstract language (i.e., talk that is beyond the here and now) promotes preschool-age children’s vocabulary and narrative skills (Beals, 2001; Demir, Rowe, Heller, Goldin-Meadow, & Levine, 2015; DeTemple, 2001; Peterson & McCabe, 1994; Rowe, 2012). Similar findings are reported in the shared-reading literature (e.g., Dickinson & Porche, 2011; Dickinson & Smith, 1994; Hindman, Connor, Jewkes, & Morrison, 2008). As such, researchers have focused on examining the effects of book genre on the quality of caregivers’ extratextual talk (i.e., talk beyond reading the text) during shared reading with children. Such research has found that book genre can influence how much abstract language caregivers use with their children. In a recent study (see paper 1 of this thesis), we found that more complex stories facilitated higher levels of abstraction in caregivers’ extratextual talk during shared reading than did simple stories (as defined by the level of inferential demand required to comprehend the story). Given the evidence for the role of abstract language in children’s language development, the present study aimed to test the hypothesis that preschoolers’ repeated exposure to simple vs. complex stories and their associated levels of abstract extratextual talk (i.e., with complex stories being read with more abstract discussions) would lead to differential gains in their vocabulary and narrative skills.

How often caregivers engage children in shared reading accounts for variance (estimated at 8%) in preschool children’s language development, emergent literacy, and later reading achievement (Bus, van Ijzendoorn, & Pellegrini, 1995). However, the quality of shared reading is also important for children’s linguistic outcomes (Fletcher & Reese, 2005). In particular, how much caregivers engage their children in extratextual talk (i.e., beyond simply reading the book text) has been found to
associate positively with children’s vocabulary skills (Fletcher, Cross, Tanney, Schneider, & Finch, 2008; Hindman, Skibbe, & Foster, 2014), showing longer-term benefits than reading frequency alone (Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013). In particular, engaging children in talk about the story (e.g., labelling and describing the pictures) has been found to promote infants’ and preschool-age children’s language outcomes (Reese & Cox, 1999; Whitehurst et al., 1988; Whitehurst, Arnold, Epstein, Angell, & et al, 1994). Likewise, as in the broader literature, talk that is abstract during shared reading (i.e., goes beyond the here and now of what is perceptually available in the pictures and text) is thought to play a special role in children’s language development in the preschool years and beyond (van Kleeck, 2008; van Kleeck & Vander Woude, 2003; Zucker et al., 2013).

During shared reading, abstract language (also known as decontextualized, non-immediate, and high demand talk) is used to bridge book content to the child’s own life, make inferences and connections about characters or aspects of the story, and provide explanations about characters’ motivations and how things work in the real world (van Kleeck, 2003). By contrast, concrete language, such as labelling referents and describing events, is closely tied to what is directly perceptible in the pictures. In a recent study, Hindman et al. (2008) found that both caregiver and child “decontextualized” talk during shared reading at the start of the preschool year predicted children’s expressive vocabulary at the end of the year, whereas “contextualized” talk related negatively to expressive vocabulary. Similarly, how often preschool teachers involve 4-year-old children of low-income backgrounds in “analytic talk” during shared reading has been shown to predict children’s receptive vocabulary and story understanding a year later (Dickinson & Smith, 1994; Dickinson and Porche, 2011). In addition to this observational work, a small set of
experimental studies have also indicated gains in children’s vocabulary and literacy skills following exposure to abstract talk during shared reading, although this evidence is more mixed (Blewitt, Rump, Shealy, & Cook, 2009; Morgan & Goldstein, 2004; Reese & Cox, 1999; van Kleeck, Vander Woude, & Price, 2006). One reason why abstract language might be beneficial for language development is that it exposes children to more complex syntax and sophisticated vocabulary, such as the use of mental/linguistic verbs (e.g., Curenton, Craig, & Flanigan, 2008; Demir et al., 2015). In addition, caregiver use of abstract language during shared reading may benefit children’s language development through encouraging children’s own production of complex language, such as their use of mental state verbs and subordinate clauses (e.g., Curenton & Justice, 2004). The shared-reading context may be a particularly supportive context for such talk, as the picturebook can serve as an object of joint attention between the caregiver and child as such conversations occur (Moerk, 1985).

Given the above reviewed research on the role of abstract language during shared reading in children’s language development, researchers have sought ways to encourage caregivers’ use of abstract language during shared reading through caregiver and educator training (e.g., Morgan & Goldstein, 2004; Rezzonico et al., 2015). Another research direction has been to investigate the role of book itself on the caregivers’ abstract language use during shared reading (Aram, 2008; van Kleeck, 2003). Recent studies have shown that book genre influences caregiver use of abstract language. For example, caregivers have been shown to engage in more extratextual talk that is abstract (e.g., explanations about concepts) when sharing informational books (vs. storybooks) with their preschool-age children (e.g., Anderson, Anderson, Lynch, & Shapiro, 2004; Potter & Haynes, 2000; Price,
Kleeck, & Huberty, 2009; Torr & Clugston, 1999). However, far less research has examined caregiver language use as a function of differing story characteristics (Greenhoot, Beyer, & Curtis, 2014; Leech & Rowe, 2014; Muhinyi & Hesketh, 2017). This is an important gap, given that stories are the most common genre of picturebook encountered by preschool-age children both at home and in preschool settings (Pentimonti, Zucker, & Justice, 2011; Yopp & Yopp, 2006). In a recent study (Paper 1 in this thesis), we investigated the effects of story complexity (as defined by the level of inferential demand required to comprehend the story) on caregivers’ abstract language use with preschoolers. Compared to simple stories, complex stories facilitated more extratextual talk and a greater overall level of abstraction, which was driven by utterances involving explanations and predictions about the plot. Interestingly, caregivers used none or very little of this “higher level” abstract talk when sharing simple stories (although they engaged in a similar amount of concrete talk, such as labelling and descriptions, and “lower level” abstract talk, such as inference, evaluation, and text-to-life references). Thus, we suggest that the complex stories provided a platform for more abstract talk.

If, as is now becoming clear, some kinds of books are better at promoting beneficial kinds of input, then the choice of book used in shared-reading interventions may be an important factor in determining the quality of language children hear during shared reading. Similarly, both the variety of books available to children and the kinds of books frequently shared may play important roles in how often children are exposed to high quality extratextual talk during shared reading. However, experimental work is needed to assess whether repeated exposure to specific kinds of books leads to differential effects on children’s language development. In a recent study, Greenhoot et al. (2014) showed that illustrated vs.
non-illustrated storybooks differentially affected parent-child interaction (with illustrated stories leading to more interactive reading). In turn, children exposed to the illustrated story were better able to recall that same story one week later, and differences in children’s recall were partially accounted for by observed differences in parent-child interaction. Other work has shown that adults engaging in scripted interactions based on caregivers’ distinct and naturally occurring reading styles can lead to differential gains in children’s language outcomes after a six-week intervention (Reese & Cox, 1999). However, to our knowledge, research has not yet shown whether repeated exposure to particular kinds of books and their associated extratextual talk can lead to differential effects on children’s vocabulary and narrative skills. Given that in our previous study we found that complex stories facilitated more abstract talk and, in particular, more explanations and predictions about the story, we might expect that exposure to this kind of story and its associated greater level of abstract extratextual talk would be particularly beneficial for preschool-age children’s language development. However, for children with lower language skills who may struggle to understand the complex plot and the extratextual talk surrounding it, we might expect that simple stories would lead to greater gains. This prediction is based on earlier work suggesting that abstract talk may be less beneficial for children with lower initial vocabulary skills (Reese & Cox, 1999).

The Present Study

Here, we tested the relative effects of exposure to two kinds of stories (complex and simple) and their associated extratextual talk on the vocabulary and narrative skills of preschool-age children. We hypothesized that exposure to complex stories would lead to better vocabulary and narrative outcomes compared to simple
stories. An exploratory hypothesis was that, by contrast, exposure to simple stories would lead to greater gains for children with lower language abilities.

### 5.3 Method

As in previous work investigating the effects of particular reading styles on children’s outcomes (e.g., Blewitt et al., 2009; Reese & Cox, 1999), children were read to by an experimenter using scripted books in a controlled experiment. A between-subjects design was used. Within each classroom, children were randomly assigned to one of two experimental conditions (simple or complex). Language outcomes were measured before and after a six-week intervention, where children were exposed to one of the two kinds of story and its associated reading style. Three- and four-year-old children were selected to participate in this study because previous research suggests that exposure to abstract language is particularly beneficial for children of this age (e.g., Dickinson & Smith, 1994; Rowe, 2012). Note that because the main hypothesis concerned the relative effects of two kinds of stories and their associated extratextual talk on children’s outcomes (and not general effects of shared reading), a non-reading control group was not considered necessary. Sample size was based on previous research that compared the effects of different reading styles and observed significant effects after similar intensities of exposure (e.g., Blewitt, Rump, Shealy, & Cook, 2009; Reese & Cox, 1999). For example, Reese and Cox compared the effects of three different reading styles on a range of outcomes using a sample of 48 children (i.e., 16 in each condition), and detected significant differences between conditions on a similar range of outcomes after six weeks’ exposure.

### Participants

Thirty-four participants (16 boys and 18 girls) ranged in age from 43 months to 59 months ($M = 51.79$, $SD = 5.34$). Children’s language abilities ranged widely
from standardized scores of 89 to 138 ($M = 105.06, SD = 11.12$), as assessed by the British Picture Vocabulary Scale (BPVS-II; Dunn, Dunn, Whetton, & Burley, 1997). Children were recruited from the preschools (nursery and reception) of two schools in the Greater Manchester area, both in areas of deprivation (i.e., the first and fourth deciles on the Indices of Multiple Deprivation; IMD, 2015). All parents provided informed consent. Ethical approval was obtained from the University Research Ethics Committee (UREC) at the University of Manchester (Ref. 2017-2523-3638). Schools were compensated with a book voucher worth £100 for their participation.

In School A, seven children were drawn from nursery classes and seven from reception. In School B, eight children were drawn from nursery and fourteen from reception. All children were monolingual, English-speaking. The ethnicity of all children was white. Originally, 36 children were recruited and assigned to groups, but one child missed the post-test because they were absent on the testing days, and another child refused to participate in the intervention beyond the first session. Therefore, the final sample comprised 34 children.

**Materials**

Ten stories (five simple and five complex) were used. Based on previous work (see paper 1 of this thesis), complex stories were defined as those involving a false belief central to the plot, whereas simple stories involved no instances of false belief. Titles are provided in Appendix 1. Commercially available stories were selected from high street bookshops, so that they were representative of those available for many preschoolers in the UK. The stories were similar in their main features (i.e., style, layout, number of pages and words, they did not contain fantasy themes, and the protagonists were animals). Stories were selected by the researcher, and their assignment to the simple and complex categories was verified by another
researcher independent of the study. All of the stories were unfamiliar to the participating children.

**Procedure**

The study consisted of three phases: pretest, intervention, and posttest. Data collection during each phase was conducted in a quiet room adjoining the classrooms. Pretest was conducted during the two weeks before the intervention phase (prior to random assignment to groups). Both pretest and the intervention were conducted by the researcher. Posttest was conducted in the week following the intervention by another researcher who was blind to the study aims and group allocation.

**Pretest and Posttest Assessment**

The testing procedure was as follows:

A. *Receptive vocabulary skills.* The British Picture Vocabulary Test 2nd edition (BPVS-II; Dunn, Dunn, Whetton, & Burley, 1997) was used to measure children’s receptive vocabulary. The BPVS is a published standardized assessment with UK-based norms for 3 to 16 year olds. It involves the examiner saying a word and prompting the child to point at the corresponding picture from a set of four on each page. The test comprises two practice trials and 14 sets of pictures each containing 12 test items (a total of 168 items). Testing begins at the set indicated in the manual for the child’s age (usually their basal level), and ends when the child reaches their ceiling level (eight or more errors in a set). Raw scores are then calculated and converted to standardized (UK-normed) scores and percentile ranks. Administration time was approximately 10–15 minutes. This assessment was selected as it is
quick to administer and has been used widely as a measure of children’s vocabulary skills.

B. **Story retelling ability.** The Bus Story (Renfrew, 1995) was used to assess children’s narrative retelling abilities. This assessment involves the researcher reading out a 168-word story while presenting 12 corresponding pictures (three per page). The child is then asked to retell the story using the pictures as cues. To make this activity more appealing, the researcher asked the child to retell the story to a monkey puppet. Children’s narrative retellings were audio-recorded on an MP3 device. Based on the Bus Story manual, children’s narrative retellings were scored for length (the mean length of utterance for the longest five sentences produced) and complexity (the number of instances of subordination produced). The Bus Story has good retest reliability. Administration time was approximately 10 minutes.

C. **Inferential story comprehension.** Children’s inferential comprehension was assessed using a probe based on the picture walkthrough task (Paris & Paris, 2003). This probe was based on two sets of three pictures, each set depicting a short series of events (pictures are available from Black Sheep Press Limited). The first set showed a girl walking on the beach and seeing a rock pool, then putting her foot into the pool, and then being pinched on her toe by a crab. The second set showed a girl looking up to a high shelf at a biscuit tin, then climbing up to get the biscuit tin, and then holding the empty biscuit tin in her hand. These pictures were selected as they allowed the researcher to ask questions that required children to make inferences about the short story. Five inferential questions were asked. Questions required the children to produce an inference about feelings (e.g., “how do you think the girl feels in
this picture?”), dialogue (e.g., what is the girl saying in this picture?), a prediction (e.g., what do you think happens after this picture?), and an explanation (e.g., “why is the girl upset in this picture?”). The final question required the child to demonstrate an understanding of the gist of the story conveyed in the pictures (e.g., “what would you tell your friend if he was going to the beach?”). After each question, the researcher prompted the child to provide a reason for their answer (e.g., “why would you tell him that?”). Children were prompted regardless of their initial response (unless no initial response was given). Children’s responses were scored based on a 2-point scale for each question (i.e., 2 = correct response and rationale; 1 = correct response but unable to provide rationale; 0 = incorrect response). Thus, 10 points were available for each set of pictures (i.e., 20 points in total).

Administration time was approximately 10 minutes. Cronbach’s Alpha for this task was very low (α = .37) and was not improved substantially by removing items. Therefore, scores on this task were not analysed in the statistical models addressing the research questions.

**Intervention Phase**

Within each classroom (nursery and reception), children were randomly assigned to one of two conditions (simple or complex stories). Children were then randomly assigned to eleven small groups of 3–4 children. Children’s characteristics by reading condition are summarized in Table 1. The experimenter read stories to children in small groups twice weekly (2 or 3 books per session) using reading styles based on the extratextual talk observed among dyads sharing simple and complex stories in a previous naturalistic study. Each reading session lasted approximately
10–15 minutes. Children in each condition were exposed to five different stories over six weeks (i.e., a total of 26 readings; five exposures to each story).

Table 1. *Children’s Sex Distribution, Mean Age, and Initial Vocabulary by Book Condition*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Males/females</th>
<th>Age in months</th>
<th>BPVS standard score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>6/11</td>
<td>50.88</td>
<td>5.37</td>
</tr>
<tr>
<td>Complex</td>
<td>10/7</td>
<td>52.71</td>
<td>5.31</td>
</tr>
</tbody>
</table>

*Note. BPVS = British Picture Vocabulary Scale. N = 34.*

The main difference in the extratextual talk between the two conditions was that the complex condition included a greater number of abstract utterances (i.e., explanations and predictions), and had slightly more extratextual talk overall. The simple story condition reading style contained no predictions or explanatory talk. This was based on the findings of an earlier observational study (see paper 1 in this thesis). Table 2 shows examples of the scripted extratextual talk from each of the two conditions. Scripts were used to ensure that the experimenter engaged children across groups in each condition with the same extratextual talk, as in previous experimental shared reading research. Numbered comments and questions were printed and placed inside the books on the script. Small printed numbers were attached to the pages of the books, indicating to the experimenter at which points in the story to read the comments and questions from the script. Set responses were prepared for children’s spontaneous story-related initiations during the session (e.g., *Hmm, let’s find out... Okay... Oh wow... Let's talk about that afterwards...*).

Regardless of the adequacy of children’s responses to questions, the experimenter always provided the model answer to the questions posed. Scripts were changed after two readings of the book in order to make the reading sessions more interesting and naturalistic as children grew familiar with the stories (as in van Kleeck et al., 2006). Thus, each story had three different scripts.
Table 2.
Examples of the Scripted Extratextual Utterances From Two Stories

<table>
<thead>
<tr>
<th>Condition</th>
<th>Examples of the extratextual utterances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Look at the ladybird crawling along. (p. 2)</td>
</tr>
<tr>
<td>(Stop monkeying about)</td>
<td>Can you see the water coming out of his trunk? (p. 4)</td>
</tr>
<tr>
<td></td>
<td>How do you think snake feels? (p. 4)</td>
</tr>
<tr>
<td></td>
<td>Parrot is shocked! (p. 6)</td>
</tr>
<tr>
<td></td>
<td>I don't think tiger thought that was very funny. (p. 13)</td>
</tr>
<tr>
<td></td>
<td>What's that? (p. 16)</td>
</tr>
<tr>
<td></td>
<td>All the insects are crawling on the log, look. (p. 16)</td>
</tr>
<tr>
<td></td>
<td>Are those all animals he was monkeying around with? (p. 24)</td>
</tr>
<tr>
<td></td>
<td>Look they’re swinging on jungle vines. (p. 24)</td>
</tr>
<tr>
<td></td>
<td>What was Little monkey swinging on before? (p. 24)</td>
</tr>
<tr>
<td>Complex</td>
<td>Look at all the geese honking. (p. 2)</td>
</tr>
<tr>
<td>(Look out Suzy goose)</td>
<td>Which one is Suzy goose? (p. 4)</td>
</tr>
<tr>
<td></td>
<td>She isn't very happy. (p. 4)</td>
</tr>
<tr>
<td></td>
<td><em>Why isn’t Suzy goose happy with the other geese?</em> (p. 4)</td>
</tr>
<tr>
<td></td>
<td>Do the woods look dark? (p. 6)</td>
</tr>
<tr>
<td></td>
<td>Does she think she is alone in the woods? (p. 8)</td>
</tr>
<tr>
<td></td>
<td>Who is following her? (p. 10)</td>
</tr>
<tr>
<td></td>
<td><em>Fox is following her because he wants to eat her for dinner.</em> (p. 10)</td>
</tr>
<tr>
<td></td>
<td>And there’s the wolf. (p. 14)</td>
</tr>
<tr>
<td></td>
<td>Does Suzy think she is by herself? (p. 14)</td>
</tr>
<tr>
<td></td>
<td><em>She thinks she’s by herself because the other animals are so quiet.</em> (p. 14)</td>
</tr>
<tr>
<td></td>
<td>Now the bear is following them too! (p. 18)</td>
</tr>
<tr>
<td></td>
<td><em>Why are the animals all running away?</em> (p. 26)</td>
</tr>
<tr>
<td></td>
<td>She thinks she was by herself the whole time! (p. 30)</td>
</tr>
</tbody>
</table>

*Note.* Higher level abstract talk during the complex story is shown in italics.

All sessions were audio-recorded to enable fidelity checking. Fidelity checks were conducted by another researcher who was blind to the study aims. One randomly selected audio-recording from each week was checked to ensure that the reader adhered to the scripted comments and questions. Of a total of 68 utterances checked from six recordings, the reader omitted one utterance and read another utterance as a statement instead of a question (i.e., “there are the butterflies” instead of “where are the butterflies?”). There were no other deviations from scripts involving a change in function or meaning. Scripted comments and questions were
all read in the prescribed order, and the reader did not engage children in any non-scripted extratextual talk about the story.

5.4 Results

Preliminary Analyses

There were no missing data for any of the language measures or demographic variables at pretest. At posttest, there were missing data from one child on all language measures because the child was absent on the testing days. One child refused to participate in the intervention beyond the first session (although pre- and posttest scores were still obtained for this child). Therefore, analyses were performed on the remaining cases \((n = 34)\). Preliminary \(t\)-tests showed no differences in age or in pretest standardized BPVS scores by condition (see Table 1). Similarly, preliminary \(t\)-tests showed no pretest differences between condition on any of the three narrative measures (see Table 3).

Posttest BPVS scores, and the length and complexity scores at both pre- and posttest were not normally distributed. Untransformed scores were used in the models, as log and square root transformations did not greatly improve the distributions of these variables (and note that univariate normality of predictors and dependent variables is not assumed in linear mixed models).

Plan of Analysis

The main study hypothesis was that the children in the complex story condition would develop better vocabulary, and narrative skills compared to those in the simple story condition. An exploratory hypothesis was that initial language skills would moderate the effect of condition, with the simple condition leading to greater gains for children with lower pre-existing language abilities. To address these hypotheses, Linear Mixed-Effects Models (LMMs) were run with group as a random
factor (to account for clustering of individual children within small groups). Separate models were run for the three posttest language skills, each including condition as a predictor (simple/complex), the relevant pretest skill as a control variable (e.g., complexity scores at pretest when estimating the effect of condition on posttest complexity scores), and an interaction term of pretest skill and condition. This approach allowed both the main and exploratory hypotheses to be tested (i.e., main effects of condition when relevant pretest scores were controlled and interactions between pretest abilities and condition would support the study hypotheses).

Complexity scores had a Poisson distribution (i.e., scores were derived from counts of the instances of subordination in children’s narratives), and thus this dependent variable did not meet the assumptions of the LMM. Therefore, a Generalized Linear Mixed Model (GLMM), which allows modelling under the Poisson distribution, was used to assess the effect of condition on Complexity scores (although note that running this model as an LMM yielded the same pattern of results). Initial models were also run with interaction terms of School by Condition and Class by Condition to test whether children responded differently to experimental condition based on school or class. However, these terms were not significant, and thus were not retained in the final models.

Models were run in R version 3.5.2, using the lme4 package (version 1.1-19; Bates, Mächler, Bolker, & Walker, 2015). Pseudo R squared estimates are presented for all models, as recommended by Nakagawa and Schielzeth (2013). These were computed using the r.squared GLMM function in the R package MuMIn package (version 1.40.4; Barton, 2018). The (G)LMM estimates for coefficients, SEs, and t/z values for the fixed effects are reported in Table 4. P-values were obtained using the anova function of the car package (Fox and Weisberg, 2011). All model residual
plots were checked for multicollinearity, homoskedasticity, and linearity, and for the presence of outliers and influential data points (Tabachnick & Fidell, 2012). The final model for each of the posttest skills is now summarized.

Table 3. Pretest and Posttest Means (Standard Deviations) by Language Measure and Reading Condition

<table>
<thead>
<tr>
<th>Test phase and measure</th>
<th>Reading condition</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Simple</td>
<td>Complex</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPVS</td>
<td>48.53 (13.52)</td>
<td>49.76 (8.96)</td>
<td></td>
</tr>
<tr>
<td>Length score</td>
<td>7.71 (2.08)</td>
<td>8.14 (3.27)</td>
<td></td>
</tr>
<tr>
<td>Complexity score</td>
<td>1.47 (1.51)</td>
<td>2.00 (2.35)</td>
<td></td>
</tr>
<tr>
<td>Inferential story comprehension score</td>
<td>6.06 (2.82)</td>
<td>6.12 (2.23)</td>
<td></td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BPVS</td>
<td>49.18 (10.32)</td>
<td>49.82 (8.78)</td>
<td></td>
</tr>
<tr>
<td>Length score</td>
<td>7.87 (2.52)</td>
<td>8.78 (3.47)</td>
<td></td>
</tr>
<tr>
<td>Complexity score</td>
<td>2.00 (2.09)</td>
<td>2.47 (2.79)</td>
<td></td>
</tr>
<tr>
<td>Inferential story comprehension score</td>
<td>8.18 (3.97)</td>
<td>8.88 (3.04)</td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 34. BPVS = British Picture Vocabulary Test. The inferential story comprehension scores were not used in subsequent analyses because of low Cronbach’s Alpha on this measure.

Effect of Story Condition on Children’s Vocabulary Skills

The final model accounted for approximately 67% of variance in children’s posttest vocabulary skills ($R^2 = .67$). As shown in Table 4, Initial vocabulary skills and Class significantly predicted posttest vocabulary skills. Children in reception had better posttest scores than children in nursery when initial vocabulary scores were controlled. Contrary to the hypotheses, neither condition nor the condition by initial skill interaction was a significant predictor of posttest vocabulary skills.
Table 4. (G)LMMs Predicting Children’s Language Skills by Condition and Initial Language Skill

<table>
<thead>
<tr>
<th>Outcome/predictor</th>
<th>b</th>
<th>SE</th>
<th>t/z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Posttest vocabulary</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>15.42</td>
<td>5.06</td>
<td>3.046</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Pretest vocabulary</td>
<td>0.54</td>
<td>0.12</td>
<td>4.610</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Condition</td>
<td>0.98</td>
<td>9.44</td>
<td>0.104</td>
<td>.952</td>
</tr>
<tr>
<td>School</td>
<td>1.470</td>
<td>2.20</td>
<td>0.669</td>
<td>.504</td>
</tr>
<tr>
<td>Class</td>
<td>4.76</td>
<td>2.41</td>
<td>1.975</td>
<td>.048*</td>
</tr>
<tr>
<td>Pretest vocabulary × Condition</td>
<td>−0.02</td>
<td>0.19</td>
<td>−0.118</td>
<td>.906</td>
</tr>
<tr>
<td><strong>Posttest length</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>1.01</td>
<td>1.50</td>
<td>0.674</td>
<td></td>
</tr>
<tr>
<td>Pretest length</td>
<td>0.66</td>
<td>0.15</td>
<td>4.391</td>
<td>&lt; .001***</td>
</tr>
<tr>
<td>Condition</td>
<td>−3.11</td>
<td>2.51</td>
<td>−1.237</td>
<td>.442</td>
</tr>
<tr>
<td>School</td>
<td>0.64</td>
<td>0.74</td>
<td>0.876</td>
<td>.381</td>
</tr>
<tr>
<td>Class</td>
<td>1.38</td>
<td>0.75</td>
<td>1.858</td>
<td>.063</td>
</tr>
<tr>
<td>Pretest length × Condition</td>
<td>0.46</td>
<td>0.31</td>
<td>1.511</td>
<td>.130</td>
</tr>
<tr>
<td><strong>Posttest complexity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>−1.50</td>
<td>0.75</td>
<td>−1.993</td>
<td></td>
</tr>
<tr>
<td>Pretest complexity</td>
<td>0.21</td>
<td>0.07</td>
<td>3.219</td>
<td>.001**</td>
</tr>
<tr>
<td>Condition</td>
<td>−0.52</td>
<td>0.50</td>
<td>−1.044</td>
<td>.296</td>
</tr>
<tr>
<td>School</td>
<td>0.06</td>
<td>0.38</td>
<td>0.165</td>
<td>.869</td>
</tr>
<tr>
<td>Class</td>
<td>0.96</td>
<td>0.42</td>
<td>2.266</td>
<td>.023*</td>
</tr>
<tr>
<td>Pretest complexity × Condition</td>
<td>0.23</td>
<td>0.14</td>
<td>1.633</td>
<td>.103</td>
</tr>
</tbody>
</table>

Note. GLMM = Generalized Linear Mixed Model. LMM = Linear Mixed-Effects Model. For the model predicting posttest complexity, the z value for the GLMM is presented. Models were fitted with random intercepts for group (i.e., allowing the intercept to vary by group). *** = p < .001, ** = p < .01, * = p < .05.

Effect of Story Condition on Children’s Narrative Length Scores

The final model accounted for 60% of variance in children’s narrative length scores ($R^2 = .60$). As shown in Table 4, Initial length scores and Class significantly predicted posttest vocabulary skills. Children in reception had better posttest scores than children in nursery when initial vocabulary scores were controlled. Contrary to the hypotheses, neither condition nor the condition by initial skill interaction was a significant predictor of posttest length scores.
Effect of Story Condition on Children’s Narrative Complexity Scores

The final model accounted for 44% of variance in children’s narrative complexity scores ($R^2 = .44$). As shown in Table 4, Initial Complexity was the only significant predictor of posttest complexity scores. Contrary to the hypotheses, neither condition nor the condition by initial skill interaction was a significant predictor of posttest complexity scores.

Exploratory Post Hoc Analysis: Children’s Language Use by Story Condition

Although no differences in children’s language outcomes were observed, it is possible that children’s language production was stimulated to a greater degree in the complex condition. To explore this post hoc hypothesis, we examined a subset of the audio recorded reading sessions from the final readings of each story (involving sessions from weeks five and six). Three readings were randomly selected from each of the small groups, resulting in a sample of 33 individual readings. These audio-recorded reading sessions were transcribed in CHAT format by the researcher. Utterances that were not related to the book reading were excluded (i.e., off-topic utterances). Transcripts were verified by another researcher blind to the study aims. Automated analyses using the CLAN program were conducted to provide an index of children’s language production in the shared-reading sessions. Two measures of literate language were calculated: the number of temporal, conditional, and causal subordinate adverbial clauses, and the number of mental and linguistic verbs. The specific measures were selected because they are key features of literate language and narrative development, and because these were the kinds of complex language use particularly emphasized by the stories and extratextual talk in the complex condition. In addition, an initial examination of the transcripts indicated that these were the main types of subordination that occurred across transcripts.
In addition to the two features of literate language, children’s mean length of utterance (MLU) was computed to provide a global index of syntactic complexity during the book-reading sessions. The number of temporal and causal clauses and the number of mental and linguistic verbs were obtained by creating by running FREQ in combination with wordlist files. The wordlist files for mental and linguistic verbs and for temporal and causal subordinating conjunctions were compiled based on previous work examining children’s use of literate language features (Curenton & Justice, 2004; Petersen, Gillam, Spencer, & Gillam, 2010). In addition, a wordlist generated from all transcripts was manually examined to identify any additional mental or linguistic verbs not already on the list. Examples are shown in Appendix 2. Subordinating conjunctions that were not followed by a clause (i.e., those with no verb) were not counted. This exploratory post hoc analysis was conducted at small-group level, as it was not possible to attribute verbal contributions to individual children based on the audio-recordings. Table 5 shows the descriptive statistics for each of the measures of children’s productive language by story condition.

Mixed-effects models were run to assess whether between-condition differences on each measure were statistically significant, with random intercepts for small group and book titles (thereby accounting for the repeated observations within each small group of children and for differences among book titles within each condition). Mixed-effects models are summarized in Table 6. Children in the complex story condition as compared to the simple story condition produced significantly more subordinates ($M = 5.73, SD = 4.11$ vs. $M = 0.33, SD = 0.69$, respectively, $z = 4.82, p < .001$) and significantly more mental and linguistic verbs ($M = 5.73, SD = 3.58$ vs. $M = 2.28, SD = 2.37$, respectively, $z = 3.36, p < .001$). In addition, children’s MLU was significantly longer in the complex story condition as
compared to the simple story condition ($M = 4.75$, $SD = 1.26$ vs. $M = 3.44$, $SD = 0.89$, respectively, $t = 2.25$, $p < .05$). In addition, there was a significant effect of class on subordinate clauses and on MLU, indicating that children in reception as compared to children in nursery produced significantly more subordinate clauses and had marginally longer MLU ($z = 3.02$, $p < .01$ and $t = 2.02$, $p < .05$, respectively). By contrast, the effect of class on mental and linguistic verbs was positive but non-significant ($z = 0.73$, $p > .10$). There were no significant interactions of class and condition ($p > .10$).

Table 5. Descriptive Statistics for Children’s Language Use by Story Condition

<table>
<thead>
<tr>
<th></th>
<th>Simple</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$ ($SD$)</td>
<td>Range</td>
</tr>
<tr>
<td>Subordinate clauses</td>
<td>0.33 (0.69)</td>
<td>0–2</td>
</tr>
<tr>
<td>Causal</td>
<td>0.28 (0.57)</td>
<td>0–2</td>
</tr>
<tr>
<td>Conditional</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Temporal</td>
<td>0.06 (0.24)</td>
<td>0–1</td>
</tr>
<tr>
<td>Mental and linguistic verbs</td>
<td>2.28 (2.37)</td>
<td>0–8</td>
</tr>
<tr>
<td>Mental</td>
<td>1.94 (2.21)</td>
<td>0–8</td>
</tr>
<tr>
<td>Linguistic</td>
<td>0.33 (0.69)</td>
<td>0–2</td>
</tr>
<tr>
<td>Mean length of utterance</td>
<td>3.44 (0.89)</td>
<td>2.35–6.00</td>
</tr>
</tbody>
</table>

*Note.* No conditional clauses were produced in any of the sessions in the simple condition.

Table 6. (G)LMMs Testing Effects of Condition and Class on Children’s Language Use During Shared-Book Reading

<table>
<thead>
<tr>
<th></th>
<th>Subordinate clauses</th>
<th>Mental and linguistic verbs</th>
<th>MLU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>$SE$</td>
<td>$z$</td>
</tr>
<tr>
<td>Condition</td>
<td>2.87</td>
<td>0.60</td>
<td>4.82***</td>
</tr>
<tr>
<td>Class</td>
<td>0.94</td>
<td>0.31</td>
<td>3.02***</td>
</tr>
</tbody>
</table>

*Note.* GLMM = Generalized Linear Mixed Model. LMM = Linear Mixed-Effects Model. MLU = Mean Length of Utterance. For models predicting the number of subordinate clauses and the number of mental and linguistic verbs, $z$ values from the GLMMs are presented. Models controlled for class (nursery/reception) and were fitted with random intercepts for group and book title (i.e., allowing the intercept to vary by group and title). School was not significantly associated with any of the outcomes in initial models and thus was not included as a predictor in post hoc analyses. *** = $p < .001$. ** = $p < .01$. * = $p < .05$. † = $p < .10$.
5.5 Discussion

This study aimed to test whether preschoolers’ exposure to simple and complex stories and the level of abstraction in their associated extratextual talk would lead to differential gains in vocabulary and narrative skills. Children were exposed to either simple or complex stories during experimenter-led reading sessions in small groups for a period of six weeks. We hypothesized that relative to simple stories, complex stories would lead to greater gains in children’s vocabulary and narrative skills, and that this effect would be moderated by children’s initial skills. Contrary to this hypothesis, the complex story did not lead to greater gains in children’s vocabulary or narrative skills on any of the measures used. Similarly, no interactions between initial language skill and condition were observed. Although there were no effects of condition on children’s language skills as measured post intervention, the results of the exploratory post hoc analysis of the interaction during the book-reading sessions showed that children in the complex condition had longer MLU and produced more subordinates and more mental and linguistic verbs as compared to the children in the simple condition.

Possible Reasons for Null Results and Directions for Future Work

Several possible reasons exist for the null findings reported here. The first possible reason to consider is that in fact exposure to abstract talk during shared reading does not improve children’s language skills. Given that the observational and experimental literature suggests that abstract language can lead to gains in children’s skills, we think that this explanation is unlikely. However, there are a number of other possible reasons why we did not observe the effects we expected in the present study. An initial concern is the sample size and relative heterogeneity of the study sample. Children varied in age and in their language abilities, and may also have
varied widely in their engagement and motivation toward literacy. Thus, any effect (if present) of the complex story condition on children’s language outcomes may have been difficult to detect in the group analyses. However, it is noteworthy that in their experimental study with a similar sample size, Reese and Cox (1999) detected small-to-moderate significant effects of reading style on children’s language outcomes following a similar duration and intensity of exposure. An important point to consider, however, is that although some experimental studies indicate that abstract talk during shared reading can benefit children’s language skills (e.g., Blewitt et al., 2006; Reese et al., 1999), the experimental literature is more mixed than the observational literature with regard to finding such an effect. One way to explain this apparent conflict of findings between the observational and experimental literature is that possibility that more exposure over time and more time for consolidation (as opposed to a controlled but relatively low dosage) is required for effects on children’s language skills. In addition, experimental studies are necessarily be more contrived than observational ones (e.g., set responses are required for children’s contributions), which could also contribute to more mixed findings in the experimental literature.

A second possibility is that in the present study the difference in extratextual talk between the two conditions was not sufficient to lead to an effect large enough to be detected on the selected measures. In Reese and Cox’s study, the three reading styles compared were characterized by all abstract talk (i.e., the comprehender and performance-oriented styles) or all concrete talk (i.e., the describer style). It could be that because in our study the two reading styles both contained a mixture of abstract and concrete talk, the differences were not distinct enough to lead to differential effects on the outcomes measured in our study. By contrast, it is possible that more
general effects on children’s vocabulary and narrative skills might be evident at a later posttest stage, after a period of consolidation.

A third reason, and perhaps the most likely one, relates to issues about the outcome measurements used in our study. We measured children’s receptive vocabulary and narrative retell skills using two published measures designed to assess children’s general abilities in these two areas. Unfortunately, data from the inferential story comprehension probe used in this study could not be analysed because the probe lacked internal consistency. It is plausible that a more valid measure of children’s inferential comprehension skills may have reflected children’s gains following exposure to the complex condition. Alternatively, the Test of Abstract Language Comprehension (TALC; Elks & McLachlan, 2004) or the Preschool Language Assessment Instrument (PLAI; Blank, Rose, & Berlin, 2003) could be used to show gains in children’s inferential language comprehension in future research in this area. The PLAI has been used to show gains in children’s understanding of inferential language relative to a control group in an intervention study (van Kleeck et al., 2006). In addition, future research investigating the effects of simple and complex stories on children’s linguistic skills might benefit from using more specific measures of vocabulary and narrative skills, such as a narrative retell of a story involving a complex plot that also includes target vocabulary from each of the conditions. This is supported by the results of the exploratory post hoc analysis, which showed that children in the complex condition had longer MLU and produced more subordinates and more mental and linguistic verbs as compared to the children in the simple condition.

Finally, it is important to consider the style of the extratextual talk used in this study, as this could also contribute to the lack of posttest differences between the
two conditions. It is plausible that the style of the extratextual talk (e.g.,
responsiveness to children’s initiations and responses) plays a role in how much
children benefit from exposure to abstract talk during shared reading, and in
particular when sharing complex stories that involve explanatory discourse. Perhaps
a more responsive and supportive use of abstract language (e.g., modifying or
scaffolding the extratextual talk in line with children’s responses) is required to
support children’s linguistic gains from challenging extratextual talk about the
complex plot. Indeed, it has been shown elsewhere that children learn better from
explanations involving word definitions when these are encountered after first
hearing more concrete or lower level talk on the same referents (Blewitt et al., 2009).
Relatively little is known about how abstract talk unfolds during shared reading.
However, observational research on whole-class reading has shown that challenging
talk such as explanations may occur in sequences of teacher-child talk involving
teachers’ topic-continuing questions and follow ups that prompt more elaborated
responses from children (Gosen, Berenst, & de Glopper, 2013). In the present study,
the experimenter adhered to scripts and did not provide any motivating or linguistic
feedback on children’s contributions. Although anecdotally it was observed that
children responded to the experimenter’s questions in both conditions, it may be that
tailored feedback on children’s contributions in the form of follow up questions and
comments to create a supportive discussion is necessary for children to optimally
benefit from challenging talk (Beck & McKeown, 2001). Future work should
explore whether the way in which abstract language about the plot is used during
shared reading affects children’s ability to participate in and learn from shared-
reading interactions.

**Strengths and Conclusion**
The intervention procedure demonstrated good fidelity, which supports previous work showing that scripted extratextual talk can be easily incorporated into shared reading sessions (Reese & Cox, 1999; van Kleeck et al., 2006). It is also noteworthy that the stories seemed well liked and appropriate for most of the children in the study. Although no effects were observed on the broad language measures used in this study, it is possible that more specific assessment probes would yield different results. This is especially plausible given the results of the exploratory post hoc analysis, which showed that children’s language use in the complex reading sessions was more structurally complex and involved the use of more decontextualized or literate language features. These results may shed more light on the specific types of change that we could expect to see in children’s developing language skills following exposure to the complex books. In sum, the present study does not provide strong support for the hypothesis that children’s exposure to complex stories and their associated extratextual talk (i.e., a greater level of abstraction) relative to simple stories leads to gains in vocabulary and narrative skills. Further research addressing the limitations outlined above is needed to investigate whether exposure to specific kinds of stories and their associated reading styles can lead to differential gains in children’s language outcomes.
5.6 References


5.7 Appendices

Appendix 1: Titles of the ten stories used

Simple books:

Stop monkeying around (by Christine Swift and Sarah Wade; published in 2015 by Alligator Publishing Ltd)

Polar bear paddle (by David Bedford and Karen Sapp; published in 2009 by QED Publishing)

Clumsy crab (by Ruth Galloway; published in 2016 by Little Tiger Press Ltd)

The bear who loved to dance (by Monika Filipina Trzpil; published in 2015 by Top That Publishing Ltd)

Hoppity skip Little Chick (by Jo Brown; published in 2016 by Little Tigers Press)

Complex books:

Pond goose (Caroline Jane Church; published in 2004 by Oxford University Press)

Don’t cry Sly Fox (by Henriette Barkow and Richard Johnson; published in 2002 by Mantra Lingua Ltd)

Milo’s pet egg (by Rebecca Elliott; published in 2010 by Bloomsbury Publishing Plc)

Look out Suzy Goose (by Petr Horáček; published in 2011 by Walker Books)

The greedy dog (by Rosie Dickins; published in 2015 by Usborne Publishing Ltd)
Appendix 2: Wordlist examples

Examples of mental verbs (referring to acts of thinking):

Think
Know
Believe
Imagine
Feel
Forget

Examples of linguistic verbs (referring to acts of speaking):

Say
Tell
Speak
Shout
Answer
Reply
6. Chapter Six: Contributions of Abstract Extratextual Talk and Elaborative Style to Preschoolers’ Language Development (Study 4)

6.1 Abstract

Previous work has consistently found that caregiver use of abstract talk during shared reading is beneficial for preschool children’s language skills. However, to date, such research has largely focused on the overall level of abstraction without consideration of the style of caregiver talk. A more elaborative style (i.e., one characterized by questions and follow ups on the child’s responses) may provide a context for children’s supported participation in discussions involving abstract talk, and thus the style of extratextual talk may be more important than the overall level of abstraction for children’s language skills. The present study investigates the contribution of these two aspects of the extratextual talk (i.e., the level of abstraction and elaboration) to children’s language development in a sample of frequently reading dyads. Thirty-five mother-child dyads (child age 3;00–4;11 years) were video-recorded during shared reading in their homes. Videos were coded for features of the extratextual talk, and children’s language skills were measured on the initial visit and again one year later. Results showed that the level of abstraction was positively associated with the degree of elaboration, and that maternal socioeconomic status was positively associated with both these aspects of the extratextual talk. All further analyses controlled for caregiver socioeconomic status and child age, and longitudinal analyses controlled for initial skill. Caregiver elaboration during shared reading was positively associated with children’s concurrent vocabulary skills, whereas the level of abstraction was not. There were few associations of elaboration and abstraction with children’s later vocabulary, syntax, or narrative skills. These results and their implications are discussed.
6.2 Introduction

Shared-book reading is linked to the development of oral language and literacy skills in preschool-age children (Bus, van Ijzendoorn, & Pellegrini, 1995; DeTemple, 2001; Dickinson, Griffith, Golinkoff, & Hirsh-Pasek, 2012; van Kleeck & Vander Woude, 2003). Thus, shared reading is considered an important activity for preschoolers, especially given that variability in children’s language skills predicts school readiness, later language, literacy, and academic outcomes (Duff, Reen, Plunkett, & Nation, 2015; Duncan et al., 2007; NICHD Early Care Research Network, 2005; Rowe, Raudenbush, & Goldin-Meadow, 2012). Importantly, the extratextual talk (i.e., talk beyond reading of the book text) used by caregivers when sharing books with children has been found to be particularly beneficial for children’s language and literacy development (Hindman, Skibbe, & Foster, 2014; Mol, Bus, de Jong, & Smeets, 2008; Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013). For preschool-age children, caregiver abstraction (i.e., the degree to which the extratextual talk goes beyond labelling and describing the pictures to focus on more abstract topics) in particular has consistently been shown to benefit later vocabulary and other emergent literacy skills (DeTemple, 2001; Dickinson & Smith, 1994; Dickinson and Porche, 2011; Hindman, Connor, Jewkes, & Morrison, 2008; Mascareño, Snow, Deunk, & Bosker, 2016). However, to date, caregiver abstraction during shared reading has largely been studied without consideration of the style of the extratextual talk. Here, it is suggested that a more elaborative style (i.e., one characterized by questions and follow ups on the child’s responses) may provide a context for children’s supported participation in discussions involving abstract talk, and thus it might be more important than the overall level of abstraction for preschool children’s language skills. Support for this hypothesis would inform
shared-reading interventions with preschoolers. It would also shed light on the mechanisms through which extratextual talk during shared reading may influence different aspects of children’s language development (i.e., through sheer exposure to challenging and more complex talk vs. supported participation in discussions about the book). The present study explores the relation between these two aspects of the extratextual talk (the level of abstraction and elaboration), and investigates their contributions to children’s vocabulary, syntax, and narrative skills in a sample of frequently reading preschoolers and their mothers.

Importantly, when reading books together with young children, adults often engage in “extratextual talk” (i.e., talk beyond what is printed in the book). This extratextual talk is thought to promote young children’s language development (Fletcher & Reese, 2005; Price, Kleeck, & Huberty, 2009). This claim has support from both correlational and experimental work. For example, Mol et al. (2008) showed in their meta-analysis of 16 experimental studies that interactive (or dialogic) shared reading is more beneficial for toddlers’ and young preschool children’s vocabulary outcomes than simply reading the text without engaging children in interaction. More recently, in a longitudinal study involving 25 preschool classrooms, Zucker et al (2013) showed that teachers’ use of extratextual talk during shared reading in preschool contributed to children’s vocabulary outcomes in kindergarten and first grade, whereas reading frequency was not related to outcomes beyond the end of the preschool year. Thus, there is now strong evidence that caregiver extratextual talk during shared reading is beneficial for young children’s language development over and above the effects of simply reading the text.

A substantial body of work has found that the amount or proportion of abstract talk used by caregivers is a predictor of children’s later oral language and
emergent literacy skills (e.g., Demir, Rowe, Heller, Goldin-Meadow, & Levine, 2015; Peterson & McCabe, 1994; Rowe, 2012). In the shared-reading context, abstract talk (often referred to as inferential, high demand, cognitively challenging, and non-immediate talk) is defined as language used to convey aspects of the book not directly perceptible in the pictures, such as linking the book to the child’s own life, making inferences, predictions, and explanations. By contrast, concrete language refers to what is perceptually available in the pictures or text (by using devices such as labelling and describing) and talk that is bound to the immediate context (Hindman et al., 2008; van Kleeck, 2003; van Kleeck, Gillam, Hamilton, & McGrath, 1997). Caregiver abstract language during shared reading has consistently been linked to preschool-age children’s vocabulary and emergent literacy skills (DeTemple, 2001; Dickinson & Smith, 1994; Dickinson and Porche, 2011; Hindman et al., 2008; Mascareño et al., 2016). One possible reason why abstract language promotes children’s language skills is through exposing children to definitions and explanations about word meaning, as well as through exposure to the more sophisticated and syntactically complex language used to convey abstract ideas (e.g., Curenton, Craig, & Flanigan, 2008; Demir et al., 2015). Importantly, abstract language is the discourse of the classroom, and thus engaging children in conversations involving abstract talk is thought to aid school readiness (van Kleeck, 2008).

In summarizing the key studies examining the role of abstract talk during shared reading in preschool-age children’s language and emergent literacy skills, we include research on shared reading both at school and in the home because similar results are found in both kinds of studies. In a recent study, Hindman et al. (2008) found that both caregiver (parent and teacher) and child “decontextualized” talk
during shared reading at the start of the preschool year predicted children’s expressive vocabulary scores at the end of the year, regardless of their initial skill level in their middle- and working-class sample. By contrast, “contextualized” talk was not associated with vocabulary scores for children with lower initial language skills, and was negatively associated with later vocabulary scores for children with higher initial language skills. Similar findings are reported from seminal shared-reading studies involving children from low-income backgrounds. For example, DeTemple (2001) studied mothers of low income reading with their 3-year old children at home, reporting that “non-immediate” talk was positively associated with children’s early literacy skills in kindergarten, whereas “immediate talk” was not. Similarly, Dickinson and Smith (1994) found that teachers’ use of child-involved “analytic talk” in low-income preschool classrooms predicted children’s receptive vocabulary and story comprehension one year later, controlling for the amount of talk and shared-reading frequency. In a recent re-analysis of the same data, Dickinson and Porche (2011) reported that this same “analytic talk” as observed during shared reading in preschool classrooms predicted children’s receptive vocabulary into the fourth grade, and that this relation was mediated by earlier receptive vocabulary. Thus, the level of abstraction is an important predictor of preschool-age children’s language and emergent literacy across different socioeconomic groups.

Importantly, most previous research on the role of abstract talk during shared reading has focused on the overall level or amount of abstract talk and its relation to children’s language development, as opposed to also considering individual utterance functions (e.g., questions, comments) or the overall style of the abstract talk (e.g., elaborative). Other research has shown that questions, and in particular
wh-questions (e.g., what, why, how questions), are beneficial for toddlers’ and preschool-age children’s language development (e.g., Cristofaro & Tamis LeMonda, 2012; Hoff-Ginsberg, 1985; Rowe, Leech, & Cabrera, 2017; Rowland, Pine, Lieven, & Theakston, 2003). Given such findings, some researchers reason that more challenging “abstract” questions might be of special benefit for the language development of older preschool children (Massey, Pence, Justice, & Bowles, 2008; Zucker, Justice, Piasta, & Kaderavek, 2010). In one study, Zucker et al. (2010) investigated the role of “inferential” and “literal” questions during classroom based shared reading on preschool-age children’s vocabulary growth. Contrary to their expectations, neither inferential nor literal questions were associated with children’s expressive and receptive vocabulary growth (as measured four weeks later), although there was a trend toward inferential questions being beneficial for children with higher initial skill. More recently, Tompkins, Bengochea, Nicol, and Justice (2017) investigated the role of different utterance functions (i.e., wh- questions, yes/no questions, and statements) at different levels of abstraction (i.e., literal vs. inferential) during shared reading in relation to preschool-age children’s receptive vocabulary outcomes 6 months later. They found that mothers’ inferential yes/no questions and statements predicted child vocabulary growth, whereas inferential wh-questions and literal utterances of any function did not. Thus, although there is some suggestion that the function of abstract talk may matter for children’s language development, there is only limited evidence for one particular function being especially beneficial.

Perhaps more important than one particular function of abstract utterance is the style of the caregiver extratextual talk. For example, a style characterized by questions and follow ups that both appraise and elaborate on children’s responses
might provide a context for discussions on abstract topics to unfold and may predict children’s language outcomes over and above the effects of the sheer amount or overall level of abstraction. Indeed, qualitative work on abstract or extended talk has documented that abstract talk (e.g., explanations and narrative) often extends over multiple speaker turns, and often involves the caregivers asking questions and following up on children’s responses to extend the interaction (e.g., Gosen, Berenst, & de Glopper, 2013; Snow & Beals, 2006). Similarly, in a recent observational study, Mascareño et al. (2016) showed that both the proportion of inferential talk and the occurrence of “mixed patterns” of caregiver-child discourse (i.e., a series of turns involving both concrete and abstract utterances) during classroom read-alouds in Chilean kindergartens were positively associated with children’s concurrent vocabulary and symbolic understanding skills. Taken together, these studies suggest that abstract discussions occur over multiple turns and may involve talk at different levels of abstraction, and are facilitated by adults asking questions and responding in sensitive ways to children’s responses. Thus, it might be expected that a more elaborative style of caregiver extratextual talk (i.e., one characterized by the use of more questions and follow ups on child responses) might be more likely to occur with a greater level of abstraction, and that such an elaborative style might be a stronger predictor than the sheer level of abstraction for children’s language outcomes.

In sum, although it is well established that children’s exposure to abstract language is beneficial for their language development, research has to date largely focused on the overall level of abstraction or, more recently, on specific utterance functions, without consideration of the style of caregiver talk. A more elaborative style (i.e., one that is characterized by questions and follow ups on the child’s
responses) may provide a context for children’s supported participation in discussions involving abstract talk, and thus the style of extratextual talk may be more important than the overall level of abstraction for children’s language skills. Research is needed to examine the role of both the level of abstraction and elaboration during shared reading in children’s language development. Such research will better inform shared-reading interventions for preschool-age children.

The Present Study

The present study investigated the contribution of two aspects of the extratextual talk (i.e., the level of abstraction and elaboration) to children’s language development by using data from a frequently reading sample of 3- and 4-year-old children and their mothers. Given the previous research on how caregivers use an elaborative style to support their child’s participation in abstract discussions, we hypothesized that the level of abstraction would be associated with a more elaborative caregiver reading style. Previous research has shown that caregivers from lower-SES backgrounds engage in less abstract talk on average during shared reading compared to those from higher-SES backgrounds (e.g., Korat, 2009; VanderMaas-Peeler, Nelson, Bumpass, & Sassine, 2009), and thus we hypothesized that caregiver SES would be positively associated both with the overall level of abstraction and with elaboration (i.e., a reading style characterized by high degree of questions and follow ups). The main study hypothesis was that both the level of abstraction and elaboration in caregiver extratextual talk would predict children’s language skills across the linguistic domains of vocabulary, syntax, and narrative skills, but that elaboration would be a stronger predictor of these skills. No hypotheses were made about interactions of the extratextual talk variables with child
age and initial language skills, but additional analyses were conducted to explore these.

The specific research questions were:

RQ1. To what degree is the level of abstraction in caregivers’ extratextual talk related to the use of an elaborative style during shared reading?

RQ2. Is caregiver SES positively associated with the level of abstraction and elaboration during shared reading?

RQ3. Controlling for caregiver socioeconomic status, child age, and the amount of extratextual talk (and initial language skill in longitudinal analyses), what are the contributions of the level of abstraction and elaboration to children’s concurrent vocabulary skills and their later vocabulary, syntax, and narrative skills?

6.3 Method

Participants

Thirty-five mother-child dyads (13 boys and 22 girls) participated in the present study. These participants were those who agreed to participate in a follow-up study after the initial study (one year earlier, N = 55). Each dyad was given a children’s book as a gift for their time. At the time of the first visit, children ranged in age from 36 to 59 months (M = 46.3, SD = 6.7), and their raw scores on the British Picture Vocabulary Test (BPVS-II; Dunn, Dunn, Whetton, & Burley, 1997) ranged from 40 to 87 (M = 63.0, SD = 12.3). Standard scores on the BPVS ranged from 91 to 138 (M = 111.29, SD = 11.15), indicating that as a group children’s language abilities were above average. Twenty-seven of the children were White, 6 Mixed-race, 1 Asian, and 1 Black. Table 1 shows participants’ socioeconomic status and frequency of home reading as reported by mothers. As shown in Table 1, most dyads were frequent readers, and most read books together more than four times a week.
English was the home language for all families. Thirty mothers had at least an undergraduate degree or equivalent (85.7%), three had at least A levels or equivalent (8.6%), two had at least 5 GCSEs (5.7%). The characteristics of the present sample at Time 1 were very similar to those of the full sample (see Study 1 of this thesis).

Children’s language abilities at Time 2 are shown in Table 2.

Table 1.
Home Reading Frequency and Socioeconomic Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>%</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home reading frequency (per week)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Once</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Twice</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Three times</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Four times</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Five times</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Six times</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seven times</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>More than seven times</td>
<td>54</td>
<td>19</td>
</tr>
<tr>
<td>IMD scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>2nd</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>3rd</td>
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<td>3</td>
</tr>
<tr>
<td>10th</td>
<td>26</td>
<td>9</td>
</tr>
</tbody>
</table>

Note. N = 35. IMD = Indices of Multiple Deprivation (Education, Skills, and Training Deprivation deciles; 10 = least deprived). Percentages may not equal 100 because of rounding.

Procedure

The shared-book reading and demographic data were collected in the initial home visit (when children were 3 and 4 years old). Children’s language abilities were then assessed one year later in a second home visit. Data from both visits were used to assess the role of aspects of the shared reading in children’s language development. On the initial visit, participants were told that the purpose of the study
was to investigate “how parents and children read different books together”, because
“reading books with children may help their language development, such as their
talking and understanding”. Written informed consent was then obtained from the
mother on behalf of herself and her child, and demographic information was
collected by a questionnaire. The researcher then played the Pop up Pirate game with
the child, before assessing their language abilities using the British Picture
Vocabulary Scale (BPVS-II; Dunn, Dunn, Whetton, & Burley, 1997). The mother-
child dyad was then videoed sharing two unfamiliar, age-appropriate, commercially
available stories. The books used are described elsewhere (see Study 1 of this thesis).
All mothers confirmed that they and their children were unfamiliar with the specified
books before the video recording.

Dyads were video-recorded using a small digital camcorder (Samsung VP-
MX20/ZEU) placed unobtrusively on a tripod approximately 2 m from the dyad at a
45° angle. The zoom function was used to capture the interaction more closely. The
dyad was asked to sit in a place where they were comfortable or would normally
read together, and the mother was instructed to “look at the two books with your
child as you normally would”. If a television was on, the mother was asked to turn it
off beforehand. During the video recording, the researcher sat away from the dyad
and scored the language assessment.

Video recordings of the shared reading activity from the initial visit were
transcribed for all mother and child speech by the researcher in CHAT format (from
the CHILDES programs; MacWhinney, 2012). Nonverbal behaviours (e.g., gazing,
pointing, page turning) were transcribed where relevant to aid coding. Utterance
boundaries were defined as outlined by Ratner and Brundage (2013) when two or
more of the following cues were present: silence for 2 seconds or greater, terminal
intonation, or a complete syntactic unit or pragmatically complete contribution (e.g., mother: *what’s that?*; child: *a lizard*). Repetitions of the same word (e.g., *no no no*, *she runs very very very fast*) and rote counting were transcribed as single words.

Character names (e.g., Little Red, Little Monkey, Sly Fox) were transcribed as single words (e.g., “*Little_red*”). Transcripts were coded, as described below.

Approximately one year from the initial visit, families were again visited by the same researcher. In this visit, the researcher played the Pop up Pirate game with the child again, and assessed their language skills by using the three language assessments: the BPVS, the Recalling Sentences subtest of the Clinical Evaluation of Language Fundamentals (CELF Preschool-2; Wiig, Secord, & Semel, 2006), and the Bus Story (Renfrew, 1997). Details of these assessments are provided below. Both the initial and later home visit lasted less than 1 hour.

**Measures**

*Child Language Skills*

**Concurrent language skills.** The British Picture Vocabulary Test 2nd edition (BPVS-II; Dunn, Dunn, Whetton, & Burley, 1997) was used to measure children’s receptive vocabulary on the initial home visit. The BPVS is a standardized assessment with UK-based norms for 3–16 year olds. This assessment involves the examiner saying a word and prompting the child to point at the corresponding picture from a set of four on each page. After two practice trials, there are 14 sets of pictures each containing 12 test items (a total of 168 items). Testing begins at the set indicated in the manual for the child’s age (usually their basal level), and ends when the child reaches their ceiling level (eight or more errors in a set). Raw scores are then calculated and converted to standardized (UK-normed) scores and percentile ranks. Administration time for this assessment was approximately 10–15 minutes.
**Later language skills.** Children’s later receptive vocabulary, syntax, and narrative skills were assessed on the follow-up home visit by using the BPVS (as described above), the CELF, and the Bus Story, respectively. Table 2 shows the mean, standard deviation, and range of children’s language scores on these three assessments. The BPVS was conducted as described above.

Children’s syntax was assessed using the Recalling Sentences subtest of the CELF. This assessment involved the experimenter saying, and asking the child to repeat, a set of sentences one by one until the end of the subtest or a discontinuation point was reached. Children’s responses were audio recorded on an MP3 device. Administration time for this subtest was approximately 5 minutes.

Children’s narrative skills were assessed by using The Bus Story (Renfrew, 1997). This assessment involved the researcher reading out a 168-word story while presenting 12 corresponding pictures (three per page). The child was then asked to retell the story using the pictures as cues. Children’s narrative retellings were audio recorded on an MP3 device. Based on the Bus Story manual, children’s narrative retellings were scored for length (the mean length of utterance [MLU] for the longest five sentences produced). It is important to point out that here we use the term narrative skills in the narrow sense. We consider MLU as our index of narrative skill, although this is only one aspect of children’s narrative skills. The Bus Story has demonstrated good retest reliability. Administration time for this assessment was approximately 10 minutes. Note that two children’s narratives did not meet the manual requirements for scoring (i.e., more than five utterances) and thus results for this assessment are based on \( n = 33 \).

**Socioeconomic status.** Caregiver SES was indexed by postcode using the Education Skills and Training Deprivation deciles of the English Indices of Multiple
Deprivation (IMD, 2015). This scale ranges from 1 to 10 (10 = least deprived).

Participants in the present sample lived in areas ranging from the most to the least deprived (see Table 1). This variable was positively skewed, with more participants living in areas of low deprivation.

Table 2. 
Descriptive Statistics for Children’s Later Language Scores

<table>
<thead>
<tr>
<th>Measure</th>
<th>M (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPVS</td>
<td>113.86 (10.65)</td>
<td>93–132</td>
</tr>
<tr>
<td>CELF (RS)</td>
<td>26.26 (5.88)</td>
<td>12–36</td>
</tr>
<tr>
<td>Bus Story Narrative (length)</td>
<td>9.41 (3.00)</td>
<td>3.80–16.40</td>
</tr>
</tbody>
</table>

Note. N = 35 (but for Bus Story n was 33). BPVS = British Picture Vocabulary Scale (standard scores). CELF = Clinical Evaluation of Language Fundamentals.

Shared-Reading Measures

Note that the maternal extratextual talk was reliably coded as part of the Study 2 of this thesis. Coding measures and reliability results are described below.

**Amount of extratextual talk.** The amount of maternal extratextual talk was indexed by the number of word tokens (i.e., the total number of words including repetitions of the same word). Number of word tokens was computed in the CLAN program (Computerized Language ANalysis). The number of utterances was also computed as an additional measure of the amount of maternal extratextual talk.

**Abstraction.** The level of abstraction was coded by coding all maternal extratextual utterances according to the coding scheme in Appendix 1. This coding scheme is based on Coding Categories for Levels of Abstraction (van Kleeck, 2003), which has been widely used in shared reading studies investigating the role of abstract talk (e.g., Price et al., 2009; Muhinyi & Hesketh, 2017; Tompkins et al., 2017). Utterances at Level 1 were considered concrete, whereas utterances at Levels 2 and 3 were considered abstract. Utterances that were not linked to the plot but related to the context or the child’s behaviour (e.g., *Do you want to turn the page?*
Let’s see!) were coded as transactional (Sorsby & Martlew, 1991). If an utterance involved levels of abstraction from more than one category (e.g., an explanation might involve a lower level inference or description), then the highest level was coded. The level of abstraction was indexed by the proportion of abstract utterances (i.e., utterances at Level 2 and Level 3) relative to the total number of extratextual utterances. To ensure reliability of the level of abstraction coding, 20% of the transcripts were coded by a second coder. Disagreements were discussed and resolved after an initial transcript. Coding agreement for the level of abstraction was 79%. Weighted kappa (κ) with corrections made for chance was .76, indicating excellent reliability (Fleiss, 1981).

Elaboration. Several measures were used to index caregiver elaboration. These are described below.

Questions. The number of questions was computed in CLAN by identifying all maternal utterances ending in a question mark.

Wh-questions. Maternal questions were categorized into wh-questions (i.e., those framed by how, what, which, when, where, who, whose, or why, such as Who is in there? What do you think she’s gonna do? What did they make in the end? Why can’t he see him?).

Other questions. All questions that were not wh-questions were coded as other questions. This category included yes/no questions, tag questions, and all other question types (e.g., Are they sweets? It does, doesn’t it? Huh?).

Follow ups. Children’s responses to maternal questions were identified and marked in CLAN. Maternal utterances that followed up on the child’s response to a question were then identified in CLAN, and hand-coded as simple or elaborative (see Appendix 2 for detailed description and examples). This coding scheme was based
on work by Mehan (1979) on the structure of social interaction in classrooms, and on more recent work on read-aloud interactions (Mascareño et al., 2016). The coding scheme provided an index of the degree to which caregivers followed up on their children’s responses to questions, thus creating a collaborative interaction about topics in the story.

*Simple follow ups.* Simple follow ups were those that evaluated or provided basic feedback on the child’s response (e.g., “okay”, “yes”).

*Elaborative follow ups.* Elaborative follow ups extended the child’s response by asking for or providing more information on the same topic.

To ensure reliability for the follow ups coding, 20% of the transcripts were coded by a second coder. Disagreements were discussed and resolved after an initial transcript. Coding agreement was 87.5%. Kappa (κ) with corrections made for chance was .76, indicating excellent reliability (Fleiss, 1981).

**Statistical Approach**

To explore the variation in caregiver extratextual talk, we present descriptive statistics of the maternal extratextual talk variables. Then, after the creation of composite variables to index amount and elaboration, bivariate correlations were run to explore the role of child age and maternal SES in each of the extratextual talk variables (amount, elaboration, and level of abstraction). Finally, to determine the relative contribution of different aspects of caregiver extratextual talk to children’s concurrent and later language development, we then ran regression models with the two variables of extratextual talk of interest and relevant control variables (e.g., amount of talk, maternal SES, child age, and initial skills) as predictors of children’s language skills. School status (i.e., whether children had started reception at the time of the second visit) was also included as a control variable in initial models, but was
dropped as it was not significantly associated with any of the outcomes. We also tested possible two-way interactions of the extratextual talk variables with child age and child language abilities. Variables were centred before testing all interactions. All model residual plots were checked for multicollinearity, homoskedasticity, and linearity, and for the presence of outliers and influential data points (Tabachnick & Fidell, 2012). Raw scores on the BPVS were used, as these reflected greater variability in children’s skills. Scaled scores were used for the CELF, as the residual plots on initial models using the raw scores showed marked heteroskedasticity.

6.4 Results

Descriptive Statistics

As shown in Table 3, there was considerable variability in maternal extratextual talk during shared reading with their preschool-age children. For example, one mother produced only 19 word tokens when sharing the two stories, whereas another produced 978 word tokens. Similar large variability was observed across book-reading variables. All maternal extratextual talk variables were positively skewed, indicating that most mothers were at the lower end of the ranges shown in Table 3. On average, mothers produced similar proportions of elaborative and simple follow ups (7% and 6%, respectively), and a greater proportion of other questions as compared to wh-questions (25% and 17%, respectively). Because we were interested in the quality of extratextual talk, proportional measures for abstract talk, questions, and follow ups were used in subsequent analyses.

Creating the Composite Variables

To address the research questions, we created composite variables to index maternal elaboration and the amount of extratextual talk. Composite variables were created by standardising the book-reading variables (so that each variable had a
mean of 0 and a standard deviation of 1), and then averaging the sum of the variables. *Amount* of extratextual talk comprised the number of word tokens and the number of utterances produced by mothers. *Elaboration* comprised the proportion of questions and the proportion of follow ups on child responses produced by mothers. The creation of the composite variable for Elaboration was based on the research questions of the present study. However, we also note that the variables comprising the composite variable were positively related among one another, and tended to relate to children’s language skills in the same direction and in similar magnitude (see Table 4), in line with our theoretical assumptions. Note that the level of abstraction was indexed by the proportion of abstract utterances (i.e., it was not necessary to create a composite variable for this variable). Table 5 shows the intercorrelations among the three extratextual talk variables of interest (and their relations to children’s concurrent and later language skills).

**Relations Among Extratextual Talk Variables and Demographic Variables**

Our first two research questions asked to what extent the level of abstraction and elaboration were associated, and to what degree socioeconomic status and child age related to these aspects of the extratextual talk. To address these two research questions, bivariate correlations were conducted among the extratextual talk variables and demographic variables (see Table 5). Abstraction was significantly positively correlated with Elaboration ($r = .54, p <.01$), indicating that on average mothers whose extratextual talk had a higher level of abstraction also used a more elaborative style of extratextual talk with their children. It is noteworthy that the *Amount* of extratextual talk was not significantly correlated with Abstraction or Elaboration ($rs < .08, ps > .10$), suggesting that in this sample the amount and quality of extratextual talk were unrelated. Maternal SES was significantly positively
correlated with Abstraction and Elaboration ($r = .44$ and $r = .51$, respectively, $ps < .01$), and positively but non-significantly correlated with Amount ($r = .26$, $p = .14$). Thus, on average mothers of higher-SES produced more and higher quality extratextual talk during shared reading as indexed by the extratextual talk variables. Child age was not significantly related to Abstraction or Elaboration ($ps > .05$), whereas there was a significant negative correlation between child age and Amount ($r = -.34$, $p < .05$), indicating that although the quality of their extratextual talk did not differ depending on child age, mothers produced less extratextual talk with older children.

Table 3.
**Descriptive Statistics for Maternal Extratextual Talk Variables (Proportions)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word tokens</td>
<td>311.57</td>
<td>237.22</td>
<td>19–978</td>
</tr>
<tr>
<td>Total utterances</td>
<td>60.83</td>
<td>47.17</td>
<td>5–225</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstract utterances</td>
<td>16.29</td>
<td>12.70</td>
<td>0–46</td>
</tr>
<tr>
<td></td>
<td>(.26)</td>
<td>(.13)</td>
<td>(.00–.57)</td>
</tr>
<tr>
<td><strong>Elaborativeness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total questions</td>
<td>25.54</td>
<td>21.25</td>
<td>1–87</td>
</tr>
<tr>
<td></td>
<td>(.43)</td>
<td>(.18)</td>
<td>(.10–.79)</td>
</tr>
<tr>
<td>Wh-questions</td>
<td>10.63</td>
<td>8.66</td>
<td>0–37</td>
</tr>
<tr>
<td></td>
<td>(.17)</td>
<td>(.10)</td>
<td>(.00–.42)</td>
</tr>
<tr>
<td>Other questions</td>
<td>14.91</td>
<td>13.60</td>
<td>0–52</td>
</tr>
<tr>
<td></td>
<td>(.25)</td>
<td>(.13)</td>
<td>(.00–.63)</td>
</tr>
<tr>
<td>Total follow ups</td>
<td>8.71</td>
<td>8.47</td>
<td>0–33</td>
</tr>
<tr>
<td></td>
<td>(.14)</td>
<td>(.09)</td>
<td>(.00–.34)</td>
</tr>
<tr>
<td>Elaborative follow ups</td>
<td>5.03</td>
<td>5.74</td>
<td>0–24</td>
</tr>
<tr>
<td></td>
<td>(.07)</td>
<td>(.07)</td>
<td>(.00–.25)</td>
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<tr>
<td>Simple follow ups</td>
<td>3.69</td>
<td>3.25</td>
<td>0–13</td>
</tr>
<tr>
<td></td>
<td>(.06)</td>
<td>(.04)</td>
<td>(.00–.17)</td>
</tr>
</tbody>
</table>

*Note. N = 35. Total follow ups and total questions (frequencies and proportions) may differ from the sum of the components shown in the table because of rounding. Proportions calculated relative to the total number of utterances.*

In addition, maternal SES was significantly positively correlated with children’s BPVS scores on the initial visit ($r = .34$, $p < .05$), and positively (albeit nonsignificantly) correlated with later scores on the BPVS, the CELF, and narrative
skills \((rs = .26, .29, \text{ and } .07, \text{ respectively, } ps > .05)\). As expected, child age was significantly positively correlated with children’s scores on all four language measures \((rs = 48–65, ps < .01)\). Thus, age and SES were included as control variables in all models predicting children’s language skills. Note that raw scores were used for all dependent variables (excluding the CELF), as these reflected greater variability. For the CELF, raw scores were converted to scaled scores (using the manual), as initial models using raw scores showed marked heteroskedasticity.

**Assessing Multicollinearity**

Given the fairly high correlations between Abstraction and Elaboration \((r = .54, p < .01)\) and between child age and initial skill \((r = .50, p < .01)\), several steps were taken to assess multicollinearity in the regression analyses. Bivariate multicollinearity was not considered problematic, as the correlation coefficients were below .90 (Tabachnick & Fidell, 2012). Next, we assessed the Variance Inflation Factor (VIF) and tolerance values after running initial regression models; all VIFs were < 10 and tolerances were > .20, indicating no problems with multicollinearity (Bowerman & O’Connell, 1990; Menard, 1995; note that VIFs were in fact all < 5, and thus met even more stringent criteria). Next, we examined the condition indices and variance proportions for every model; there were no instances of condition indices above 30 coupled with high variance proportions (> .50), again indicating no issues with multicollinearity (Tabachnick & Fidell, 2012). Finally, we compared the pattern of findings from separate linear regressions (i.e., with only one extratextual talk variables as a predictor per model) to those yielded by full models (i.e., those containing all three extratextual talk variables as predictors) for each dependent variable. The same pattern of significant results was yielded in separate models as in full models, although coefficient sizes differed in size in models adjusting for the...
other predictors. Thus, we concluded that multicollinearity was not an issue in the following analyses.

**Predicting Children’s Concurrent and Later Language Skills**

To address the third research question, investigating relations between the two extratextual talk variables and children’s concurrent and later skills, we first examined bivariate correlations between the extratextual talk variables and children’s language scores (see Table 5). There were no significant correlations between Abstraction and any of the child language measures ($ps > .10$) at either time-point. However, Elaboration was significantly positively correlated with children’s initial scores on the BPVS ($r = .45, p < .01$), and marginally positively correlated with children’s later scores on the BPVS ($r = .32, p < .10$). Interestingly, Amount was significantly negatively correlated with children’s scores on the CELF ($r = -.41, p < .05$), and marginally negatively correlated with children’s scores on the Bus Story narrative ($r = -.34, p < .10$). Although non-significant, Amount was also negatively correlated with children’s concurrent and later scores on the BPVS ($r = -.27$ and $r = -.30, ps > .10$, respectively). There were no other significant or marginal correlations between the extratextual talk variables and any of the child language measures.

Next, we ran separate hierarchical regression models predicting children’s language skills with relevant variables controlled. In models predicting initial language skill, child age and maternal SES were entered as control variables at Step 1 and the amount of extratextual talk was entered at Step 2. In models predicting children’s later language skills, children’s initial language skill (i.e., initial BPVS scores) was entered as an additional control variable at Step 1 (i.e., providing a conservative estimate of the potential role of the extratextual talk variables on
children’s later language measures by controlling for earlier skill). At Step 3 in all models, the two extratextual talk variables were entered separately to assess the additional variance accounted for once relevant variables were controlled. An additional step was conducted to test for two-way interactions of age (and initial skill in models predicting later skills) with each of the two extratextual talk variables. However, none were significant and, therefore, these are not presented. Note that examination of the residual plots for initial models indicated possible issues with heteroskedasticity, which was improved by log transformation of the Amount variable (which was positively skewed). Models are presented with the transformed variable, although the same pattern of significant results was yielded. Note that the third step (Step 3) represents the model of theoretical interest in the present study (i.e., including all hypothesized effects), and not necessarily the best fitting model.

Table 6 shows the separate hierarchical regression models for each dependent variable. Step comparisons are based on R squared improvement. The model predicting concurrent scores on the BPVS indicates that Step 1 (maternal SES and child age) accounted for approximately 36% of the variance in children’s concurrent scores on the BPVS. Step 2 (Amount) did not account for additional significant variance in the model. However, at Step 3, Elaboration was a significant predictor, accounting for an additional 9% of variance in children’s concurrent scores on the BPVS, whereas Abstraction did not explain additional variance in children’s concurrent language scores. The model predicting children’s later scores on the BPVS indicates that maternal SES, child age, and initial skill accounted for approximately 45% of the variance in children’s later scores on the BPVS. Entering Amount at Step 2 did not significantly increase the variance accounted for by the model. Similarly, the extratextual talk variables at Step 3 did not significantly
increase the proportion of variance accounted for, and thus neither of these extratextual talk variables were significant predictors of children’s later BPVS scores. The model predicting children’s scores on the CELF indicates that approximately 24% of the variance in children’s scores on the CELF was accounted for maternal SES, child age, and initial skill. At Step 2, Amount was marginally negatively associated with children’s scores, increasing the variance accounted for by approximately 8%. Step 3 was not significant for Abstraction or Elaboration, and these extratextual talk variables did not significantly predicted children’s scores on the CELF. The model predicting children’s narrative scores indicates that maternal SES, child age, and initial skill (Step 1) accounted for approximately 60% of the variance in children’s MLU. Neither Amount (Step 2), Abstraction, nor Elaboration (Step 3, respectively) accounted for additional variance in children’s scores on the CELF, and none of these predictors were significant. In addition, there were no significant interactions among the significant extratextual talk variables and children’s age or initial skill for any of the dependent variables.

As a final step we assessed the simultaneous contribution of abstraction and elaboration to variance in children’s language skills by entering them in the same regression model for each of the dependent variables. As before, demographic control variables were entered at Step 1 and the Amount of extratextual talk was entered at Step 2. Then, Elaboration and Abstraction were entered together at Step 3. Table 7 shows the overall hierarchical regression model for each dependent variable. The same pattern of significant results was yielded in the overall regression model as in the separate models. However, the negative association between Abstraction and children’s later scores on the BPVS, and the positive association between the Abstraction and children’s scores on the CELF, were both marginally significant in
the overall model \((p < .10)\). These models indicated that Abstraction marginally accounted for approximately 6% of additional variance in children’s later scores on the BPVS, and approximately 8% of additional variance in children’s later scores on the CELF.
Table 4.
Correlation Matrix for Maternal Extratextual Talk Variables and Initial BPVS Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total utterances</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word tokens</td>
<td>.97***</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstract utterances</td>
<td>.19</td>
<td>.34*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total questions</td>
<td>.06</td>
<td>.17</td>
<td>.54**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WH-questions</td>
<td>.10</td>
<td>.11</td>
<td>.35*</td>
<td>.72***</td>
<td>1.00</td>
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<td></td>
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<tr>
<td>Other questions</td>
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<td>.26</td>
<td>.57***</td>
<td>.81***</td>
<td>.25</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total follow ups</td>
<td>.10</td>
<td>.15</td>
<td>.47**</td>
<td>.67***</td>
<td>.59***</td>
<td>.51**</td>
<td>1.00</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Elaborative follow ups</td>
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<td>.36*</td>
<td>.59***</td>
<td>.65***</td>
<td>.42*</td>
<td>.65***</td>
<td>.86***</td>
<td>1.00</td>
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<td></td>
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<tr>
<td>Simple follow ups</td>
<td>.02</td>
<td>–.02</td>
<td>.11</td>
<td>.40*</td>
<td>.52**</td>
<td>.16</td>
<td>.73***</td>
<td>.35*</td>
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<tr>
<td>Initial BPVS</td>
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<td>–.26</td>
<td>.12</td>
<td>.32†</td>
<td>.36*</td>
<td>.20</td>
<td>.49**</td>
<td>.34*</td>
<td>.43*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later BPVS</td>
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<td>–.25</td>
<td>–.09</td>
<td>.19</td>
<td>.31†</td>
<td>.03</td>
<td>.34*</td>
<td>.21</td>
<td>.31†</td>
<td>.71**</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Later CELF</td>
<td>–.39*</td>
<td>–.37†</td>
<td>.03</td>
<td>.01</td>
<td>.07</td>
<td>–.04</td>
<td>.09</td>
<td>–.08</td>
<td>.18</td>
<td>.59**</td>
<td>.51**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Later BS</td>
<td>–.35*</td>
<td>–.32†</td>
<td>.03</td>
<td>.09</td>
<td>.12</td>
<td>.03</td>
<td>.29†</td>
<td>.16</td>
<td>.22</td>
<td>.75**</td>
<td>.69***</td>
<td>.68***</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note. N = 35. Spearman correlations were used as these are less sensitive to outliers. Proportional variables were used for abstract talk, all question variables, and all follow-up variables. BPVS = British Picture Vocabulary Scale. CELF = Clinical Evaluation of Language Fundamentals. BS = Bus Story. Raw scores were used for the BPVS and CELF assessments. † = p < .10. * = p < .05. ** = p < .01. *** = p < .001.

Table 5.
Correlation Matrix for Composite Extratextual Talk Variables, Child Language Skills, Child Age, and Maternal SES

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Abstraction</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Elaboration</td>
<td>.03</td>
<td>.54**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial BPVS</td>
<td>–.27</td>
<td>.14</td>
<td>.45**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later BPVS</td>
<td>–.30</td>
<td>–.08</td>
<td>.32†</td>
<td>.64***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later CELF</td>
<td>–.41*</td>
<td>.09</td>
<td>.06</td>
<td>.67***</td>
<td>.53**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Later BS</td>
<td>–.34†</td>
<td>–.02</td>
<td>.15</td>
<td>.67***</td>
<td>.70***</td>
<td>.67***</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child age</td>
<td>–.34*</td>
<td>–.04</td>
<td>.08</td>
<td>.50**</td>
<td>.48**</td>
<td>.56**</td>
<td>.65***</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Maternal SES</td>
<td>.26</td>
<td>.44**</td>
<td>.51**</td>
<td>.34*</td>
<td>.26</td>
<td>.29†</td>
<td>.07</td>
<td>.01</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note. N = 35. For the correlation between Maternal SES and Amount, n = 34 (one outlying data point was excluded). Pearson correlations were used. BPVS = British Picture Vocabulary Scale. CELF = Clinical Evaluation of Language Fundamentals. BS = Bus Story. Raw scores were used for the BPVS and CELF assessments. † = p < .10. * = p < .05. ** = p < .01. *** = p < .001.
Table 6.
Separate Hierarchical Regression Models Predicting Children’s Language Skills With Relevant Controls

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Initial BPVS</th>
<th>BPVS</th>
<th>CELF</th>
<th>Bus Story Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>β</td>
<td>t</td>
</tr>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>1.26</td>
<td>0.54</td>
<td>.33</td>
<td>2.32*</td>
</tr>
<tr>
<td>Age</td>
<td>0.83</td>
<td>0.23</td>
<td>.50</td>
<td>3.52**</td>
</tr>
<tr>
<td>Initial skill</td>
<td>0.55</td>
<td>0.18</td>
<td>.50</td>
<td>2.99</td>
</tr>
<tr>
<td>F stat and R²</td>
<td>F = 9.01***, R² = .36, adjusted R² = .32</td>
<td>F = 8.54***, R² = .45, adjusted R² = .40</td>
<td>F = 3.31*, R² = .24, adjusted R² = .17</td>
<td>F = 14.55***, R² = .60, adjusted R² = .56</td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount</td>
<td>-6.25</td>
<td>8.37</td>
<td>-.11</td>
<td>-.75</td>
</tr>
<tr>
<td>F stat and R²</td>
<td>F = 6.11**, R² = .37, adjusted R² = .31, ΔR² = .01</td>
<td>F = 6.37***, R² = .46, adjusted R² = .39, ΔR² = .01</td>
<td>F = 3.50*, R² = .32, adjusted R² = .23, ΔR² = .08†</td>
<td>F = 10.94***, R² = .61, adjusted R² = .55, ΔR² = .01</td>
</tr>
<tr>
<td>Step 3:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstraction</td>
<td>3.42</td>
<td>13.87</td>
<td>.04</td>
<td>.25</td>
</tr>
<tr>
<td>F stat and R²</td>
<td>F = 4.46**, R² = .37, adjusted R² = .29, ΔR² = .00</td>
<td>F = 5.7***, R² = .50, adjusted R² = .41, ΔR² = .04</td>
<td>F = 3.11*, R² = .35, adjusted R² = .24, ΔR² = .03</td>
<td>F = 8.49***, R² = .61, adjusted R² = .54, ΔR² = .00</td>
</tr>
<tr>
<td>Step 4:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elaboration</td>
<td>4.28</td>
<td>1.94</td>
<td>.35</td>
<td>2.21*</td>
</tr>
<tr>
<td>F stat and R²</td>
<td>F = 6.37***, R² = .46, adjusted R² = .39, ΔR² = .09</td>
<td>F = 4.97***, R² = .46, adjusted R² = .37, ΔR² = .00</td>
<td>F = 2.93*, R² = .34, adjusted R² = .22, ΔR² = .02</td>
<td>F = 8.62***, R² = .61, adjusted R² = .54, ΔR² = .00</td>
</tr>
</tbody>
</table>

Note. N = 35 (but for Bus Story n was 33). BPVS = British Picture Vocabulary Scale. CELF = Clinical Evaluation of Language Fundamentals. SES = Socioeconomic Status. Step 1 (introduction of the control variables) for each dependent variable produced the same results for each of the three Step 2 analyses, thus it is presented only once. Step 4 tested for possible two-way interactions of age and initial skill with the significant extratextual talk variables (these are not presented as none were significant). For the model predicting the CELF, age is effectively controlled for twice (once in the scaled score and again as a predictor in the model). Therefore, we re-ran the model without age as a predictor (thus controlling only once for age), and this yielded the same pattern of results as shown in the table. † = p < .10. * = p < .05. ** = p < .01. *** = p < .001.
Table 7.
Overall Hierarchical Regression Models Predicting Children’s Language Skills With Relevant Controls

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Initial BPVS</th>
<th>BPVS</th>
<th>CELF</th>
<th>Bus Story Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>β</td>
<td>T</td>
</tr>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>1.26</td>
<td>0.54</td>
<td>.33</td>
<td>2.32*</td>
</tr>
<tr>
<td>Age</td>
<td>0.83</td>
<td>0.23</td>
<td>.50</td>
<td>3.52**</td>
</tr>
<tr>
<td>Initial skill</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.55</td>
<td>0.18</td>
<td>.50</td>
<td>2.99</td>
</tr>
<tr>
<td>F stat and R²</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount</td>
<td>-6.25</td>
<td>8.37</td>
<td>-.11</td>
<td>-.75</td>
</tr>
<tr>
<td></td>
<td>F 6.11**, R² = .37, adjusted R² = .31, ΔR²= .01</td>
<td>F 6.37***, R² = .46, adjusted R² = .39, ΔR²= .01</td>
<td>F 3.50*, R² = .32, adjusted R² = .23, ΔR²=.08†</td>
<td>F 10.94***, R² = .61, adjusted R² = .55, ΔR²= .01</td>
</tr>
<tr>
<td>Step 3:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstraction</td>
<td>-9.85</td>
<td>14.24</td>
<td>-.12</td>
<td>-.69</td>
</tr>
<tr>
<td></td>
<td>F 5.10**, R² = .47, adjusted R² = .38, ΔR²=.10†</td>
<td>F 4.98**, R² = .52, adjusted R² = .41, ΔR²= .06</td>
<td>F 3.14*, R² = .40, adjusted R² = .27, ΔR²=.08</td>
<td>F 6.92***, R² = .62, adjusted R² = .53, ΔR²= .01</td>
</tr>
<tr>
<td>Elaboration</td>
<td>4.89</td>
<td>2.15</td>
<td>.40</td>
<td>2.28*</td>
</tr>
<tr>
<td></td>
<td>F 5.10**, R² = .47, adjusted R² = .38, ΔR²=.10†</td>
<td>F 4.98**, R² = .52, adjusted R² = .41, ΔR²= .06</td>
<td>F 3.14*, R² = .40, adjusted R² = .27, ΔR²=.08</td>
<td>F 6.92***, R² = .62, adjusted R² = .53, ΔR²= .01</td>
</tr>
</tbody>
</table>

Note. N = 35 (but for Bus Story n was 33). BPVS = British Picture Vocabulary Scale. CELF = Clinical Evaluation of Language Fundamentals. SES = Socioeconomic Status. Step 1 (introduction of the control variables) for each dependent variable produced the same results for each of the three Step 2 analyses, thus it is presented only once. Step 4 tested for possible two-way interactions of age and initial skill with the significant extratextual talk variables (these are not presented as none were significant). For the model predicting the CELF, age is effectively controlled for twice (once in the scaled score and again as a predictor in the model). Therefore, we re-ran the model without age as a predictor (thus controlling only once for age), and this yielded the same pattern of results as shown in the table. † = p < .10. * = p < .05. ** = p < .01. *** = p < .001.
6.5 Discussion

Although it is well established that caregiver use of abstract extratextual talk during shared reading predicts preschool children’s language outcomes, the research to date has largely focused on the overall level of abstraction in caregiver extratextual talk without consideration of the style of the extratextual talk. A more elaborative style (i.e., one that is characterized by questions and follow ups on the child’s responses) may provide a context for children’s supported participation in discussions involving abstract talk, and thus the style of extratextual talk may be more important than the overall level of abstraction for children’s language skills. This study aimed to make a unique contribution by examining both these aspects of the extratextual talk simultaneously in relation to children’s concurrent and later language skills. In a sample of 35 preschool-age children and their mothers, we tested the hypothesis that caregiver elaboration during shared reading would be a stronger predictor than the overall level of abstraction for children’s language skills. We also examined the association between these two aspects of the extratextual talk (the level of abstraction and elaboration), and their relation to caregiver SES. As expected, the results showed that caregivers’ level of abstraction was significantly positively associated with their degree of elaboration, and that maternal socioeconomic status was significantly positively associated with both these aspects of the extratextual talk. Furthermore, caregiver elaboration during shared reading was significantly positively associated with children’s concurrent vocabulary skills. However, contrary to our hypothesis, the level of abstraction was not related to children’s concurrent language skills. In addition, neither the level of abstraction nor elaboration was significantly associated with children’s later language skills. These results and their implications are discussed.
Caregivers’ level of abstraction was significantly positively associated with their degree of elaboration, as expected. This finding supports the previous qualitative research showing that abstract talk often occurs over multiple turns involving caregiver questioning and follow ups on child responses (Gosen et al., 2013; Snow & Beals, 2006). However, the present study data did not support the main study hypothesis that caregiver elaboration would be a stronger predictor than the overall level of abstraction for children’s language skills. First, it was expected that the level of abstraction would be associated with children’s language abilities, as in the previous research (DeTemple, 2001; Dickinson & Smith, 1994; Dickinson and Porche, 2011; Hindman et al., 2008; Mascareño et al., 2016). However, caregiver abstraction was not associated with children’s concurrent vocabulary language skills, and there was a marginal negative association between abstraction and children’s later vocabulary skills. The only (marginal) positive association involving abstraction was with children’s later syntax skills, which suggested that mothers who used extratextual talk at a higher level of abstraction during shared reading had children with better syntax skills one year later. Next, it was expected that caregiver elaboration would (more strongly) predict children’s later language skills. However, elaboration was not significantly associated with any of the later language measures. Furthermore, although not related to the main hypothesis, the amount of extratextual talk was negatively (albeit non-significantly) associated with children’s language skills, while the opposite pattern would be predicted based on previous research (e.g., Hindman et al., 2014; Zucker et al., 2013). Given that there was great variation in mothers’ extratextual talk as measured in the present study, we would have expected to see relations to children’s later language skills had these been present.
How should these results be interpreted? One interpretation is that the level of abstraction during book reading does not predict preschool-aged children’s language development. However, this interpretation seems unlikely given the previous observational literature, which has reported relations between abstraction and language development. Therefore, we believe that these results may reflect the characteristics of our study sample. Our sample included children who on average had high language abilities, were mostly highly engaged during book reading, and most were reported as participating in frequent home-based shared reading. Furthermore, the present study sample had all volunteered to participate in this follow-up study, possibly suggesting that these children were particularly keen on literacy and/or that their mothers had a special interest in the benefits of shared reading for children’s language and literacy skills. Perhaps our somewhat advanced sample was on average more likely to benefit from caregivers simply reading the text rather than engaging in extratextual talk about the books. In this case, then less extratextual talk (and less abstract talk) from caregivers would reflect a greater attunement to children’s abilities. Lending some support for this interpretation, Crain and Thoreson-Dale (1992) found that caregiver extratextual talk did not predict language development in a sample of verbally precocious 2-year olds, whereas children’s level of engagement did. They suggested that child engagement may reflect the degree to which children “have [already] learned how to learn” from books (p. 428). Thus in our sample, child engagement may be a better indicator of shared-reading quality than features of the extratextual talk.

Interestingly, however, there was a marginal positive association between abstraction and children’s later syntax (once amount and elaboration were included in the model). This result suggests that children who were exposed to a greater level
of abstraction had better syntax skills on average one year later even when controlling for SES, age, and earlier language skills. Given that abstract language is often more syntactically complex, and exposure to more complex language has been shown to relate to children’s syntactic production (e.g., Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010), this result is as expected. However, it is unclear why caregiver abstraction was important for children’s syntax but it did not relate to other aspects of linguistic skill. One interpretation of this unexpected pattern of results is that different aspects of the extratextual talk may be more or less important for specific linguistic skills at different points in development. For example, the overall level of abstraction may be more important for children’s syntactic skills than to vocabulary, whereas elaboration may be more important for vocabulary and narrative skills at different ages or depending on initial skill. However, caution is needed in interpreting these results, given that the significance level was only marginal and multiple models were run on a relatively small sample.

As expected, there was a positive association between caregiver elaboration during shared reading and children’s concurrent vocabulary skills. That is, even when controlling for child age and caregiver SES, mothers who used a more elaborative style had children whose language skills were more advanced. One interpretation of this finding is that the use of an elaborative style promotes children’s vocabulary development, as children’s verbal participation in the shared reading is encouraged through questions, and their contributions are elaborated on affording further learning opportunities. This interpretation is in line with previous shared-reading research that shows that an interactive reading style is beneficial for children’s vocabulary skills (e.g., Mol et al., 2008). Another interpretation of this
finding is that mothers found it easier to engage children with better language skills in discussions about the book. Both interpretations are possible and need not be mutually exclusive. The positive (but non-significant) coefficient for elaboration predicting later BPVS scores lends some support to the idea that elaboration promoted children’s earlier language skills, as opposed to only reflecting that children with better language skills were likely to be easier to engage in extended conversations during shared reading. It is, however, noteworthy that the level of abstraction was not associated with concurrent language skills. This may reflect the fact that using language at a high level of abstraction without necessarily engaging the child in discussion does not necessarily require caregiver sensitivity to the child’s level of linguistic ability. Again, caution is needed in interpreting these results, given the fact that multiple models were run on a relatively small sample.

There are several important limitations to the present study. First, the sample size was very small, and the lack of power may have prevented us from detecting significant associations (if present) between the language outcomes and the study variables of interest, and the running of multiple models may have led to some spurious results. Second, the sample characteristics may have led to the unexpected results, as previously discussed. Third, the sample was fairly homogenous in terms of socioeconomic status (although there was some variation in IMD scores). Finally, another limitation is that this study was not pre-registered and did not follow CONSORT (Consolidated Standards of Reporting Trials; Schulz et al., 2010). The CONSORT statement includes a 25-item checklist to facilitate the reporting and appraisal of intervention studies. Key elements of this include the methods (e.g., reporting of primary and secondary outcome measures, information about blinding of assessors) and the pre-registration of the trial. Although the present study meets
many of the CONSORT checklist items (e.g., blinding was reported), we did not follow the full checklist (e.g., the trial was not preregistered, outcomes were not clearly defined as primary and secondary outcomes, power analysis was not conducted). Future research should address the same questions with a larger, more socioeconomically diverse sample, with less advanced children. In addition, it would be useful to collect data on maternal beliefs about children’s early literacy and the benefits of shared reading, since variability in such factors might help explain variation in how mothers engage in extratextual talk during shared reading.

In conclusion, it remains a question of theoretical and practical importance whether a more elaborative style would be a stronger predictor than the overall level of abstraction for children’s language skills in a more typical sample of preschool-age children. The results presented here also raise additional questions about whether we might expect to see differential effects of these two aspects of the extratextual talk on specific linguistic domains. Addressing these questions would help inform the design of shared-reading interventions and inform our understanding of how extratextual talk promotes preschoolers’ language skills. For example, the level of abstraction (i.e., children’s sheer exposure to challenging and more complex extratextual talk) might be more important for children’s syntax skills, whereas a more elaborative style in which the child is encouraged to participate in discussions and practice new vocabulary may lead stronger gains in their narrative and vocabulary narrative skills. Future research could aim to address these questions in a less advanced sample of preschool-age children.
6.6. References


6.7 Appendices

**Appendix 1: Coding Scheme for Maternal Level of Abstraction**

<table>
<thead>
<tr>
<th>Level of abstraction</th>
<th>Subtype of talk</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: Matching Perception and Selective Analysis of Perception</td>
<td>Description (DES). Refers to what is on the page (e.g., events, referents).</td>
<td>There’s a seal there!</td>
</tr>
<tr>
<td></td>
<td>Includes rote counting.</td>
<td>What’s it made of?</td>
</tr>
<tr>
<td></td>
<td>Meaning (MEA). Provides an explicit definition of a word, asks if child knows meaning, or comments on a word.</td>
<td>Do you know what a stick insect is?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>It’s like with their beaks, going peck peck peck.</td>
</tr>
<tr>
<td>Level 2: Reordering Perception</td>
<td>Inferences, bridging, or recalling (BRI). Connects what is in the story with the child’s own experience, recalls the parts of the story, talks about similarities and differences, make simple inferences.</td>
<td>Can you do squiggling?</td>
</tr>
<tr>
<td></td>
<td>Psychological states (PSY). Refers to characters’ mental state.</td>
<td>It must be night-time.</td>
</tr>
<tr>
<td></td>
<td>Reflections or evaluations (REF). Makes a moral judgement or evaluation about an event or character.</td>
<td>Oh no, is he sad?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Is that naughty?</td>
</tr>
<tr>
<td>Level 3: Reasoning about Perception</td>
<td>Predictions and explanations (PRE). Refers to cause-effect relations in the past (i.e., explaining why something happened) or in the future (i.e., predicting what will happen in the story).</td>
<td>His mummy would be cross with him (be)cause he didn't catch the chicken.</td>
</tr>
<tr>
<td></td>
<td>Transactional talk (TRA). For example: Provide feedback, direct the child’s attention, manage the child’s behaviour, or referred to aspects of the book context that were not linked to the storyline.</td>
<td>I bet she was coming in to get a nice cup of tea.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sit down and listen.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Did you like that story?</td>
</tr>
</tbody>
</table>

*Note.* Coding scheme based on the Coding Categories for Levels of Abstraction (van Kleeck, 2003).
### Appendix 2: Coding Scheme for Maternal Follow Ups

<table>
<thead>
<tr>
<th>Follow up category</th>
<th>Subtype of follow up</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Confirmation (CON). Validates or confirms the child’s response.</td>
<td>Yeh / Okay / Mmm</td>
</tr>
<tr>
<td></td>
<td>Evaluation (EVA). Positively or negatively evaluates the child’s response.</td>
<td>Well done</td>
</tr>
<tr>
<td></td>
<td>Falsification (FAL). Falsifies or repeats the child’s inadequate response.</td>
<td>No, it’s not called that</td>
</tr>
<tr>
<td></td>
<td>Answering (ANS). Provides the correct answer.</td>
<td>He looks happy</td>
</tr>
<tr>
<td></td>
<td>Simple reformulation (REF). Reformulates some or all of the child’s utterance, but adds no new semantic information.</td>
<td>Child: Those are gooses Mother: Yes, they are geese</td>
</tr>
<tr>
<td>Elaborative</td>
<td>Elaboration (ELA). Adds new information that complements the child’s response.</td>
<td>Child: because he’s not like them Mother: those ones are all dirty so you can see them near the snow.</td>
</tr>
<tr>
<td></td>
<td>Hint (HIN). Requests extra information to stimulate a further response from the child (this may occur after the child has failed to answer the question adequately).</td>
<td>Well have a look what do you think? / And what colour is the snow?</td>
</tr>
</tbody>
</table>

*Note. Table adapted and modified from Mascareño et al. 2016.*
7. Chapter Seven: Discussion

7.1 Overview

In line with the alternative (journal) format of this thesis, the detailed discussions for individual studies are provided in their respective chapters (Chapters 2–6). This chapter provides a short summary and discussion of the findings for each study. This is followed by sections on the practical implications of the thesis, limitations to be addressed by future research, and conclusions and further directions for future research.

7.2 Summary of findings and general discussion

The findings of this thesis contribute to our knowledge about storybook-reading interactions and their role in preschool-age children’s language development. Given that storybooks are the predominant genre for preschool-age children both at home and in the school setting, and abstract talk has been shown to promote language development, it was important to consider whether some kinds of stories may be more useful than others in promoting abstract talk. It was also important to understand how the kind of story relates to caregiver use of abstract language in the context of caregiver and child factors. Study 1 addressed this gap in the literature by showing effects of child engagement and story genre on caregiver abstract talk during shared reading, while also considering the role of caregiver SES, child age, and child language abilities. Results showed that 1) child engagement predicted abstract language use, driven by the proportion of lower level abstract utterances (e.g., evaluations and inferences); and 2) story genre (complexity) predicted the level of abstraction, driven by the proportion of utterances at the highest level of abstraction (i.e., involving cause-effect reasoning). These findings highlight the
importance of contextual factors in language development and have strong implications for parent-focused interventions.

Study 2 provided a closer examination of the influence of story genre on caregiver language use, and contributed to our knowledge by showing that not only is the level of abstraction greater when sharing complex stories, but that the nature of caregiver talk differs across different aspects (e.g., elaborativeness and linguistic complexity). Specifically, the results showed that complex stories facilitated more extratextual talk from mothers, and a higher quality of extratextual talk (as indexed by linguistic richness and level of abstraction). Although the type of story did not affect the number of questions mothers posed, more elaborative follow ups on children’s responses were provided by mothers when sharing complex stories. Thus, stories that are more complex may facilitate more and linguistically richer caregiver extratextual talk, having implications for children’s developing language abilities.

To move the literature on the role of genre in shared-reading interactions another step forward, Study 3 tested whether exposure to the two story genres and their associated levels of abstract talk leads to differential gains in children’s language skills. Contrary to our hypotheses, no between-condition differences were found in children’s vocabulary or narrative skills on the post-test measures. However, an exploratory post hoc analysis of the reading sessions showed that children in the complex story condition used more complex language, as indexed by their mean length of utterance and important literate language features. Although the main results were inconclusive, the exploratory post hoc analyses suggested possible mechanisms through which complex stories and their associated extratextual talk might relate to children’s language development in specific domains. Specifically, the fact that the complex story condition elicited more complex language from
children (in terms of their use of subordinate clauses, mental and linguistic verbs, and MLU) suggests that children’s exposure to greater levels of abstract talk during shared reading might promote their language skills through providing children with opportunities to practise using complex language in a highly supportive conversational context. Given this hypothesis, we might expect that the use of more specific assessment probes (e.g., retelling of a complex story, use of the PLAI to assess inferential language skills) would detect differences in children’s language skills as a function of story condition. In addition, given that the complex stories seem to provide opportunities for children to practise engaging in more sophisticated conversations, we might expect to see effects on broader language abilities (as assessed using assessments of general vocabulary and narrative skills) after a longer period of time, once children have mastered these forms and are participating in such sophisticated conversations more frequently and thus being exposed to and practising more diverse and complex vocabulary, grammar, and narrative devices.

The findings of Study 4 may provide some support for this interpretation. In Study 4, we observed that a more elaborative style (i.e., one characterized by questions and follow ups on the child’s responses) provided a context for children’s supported participation in discussions involving abstract talk, and that this elaborative style was linked to children’s concurrent vocabulary skills (whereas the level of abstraction was not). There were few associations of elaboration and abstraction with children’s later vocabulary, syntax, or narrative skills at a one-year follow-up. However, the pattern of results suggested that these two aspects of the book-reading interaction may relate to different domains of children’s language development. The significant relation between caregiver elaboration and children’s concurrent vocabulary skills suggests that one mechanism through which abstract
talk predicts children’s vocabulary development may be through the elaborative, child-involved style of conversation in which this talk often unfolds.

Together, these studies suggest that the conversational context facilitated during shared reading differs both qualitatively and quantitatively depending to a large degree on the kind of story shared, and in ways that may affect children’s language development. They also suggest that stories at an appropriately complex level may promote children’s language skills through providing a platform for conversations that support children’s own engagement and participation in conversations involving complex language. There is a need to investigate more closely the role of different aspects of the interaction during shared reading in preschool-age children’s language development.

7.3 Practical implications

This thesis has three main practical implications for those designing shared-reading interventions and for caregivers of preschool-age children. These are summarized below.

7.3.1 Story choice matters for extratextual talk and language development

The first practical implication of the present study is the importance of choosing stories in the light of children’s developing abilities. As shown in our studies, stories can be carefully selected to promote caregiver extratextual talk that supports children’s verbal participation in extended discussions about the plot (e.g., involving reasoning about characters’ motivations) and greater use of complex language from children. Based on these findings, it is recommended that stories be selected with consideration of the kinds of opportunities they afford for extratextual talk, as different kinds of stories will offer differing opportunities for children’s learning depending on the age of the child. In the preschool years, children benefit
from more challenging interactions, such as those involving explanatory discourse (Rowe, 2012). Therefore, complex books such as those containing a false-belief are likely to be particularly beneficial in the preschool years, and may serve to prepare them for the extended discourse that will be encountered in the classroom. As well as selecting books based on the opportunities they afford for beneficial extratextual talk, it is also important to consider the child’s own preferences. Letting the child choose the book can promote their engagement during shared reading (Ortiz et al., 2001), which, in turn, could encourage more meaningful and beneficial extratextual discussions about the book (e.g., Malin, Cabrera, & Rowe, 2014).

The choice of story is an especially important consideration for those conducting shared-reading interventions. Complex stories, as defined in this thesis, may be particularly useful in shared-reading interventions targeting preschool children’s language skills through training caregivers to engage in rich and abstract discussions about the story (e.g., Morgan & Goldstein, 2004). By contrast, younger children or those with language delays (who may not be developmentally ready for the more challenging kinds of discussions surrounding false-belief books), may benefit more from the less demanding extratextual talk associated with simple stories. In addition to the complexity of the story in terms of its conceptual demand, those designing shared-reading interventions for younger children may also wish to consider other book characteristics. For example, a recent study showed that simple (i.e., non false-belief) stories with low amounts of text were useful for promoting high rates of extratextual talk (i.e., number of utterances per minute) with three-year-olds, as compared to their higher-text, simple (i.e., also non false-belief) counterparts (Muhinyi & Hesketh, 2017). Thus, these kinds of stories may be appropriate for younger children and those with lower language or engagement skills.
In light of these recommendations, the provision of resources in low-SES populations is also important. Children’s book access has been linked to linguistic and cognitive outcomes in children at developmental risk because of low SES (Baydar et al., 2014; Farver, Xu, Lonigan, & Eppe, 2013; Lugo-Gil & Tamis-LeMonda, 2008). Thus, the provision of a wide repertoire of books should increase opportunities for preschool-age children’s exposure to those books that are likely to be developmentally appropriate and promote optimal caregiver extratextual talk to support language development.

7.3.2 Child engagement as a potential target in shared-reading interventions

The second practical implication of this thesis is that parent-focused interventions, and in particular shared-reading interventions, could benefit from targeting child engagement, which in Study 1 was predictive of maternal use of one type of abstract language. Based on this preliminary finding, we suggest that child engagement could be an initial target in such interventions. Importantly, experimental work has shown that child engagement in shared reading is malleable to change, in that it can be promoted in relatively simple ways such as by choosing books with bright or interesting illustrations, letting the child turn the pages, and reading at a time when the child is motivated to engage (Ortiz, Stowe, & Arnold, 2001). Such strategies can be used to promote child engagement, which in turn may facilitate more abstract language from the caregiver. Other research has shown that younger children’s engagement in shared reading is positively associated with caregiver use of beneficial interactive behaviours such as prompts, recasts, and labelling (Deckner et al., 2006; Fletcher et al., 2008; Malin, Cabrera, & Rowe, 2014). Our findings contribute to this picture suggesting that child engagement may be an important initial intervention target for shared-reading interventions.
7.3.3 Tailoring shared-reading interventions to individual needs

The third practical implication of this thesis is the need for interventions that teach caregivers both the importance of using abstract language during shared reading with preschool-age children, and importantly, how to engage children in discussions involving abstract talk. Importantly, when engaging children in more abstract discussions, some of the mothers in our study used questions and elaborative follow ups, which build on the child’s response and extend the conversation. However, consistent with previous research (e.g., Muhinyi & Hesketh, 2017; Nyhout & O’Neill, 2013; Price et al., 2009), there was very wide variation in mothers’ reading styles, and some mothers missed opportunities to engage their children in abstract conversations, even when sharing the complex stories. Parent-focused intervention studies may need to provide specific training on how to involve children in abstract talk through questioning and following up on children’s responses in ways that extend the discussion. This is likely to be more beneficial than simply commenting or posing challenging questions which the child may not yet be ready to answer without support. It remains a question whether a more elaborative style would be a stronger predictor than the overall level of abstraction for children’s language skills. However, it is possible that simply encouraging caregivers to use more abstract talk or certain kinds of abstract talk (such as linking the text to the child’s own life) may lead to a commentary that is high in its level of abstraction, but may not promote those beneficial conversations that involve the child’s participation and that theoretically would be expected to be especially important for language development.
7.4 Limitations to be addressed in future research

The research presented in this thesis has three main limitations, which could be addressed in future work. The first limitation is the relative homogeneity of the sample used in the observational studies (Studies 1, 2, and 4). Although we aimed to recruit a socioeconomically diverse sample, more than half of the families lived in areas within the top three deciles. This lack of variation may have prevented us from identifying SES as a significant predictor of maternal abstract language use. Notably, in Study 1, the non-significant model coefficients (albeit small) for factors hypothesized to predict caregiver abstract language use were in the hypothesized direction, and $t$-values were 1 or greater. Thus it may be that, in a larger and more socioeconomically diverse sample, SES would predict caregiver use of abstract language. Related to this issue, although our measure of SES (IMD scores) reflected greater variability in SES than the self-report of maternal education (which was limited to four levels), the use of IMD scores as a measure of SES also has limitations, as it is based on geographical averages rather than on individual families’ characteristics. For example, some families may have a higher or lower income and educational attainment than is average in their local area (particularly in formerly industrial cities such as Manchester, parts of which and surrounding areas are undergoing rapid processes of gentrification). A more sensitive and direct measure of SES (e.g., a composite measure of income and educational attainment based on participant report) may have resulted in a significant effect of SES, even in a sample with characteristics similar to the present one.

Similarly, in Study 1, low variability in child engagement may have led to an underestimation of the relation between child engagement and maternal abstract language use. We measured child engagement using the COB, a global measure of
child engagement that considers multiple domains of the child’s behaviour during shared reading. This scale demonstrated good internal reliability in our study, and has elsewhere shown predictive validity for children’s early literacy skills (Kaderavek et al., 2014). Therefore, we believe that this measure was sensitive to the variability that existed in our data, and this is also attested to by the fact that we observed a significant relation between child engagement and maternal Level 2 utterances. However, given the low variability in child engagement within our sample, we could expect that a larger effect would be detected in a sample that included more children who displayed low or very low engagement. Thus, future research could examine relations among these same variables in a more diverse sample (both in terms of SES and child engagement). Given the lack of variation in child engagement and with consideration of the reviewers’ comments on Study 1 (see main Appendix 2), we consider the findings of Study 1 as preliminary. Thus we use caution in their interpretation, and we did not include the child engagement variable in subsequent studies.

Furthermore, Study 4 included a smaller subset of the same sample, and thus a lack of power may have prevented us from detecting significant associations (if present) between the language outcomes and the variables of interest. In addition, although similar in characteristics such as language abilities and SES, this subset of the sample may have had an especially keen interest in shared reading and in research, given that they were still interested in participating in the follow-up study one year later. Coupled with the lack of variation in the sample in terms of language skills, engagement, home reading frequency, and SES, this could mean that the results of Study 4 are largely a reflection of very specific sample characteristics. Perhaps our somewhat advanced sample was on average more likely to benefit from
caregivers simply reading the text rather than engaging in extratextual talk about the books. Future research could aim at understanding the relation between, and the relative benefits of abstract talk vs. elaboration, in a larger and more diverse sample. Indeed, all four studies of this thesis would have benefited from a larger sample size to increase statistical power to detect the hypothesized effects (if present).

A second limitation is that not all possible sources of variation in caregiver use of abstract language were considered in the observational studies (Studies 1, 2, and 4). Other factors have been identified by previous research as playing a role in caregiver input, such as birth order of the child and the age of the caregiver (Hoff, 2006). In addition, maternal beliefs about book reading, knowledge of child development, depression, intelligence mindsets (e.g., whether a growth-oriented mindset as opposed to a fixed mindset is held about abilities and skill development) might also play a role in the quality of caregiver-child interaction (Rowe, 2008, 2018), and thus some of the large variation that was unaccounted for in these studies could have been explained by these factors. We did not collect information on these variables in the present study. Future research could consider the role of these factors in shared reading, and whether they predict the quality of the shared-reading interactions and/or moderate the effects of story genre. Considering the role of maternal belief in the use of abstract talk during shared reading may be particularly informative, given Heath’s (1982) early observation that differences in the use of decontextualized language used by caregivers in three communities was linked to their beliefs about children’s language development.

The third limitation relates to Study 3, which aimed to assess the relative effects of simple and complex stories on children’s language skills. Unfortunately, data from the inferential story comprehension probe used in this study could not be
analysed because the probe lacked internal consistency. It is plausible that a more valid measure of children’s inferential comprehension skills may have reflected children’s gains following exposure to the complex condition. Alternatively, the Test of Abstract Language Comprehension (TALC; Elks & McLachlan, 2004) or the Preschool Language Assessment Instrument (PLAI; Blank, Rose, & Berlin, 2003) could be used to show gains in children’s inferential language comprehension in future research in this area. The PLAI has been used to show gains in children’s understanding of inferential language relative to a control group in an intervention study (van Kleeck et al., 2006). In addition, future research investigating the effects of simple and complex stories on children’s linguistic skills might benefit from using more specific measures of vocabulary and narrative skills, such as a narrative retell and comprehension probe based on a story involving a complex plot, and a vocabulary probe testing target vocabulary from each of the story conditions. In addition, although the exploratory post hoc analyses suggested that complex stories as compared to simple stories facilitated more complex language production from children, because this study was not designed to measure children’s language production during the shared-reading sessions, we could only analyse this at small-group level (as opposed to the level of the individual child, which would have required video-recordings to identify which child was speaking). Similarly, the study design (i.e., involving repeated readings of the same books) did not allow us to investigate the effects of story complexity over time on children’s language production in the shared-reading sessions (i.e., learning effects), as familiarity with story content would be a confounding factor. Future research could use designs that can investigate the role of story complexity on children’s complex language production over time (controlling for familiarity with the stories), and on the role of
these productions in their subsequent language development. Following the CONSORT (Consolidated Standards of Reporting Trials; Schulz et al., 2010) in future research could help address some of these limitations. The CONSORT statement includes a 25-item checklist to facilitate the reporting and appraisal of intervention studies. Key elements of this include the methods (e.g., reporting of primary and secondary outcome measures, information about blinding of assessors, reporting of power calculations) and the pre-registration of the trial. Although the present study fulfils many of the CONSORT checklist items (e.g., blinding was reported), the main limitations are that the trial was not preregistered, outcomes were not clearly defined as primary and secondary, and a power analysis was not conducted.

A final limitation is that for the observational studies (Studies 1, 2, and 3) we did not recruit a sample that can be considered representative of those whose children may benefit most from language interventions (i.e., those at risk for language and literacy delays). It is likely, given the degree of educational attainment, that parent literacy levels in our sample were relatively high on average. Therefore, the above recommendations for parenting interventions are less applicable to those families in the UK where parents’ literacy levels are low, for whom other approaches (e.g., elaborative reminiscing rather than shared reading) might be more useful (Reese et al., 2010). A related issue worthy of discussion here is that of the difference-deficit debate, i.e., how to interpret differences in the developmental trajectories of children’s language skills from low vs. higher SES groups (e.g., see Developmental Psychology special issue on Deficit or Difference, Callanan & Waxman, 2013). The “deficit” side of the argument posits that children from low-SES groups (as well as those from minority language backgrounds) have lower
language skills that should be remediated through interventions. By contrast, the “difference” side of the argument posits that the differing trajectories do not represent deficits in ability, but rather, differences that arise through distinct (but equally valid) social and cultural practices. This thesis adopts the pragmatic stance clearly articulated by Erika Hoff, “in which the interpretation of differences in developmental trajectories and recommendations regarding remediation are guided by data on the consequences and causes of those differences” (Hoff, 2013, p. 4). That is, this thesis has aimed to contribute to a body of knowledge that can be used to help design interventions for children from low SES backgrounds – given that such children are more likely to arrive at school with lower oral language skills than those of their peers (as measured through assessments at school), and given that this gap is expected to increase over time, leading to adverse academic, social, and economic outcomes (see p. 13 of this thesis).

7.5 Conclusions and further directions for future work

The findings of this thesis contribute to our knowledge about storybook-reading interactions and their role in preschool-age children’s language development. Several directions for future research were outlined in the above section to address the study limitations, as well as in the main discussions contained in each paper. This section concludes by elaborating on three main directions for future research based on the findings of this thesis that can further move forward the research literature.

7.5.1 Understanding which genres may be most beneficial at which stages in the child’s development

An important direction for future work is to continue expanding the existing work on the role of genre in caregiver interaction, but with closer attention to specific features of books and with consideration of children’s differing
characteristics. This thesis suggested that false-belief books could be considered more “complex” for preschool-age children than non false-belief books, and that the former promote interactions that are potentially more stimulating and beneficial for preschool-age children’s language abilities. Future work could continue to map out whether certain kinds of books (e.g., wordless books, rhyming books, personalized books) might be more beneficial for particular linguistic skills at given developmental stages. Importantly, based on Fletcher and Reece’s (2005) hypothesis that more complex books are likely to promote more beneficial interactions, researchers should continue to theorize about what kinds of books and what specific aspects of books might be considered appropriately complex at a given developmental stage, and then test hypotheses based on this (as in the present thesis). This could lead to an evidence-based resource for parents and early years’ practitioners to help them provide a selection of optimal books for children at given developmental stages.

7.5.2 A closer look at false-belief books and the types of interactions they facilitate

A specific direction for future work here is to examine more closely variations within the false-belief genre (e.g., the amount of mental state language in the text, the number of false-beliefs, whether the false belief is explicitly stated in the text), and their influence on caregiver interaction during shared reading. In the present thesis, we observed shared-reading interactions using only a small pool of books (two stories that contained a false-belief, and two that did not). Both of the complex stories had a false-belief that was central to the plot, and in both books the false-belief was depicted through the behaviours of the protagonists (as depicted in the pictures and described in the text), rather than being explicitly stated in the text.
One possibility is that stories where the false belief is explicitly stated in the text would not yield the same degree of challenging extratextual talk as observed in the present study, because caregivers may perceive less of a need to explore children’s understanding of complex aspects of the plot in extratextual discussions when it is stated in the text. Uncovering the role of such variations can add to our knowledge base for informing shared-reading interventions.

7.5.3 Teasing apart potential effects of the extratextual talk on different domains of children’s linguistic abilities

It remains a question of theoretical and practical importance whether a more elaborative style would be a stronger predictor than the overall level of abstraction for children’s language skills in a more typical sample of preschool-age children. The results presented in Study 4 also raise additional questions about whether we might expect to see differential effects of these two aspects of the extratextual talk on specific linguistic domains. Addressing these questions in a less advanced sample of preschool-age children might help inform the design of shared-reading interventions and inform our understanding of how extratextual talk promotes preschoolers’ language skills. For example, the level of abstraction (i.e., sheer exposure to challenging and more complex extratextual talk) might be more important for children’s syntax skills, whereas a more elaborative style in which the child is encouraged to participate in discussions and practice new vocabulary may lead stronger gains in their narrative and vocabulary skills. Addressing this question in future research can again add to our knowledge base for informing shared-reading interventions.
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Stahl, S. A. & Bauer, E. B. (Eds.), *On reading books to children: Parents and
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Appendices

Main Appendix 1: Power Considerations

Studies 1 and 2:

The sample size for Studies 1 and 2 were based on a previously conducted power analysis using G*power software (Faul, Erdfelder, Lang & Buchner, 2007), which indicated a sample size of 77 to detect a medium effect ($F^2 = .15$) at a power level of .8 in a multiple regression analysis with three predictors, as originally planned. The final sample size was 53.

Studies 3 and 4:

No power analysis was conducted for Studies 3 and 4. The sample size for Study 3 was based on previous research that compared the effects of different reading styles and observed significant effects after similar intensities of exposure (e.g., Blewitt, Rump, Shealy & Cook, 2009; Reese & Cox, 1999). Reese and Cox compared the effects of three reading styles on a range of outcomes using a sample of 48 children, and detected significant differences between conditions on a similar range of outcomes after 6 weeks’ exposure. The present study target sample size was set at 55, based on that of Reese and Cox but with an additional 10% in case of attrition. The final sample size was 34.
Main Appendix 2: Child Development Peer Reviews on Study 1 (“Two Predictors of Caregivers’ Abstract Language Use: Story Complexity and Child Engagement”)

Reviewer 1

Thank you for the opportunity to review your manuscript, Two Predictors of Caregivers’ Abstract Language Use: Story Complexity and Child Engagement. This paper examines child and storybook characteristics that putatively predict different features of caregiver abstract language use.

Important Contributions to the Literature: This study is an interesting and novel investigation into the interactive processes that link caregiver-child engagement during book reading, the features of the story, and caregiver abstract language use. The authors make a compelling case for the utility of their research questions, use an appropriate study design, and provide clear and justified analyses.

Introduction: The introduction is well written, and provides a good setup for the analyses. There are some minor organizational issues that would improve the flow, such as the following:

The research questions are helpful, but should include the hypothesized direction of effect. (e.g., “Does greater child engagement positively predict…”). Exploratory questions should also be added here, and labeled as exploratory.

On p. 8 in the paragraph just prior to ‘The Present Study’ section, the authors indicate that evidence about shared reading will contribute to our understanding of child language development; this is overstated, as this study is aiding our understanding of the factors that influence caregiver talk.

Further analyses (such as a mediation analysis) will be needed to determine if these factors influence child language development via caregiver talk.

I recommend removing any information from the introduction that is provided in the method section, such as the sample size.

Methods: The analytic choices are clearly laid out and appear sensible, although there are some limitations to dichotomized predictor variables that should be discussed (see for example MacCallum et al., 2002).

The assertion that AIC and BIC values were not included for brevity is not convincing; please provide these, and corresponding interpretations, in the results section.

Discussion/Conclusion: There are a few issues with the conclusion. First, the authors are likely overstating the findings in their discussion of interventional implications. The sample was not a clinical sample, and it is unclear if the associations uncovered in this study would apply to children who are in need of language intervention. The authors should re-frame the discussion in these terms, and suggest hypotheses for clinical samples that could be tested in future research.

The sample size is also relatively small and homogenous- the authors need to discuss the implications of this and the extent to which the findings from this study may or may not generalize outside the sample population.
As mentioned in my comments on the intro, there is also no evidence that increasing caregiver abstract language use via the predictor variables uncovered in this study is associated with improved child language. The authors should be more clear that this study generates hypotheses about potential relationships between child/storybook characteristics, caregiver talk, and ultimately child language development, but these associations will need to be explored in future research. This important point is referenced at the end of the discussion, but stronger language about the implications of this study for child language development are used in earlier portions of the paper.

Likewise, on p. 20 the authors overstate the child’s ‘engagement with caregiver utterances’; as far as I can tell, the authors only measured the caregivers’ production of abstract utterances, not whether or not the child was ‘engaged’ with those utterances. This should be clarified.

Finally, the authors may find it helpful to consider Vygotsky’s Zone of Proximal Development when interpreting their findings, particularly in relation to the lack of association between child engagement and level 3 utterances. It could be that (a) level 3 utterances are too complex (i.e., not within the ZPD), and so the child is unable to engage with this level of utterance, or (b) children who tend to be more engaged during book reading have caregivers who are better at adapting the complexity of their utterances to their children’s developmental level (which is below level 3).

Minor Issues
*The introduction is well written, but would be improved by better transitional sentences between paragraphs
*On p. 4, start the second full paragraph with the sentence “One specific feature of caregiver talk…”
*Add ‘also’ after ‘can’ in the first sentence of the first full paragraph on p. 8
*“during” is missing between “engagement” and “reading” in the 2nd line from the top on p. 20.
*The word ‘driven’ on p. 21 in the second sentence of the first full paragraph suggests causality and a direction of effect. I suggest you replace this with something along the lines of “most apparent when examining…”

References

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**Reviewer 2**

The overall topic of this manuscript is an important one; understanding factors that contribute to caregivers’ use of abstract language has important clinical implications. Overall the manuscript is well written, the science is well designed and the limitations are well described. Nevertheless, there are some relatively minor suggestions that would strengthen this work:

Introduction

1. Please consider giving some examples of decontextualized and contextualized talk in the introduction (p. 5, first paragraph).
2. Please read introduction for the passive voice (e.g., “to be comprehended” P. 8, second paragraph).
**Method**

1. Please define GCSEs for readers not from Great Britain.
2. Please describe the purpose of the familiarization session.
3. Please provide a more detailed description about how books were selected (What are "high-street" bookstores? What were the criteria for selection?)
4. Please provide more description as to how the COB scale was coded. Was it coded by intervals? Partial, whole?
5. Please provide more information regarding how SES was determined.
6. Please provide citations for R packages.

**Results**

1. Please provide effects sizes for results
2. Please considering separating child engagement (a primary independent variable) from "other caregiver and child variables" in the presentation of results
3. My only major concern was the lack of consideration as to how the complexity of the study (one IV) may influence engagement. Please consider including a table that shows COB level by book complexity.

**Other**

1. Please check for typos such as a period outside of quotation marks (p. 10, 2nd paragraph).

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**Reviewer 3**

This study examined the use of two aspects of joint bookreading (the abstract nature of the book and child engagement) that might impact the way caregivers/ mothers use language with their young children. The idea of examining the complexity of books is an interesting one and has not been studies as much as it should have in the past. There is a literature on attention as well as joint attention that has been well studied in early language development. The study examined 53 mother/child dyads, including younger and older preschool children. The study focused on using books Two books were complex in nature and included a false belief as central to the story. Two other books were used that has a simple straightforward plot. The bookreading was videoed and later coded for child engagement. There was interest in examining whether child age and SES were related to the way mothers interacted verbally with their children with respect to these two major bookreading constructs.

Although the overall aims of the study might be important there are number of serious concerns about the actual way the study is characterized theoretically and also the severe limitations of the measures and sample.

**Introduction**

The introduction makes a good case for examining differences in the complexity of books read to children that might be related to the way caregivers talk to their children while reading books to them. Unfortunately, the way in which the authors define complexity and ‘abstract’ is very confusing. “Abstract” is not clearly defined and seems to be different in many ways from the coding system used to code talk. The table on page 34 defines the levels of abstractness but this is not discussed in the introduction. Talk “beyond the here and now” that is how abstract is defined is different from what is described in the table on page 34. Complex books appear to be ones that include a
“false belief”. Thus, it really seems to this reviewer that the article is really about whether maternal language might change as a result of whether the story contains a “false belief” not just more complex. It would have been useful if the authors had related their hypotheses more to “Theory of Mind” and the research that has been done on Theory of Mind and language development. Currently, there is not a good argument for why ‘false belief’ books would change maternal language input as well as in what ways it might change language input (See Marilyn Shatz work and Henry Wellman).

The literature review is also lacking on the concept of engagement, especially during bookreading and during language input. There is really no discussion of the role of engagement in language learning and especially joint attention. The authors do not make a good case for engagement as independent of the role of the mother during bookreading. Thus, a much better argument needs to be made, using the large literature on joint attention, language development and language input.

Beyond these constructs of “false belief” and child engagement, the role of SES, child language ability and child age were also explored. These last three constructs are discussed very little in the introduction with respect to the literature on “false belief” and child engagement.

The questions on page 9 are not well grounded in the research so they do not seem compelling. Especially question 3 seems somewhat unconnected to questions 1 and 2. It would seem that the authors would want to know whether book complexity and child engagement are predictive of maternal language after controlling for SES, child language, and child age or whether these latter three might moderate the association of book complexity/child engagement in the prediction of maternal language. There is no discussion of order effects within these questions, yet they are presented in the results section. In addition, there are no questions related to the level of abstractness of maternal language (i.e. reordering perception and reasoning about perception). What are the hypotheses and questions about these different levels of abstractness in relationship to book complexity and child engagement.

It is also not clear why the authors did not code maternal language in a more traditional way, using number of words/different words and complexity measures to understand whether book complexity and child engagement might predict maternal abstractness in addition to more traditional measures of maternal language input. Some discussion of the more traditional measures of language input are needed in the introduction and why they may not be as important as the ones used in this study.

Methods
The sample consisted of 53 mother/child dyads with half the sample being 3 years of age and half the sample being 4 years of age. Forty-three mothers had at least an undergraduate degree or equivalent (81%). A vocabulary measure similar to the PPVT was administered to the children. Caregiver SES was indexed by postcode using the Education Skills and Training Deprivation deciles of the English Indices of Multiple Deprivation (IMD, 2015). This reviewer is not familiar with this SES measure and it is not defined at all in the text. Given the previous literature on language development (See the work of Hoff, Snow & Rowe) maternal education seems like the most likely marker of maternal language input and there is so little variation in maternal education that this sample does not appear to be a good one to examine the construct of SES.

There is not a good rationale for choosing the books for this study. There do seem to be differences on “false belief” but the simple story also contains emotions which many researchers might argue are complex constructs for children. More rationale for the books is needed and why “false belief” is so important for story complexity. The child engagement measure has many thorny issues also. It is unlikely that child engagement is independent of the mother’s influence. Mothers are attuned to their child’s level of interest and use a variety of techniques to help children engage with a
book. Thus, just coding child engagement ignores the role of the mother. The literature on joint attention might be helpful to the authors in making their argument and possibly altering their coding system. The COB was developed as a measure of child engagement during a large group reading activity conducted by the preschool teacher. This is very different from a one-on-one mother/child bookreading activity where engagement is a joint function of mother and child. Thus, there would need to be much more detail on the COB to show that is valid in a mother/child bookreading situation. There is very little variation on the COB with only a really binary variable since 96% of the child scores were 3 or 4 (the explanation of making this a binary measure should be in the method not the results section). In any case, the COB in this study does not seem to be capturing important nuances in the variation of child engagement. The IMD scores for SES are not clearly explained and do not seem to match maternal education so some explanation is needed for why this is the case. The explanation of the coding for the level of abstractness of maternal talk is not carefully described and it does not seem to relate to the literature review. The reviewer is not clear why these levels of abstractness should be related to book complexity about “false belief”.

Results
The results are very confusing because they do not directly relate to the questions. The results also contain more analyses that were not really explained. For instance, the order of the book types (complex vs. simple) is analyzed but there is nothing in the literature review or methods or questions that would help the reader understand why this might be important. It appears that child engagement did predict maternal language but with some important variables related in the opposite direction from the prediction. For instance, vocabulary and child age were negatively related to maternal language. This does not make sense. Story complexity was also related to maternal language input but it is not clear how to explain the both positive and negative results for the levels of abstractness without some hypotheses about these relationships. In summary, this study has some interesting elements but the theoretical grounding is mostly absent along with incomplete questions and hypotheses. The small sample limits the value of the study and the measures have some significant limitations. The results are somewhat interesting but because of the many limitations, they seem very preliminary in nature.

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### Main Appendix 3: Coding Scheme for Maternal Extratextual Talk

<table>
<thead>
<tr>
<th>Level of abstraction</th>
<th>Subtype of talk</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: Matching Perception and Selective Analysis of Perception</td>
<td>Description (DES). Refers to what is on the page (e.g., events, referents). Includes rote counting.</td>
<td>There’s a seal there! What’s it made of?</td>
</tr>
<tr>
<td></td>
<td>Meaning (MEA). Provides an explicit definition of a word, asks if child knows meaning, or comments on a word.</td>
<td>Do you know what a stick insect is? It’s like with their beaks, going peck peck peck.</td>
</tr>
<tr>
<td>Level 2: Reordering Perception</td>
<td>Inferences, bridging, or recalling (BRI). Connects what is in the story with the child’s own experience, recalls the parts of the story, talks about similarities and differences, make simple inferences. Psychological states (PSY). Refers to characters’ mental state. Reflections or evaluations (REF). Makes a moral judgement or evaluation about an event or character.</td>
<td>Can you do squiggling? It must be night-time. Oh no, is he sad? Is that naughty?</td>
</tr>
<tr>
<td>Level 3: Reasoning about Perception</td>
<td>Predictions and explanations (PRE). Refers to cause-effect relations in the past (i.e., explaining why something happened) or in the future (i.e., predicting what will happen in the story).</td>
<td>His mummy would be cross with him (be)cause he didn't catch the chicken. I bet she was coming in to get a nice cup of tea.</td>
</tr>
<tr>
<td></td>
<td>Transactional talk (TRA). For example: Provide feedback, direct the child’s attention, manage the child’s behaviour, or referred to aspects of the book context that were not linked to the storyline.</td>
<td>Sit down and listen. Did you like that story?</td>
</tr>
</tbody>
</table>

*Note.* Coding scheme based on the Coding Categories for Levels of Abstraction (van Kleeck, 2003). The original coding scheme has four levels, but here Levels 1 and 2 are collapsed into “Level 1”, to represent all concrete talk.