

CLUSTERS OF PARENT INTERACTION STYLES DURING STORYBOOK AND  
EXPOSITORY BOOK SHARING WITH PRESCHOOLERS

by

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(Under the Direction of Anne van Kleeck)

ABSTRACT

During book sharing, many parents of preschool children mediate their children's comprehension and verbal participation by discussing the book content and illustrations (Ninio, 1983; Teale & Sulzby, 1987). The extratextual utterances parents provide are important because they are considered by many scholars to be critical to children's learning from book sharing (e.g., Bus, Leseman, & Keultjes, 2000; Harkins, Koch, Michel, 1994; van Kleeck, Gillam, Hamilton, & McGrath, 1997). The most prevalent finding to date regarding parents' extratextual talk during book sharing is that there is large variability in the number and types of extratextual utterances parents offer. Some of this variation has been explained by the age and abilities of the child, the sociocultural or socioeconomic status of the family, and text factors such as familiarity or genre. Nonetheless, even studies that have been designed to control for these various factors have revealed substantial variability in the amount of talk parents provide and the types of utterances they use.

The purpose of the current study was to replicate a cluster analysis study conducted by Hammett, van Kleeck, and Huberty (2003) which illuminated the systematic ways in which middle-income parents varied in their extratextual talk during

storybook reading, and to extend the research to expository book sharing. Fifty seven parents and their typically-developing child between 3 years 4 months and 4 years 2 months participated in the study. Dyads were videotaped on two occasions reading unfamiliar storybooks and expository books. Parents' extratextual utterances were coded for their content and these data were submitted to cluster analysis.

The results indicated that the styles of parent interactions in the current study did indeed replicate the findings of Hammett et al. (2003), indicating that the variability in parent style of interactions was systematic rather than random. Comparisons between the storybook and expository book conditions confirmed that text factors did influence parents' interactions during book sharing. Specifically, parents provided greater numbers of extratextual utterances and more input at high levels of abstraction during expository book sharing compared to storybook sharing. Thus, sharing different genres of books naturally altered the types of interactions that occurred.

**INDEX WORDS:** Book sharing, Parent-child book reading, Early literacy, Abstract language, Decontextualized language, Interaction styles, Storybook reading, Expository book reading

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## DEDICATION

Several days before she died, my mother, Carol Hammett, who could no longer talk, wrote on her pad of paper, “Dr. L.A. Hammett” and pointed to me. Her eyebrows were raised and it seemed to be a question, “Will you go back to school and finish your Ph.D.?” At the same time, it seemed to be a request, “Please don’t let my death interfere with your future. Don’t let it stop you from achieving your goals and dreams.” I reassured her that I would indeed finish, and although there were times during the year that followed that I was not sure I would continue in the program, ultimately, her faith in me and that conversation, which was one of our last, kept me going. Thank you, mom, for what you taught me during your life and through your death, and for the way your spirit continues to speak to me and support me through your art. I know that you celebrate with me on this accomplishment and you will continue to encourage and support me throughout my life. This dissertation is dedicated to you.

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## CHAPTER 1

### LITERATURE REVIEW AND STATEMENT OF THE PROBLEM

One-on-one book sharing is a frequent routine in many families during which an adult typically supports a young preschool child's ability to understand a book by discussing the content of the story and the pictures, and at times focusing the child's attention on the print. A large body of research exists, spanning more than three decades, on parent-child book sharing practices. Despite such a long history, there has been controversy over just how important this activity is for preparing young children for the language and literacy demands of society. In trying to evaluate its importance, researchers have explored the effects of book sharing frequency, and the types of interactions that take place during the activity, on children's language abilities, and emerging and early literacy skills (e.g., Crain-Thoreson & Dale, 1992; Leseman & de Jong, 1998; Sigel & McGillicuddy-Delisi, 1984; Teale, 1986; van Kleeck, Gillam, Hamilton, & McGrath, 1997; Wells, 1985).

Although frequency of book sharing has been found to be related to child outcomes, this relationship has been found to be relatively weak, and further, this variable alone does not take into consideration the types of interactions that take place during the activity. For this reason, researchers have explored the specific types of extratextual utterances that parents contribute during book sharing in an attempt to determine whether their styles of interacting might have special importance. What has consistently emerged from this research, though, is the existence of substantial variability across parents in book-sharing interactions. Although some of this variability can be explained by factors such as the age and abilities of the child, the family's sociocultural membership, and

characteristics of the books being shared, considerable variability remains even when these factors are controlled.

In exploring this variability in parents' styles of interactions during book sharing, a few studies have revealed systematic patterns across parents; that is, rather than finding that parents varied randomly in their styles of interactions, subgroups of parents appeared to demonstrate similar patterns of extratextual interactions during the activity. To date, however, there are only four studies that have explored the variability, some with substantial weaknesses, and none have been replicated to substantiate their findings (De Temple & Tabors, 1994; Haden, Reese, & Fivush, 1996; Hammett, van Kleeck, & Huberty, 2003; Harte, 1997). Thus, while the literature provides initial styles to explore, it allows for few if any solid conclusions.

In order to understand why research on the patterns of parents' extratextual utterances is important, one must understand the broader historical context from which this research has emerged, including the influence of the sociocultural theoretical perspective, and the research on frequency of book sharing and the types of extratextual utterances used during the activity. Thus, these topics will be reviewed first. In addition, the literature on interactions during book sharing indicates three factors that influence parents' use of extratextual utterances, specifically, the age and abilities of the child, the family's sociocultural membership, and the characteristics of the books being shared. Within this body of literature, though, there is evidence for substantial variation across parents that remains unexplained, in part due to research designs that focus on central tendencies and rely on univariate analyses. Several studies have been conducted that have begun a much-needed methodological shift in this research toward systematic, multivariate exploration of the variability across parents in the types and amounts of extratextual talk during book sharing. The focus of the current study will be to replicate a previous study (Hammett et al., 2003) to determine the validity of the patterns

found in that particular sample, and to extend that study beyond storybooks to also include expository books.

### *Historical and Theoretical Context of Book Sharing Research*

Book sharing refers to the act of an adult reading books aloud and discussing them with children. Although this activity has received considerable attention in the last two decades, the notion that book sharing makes an important contribution to children's development has its roots in the literature as early as 1898 (Iredell, 1898), when Iredell described a book sharing episode, along with various other early experiences with text, and suggested that they contributed to children's emerging understanding of print and its relationship to speech. In the early 1900s, Huey (1908/1968) indicated that the home was the natural place for a child to learn to read, through exposure to environmental print, atlases containing pictures paired with words, and book reading with a parent. Huey suggested that the interest in reading sparked by such natural exposure led children to engage in "story-telling" and "picture-reading" (p. 379) from highly familiar, favorite books, and eventually to memorize the text and match spoken words to the printed word (p. 332). "The secret of it all," he stated, "lies in parents' reading aloud to and with the child" (p. 332), with the child learning to read "almost as naturally as the sun shines, in these sittings on the parent's knee" (p. 332). Despite these early references to the benefits of book sharing with young children, the primary emphasis in the early part of the 1900s was on teaching reading to school-age children; literacy in preschool children was virtually disregarded (Teale & Sulzby, 1987).

In the 1930s, the concept of reading readiness emerged, and researchers began to take note of the skills that appeared to be important for children to have before literacy instruction began. Exploration of what experiences could help children acquire reading readiness led to research on the quality of children's home libraries with the recommendation that this aspect of children's early experience could be improved (Nystrom, 1931). The second edition of *Children's Reading: A Guide for Parents and*

*Teachers* by Terman and Lima came out in 1931, and contained descriptions of numerous children's books that were deemed good quality literature and that had proved interesting and motivating for children at certain ages. They indicated at that time that "nearly all children are read to" (Terman & Lima, 1931, p. 31) before the age of five, and they emphasized the need to supply the types of books that would teach children "to enjoy good literature" (p. 4).

Although this early literature points to support for book sharing prior to school entry, there are also reports of educators discouraging the practice, along with anything akin to reading instruction, at home by parents, suggesting that there was a correct method for learning to read and such untrained attempts to teach reading at home would be detrimental to their children's development of the skill (Austin, 1932). Indeed, Durkin (1966) reported that such advice to parents was prevalent in the 1950s when she was collecting data for the first of her two studies reported in that volume. Yet Durkin's (1966) research provided evidence that parents who did *not* follow such advice had children who were more likely to be early readers compared to children whose parents did follow the recommendation. Specifically, in Durkin's (1966) studies of children who had learned to read prior to formal school reading instruction, early readers were more likely to be found in families in which parents disregarded educators' current recommendations, and engaged in a variety of print-related activities with their children at home, including reading books aloud. Non-early readers, on the other hand, were more frequently from families in which parents reported that they discouraged reading activities at home, even when their children requested it. During a second round of data collection for her study, which took place in 1961, Durkin found similar results, but noted that there had been a shift away from advice that reading instruction at home prior to school entry would be detrimental to children's school achievement, and more parents were engaging in book sharing at home.

In fact, research in the 1960s and 1970s began to show that children could indeed learn a great deal about literacy prior to first grade, with beneficial effects on their reading achievement. Although early reading education in America typically began in first grade, Brzeinski (1964) found that kindergarten children in his experimental group, who received a program that included instruction in letter names and sounds, made greater gains than the controls on these beginning reading skills, and they performed better than controls in reading at the end of first grade. He also found, though, that the children in both the experimental and control groups made significant gains on tests of letter-sound knowledge if they were also read to at home. One of his conclusions was that “parents can help their children begin to read” (p. 21). Several books during this time also described various methods that parents could use to actively teach their children to read prior to school entry (Doman, 1964; Emery, 1975; Soderbergh, 1977).

After a long history of interest in parent-child book sharing, this activity eventually made it into the spotlight, and it became a highly recommended practice in both educational circles and the popular media alike. The first edition of Jim Trelease’s *Read-Aloud Handbook* was released in 1979, and has remained a national bestseller through its current fifth edition (Trelease, 2001). By 1985, reading aloud with children was deemed by the Commission on Reading (Anderson, Hiebert, Scott, & Wilkinson, 1985) to be the “single most important activity for building the knowledge required for eventual success in reading” (p. 23). The image of parent and child nestled together sharing a bedtime story had become part of American popular culture, and it was taken for granted that this activity could almost guarantee later literacy success. In light of this, many family literacy programs have focused on ensuring that this activity takes place in the homes of children deemed to be at risk for literacy failure, often directed at children from low-income or culturally-diverse families (e.g., Cairney, Lowe, & Sproats, 1995; Darling & Hayes, 1996; Eldridge-Hunter, 1992; Hannon, 1996; Somerfield, 1995).



*The Influence of Theoretical Perspective on Book Sharing Research*

Part of the surge in research on book sharing in the 1980s was a result of the increased popularity of Vygotskian sociocultural theory during that time, which supplanted several years of research and educational practices guided by Piagetian cognitivist theory. Piagetian cognitivist theory is focused primarily on the belief that children's cognitive development progresses in distinct stages in a fixed sequence. Children at each stage exhibit qualitatively different patterns of thinking that provide them with new ways of interacting with and taking meaning from their world. Development is seen as being driven from within the child as he or she acts upon the world, and although environments can be arranged to enhance children's active exploration, the stages of development are not easily manipulated. Given this basic perspective on development, research and practice generated from a Piagetian perspective focused on children's actions on the world and what they showed us about their knowledge of the world. There was far less interest in what adults did to foster children's learning.

Vygotskian sociocultural theory, on the other hand, is founded on the belief that "developmental change is rooted in society and culture," (Vygotsky, 1978, p. 7) and that children acquire knowledge of culturally appropriate activities and behaviors through social interaction with other members of the culture (Vygotsky, 1978, p. 84). Experiences between a child and more competent members of the community (e.g., teachers, parents, peers, siblings) allow opportunities for those individuals to scaffold the child to participate in more sophisticated ways than she or he would be capable of independently. This creates what is called the zone of proximal development, which can be defined as the distance between a child's ability to perform a task independently and the child's ability on the task when supported by the guidance of or collaboration with more capable others (Vygotsky, 1978, p. 86). In this way, the development of cognitive, language, and literacy abilities, and the acquisition of world knowledge, are allembded within the

wider context of human social interaction, rather than being seen as occurring, from the Piagetian perspective, due to a “self pedagogic” child.

From the standpoint of early literacy learning, sociocultural theory suggests that exposure to and apprenticeship in the literate practices valued by a community are important and influence the amount and types of literacy knowledge children bring to school upon their entry (Cochran-Smith, 1984; Heath, 1982; Snow & Ninio, 1986; Teale & Sulzby, 1987). Thus, parents have an important role to play in preparing young children for the demands of schooling through exposure to the functions and uses of literacy materials and interactions. Seminal works by Wells (1986) and Heath (1983), for example, described home literacy environments and verbal interaction styles within homes and communities of several socioeconomic groups. Both studies revealed that the degree of literate-style language used in the home, often in the context of shared book reading, prepared children for the demands of traditional school environments and supported children’s early success in reading. Children who come from communities in which they received an early apprenticeship in literacy practices prior to formal education entered school with knowledge of what Snow and Ninio (1986) called the “contracts of literacy,” including an understanding of how books work and how people act upon them. For example, children from literate communities had learned that the book leads the reader, that pictures represent things or even events and these can be named, and that book time is not the same as real time. Such knowledge might have contributed to these children’s success with reading compared to children without such early experiences (Heath, 1982, 1983).

A Vygotskian sociocultural perspective on child development, then, provides a framework that can explain the beneficial effects of book sharing on children’s language and literacy learning (Vygotsky, 1962, 1978). The work of Heath (1982, 1983) and Wells (1986) indicates that book sharing is important because of its literacy apprenticeship potential; however, it also is likely that book sharing provides practice in the basic

discourse patterns that are prevalent in schools. Sociocultural theory in the context of book sharing with young children suggests that adults or more competent members of a community mediate texts for young children, scaffolding their comprehension through interactions about the content and the illustrations (e.g., Ninio, 1980, 1983) and teaching children to engage in the verbal display of knowledge, a social practice common in schools (for discussion see van Kleeck, 2003). As one example, Teale and Sulzby (1987) describe the interactions between one parent and child across repeated readings of a counting book. With each reading, the child began to take on a more active role, often asking the questions her mother had posed in previous readings and answering them herself. This child subsequently was observed to “read” this book to one of her dolls in the same manner. In this last activity, she demonstrated her acquisition of the social routines associated with book sharing in her culture and family, and her competence in the role of mediator of the book with her doll. This transfer of both knowledge and social roles took place over time through extended interactions with her mother.

Even though children without book sharing experience at home as preschoolers do begin to have such exposure at school, it is unlikely that it can have the same impact as that received by children at home. Edwards (1994) points out that parents can provide a unique book-sharing context that schools cannot provide, specifically because of their one-on-one support. In addition, the number of book reading opportunities and the amount of time that can occur in the home environment is simply not possible in the school environment (Edwards, 1994). Similarly, Adams (1990) describes her experience with her own son, calculating that he had received between 1000 and 1700 hours of one-on-one book sharing at home prior to his entry into first grade. She compared this with the calculation that reading instruction in first grade would likely involve no more than 360 hours, and the teacher would necessarily have to divide his or her attention during that time among all the students in the classroom. Thus, she concluded that waiting until a

child enters school to begin book-sharing routines would result in years of lost learning opportunities.

### *The Call for Better Research Evidence*

Book sharing emerged on the literacy scene, and came to be viewed as not just a beneficial literacy practice, but also as a virtually essential one. Despite this, the research to substantiate book sharing's value was primarily anecdotal. In fact, in 1984, Teale (1984) pointed out that "surprisingly little research has been conducted" on the "advantages of being reading to" (p. 110). Some even questioned the strong advice to parents to read to their children. For example, Burton White (1975) indicated in his book on child development during the first three years of life that such advice exploits parents' insecurities (pp. 145-146). Although the practice was generally accepted, it lacked a sufficient evidence base. In the years since, book sharing has become one of the most frequently studied facets of emergent literacy (Sulzby & Teale, 1991; Yaden, Rowe, & MacGillivray, 2000), with two aspects of the activity being focused upon. First, research on the effects of book sharing frequency has received considerable attention; and second, the types of interactions that take place between parent and child during the activity have been broadly investigated.

### *Research on the Frequency of Book Sharing*

Numerous studies have investigated the effects of book sharing frequency on children's language and literacy outcomes. In fact, frequency has received so much attention that two groups of researchers have conducted reviews in order to determine what conclusions the large body of evidence could support regarding the frequency of book sharing (Bus, van IJzendoorn, & Pellegrini, 1995; Scarborough & Dobrich, 1994). The empirical evidence across studies indicated that the effects of book sharing frequency on later literacy and language skills were far more modest than is generally believed. Both reviews found that approximately 8% of the variance in later language and literacy skills could be explained by variation in the frequency of book sharing prior to school entry,

and this was true for both low- and middle-income samples. Given the enthusiasm with which book sharing had been recommended to parents and preschool teachers as a method for preparing children for reading, this figure of 8% was lower than expected, and the findings sparked considerable debate.

Of particular concern are the conclusions drawn by Scarborough and Dobrich (1994). They questioned the uncritical acceptance of the notion that frequent book sharing with preschoolers contributes to early language and literacy development (Scarborough & Dobrich, 1994, p. 247), and they proposed that researchers and educators should explore other means of enhancing preschooler's emerging literacy skills. A similar call was made in the same year by Meyer, Stahl, Wardrop, and Linn (1994) regarding the use of book sharing in classrooms. Their results indicated that the amount of time spent sharing books in the classroom based on observational data actually was negatively correlated with later decoding abilities, and they concluded that book sharing "should not supplant the instruction in reading that leads to phoneme awareness before children enter school and the practice with text that children receive after they enter school" (p. 83).

Because these findings challenged years of emphasis on the importance of frequent book sharing, they were considered quite controversial. The outcome, however, has been a much-needed debate regarding exactly what effects book sharing can have on children's language and literacy abilities, and the relative importance of this activity in the scope of literacy learning. These results perhaps rightly dampen some of the enthusiasm for this single activity and suggest, as van Kleeck and Stahl (2003) have stated, that sharing books with young children likely "will not, in itself, cure or prevent children's reading problems" (p. xi) or result in what Meyer et al. (1994) called magical outcomes, which is a prevalent notion in the popular media. Furthermore, it calls into question whether there is sufficient empirical evidence for the bold statement made in *Becoming a Nation of Readers* (Anderson et al., 1985) that "the single most important

activity for building the knowledge required for eventual success in reading is reading aloud to children” (p. 23).

However, the call to temper enthusiasm for the benefits of frequent book sharing and pursue other literacy-related activities as a means of enhancing early literacy and language skills was premature for three reasons (Dunning, Mason, & Stewart, 1994; Lonigan, 1994). First, many of the studies upon which Scarborough and Dobrich (1994) based their recommendation contained substantial weaknesses in research designs and methods, and their review did not attempt to statistically control for design differences. For example, the vast majority of the research they reviewed was correlational. Although such designs are capable of revealing relationships among variables, they are inadequate for confirming the directions of those relationships. Despite this fact, the preponderance of positive correlations between frequency and child outcomes has led to a tendency for researchers and readers alike to use language suggesting that the relationship *is* causal. It may be true that frequent book sharing results in improvements to children’s language and literacy abilities; but equally plausible is that children with better language and literacy skills themselves influence the frequency of book sharing and/or the types of interactions that take place during the activity. Furthermore, it may be that both variables, book sharing frequency and child abilities, are marker variables for other characteristics of the family environment that account for the variance in language and literacy gains found in these studies. For example, families that engage in shared book reading have been found to engage in other activities that also have been linked to reading success (e.g., teaching letter names and sounds, identifying words, helping children to write) (Durkin, 1966; McNaughton, 1995).

The limitations of correlational studies are further exacerbated by a lack of methodological rigor. Specifically, researchers have tended to rely on small sample sizes with large numbers of variables and/or statistical tests, resulting in low power and an increased risk of Type I error (e.g., Anderson-Yockel & Haynes, 1994; Pellegrini,

Perlmutter, Galda, & Brody, 1990; Watson & Shapiro, 1988). A majority of these correlational studies were based on concurrent measures of ability and book sharing. Yet, concurrent correlational designs are inconsistent with a Vygotskian theoretical framework (for discussion, see van Kleeck, 2003). From this perspective, the frequency of book sharing and the strategies a parent uses during book sharing would be related to children's later abilities, but not likely concurrent abilities. In fact correlations between parent interactions and children's abilities measured concurrently would likely be negative. Over time, children would become less dependent on parent regulation of the book sharing interactions and measures of their language and/or literacy abilities would likely reveal the learning that has resulted from those experiences. Based on this theoretical perspective, then, measures of parent interactions need to be related to children's later abilities, not their concurrent abilities. Much of the research reviewed by Scarborough and Dobrich (1994) relied on concurrent correlations, and this may have resulted in their overall finding of weak relationships across studies between parent-child book sharing and children's language and literacy abilities.

Second, although a variable that explains only 8% of the variance might be considered relatively inconsequential, as Scarborough and Dobrich (1994) concluded, there is evidence that this amount represents a strong practical significance (Bus et al., 1995). Like Scarborough and Dobrich (1994), Bus et al. (1995) conducted a review of the body of research on frequency of parent-child book sharing; however, they applied rigorous statistical meta-analysis procedures that controlled for the differences in sample sizes, preventing larger samples from dominating the results. Even more importantly, they obtained effect sizes to evaluate the practical significance of the results. Consistent with Scarborough and Dobrich (1994), Bus et al. (1995) found that book sharing frequency with preschool children explained only 8% of the variance in their emergent literacy, reading, and language outcomes; however, their analyses also revealed a large effect size (Cohen's  $d = 0.59$  based on the analysis of data from 3,410 participants). Hence, their

conclusions differed substantially from those of Scarborough and Dobrich (1994). Specifically, Bus et al. (1995) interpreted the large effect size as providing “a clear and affirmative answer to the question of whether or not storybook reading is one of the most important activities for developing the knowledge required for eventual success in reading” (p. 15). Furthermore, they acknowledged that frequency of book sharing is not the only variable of interest, and they called for further investigations that seek to determine which aspects of book sharing are most important for literacy acquisition.

In addition to an effect size measure indicating the practical importance of explaining 8% of the variance, Dunning et al. (1994) pointed out that frequency of book sharing is a variable that can be manipulated, unlike other variables found to make similar contributions to later achievement. For example, White (1982) found that socioeconomic status accounted for 5% of the variance in children’s school achievement; yet socioeconomic status is not a variable that educators can manipulate. The frequency of book sharing, on the other hand, can be altered; indeed, experimental studies provide evidence that intervention can result in increases in the frequency of parent-child book sharing at home during the preschool years (Donachy, 1976; High, Hopmann, LaGasse, & Linn, 1998; Hockenberger, Goldstein, & Haas, 1999; Swinson, 1985; Whitehurst, Epstein et al., 1994) with some also showing at least short term gains in children’s language abilities (Donachy, 1976; Swinson, 1985; Whitehurst, Epstein et al., 1994).

A third reason that a proposal to shift attention away from book sharing is premature comes from the fact that the suggestions were based on the research on frequency of book sharing; yet, this does not account for the other variables that have been found to influence frequency, or the evidence that the types of interactions during the activity may be equally or even more important than frequency. Frequency is more than simply a choice that parents make consciously; it has been shown to be influenced by parental beliefs regarding their role in their children’s education (Neuman, Hagedorn, Celano, & Daly, 1995; Sonnenschein, Baker, Serpell, & Schmidt, 2000), the child’s



interest in the activity (Toomey & Sloane, 1994), the nature of book sharing within a culture (Heath, 1983; McNaughton, 1995), and the dyad's ability to negotiate the activity (Bus, Belsky, van IJzendoorn, & Crnic, 1997; Bus & van IJzendoorn, 1992). If there is a mismatch between parent and child for any reason, such that book sharing becomes a negative experience for either or both participants, it is possible that they will choose other activities and engage in book sharing less frequently (Kaderavek & Sulzby, 1998). The resulting decrease in opportunities for the parent to establish book sharing as a routine with predictable interactions, along with a decrease in opportunities for the child to learn the types of skills that allow her or him to be successful within the routine, can lead to the Matthew effect (i.e., the rich get richer and poor get poorer phenomenon; Stanovich, 1986) quite early in a child's life. Thus, although frequency is important, it is not the only variable of interest; in fact, exploration of other variables might help better explain why frequent book sharing leads to educational benefits.

Specifically, research is finally providing concrete information regarding the importance of the types of interactions that take place during book sharing. It is probable that the frequency of book sharing and the types of interactions between parents and children both contribute to children's learning, and these variables likely interact in important ways. Since the two reviews of frequency of book sharing were published, there have been numerous studies focused on the nature of book sharing interactions. However, this body of research has yet to be reviewed with the rigorous meta-analysis procedures used by Bus et al. (1995) to determine the evidence for the effects of parent style on children's language and literacy skills or motivation for reading. What is needed is a "careful discussion of conceptual and methodological connections between studies" (Yaden et al., 2000, p. 446) on this aspect of book sharing. A focus on frequency to the exclusion of other aspects of book sharing is far too simplistic given the complex nature of this activity. Therefore, any conclusions based on the frequency of the activity alone

may underestimate the overall benefits of shared book reading with young children, and perhaps the benefits of particular types of interactions.

In summary, weaknesses in research methods, a lack of recognition of the importance of a variable that explains 8% of the variance, and the emphasis on frequency without consideration of the available evidence on the types and amounts of interactions during book sharing has led to a premature conclusion that book sharing has a limited effect on children's language and literacy development. Rather than suggesting that we abandon book sharing in pursuit of other activities, these issues indicate that researchers and educators need to increase efforts to better understand what contributions book sharing might be making to children's development of language and literacy skills, and how those contributions can be maximized.

#### *Research on Extratextual Utterances Used During Book Sharing*

Sharing books with children involves the reading of the text of the book; however, it can also involve negotiations between parent and child and "beyond the text" interactions about the content of the book. A few studies have considered what parents do with the *text* of books during book sharing, such as paraphrasing or deviating from the print (Bus, Leleman, & Keultjes, 2000; Martin & Reutzel, 1999). However, in characterizing types of book sharing interactions, the primary interest has been on the extratextual utterances offered during the activity; that is, the utterances that go beyond the actual text reading. Although some researchers analyze both parents' and children's utterances, the majority focus on the parents' contributions. When children's utterances are considered, it is usually as a means for determining whether certain types of parent interactions result in greater child participation compared to other types of interactions.

Consistent with a Vygotskian theoretical perspective, the interest here is in parents' extratextual talk during book sharing primarily because it can scaffold children's engagement during such text-based interactions. Two aspects of the interactions have been explored: (a) the amount of extratextual talk; and (b) the types of extratextual

utterances offered, which are usually coded based on their content (e.g., utterances about print or pictures, offering feedback, concrete versus abstract utterances). These two are often combined in that researchers consider the number of utterances of each particular type. Coding of types of utterances varies substantially across studies; however, a review of the literature reveals three general types of utterances most often considered: (a) praise or feedback; (b) print and book convention; and (c) concrete and abstract language.

#### *Praise or Feedback*

Parents' utterances that provide praise, positive or negative feedback, and confirmation do not provide information about the book itself, but they acknowledge and encourage children's verbal and nonverbal participation and attention during book sharing (DeLoache & DeMendoza, 1987; Fagan & Hayden, 1988; Flood, 1977; Haden et al., 1996; Hammett et al., 2003; Reese, Cox, Harte, & McAnally, 2003; Shapiro, Anderson, & Anderson, 1997; Sorsby & Martlew, 1991). For example, parents' use of positive reinforcement has been found to be one predictor of children's concurrent language and literacy abilities (Flood, 1977). When parents provide negative feedback, they most often frame it indirectly (DeLoache & DeMendoza, 1987).

In a comparison across three cultural groups, Bus et al. (2000) found that the use of praise and feedback appeared to reflect parents' different views regarding the culturally-appropriate or relevant ways of interacting with young children. In addition, parents who used more praise and feedback utterances, and thereby created a highly supportive climate, were noted to also use more abstract utterances (a type of utterance discussed further on) than parents who used fewer praise and feedback utterances. McNeill and Fowler (1999) observed a similar result in their intervention program; specifically, when parents were taught to provide praise, increases in other behaviors were noticed as well, including increases in the use of open-ended questions and expansions of children's utterances. This worked in the opposite direction in another study; when parents were taught to use a highly interactive style of reading called dialogic

reading, they also increased their use of praise and feedback utterances (Crain-Thoreson & Dale, 1999). Praise and feedback offered during book sharing appear to help create a warm, positive atmosphere that likely is beneficial to both parent and child in this context.

#### *Print and Book Conventions*

Researchers have also analyzed parents' use of utterances about print or book conventions (Hammett et al., 2003; Justice & Ezell, 2000b; Reese et al., 2003; Shapiro et al., 1997; van Kleeck et al., 1997). Parents' references to print or book conventions have been of interest because they potentially teach children early literacy concepts that prepare them for later success in reading. However, several studies have revealed that parents rarely provide print references during storybook sharing with typically developing children (Justice & Ezell, 2000a; Phillips & McNaughton, 1990; van Kleeck et al., 1997) or children with language delays (Ezell & Justice, 1997, 1998). In fact, children and parents alike focus their attention primarily on the meaning of storybooks rather than on the print (Shapiro et al., 1997; Snow & Ninio, 1986; van Kleeck, 1998a; Yaden & McGee, 1984), and comments about book illustrations dominate extratextual interactions (Ezell & Justice, 1997, 1998; Shapiro et al., 1997).

Van Kleeck's (1998a) research indicates that middle-income parents tend to focus on meaning during book sharing with young children until they get closer to preschool and kindergarten entry, at which time they begin to shift attention to print in the context of reading alphabet books, but not in the context of storybooks. However, in another study of middle-income families, the analysis revealed a small subgroup of nine parents out of a total sample of 96 who contributed greater numbers of utterances about print and book conventions during storybook reading compared to parents in other subgroups (Hammett et al., 2003). Although print references and discussion about book conventions were combined in this study, the results suggest that parents' use of these types of utterances also might be related to their preferred style of interaction rather than simply

being related to the type of book being read or the age of the child. Print referencing during storybook sharing, however, does appear to affect children's learning of specific early literacy concepts. Recent intervention research has shown that teaching parents to use print references can result in gains in children's scores on assessments of concepts about print and alphabet knowledge (Ezell, Justice, & Parsons, 2000; Justice & Ezell, 2000a).

### *Concrete and Abstract Language*

In the exploration of the content of extratextual utterances during book sharing, most researchers have included some method for describing the concrete versus abstract content of the talk. The language used to communicate with others can be conceptualized along a continuum ranging from concrete to abstract (Blank, Rose, & Berlin, 1978a; Moffett, 1968; Vygotsky, 1972). Language is more concrete when it is embedded in the physical and historical context; that is, it is supported by perceptual and situational cues, shared knowledge between participants, and often previous experiences that assist the child's understanding or language use (Snow, 1983). Language is more abstract when it involves objects, actions, or events that are not present in the perceptual scene, when it is cognitively demanding (i.e., it requires conceptual understanding or mental manipulation), and/or when it requires perspective taking (Blank et al., 1978a; Cummins, 1983; Mason, 1986; Scollon & Scollon, 1982; Sigel, 1982; Vygotsky, 1962). Tasks that require abstract language include making inferences and predictions, hypothesizing, summarizing, or explaining. One useful coding system for describing the concrete and abstract content of utterances comes from Blank, Rose, and Berlin (Blank et al., 1978a), who created a scale including four levels of abstraction for the purpose of evaluating the language used by teachers and children in preschool classrooms. Van Kleeck et al. (1997) adapted the Blank et al. scale to describe the language used specifically in book sharing contexts (see Table 1.1).

*Four levels of abstraction.* The four levels of abstraction describe the linguistic and cognitive demands of an utterance. In the context of book sharing, Level I utterances require matching perception, and include comments and questions that involve noticing an object or character, labeling a picture, or locating an object within a scene. Such utterances require the mapping of language onto perception, namely the pictures and orally presented text of the book. Examples include such utterances as “That’s Little Bird,” and “Where’s the flower?”

Level II utterances require selective analysis or integration of perceptions, including descriptions of objects or scenes, and completion of cloze tasks. For example, “Bear has a bucket full of water,” and “What is Little Bird making?” are Level II utterances. Utterances at Levels I and II are considered to be concrete, or low level, because they refer to information that is perceptually present and less cognitively challenging. Level I and II comments and questions by the parent serve to model language or allow the child to practice language. Because they often contain content well within a child’s cognitive and linguistic capabilities, van Kleeck (2003) has hypothesized that Level I and II utterances offer opportunities for the verbal child to display his or her knowledge. Experience with Levels I and II may also expose children to the use of language for thought (Frawley, 1997), albeit at concrete levels, and therefore, may help children learn to verbally mediate high-order thinking. This may help explain why frequency of parental input at these low-levels during book sharing, in combination with exposure to input at higher levels, has been found to be related to the child’s subsequent development at high levels of abstraction (van Kleeck et al., 1997).

Level III utterances are those requiring reordering of perception or inferring, including recalling information; making comparisons, inferences, or judgments; and summarizing information across pictures. Level III tasks require that the parent and child restructure the information provided within the perceptual scene, in this case within the book. Making a comparison between two characters in a story, for example, requires a

person to ignore obvious perceptual differences between the two. Although the two characters are perceptually present in the book, as is true for Level I and II utterances, this

Table 1.1

*Levels of Abstraction Based on the van Kleeck et al. (1997) Adaptation of the Levels of Abstraction Developed by Blank, Rose, and Berlin (1978a; 1978b).*

<b>Level I: Matching perception</b>	<b>Level II: Selective analysis/integration of perception</b>	<b>Level III: Reorder/infer about</b>	<b>Level IV: Reasoning about perception</b>
<p><b>Label:</b> name an object or person (or stated as question, e.g., “who did X?” or “you know what this is called?” or “what do you think that is?”); including negative label (“It’s not a X.”).</p> <p><b>Locate:</b> Describe the location of an object or character; ask a question regarding location.</p> <p><b>Notice:</b> Direct attention to a pictured object.</p> <p><b>Rote counting</b></p>	<p><b>Describe characteristics:</b> Focus on perceptual properties (size, shape, color) or parts of objects or characters. This includes colors or numbers if there is a referent. Specify the type of object (“what kind of X?”), quantity of something, or possession.</p> <p><b>Describe/notice scene:</b> Describe or notice actions that are immediately perceptual in text or pictures.</p> <p><b>Cloze:</b> Pause to allow child to complete sentence.</p>	<p><b>Infer:</b> Based on pictures/text and not explicitly stated/shown in pictures, e.g., “he tried.”</p> <p><b>Recall information:</b> Focus on prior information presented in book during current or previous reading; summarize/synthesize information from a series of pictures.</p> <p><b>Judgment/Evaluation:</b> (about characters, objects, or ideas) includes nonperceptual qualities and internal states (sad, hungry); sometimes introduced by epistemic verb (I think, I bet); judgments (beautiful, funny, etc.); providing point of view: an interpretation of what character is thinking or feeling.</p> <p><b>Identify similarities:</b> Compare and/or contrast between things in book, e.g., “that looks like an X.”</p>	<p><b>Predict:</b> Offer or request what will happen next in the story. Used when the child doesn’t know (or seem to know) the story, otherwise it’s Level III recall.</p> <p><b>Factual knowledge/definitions:</b> Provide general information that is not directly given in the story. Includes defining word meanings or distinguishing between fantasy and reality (e.g., “Can the bear really fly?”).</p> <p><b>Explain:</b> Going beyond story or actions to provide an explanation, often indicated with words like “because,” “so that,” “since,” or asking “why” questions.</p>

Level III task requires greater cognitive demands to identify underlying similarities between the two characters. Other Level III tasks require thinking beyond what is directly available through perception in the pictures and text of the story. For example, making an inference involves making connections between pieces of information that are not explicitly linked. Making a judgment (e.g., “How do you think Little Bear felt?”) requires that one consider another’s perspective, which is typically not made explicit in the story.

Level IV utterances require reasoning about perceptions, which underlies making predictions, providing definitions, or explaining ideas that go beyond the story. Such reasoning tasks require the speaker and listener to reason about the relationships among objects, characters, or pieces of information, typically generating new ideas that go beyond what already has been presented. For example, making predictions requires recalling previous events in the story and determining future events that might plausibly occur next (e.g., “I think maybe Little Bear and Little Bird will become friends again”). Generating definitions involves a metalinguistic awareness that words can be defined, and identification of the relevant features or attributes that characterize the word (e.g., “blubber is the fat on the whale that keeps it warm”).

Level III and IV utterances are considered to be abstract, or high level, because they refer to information not immediately present, they also involve greater memory and cognitive demands than Level I and II utterances. In addition, abstract utterances often include complex semantic and syntactic structures compared to concrete utterances. For example, they may include causal terms (e.g., because) or temporal terms (e.g., since, before), or subordinate clauses (e.g., “Did you have fun playing outside this morning?”; Moerk, 1983, p. 126).

A variety of terms have been used in the literature to refer to utterances at low and high levels of abstraction, and these are outlined in Table 1.2. Researchers often establish a dichotomy between low and high levels of abstraction or, as Blank et al. have done, they define even more specific levels. However, in reality language exists along a continuum



from concrete to abstract (Moffett, 1968), with placement on the continuum depending on whether the content is perceptually present or not, and the extent to which the content must be cognitively and linguistically manipulated. Although some researchers have not explicitly discussed the continuum of concrete to abstract language, they have included categories that are consistent with the definitions of low and high levels of abstraction. For example, the following coding categories have been included in certain studies and are consistent with concrete, low levels of abstraction: labels and descriptions (Haden et al., 1996; Reese et al., 2003); fact questions (Flood, 1977); and what-questions, where-questions, and labeling statements (Ninio, 1983). Likewise, the following coding categories are consistent with abstract, high level language: evaluations, predictions or inferences, personal experiences (Haden et al., 1996; Reese et al., 2003); evaluative devices (Harkins, Koch, & Michel, 1994); interpretive questions (Flood, 1977); connections beyond the text (Bus et al., 2000); and predicting and elaborating utterances (Shapiro et al., 1997).

Table 1.2

*Various Terminology Used in the Empirical Studies of Book Sharing to Describe Low and High Levels of Abstract Language*

<b>Low Levels of Abstraction</b>	<b>High Levels of Abstraction</b>	<b>Researchers Using the Terms</b>
Immediate utterances	Non-immediate utterances	De Temple & Tabors (1994) De Temple & Snow (1996) De Temple & Snow (1998)
Low-cognitive demand utterances	High-cognitive demand utterances	Pellegrini, Brody, & Sigel (1985) Allison & Watson (1994)
Low-distancing strategies	High-distancing strategies	Sigel & McGillicuddy-Delisi (1984) Pellegrini et al. (1990) Leseman & deJong ENRfu(1998)
Concrete talk	Cognitively challenging talk	Smith & Dickinson (1994)
Not Discussed	Decontextualized language	Heath (1982; 1983) Pellegrini (2001)
Not Discussed	Disembedded language	Wells (1986) Pappas & Pettegrew (1991)

Interest in parents' use of concrete and abstract utterances has grown because of evidence that they contribute to children's development of language and literacy skills. In one study, parents' use of evaluative devices consistent with the definition of abstract language (e.g., references to internal states of characters, reference to absent characters or events, causal statements) was highly correlated with children's use of similar language during a later retelling of the same story (Harkins et al., 1994). In another study, it was more frequent input at both low and high levels that was related to children's gains one year later in comprehension and use of language at the highest level of abstraction, Level IV (van Kleeck et al., 1997).

In addition, the use of abstract language has been found to be characteristic of the discourse style used in literate societies, and therefore, it has been hypothesized to be important for educational success (Bruner, 1986; Snow, 1983; Watson, 1989). In fact, empirical studies have demonstrated that the degree to which children acquire abstract language prior to school entry is related to their success in the educational system and their ability to function within a highly literate society (Heath, 1982, 1983; Peterson & McCabe, 1994; Watson, 1989). Several studies have demonstrated specifically that early exposure to abstract language is related to children's abstract language capabilities measured longitudinally (Gordon, 1984; Peterson & McCabe, 1994; van Kleeck et al., 1997).

Once in school, children who exhibit good reading comprehension skills use strategies that involve abstract language, such as relating information to prior knowledge, making inferences while reading, summarizing what has been read, considering multiple perspectives, generating questions regarding the content, and self-monitoring text comprehension (Trabasso & Bouchard, 2003). In addition, students appear to benefit from direct and explicit instruction in these skills (Gaskins, Anderson, Pressley, Cunicelli, & Satlow, 1993; Pressley et al., 1992; Pressley et al., 2001). Research has demonstrated that children with deficits in reading comprehension are impaired in such

abstract uses of language that would facilitate their comprehension, even compared to younger children matched on reading comprehension (Cain & Oakhill, 1999). Thus, fostering abstract language abilities in preschool children likely prepares them to understand the language they encounter when they enter school, and to be successful with literacy demands throughout their school careers (Gordon, 1984; Heath, 1982; Peterson & McCabe, 1994; van Kleeck et al., 1997; Watson, 1989).

Studies of naturally occurring book sharing have revealed that parents of preschool children use concrete utterances far more often than abstract utterances (e.g., Allison & Watson, 1994; De Temple & Snow, 1996; De Temple & Snow, 1998; De Temple & Tabors, 1994; Pellegrini et al., 1985; van Kleeck et al., 1997). This leads to another question: how much high level input might children need in order to acquire the ability to handle its demands? While this question has not been directly answered, recommendations have been offered based on what parents have been observed to do naturally, and how low-level and high-level input each might serve a different purpose, particularly during the context of book sharing. Blank et al. (1978a) provided guidelines for preschool teachers regarding the ratio of low to high levels of abstraction, suggesting that approximately 70% of their discourse should be presented at levels easily understood by the children (i.e., at Levels I and II), while the other 30% should be more cognitively and linguistically demanding (i.e., at Levels III and IV). van Kleeck et al. (1997) found that parents of 3;6 to 4;0 year olds demonstrated talk at low and high levels during book sharing that was consistent with the Blank et al. (1978) guidelines, with 63% of their utterances at Levels I and II, and 37% at Levels III and IV.

Van Kleeck (2003) has proposed that the ratio of approximately 70% low-level to 30% high-level utterances might be particularly beneficial for preschool children, with input at low and high levels serving different purposes. She suggests that because preschool children usually have mastered low-level language, input at low levels during book sharing may create a context of success and encourage children's engagement in the

book sharing routine. Moreover, since answers to low-level questions are typically known by both parent and child, their use during book sharing likely facilitates children's understanding of and ability to participate in the verbal display of knowledge so prevalent in school (van Kleeck, 2003). Preschool children typically are considerably less competent with high-level language (e.g., Blank, Rose, & Berlin, 2003; Lehrer & deBernard, 1987; Skarakis-Doyle, Miller, & Reichheld, 2000); therefore, input at high levels provides opportunities to develop abstract language. It may be that the supportive context created by a majority of low-level utterances combined with scaffolded opportunities for interactions at high levels together enhance the language learning that takes place during book sharing (van Kleeck, 2003).

In summary, investigations of the types of parents' extratextual utterances during book sharing have revealed that the three categories of utterances just described (i.e., praise and feedback, print references, and concrete and abstract utterances) have particular benefits for children during book sharing interactions. However, this research also reveals considerable variation in how much parents use these different types of extratextual utterances during book sharing. Included in the literature, though, are studies that have explored several factors that appear to influence parents' interactions during book sharing, thereby explaining some of this variation.

#### *Factors that Influence Parents' Interactions During Book Sharing*

To date, three factors have been explored that help explain some of the variation in parents' amount of talk and use of different types of extratextual utterances: (a) the age and abilities of the child; (b) the cultural or socioeconomic status of the family; and (c) text factors related to the book being shared. Even when these factors are controlled, though, variability continues to be a prevalent finding. This has led to beginning efforts to determine style differences among parents when such factors are controlled.

*Style Variation Related to Age and Language Abilities of the Child*

Given the phenomenal changes that occur in language, cognition, memory, and attention over the course of children's toddler and preschool years, we would expect to find variations in interactions during book sharing that are related to the age of the child. Longitudinal and cross-sectional studies indicate that as children get older, parents tend to decrease their amount of extratextual talk and alter the types of utterances they contribute.

First, there is evidence that parents provide more discussion about a book for younger preschool children, and then decrease their total amount of talk as children get closer to school age (De Temple & Snow, 1996; Goodsitt, Raitan, & Perlmutter, 1988; Hammett, Bradley, & van Kleeck, 2002; Sulzby & Teale, 1987; van Kleeck, 1998a; van Kleeck & Beckley-McCall, 2002). De Temple and Snow (1996) found this to be true in their longitudinal sample, in which mothers' amount of input when their child was 4;6 years of age had decreased compared to amount of input one year earlier. Van Kleeck and Beckley-McCall (2002) found that mothers used more extratextual talk and scaffolding in book sharing episodes with their toddlers compared to episodes with an older preschool-age sibling. In another study, Goodsitt et al. (1988) found that both parent and child decreased their total numbers of extratextual utterances as the child got older, although parents dominated the interactions at all ages, contributing over 75% of the total extratextual utterances with their children at 2 years, 3;6 years, and 5 years of age. In addition, the children's percentage of participation decreased slightly from 25% at 2 years to 16% at 3;6 and 5 years. Parents may be approximating expected "school-like" behavior during book sharing as children get older. In fact, one mother indicated exactly this during an interview on her book sharing interactions (Hammett, Bradley et al., 2002), stating that she talked less during story reading with her 4-year-old twins compared to when they were younger in order to ensure that they could sit and listen when they started school. Alternatively, there is some evidence that parents decrease their amount of talk

and allow the child to take on the storytelling role (Robinson & Sulzby, 1984; Sulzby & Teale, 1987).

Second, parents also alter the types of extratextual utterances during book sharing as children get older. DeLoach and DeMendoza (1987) found that mothers' use of elaborations was three times as high with 18 month olds compared to 12 month olds, with whom they offered mostly labels. Similarly, mothers have been found to be more likely to use abstract utterances with 5-year-old children, whereas concrete utterances were more prevalent with 2 year olds (De Temple & Tabors, 1994). Longitudinal data (De Temple & Snow, 1996) have revealed similar findings of increases in mothers' proportion of abstract language. The combination of a decrease in overall amount of talk and a simultaneous increase in the use of abstract language results in a greater density of high-level language during the activity (van Kleeck, 1998a; van Kleeck & Beckley-McCall, 2002).

Although changes in book sharing over the preschool years may reflect preparations for the demands of schooling, there is also evidence that parents are responding directly to their children's current ability levels, or at least their perceptions of their children's abilities, and making relevant adjustments based on them. With younger children, parents' modeling of and requests for labels appear to depend on whether they believed their child had those words in his or her expressive vocabulary (Ninio, 1983). Specifically, Ninio found that mothers modeled words they believed their child did not know, while they requested labels for words they believed the child had in her or his expressive repertoire. Given such evidence for adjustments in response to children's abilities, one might expect to find systematic differences in the number and/or types of extratextual interactions during book sharing with children who have language disorders. Indeed, van Kleeck and Vander Woude (1999) found that parents of two children with language impairments used many more comments and questions during book sharing that

contained embedded lexical information compared to the comments and questions of parents of two typically developing children.

Three additional studies have investigated adjustments to children's abilities using multivariate comparisons between two groups of dyads, those including a child with a language disorder and those including a child who was typically developing (Pellegrini et al., 1985; Sigel & McGillicuddy-Delisi, 1984). Pellegrini et al. (1985) found that parents used more directives and low-level demands (i.e., more concrete language) with children with language disorders, and more high-level demands with children without disorders. The children's ages ranged from 3;6 to 5;8 years, and parent style was related to children's language abilities rather than to children's age. Highly similar results were found in two similar studies conducted by Sigel and McGillicuddy-Delisi (1984).

In addition to the adjustments parents appear to make based on their children's abilities, or their beliefs about them, other evidence indicates that parents also make adjustments online during book sharing based on feedback from the child regarding his or her current success or failure in understanding the story. For example, in one study (Martinez & Roser, 1985), a father provided explanations of the text in direct response to his 4-year-old daughter's difficulties understanding the high-level inferences contained in the story. Parents have also been observed to decrease the level of their demands after a child's response was inadequate, demonstrating on-line adjustments to help children be successful (Pellegrini et al., 1990). Thus, parents alter their demands based on their children's on-line competence with a task, as well as their perceptions of their children's abilities, not just their age (DeLoache & DeMendoza, 1987; Ninio, 1983; Pellegrini et al., 1990).

#### *Style Variation Related to Sociocultural Group*

Heath (1982) was probably the first to systematically describe differences in book sharing interactions that were related to sociocultural group. Using ethnographic methods, she studied a broad array of interaction patterns between parents and children in three

communities in Piedmont, South Carolina, and her description included book sharing and literacy practices. In Roadville, a white, working class community, parents read with their children with the apparent goal of teaching specific skills, such as colors, labels for pictures, and letter names. In Trackton, an African-American working class community, adults engaged in interactions with their children around literate materials including newspapers, mail, circulars, school materials, brochures and advertisements, the Bible, and other church-related materials. Although oral storytelling was part of the culture, adults typically did not sit and read books with children, with the exception of children's Sunday school materials. In Maintown, a middle class community, parents read storybooks regularly and used them as a context in which to engage children in discussion. However, the sample from the Maintown community consisted of parents who were also teachers, and thus it was not a representative sample.

Heath reported infrequent book sharing opportunities for children from low-income, African-American homes, and book sharing with an emphasis on low-level, rote skills for the children from low-income, white homes, when compared to children from middle-income families. Upon entry into school, where middle-income literate practices were typical, children from Trackton experienced difficulties from the start, demonstrating a lack of understanding of the discourse patterns prevalently used or how to take meaning from the texts they encounter. Although children from Roadville were generally successful in learning to decode, they experienced difficulties later when higher levels of abstraction were needed to comprehend text and engage in classroom discussions.

Anderson-Yockel and Haynes (1994) also studied low-income African-American book sharing practices, directly comparing them with low-income white families, and found many similarities between the two groups in terms of the numbers and types of parent interactions. They did find robust differences, however, in the amount of questioning parents in each group did, with African-American mothers asking few yes/no



and wh-questions (mean = 6.2 and 4.7, respectively) and white mothers asking many (means = 13.6 and 18.9, respectively) during the sharing of three books. These findings are consistent with those of Heath (1982; 1983) and Hammer (2001), and together they point to cultural differences in parents' demands for their children to verbally display their knowledge.

Hammer (2001) provided further evidence for possible differences between low-income and middle-income African-American mothers when sharing books with their infants (13 to 18 months old). Although the sample was small ( $n = 6$  with 3 low-income and 3 middle-income) and analyses were descriptive, two differences in interactions emerged. First, middle-income mothers used more modifiers in their interactions during book sharing compared to the low-income mothers. Second, low-income mothers used more directives during book sharing, while middle-income mothers' utterances were equally divided between directives and comments. Hammer (2001) hypothesized that these differences in interactions also were related to the differences in maternal education and frequency of book sharing. Others have also provided evidence that parents from low-income families talk less during book sharing than their middle-income counterparts, elicit fewer verbal interactions from their children during book sharing, and exhibit fewer adjustments to their children's language abilities (McCormick & Mason, 1986; Ninio, 1980; Snow & Ninio, 1986).

Differences in book sharing interactions related to sociocultural group have also been studied in the Netherlands. Leseman and deJong (1998) and Bus, Leseman, and Keultjes (2000) conducted studies involving samples ( $N = 89$  and  $N = 56$ , respectively) of three sociocultural groups, including Dutch, Surinamese-Dutch, and Turkish-Dutch families and their four-year-old children. Leseman and deJong (1998) used structural equation modeling to determine both direct and indirect effects of home background on language and literacy outcomes at age seven. Differences in style of book sharing were entered into the model. Compared to the other two groups, Turkish-Dutch parents were

noted to use larger numbers of procedural utterances, or utterances to manage behavior and keep the interaction going. Both Turkish-Dutch and Surinamese-Dutch parents asked children to repeat lines of the story verbatim, while Dutch parents were not observed to do this. Dutch parents used higher proportions of high-level utterances than the other two groups. In this study, however, the results were confounded for income level and culture due to the fact that the Dutch families were middle-income, while the Turkish and Surinamese families were low-income.

In the second investigation of the same three cultural groups, Bus et al. (2000) ensured that all families studied were low income. This design allowed analysis of differences among the three cultural groups without the additional confound of economic status. Using descriptive discriminant analysis (DDA), Bus et al. determined the dimensions along which the three groups differed, and the results both confirmed and expanded the findings of the previous study. The two linear discriminant functions (LDFs) identified the variables that explained group differences. LDF 1 accounted for 84% of the variance and served to highlight differences between the Dutch and Turkish-Dutch groups. Specifically, the Dutch parents more frequently changed the text during reading (e.g., omitting words or phrases, simplifying sentence structures and vocabulary), offered more utterances that related the text to the child's life and or related the text to the illustrations, and provided fewer behavior management utterances compared to the Turkish parents. LDF 2 accounted for 16% of the variance and served to highlight differences between the Surinamese group and the other two groups. The Surinamese parents exhibited a restrictive and discipline-oriented style, and more of their extratextual utterances simply paraphrased the text, compared to the other two groups of parents. The results of this study extend the findings of the previous one, and indicate that many of the differences found among these three groups were attributable to cultural background rather than socioeconomic status.

McNaughton (1995) and Hohepa and MacNaughton (2002) have provided rich description of the literacy environments and book sharing interactions of low-income families from three cultural groups in New Zealand, including Maori, Pakeha, and Samoan families. While all the families demonstrated a style of the researchers called “collaborative participation” (McNaughton, 1995, p. 105) during which parents and children engaged in talk about the story during reading, the Maori families also exhibited a performance-tutorial style, particularly with non-narrative texts such as beginning reading texts from school, and some seemed to prefer this style. During the performance-tutorial style, the reader provided a model of some portion of the text, and the child was expected to recite it verbatim. As described above, But et al. (2000) observed this in their Turkish-Dutch and Surinamese-Dutch families, and a similar style was found in a sample collected by De Temple and Tabors (labeling it a “recitation style”; De Temple & Tabors, 1994). In interviews with low-income African-American mothers, and Neuman, Hagedorn, Celano, and Daly (1995) found that such a style was related to the underlying beliefs of some of these mothers regarding their role in their children’s learning. They believed that their job as parents was to model specific skills and have their children imitate them.

Information on the types of interactions that occur during book sharing in Spanish-speaking families comes from research on family literacy programs. For example, Janes and Kermani (2001) implemented a program with Mexican parents and their preschool-age children. The program was initially designed to help parents use storybooks to increase their children’s literacy knowledge. However, when parents shared published children’s storybooks with their children, they were observed to use minimal eye contact or physical contact with their child, monotone reading, minimal extratextual talk, and limited evidence of enjoyment. Similarly, their children typically did not talk and often did not attend to the book. In addition, the dropout rate for the program was 70%. When the program was altered to reflect the current literacy practices found in

families within this community, the intervention became focused on groups of parents working together to write and illustrate their own texts to share with their children. These texts tended to revolve around factual family experiences, and often contained a moral message. Although the researchers did not present specific data regarding parents' extratextual talk during the book sharing interactions about these texts, they did note that when parents shared the homemade books with their children, they laughed and smiled, made jokes and showed affection toward their child, and exhibited an engaging and dramatic style of reading. They also were observed to handle the books very gently, treating them as objects deserving of special care. Their children exhibited a more positive affect during reading as well, and they preferred these books for repeated readings. After the change in the focus of the program, researchers noted a dramatic decrease in the dropout rate.

Similarly, Delgado-Gaitan(1996) suggested that her family literacy project with Latino parents would likely have had more success if family stories had been incorporated rather than emphasizing commercially-available children's books. These results suggest that the texts families read have an effect on the interactions that take place during book sharing, as discussed in the next section, but it also revealed that the reason for this was cultural in nature: these Spanish-speaking families found the published storybooks "culturally alien"(Janes & Kermani, 2001, p. 463). Conversely, the homemade texts more likely reflected what was culturally relevant to families because they contained moral themes and lessons that parents saw as important for their preschool children.

Continued research efforts are needed to better understand the book sharing interactions that occur between parents and children from a wide range of sociocultural groups. Yet, the studies described here provide evidence that parents from different sociocultural groups do vary in the numbers and types of extratextual utterances they use during book sharing. Several studies also indicated that cultural factors might interact with factors related to the texts being shared.

*Style Variation Related to Text Factors*

When parents and children share a book together, their interactions revolve around a particular text. As outlined earlier, children's language abilities affect the interactions that take place during book sharing, with parents providing more or less scaffolding, more or less abstract language, and more or less explanation based on children's abilities and age. Children's ability to understand a book, however, has much to do with the language and content of the text itself. If the text is challenging for the child, different extratextual interactions will likely result compared to a text that is within the child's repertoire of knowledge and linguistic ability, especially given the evidence presented above that parents make on-line adjustments to their children's responses to a text. Thus, the *text* itself influences the interactions that occur and deserves full consideration in the research on book sharing.

Yet, the majority of research conducted to explore book-sharing interactions has included little more than superficial descriptions of the characteristics of the books used, such as the page length (e.g., Goodsitt et al., 1988), the quality and types of illustrations (e.g., Whitehurst et al., 1988), or the developmental appropriateness for the age group being studied (e.g., Hockenberger et al., 1999). Few have provided analyses of the linguistic complexity and/or vocabulary diversity that likely impact both the children's and adults' comments and questions about the content (for several exceptions, see Crowe, 2000; Hammett et al., 2003; Sorsby & Martlew, 1991; van Kleeck et al., 1997). Furthermore, the potential effects of text factors on book sharing interactions are rarely considered or discussed (for discussion see van Kleeck, 2003). A small body of research, though, indicates three text factors that appear to influence book sharing interactions: (a) parent and child familiarity with the book; (b) genre of the book; and (c) the format of the text.

*Book Familiarity.* Book familiarity has been studied directly as part of five investigations in which researchers compared the interactions that took place around

familiar versus unfamiliar texts (Anderson-Yockel & Haynes, 1994; De Temple & Snow, 1996; Fagan & Hayden, 1988; Goodsitt et al., 1988; van Kleeck et al., 1997). Findings from these studies revealed that children tend to participate verbally more frequently when books are familiar to them. With familiar books, they more often refer to past experiences (Goodsitt et al., 1988), pay attention to the text (Fagan & Hayden, 1988), and eventually may take on the role of storyteller (Robinson & Sulzby, 1984; Teale & Sulzby, 1987). Parents, on the other hand, contribute fewer extratextual utterances during the sharing of a familiar book compared to an unfamiliar one. When parents do make extratextual contributions during the reading of a familiar book, however, there is some evidence that they increase their cognitive demands by using fewer yes/no questions (Anderson-Yockel & Haynes, 1994) and more abstract language, and that they focus the child more on the text through cloze procedures or references to the print (Fagan & Hayden, 1988).

In contrast, during unfamiliar book reading, the parent is typically in control of the extratextual talk and tends to be the primary contributor (Goodsitt et al., 1988; van Kleeck et al., 1997). Specifically, parents emphasize world knowledge and past experiences (Goodsitt et al., 1988) and provide more descriptions and directives (Anderson-Yockel & Haynes, 1994), perhaps as a means of scaffolding their children's understanding and engagement with the book content. Children are less likely to talk during unfamiliar book sharing, and when they do contribute it is often in response to a parent question or prompt (De Temple & Snow, 1996).

Based on these five studies, the interactions observed during book sharing appear to be affected by the level of familiarity the parent and child have with the book. Consequently, it is important for researchers to control or to intentionally manipulate this variable, and yet book familiarity is frequently not controlled, or only loosely controlled (see discussion in van Kleeck, 2003). Familiar and unfamiliar books offer two contexts in which to study parent-child interactions. Familiar books allow researchers to observe the

extent to which children participate during book sharing; unfamiliar books create a context in which to observe the amount and types of extratextual utterances used by parents. Book familiarity contexts also present unique challenges to researchers in designing studies. When the goal is to observe book sharing around unfamiliar books, it must be confirmed with both parent and child that the books chosen are actually unfamiliar, requiring that sufficient alternative choices be available, and that all choices are deemed to be equivalent on certain characteristics.

When the research goal is to observe book sharing around familiar books, two issues must be addressed. The degree of familiarity needs to be controlled across all dyads, and the books must be controlled for complexity, genre, and length. In the research to date, parents have been asked to choose a favorite storybook from their home library to share for the familiar condition. In this scenario, though, it is not possible to control for either degree of familiarity or length and complexity of the book. For example, one dyad may share a book read together three times previously, while another dyad shares a book read twenty times. In addition, the books parents choose from their own collections will vary across all dimensions, including length, complexity, vocabulary diversity, genre, and type and quality of illustrations. Even when asked to pick a narrative storybook, there is likely substantial variability in the story themes, sequence of events, and aspects of the narrative structure. In some cases, stories also may be available as children's videos, adding another level of familiarity with the story that might influence the book sharing interactions.

Some researchers have attempted to control for the differences in length of parents' self-selected books by using proportional data; however, this does not solve the problems described above. It results in the loss of information about talkativeness. Parents in two dyads, for instance, might demonstrate a 60% to 40% ratio of low-level to high-level utterances, suggesting that they are similar in style. The raw data, though, might reveal that one contributed four times the total number of utterances compared to

the other, despite the fact that the books chosen were comparable in length. Even if talkativeness is not of interest, use of proportional data will not control for the range of differences that exist across freely chosen texts. Thus, control through the use of proportional data is not a good solution and potentially results in misleading conclusions if frequency data are not also reported and discussed. The best method for controlling the degree of familiarity, and the content and complexity, of books used in a familiar book condition involves providing unfamiliar books to dyads and observing book sharing after a specific number of readings have occurred. Such a design could also be used to explore how interactions change as a book moves from being unfamiliar to familiar over multiple book sharing sessions. From a Vygotskian perspective, observing repeated readings of a book as it becomes more and more familiar also allows one to study the gradual transmission of ways of interacting with books from a parent or adult to a child. One would expect the child's interactions with familiar books to in many ways mirror the adult interactions to which they had been exposed during earlier readings, as was described for one child by Teale and Sulzby (1987).

*Book genre and format.* Other text factors that are infrequently considered in the book sharing literature, at least as variables that are systematically explored, are those of book genre and format (van Kleeck, 2003). Researchers investigating the effects of book sharing on children's outcomes most frequently provide storybooks to dyads; and indeed, storybooks are by far the most prevalent text genre that adults naturally choose to read to preschool children (De Temple & Snow, 1996; Dickinson, De Temple, Hirschler, & Smith, 1992; Duke, 1999; Phillips & McNaughton, 1990). However, there is growing evidence that text genre influences what children can and do learn from books, and it alters the types of interactions both adults and children engage in while sharing the book. Three genres will be discussed here, alphabet books, storybooks, and expository books.

One primary catalyst for exploring book genre has been to determine how it impacts parents' use of print referencing, because children's knowledge of print is often



linked to later reading achievement (e.g., Menyuk et al., 1991; Share, Jorm, Maclean, & Matthews, 1984; Stuart, 1995). Efforts to observe print referencing, defined as specific prompts about print conventions, concept of word, or alphabet letters and sounds, have revealed that adults rarely refer to print during storybook reading; instead, they focus almost entirely on the meaning (Ezell & Justice, 2000; Justice & Ezell, 2000a; Phillips & McNaughton, 1990; Shapiro et al., 1997; Snow & Ninio, 1986; van Kleeck, 1998a; van Kleeck et al., 1997; Yaden & McGee, 1984). Likewise, children primarily focus on the meaning when listening to book reading (Yaden, Smolkin, & Conlon, 1989), and their eye gaze falls almost entirely on the illustrations and not on the text (Justice & Lankford, 2002). However, when parents read alphabet books, or other books that include highly salient forms of print, such as large letters in isolation, speech balloons, and labels within pictures, children are much more likely to focus their eye gaze on them (Justice & Lankford, 2002), and to make print references (Holdaway, 1979; Smolkin, Conlon, & Yaden, 1988; Smolkin, Yaden, Brown, & Hofius, 1992). Therefore, alphabet books offer a rich context in which print is made highly salient, and information about the structure of the sound system and the graphic features of print often becomes the focus of children's interest and parents' scaffolding. Smolkin and Yaden (1992) add, however, that simply having alphabet books available does not necessarily generate this context of literacy apprenticeship; rather, it is the nature of parent scaffolding and mediation of alphabet texts that encourages children to taking meaning from the text.

Age also appears to interact with text genre, at least in the case of alphabet books. When reading with younger children, adults often treat alphabet books as though they were picture books (DeLoache & DeMendoza, 1987; van Kleeck, 1998a). In contrast, when reading with older children, they are more likely to make print references (Bus & van IJzendoorn, 1988; Smolkin et al., 1992; van Kleeck, 1998a). Such evidence indicates that parents are sensitive to the child's developmental level and prior knowledge about print, focusing on vocabulary learning first, and moving to print aspects of the text later.

Yaden, Smolkin, and MacGillivray (1993) also revealed that children often misunderstand these early conversations about sounds and letters; however, such misunderstandings provide opportunities for parents and children to engage in the discussions that lead children to understand that the print exists separate from the meaning it conveys.

The distinctions between alphabet books and storybooks are striking. There is, however, a great deal of variation among storybooks, as well. Despite this, storybooks are often treated as though they represent a uniform and consistent type of text structure. Three studies have specifically investigated the effects of text variations within the storybook genre (Elster, 1998; Martinez & Roser, 1985; Neuman, 1996). In a case study by Martinez and Roser (1985), the three storybooks shared by a father and his four-year-old daughter varied in the demands for making inferences. Both father and daughter initiated interactions around specific story sequences that required inferences, with the father often providing the specific information necessary in order for his daughter to understand them. As the inference demands of the stories increased, so did the frequency of these extratextual discussions of their content. Similar findings emerged from a second study using an intervention design. Neuman (1996) found that parents used more low-level interactions that were focused on the book during reading in highly predictable storybooks, while they used more abstract language during reading of storybooks without predictable language or sequential episodic structures.

In a third study, Elster (1998) elicited three emergent storybook readings from 33 five-year-old Head Start students who had heard the stories read by their teachers three times each. Although the study involved teachers rather than parents, the teachers' styles and the children's emergent readings offered insights into the effects of text variations. The stories varied in story structure, story language, degree of fantasy involved, and text-picture relationships. Teachers offered more explanations and story-related talk during the reading of a highly picture dependent text (i.e., one that required attention to both the text

and illustrations in order to understand the story). They elicited much more child participation during the reading of the story with repetitive text. Children's repeated emergent readings also revealed patterns of variation related to text features. For example, the children offered more explanations and story-related talk when reading the picture-dependent story, perhaps because their teachers had modeled this. Also, highly salient pictures and repetitive story language patterns were more likely to find their way into the children's emergent readings than less salient pictures or less repetitive language patterns. Both of these studies indicate that even within the realm of storybook genre, variations in aspects of the texts and pictures appear to influence adult styles of reading, children's participation routines, and the information that children take from the book sharing interactions as evidenced in their emergent readings.

Expository texts, also referred to as informational or non-fiction texts, have rarely been studied in the context of parent-child book sharing. Some expository books contain a narrative structure that is most often associated with the genre of storybooks. These are not the focus here; rather, expository texts in the current discussion refer to books written with the purpose of providing information about a topic. There is some evidence that expository texts elicit different interactions between adults and children than occur with storybooks. For example, Vander Woude (1998) explored the effects of genre on book sharing interactions between four parents and their children with language disorders. In all four cases, the expository book readings resulted in substantially more extratextual talk than occurred when reading storybooks, and object labeling routines were prevalent. Familiarity appeared to have a role also, with parents using more comments when sharing unfamiliar expository books and more wh-questions when sharing familiar expository books.

While Vander Woude's study revealed that genre interacts with book familiarity, other researchers have shown that genre interacts with sociocultural group. One study involving low-income, African-American parent-child dyads (Pellegrini et al., 1990)

involved observation of mothers and preschool children sharing four types of texts. One storybook and one expository book were published children's books that were less common in these families' households, and therefore, less familiar to their children. Another story-related text and expository text were provided that were more familiar to the participants, and included comics for the story genre condition and newspaper toy advertisements for the expository condition. Pellegrini et al. (1990) found that more extratextual talk occurred in general when sharing expository texts, and mothers used greater numbers of high-demand utterances and metalinguistic verbs specifically in the familiar expository condition. In addition, mothers adjusted their level of demands when reading the published storybooks, offering more low-demand utterances and enabling the child to participate successfully. A study by Janes and Kermani (2001), which was described above in the section on sociocultural influences on book sharing interactions, found similar format and genre effects in their study of book sharing between Spanish-speaking parents and their preschool children. Both of these studies (Janes & Kermani, 2001; Pellegrini et al., 1990) indicate that although genre and format influence interaction patterns, these book factors also interact with sociocultural practices.

Two additional studies of expository text genre come from the literature on teacher styles of reading with kindergarten children, and the effects on children's ability to retell or "pretend read" books with which they are familiar. Pappas (1991) analyzed four children's emergent readings of informational texts for the specific lexical and grammatical features the children used. Across three retellings of the same texts, children were observed to become more consistent with the use of the lexical and grammatical features characteristic of each text. For example, they initially used placeholders for technical vocabulary used in the story, and later were able to approximate or accurately use those lexical items. They also increased their ability to recall the grammatical structures typical of expository texts to describe attributes and explain events characteristic of the topic (e.g., attributes and activities of squirrels).

In a later study (Pappas, 1993), compared 20 kindergarten children's retellings of storybooks and expository books. As in her previous study, the children demonstrated the ability to use language patterns characteristic of the text they were retelling. For example, in storybook retellings, they attempted to sustain appropriate referencing of story characters after they were introduced (e.g., one child first used "A owl..." and later "the owl" and "he," p. 108), and maintain past tense throughout the story (e.g., "but the owl worked all night and slept all day," p. 108). Likewise, in expository text readings, children's retellings contained features specific to this text type, such as co-classification (e.g., reference to "squirrels" and the plural pronoun "they" rather than "*the* squirrel" and "he," p. 111-112) and maintaining the use of present tense (e.g., "the last day of autumn the squirrels are scurrying to hide their acorns," p. 113). In addition, lexical items specific to each text were learned and used over several retellings (e.g., "saucepan" and "bathroom tissue" in a story rather than the more common "pot" and "toilet paper," p. 117-118; and "prairie dogs" rather than "rats" or "dogs" in an expository text, p. 121). Evidence was strong that these children were gaining specific knowledge about the differences between the written registers in each genre through repeated exposure to them.

Given these results, Pappas (1993) questioned what she called the tendency to consider storybooks as the genre of importance in book sharing with young children, and she described the important text features that children can learn through exposure to other genres beyond stories. Smolkin and Donovan (2002) have suggested that the comprehension difficulties children exhibit upon entering fourth grade might be caused by the varied nature of the texts they are suddenly required to read, and the predominance of exposure to storybooks prior to that. Indeed, Duke (1999) found a scarcity of expository texts in the first-grade classrooms she studied, including what she called "narrative-informational texts," which combine expository content presented in narrative form. Expository texts comprised 6.9% of the classroom libraries in low-income schools,

and 12.7% in high-income schools. On average, expository texts were the focus of an average of 3.6 minutes per day across the 20 classrooms. Children's almost exclusive exposure to storybooks in the early grades fails to prepare them for the demands of the content area reading they face later in school and the huge range of expository text structures they will encounter (Smolkin & Donovan, 2002).

In summary, evidence was reviewed in this section indicating several factors that influence parents' interactions with their children during book sharing, including child age and ability, family's sociocultural background, and text familiarity, genre, and format. Although more research is needed on how each of these factors influences book sharing interactions, collectively they substantiate that variation in parents' interactions during book sharing is not entirely random. Rather, parents' styles reflect their sociocultural background, their responses to their children's age and abilities, and their responses to the texts being shared. Nonetheless, even studies that have been designed to control for these various factors have revealed substantial unexplained variability in parent's number of extratextual utterances and the types of utterances they contribute.

#### *Unexplained Variability*

A prevalent finding in the book sharing literature is that of variability in the number of parent interactions when reading with their preschool children. For example, Hockenberger, Goldstein, and Haas (1999) found that the total number of extratextual utterances during book sharing between the six parent-child dyads they studied ranged from 19 to 121 during their baseline book-sharing sessions. This variability remained even after participating in the intervention, with the number of post-intervention extratextual utterances during the reading of two to four books ranging from 155 to 341. The duration of the book sharing interactions also varied considerably throughout the study, ranging between 1.5 minutes and 14.3 minutes for the various books read. They noted, however, that the length of the book was not related to the duration of the parent-

child interaction. At times, relatively short books resulted in long book sharing times, and vice versa. Thus, this variability cannot be explained by the length of the book.

Hockenberger et al, (1999) used a multiple-baselines, single subject design, and therefore, they did not control the number, length, or content of the books used across the six parent-child dyads. This makes their findings of variability somewhat difficult to interpret. However, studies that have held the length of the books constant, and controlled them for topic consistency and familiarity, have likewise revealed a great deal of variability in the number of extratextual utterances parents contribute during book-sharing sessions. For example, De Temple and Snow (1996) found that mothers' total number of extratextual utterances ranged from 1 to 114 ( $M = 42.9$ ,  $SD = 28.9$ ) during the initial sharing of *The Very Hungry Caterpillar* (Carle, 1969). In another study that used the same book, the low- and middle-income parents contributed a mean of 33.6 extratextual utterances with their preschool children (van Kleeck, DeTemple, Snow, & Breshears, 1996). The standard deviation, however, was 29.1, nearly equal to the mean. The variability remained when low- and middle-income groups were analyzed separately. In yet another low- to middle-income sample of parents sharing a different storybook, the standard deviation for the number of parent contributions was double the mean ( $M = 6.83$ ,  $SD = 13.96$ ; Allison & Watson, 1994). Such high variability in the amount of parent talk during book sharing appears to be consistent with findings regarding other parent-child interactions. For example, Hart and Risley (1995) found similar variability in amount of parent input in their study of the verbal interactions that occurred during everyday activities (e.g., play, meal time, getting dressed).

In addition to variability in the amount of extratextual utterances, the types of parents' extratextual utterances during book sharing also appear to vary substantially. Large variability has been found in the number of utterances provided at different levels of abstraction, and although studies show differences that are related to sociocultural group, this variability appears to be substantial even within middle-income (Shapiro et

al., 1997; Sorsby & Martlew, 1991; van Kleeck, DeTemple et al., 1996; van Kleeck et al., 1997) and low-income groups (De Temple & Tabors, 1994; Leseman & de Jong, 1998; van Kleeck, DeTemple et al., 1996). For example, in a homogenous sample of middle-income mothers and children, Shapiro et al. (1997) found that parents' number of utterances about specific illustrations ranged from 0 to 97. In a homogenous sample of low-income parents, Neuman (1996) found similar variability across almost all types of extratextual utterances during the reading of three different types of storybook texts. For example, parents contributed a mean of 16 feedback utterances when reading with a highly predictable storybook, with a standard deviation of 10; a mean of 14 utterances that recalled previous story details when reading a narrative-style storybook, with a standard deviation of 19; and a mean of 7 attention-getting utterances when reading a predictable storybook, with a standard deviation of 10.

*Focus on mean tendencies.* Evidence for such large variability within homogenous samples of parent-child dyads, even when researchers have controlled for child age and ability, and the books shared, suggests a need to explore differences in parents' patterns of interactions that are not explained by other factors. However, even when researchers have studied homogenous groups of parents and children, they have tended to focus on identifying central tendencies, disregarding the variability in the number and type of parents' extratextual utterances. This practice has led to inaccurate conclusions and applications of the research.

This predominant focus on mean tendencies, combined with the fact that the majority of studies have been conducted with white, middle-income families, has resulted in the conclusion that there is a "typical" way in which these parents share books with their children. These findings perpetuate the notion that middle-income parents exhibit one characteristic style, specifically, that they provide their children with numerous extratextual utterances that scaffold and extend children's understanding during book



sharing. As described earlier, though, even parents in more homogenous samples exhibit considerable variability, rendering conclusions based on mean tendencies misleading.

Most studies have not used designs capable of exploring the multivariate nature of book sharing, but rather focus on mean tendencies of groups using descriptive statistics (i.e., means and standard deviations) or univariate comparisons (e.g., Anderson-Yockel & Haynes, 1994; De Temple & Snow, 1996; De Temple & Snow, 1998; De Temple & Tabors, 1994; Goodsitt et al., 1988; Lonigan, 1993; McCormick & Mason, 1986; Pellegrini et al., 1990; Phillips & McNaughton, 1990; Sigel, 1982; Sigel & McGillicuddy-Delisi, 1984; Swinson, 1985; van Kleeck, DeTemple et al., 1996; van Kleeck et al., 1997). Mean tendencies for the total number of extratextual utterances, and mean tendencies for each type of utterance, have been used to identify significant differences between groups or book sharing conditions (e.g., familiar vs. unfamiliar books). Given the high amount of variability, statistically significant results will only be found when differences between groups or conditions are robust; therefore, such findings are important and reveal that child age and ability, family's sociocultural group, and text factors do influence differences in parents' use of extratextual utterances. However, the univariate nature of these analyses, and the focus on comparisons between groups or conditions, result in a failure to capture more of the variability in these data that might be explained by style differences that exist and that distinguish subgroups of parents within homogenous groups (i.e., samples from one socioeconomic group).

In much of the book sharing research described up to this point, researchers have analyzed parents' extratextual utterances by coding each utterance based on type. This has typically involved describing the content of utterances, such as whether they provide praise or feedback, or information about print and book conventions, and whether they demand low-level or high-level thinking and language. These coding systems typically include at least five or six categories in order to sufficiently capture the variety in types of parents' extratextual utterances during book sharing, and often they contain many more.

Yet, researchers frequently use a univariate approach to analyze their data, which assumes that each of these variables, is unrelated to the others in the collection; however, each variable likely shares some of its explanatory power with others in the set. Consequently, univariate analyses of each coding category are inappropriate; multivariate methods are a better choice.

Multivariate comparisons between groups or conditions would represent an improvement over the univariate comparisons described above because they would indicate whether parents differ in their use of collections or sets of utterance types. Groups or conditions could then be further described by using multivariate contrasts or descriptive discriminant analysis to identify the variables that serve to distinguish them. Although multivariate comparisons between groups or conditions would represent progress, and contribute to the empirical base within this literature, they too are based on the mean tendencies of groups and treat unexplained variability as though it is random. Even when differences among groups are robust, and significant results are obtained, the remaining unexplained variation in parents' interactions across utterance types might not be random. Rather, different parents may have different characteristic styles of interaction during book sharing that are reflected both in the overall amount of extratextual talk they engage in, and in the types of utterances they emphasize during the interaction.

*Need for a methodological shift.* Given that variability appears to be the norm, it is surprising that researchers continue to focus on mean tendencies and have rarely attempted to explore the variability in systematic and meaningful ways. A move away from t-tests, univariate analysis of variance, and simple descriptions of means and standard deviations will be imperative if the field is to move forward in understanding variations across parents in their book sharing interactions within and across different sociocultural groups, and specifically variation not accounted for by child age and ability, sociocultural group, and text factors. Of particular interest is whether parents vary systematically in their use of extratextual utterances during book sharing (i.e., form

subgroups of different styles), both in the amount of extratextual talk they use, and in the patterns of utterance types in that talk. This calls for a methodological shift toward the use of multivariate approaches, and specifically the use of procedures to analyze and describe variability within homogenous groups rather than focusing on mean tendencies across groups (for discussion see Hammett, van Kleeck, & Huberty, 2002; Hammett et al., 2003). To date, four studies have been conducted that explore the patterns of extratextual utterances used by parents (De Temple & Tabors, 1994; Haden et al., 1996; Hammett et al., 2003; Reese et al., 2003).

*Systematic Patterns of Parents' Extratextual Utterances*

Four studies exist within the literature that have attempted to describe style variations in different parents' book sharing interactions by exploring systematic patterns in their extratextual utterances. One of these relied on a descriptive design (De Temple & Tabors, 1994), and three used multivariate cluster analysis procedures capable of systematically exploring variability statistically (Haden et al., 1996; Hammett et al., 2003; Reese et al., 2003).

*De Temple and Tabors (1994)*

De Temple and Tabors (1994) reported on a study in which the goal was to determine what patterns of interactions might exist during book sharing in a group of 290 young mothers (i.e., 16 to 21 years old), 84% of whom were African-American, and all of whom were receiving public assistance. These mothers were followed longitudinally as part of the New Chance Observational Study. Their children ranged in age from 2;3 years to 5;3 years old. Parents were asked to share the book *The Very Hungry Caterpillar* (Carle, 1969) with their child and spend a few minutes talking about the book when they finished. The majority of parents in this sample talked a considerable amount, contributing a mean of 51 extratextual utterances. However, considerable variability was also evident, with the number of extratextual utterances ranging from 1 to 195. De Temple and Tabors (1994) analyzed the extratextual utterances parents contributed to

identify patterns, and made speculations regarding the underlying assumptions upon which the parents might be basing these interactions.

Parents exhibited four approaches to book sharing: (a) straight readers; (b) non-readers; (c) interactive readers; and (d) recitation readers. The straight readers ( $n = 14$ ) were those who did not interact much during reading, but rather read the text from beginning to end. These mothers offered no more than five extratextual utterances during the book reading. Because these parents contributed little outside of the reading itself, the assumptions underlying their style were not apparent. Non-readers ( $n = 36$ ) were mothers who did not actually read the text; instead they looked at each page and talked about the pictures with their child. They used primarily concrete utterances, asking their children to label objects, name colors, and count. They appeared to be operating under the belief that books were meant to teach children to label and count and identify colors. These mothers' literacy scores did not differ from any other group, and therefore, this did not explain their avoidance of reading the text; however, their children were younger than those in other groups, suggesting that their approach may have been related to child age.

De Temple and Tabors (1994) describe a third group of mothers in their sample as interactive readers ( $n = 231$ ). These were mothers who discussed the story during book sharing, pausing often to interject comments and questions. Parents in this group varied substantially, however, in the extent to which they tended to use concrete versus abstract extratextual utterances. This was explained to some extent by the age of the child, with a significant negative correlation between number of concrete utterances and child age, and a significant positive correlation between number of abstract utterances and child age. Additionally, the variation was related to mothers' literacy level, with more abstract talk used by mothers with higher literacy skills, and more concrete talk used by mothers with lower literacy skills. Mothers in the interactive group appeared to perceive reading as a time to think about the story and relate it to information about the world, and/or as a time

when children can learn to label and count (although, looking at the specific book read, it is quite possible that its unique features accounted for a focus on counting).

The interactive group contained almost 80% of the total sample ( $n = 231$ ), suggesting that the most common pattern was one in which mothers used a fairly large number of extratextual utterances to engage their children in interaction around the text. However, the researchers also reported considerable variability in the amount of parent talk within this group, with parents' use of concrete utterances ranging from 4 to 133, and their use of abstract utterances ranging from 0 to 17. There are likely further patterns of systematic variation in interactions within this particular sub-group. Further analysis of this sub-group would have strengthened the findings.

Finally, a fourth group of mothers were called recitation readers ( $n = 9$ ) because they exhibited a pattern in which the mother read a phrase or sentence and asked the child to immediately repeat it verbatim. These mothers often followed the words with their finger during reading, and seemed to be guided by the assumption that book sharing was meant to teach the children to read. A similar pattern of book sharing has occasionally been found in other low-income samples, including Maori families from New Zealand (Hohepa & McNaughton, 2002; McNaughton, 1995), Turkish-Dutch families in the Netherlands (Bus et al., 2000; Leseman & de Jong, 1998), and urban African-American families in the southern United States (Hammer, 2001).

De Temple and Tabors (1994) used the patterns of extratextual utterances they observed in each group to speculate on parents' beliefs that might be contributing to parents' choices of interactions. They did not directly assess mothers' beliefs in their study. In another study, though, Neuman et al. (1995) specifically explored maternal beliefs in a sample from a similar population using a qualitative, interview discussion group design. Nineteen low-income African-American mothers who were teenagers when their children were born participated in the study. Qualitative analysis of transcripts from the interview discussion groups revealed three maternal perspectives on learning and

literacy. Seven of the 19 mothers held a *transmissive* view of children's learning and literacy, believing that knowledge is a set of skills to be transmitted by adults to the child, and a child's role is to pay attention and be obedient. A transmissive perspective on learning may account for De Temple and Tabor's (1994) recitation and non-reader groups.

A second group of eight mothers in the Neuman et al. (1995) sample held a *maturational* view on learning and literacy, believing that children initiate learning experiences based on their interests and social needs. Parents need to provide a nurturing environment and create opportunities for children to explore, but no attempts are made to teach specific skills. Mothers in De Temple and Tabor's (1994) straight-reader group might hold this perspective regarding learning. The third group of four mothers held a *transactional* view of learning and literacy. They encouraged their children to construct knowledge by following their child's lead during storybook reading and play activities, encouraging their children to reason, ask questions, and participate in conversation. This perspective may explain the interactive reader's approach found by De Temple and Tabors (1994). The findings of Neuman et al., along with the patterns of extratextual utterances reported by De Temple and Tabors (1994), support the idea that maternal beliefs about their role in their children's learning influence their patterns of interaction during book sharing.

Although De Temple and Tabors (1994) reported four distinct styles, it was unclear exactly how the groups were identified beyond an "eyeballing the data" approach. Therefore, there is no way to evaluate the validity of their findings or to critically analyze what conclusions are justified given their design and methods. Consequently, their results allow only tentative speculation about the conclusions that might be drawn. Their findings suggest that different mothers have different patterns of interaction, which counters the notion that the variation is completely random within a sample that is homogenous in terms of socioeconomic status. They described four groups of parents

who appeared to exhibit within-group similarity and between-group differences. The fact that they found three relatively small groups within this socio-economically homogenous sample also suggests the existence of small numbers of parents who demonstrate less common patterns of interaction during book sharing. Three of the four groups ranged in size from 9 to 36 despite the fact that the overall sample size was large ( $n = 290$ ).

Although the findings of De Temple and Tabors are interesting, the reliance on purely descriptive methods is a substantial limitation. Another avenue for exploring variability in parents' interactions during book sharing is to use cluster analysis to identify how both the overall amount and combinations of types of extratextual utterances vary for different subgroups of parents. Cluster analysis methods are a family of statistical procedures that provide a means for identifying patterns within a sample. This is accomplished by "...divid[ing] a heterogeneous sample of entities... into more homogeneous subgroups" (Speece, 1990, p. 201). While researchers have considered particular socioeconomic groups to be homogenous samples, the large amounts of unexplained variability found in this research suggest that they are not homogenous in terms of the interactions used during book sharing. Cluster analysis offers a means for exploring the variability among them. In addition, cluster analysis is a multivariate statistical procedure, and therefore, allows exploration of the variability across multiple input variables at the same time. Hence, cluster analysis provides a method for understanding more about the nature of the variability that exists within a particular sample and it is ideal for accomplishing the methodological shift needed in this research. Three studies have applied cluster analysis methods to explore the different systematic patterns that characterize subgroups of parents (Haden et al., 1996; Hammett et al., 2003; Reese et al., 2003).

*Haden, Reese, and Fivush (1996)*

Haden, Reese, and Fivush (1996) conducted what they called an exploratory study using cluster analysis methods, with the purpose of identifying and describing different

styles of interactions used by different mothers during book sharing. In addition, they investigated the consistency of these patterns over time, differences in style when reading familiar versus unfamiliar storybooks, and how these styles might relate to children's language and literacy outcomes one year later. Their sample originally included 24 mothers; however, due to attrition and equipment failure, their final samples contained 19 for the unfamiliar book condition and 18 for the familiar book condition. Fifteen of the mothers had completed a college degree, with the remaining four having attended college, and only two did not work outside the home at least part time. All the children were 3;4 years old at the time of the initial book sharing session and 4;10 at the time of the second session. This homogeneous sample provided good internal validity; however, this homogeneity results in limitations in the ability to generalize the results to parents who do not share these exact characteristics (i.e., limited external validity).

At each session, mother and child were audio taped sharing two books, one familiar storybook chosen from their home library, and one of two unfamiliar storybooks provided by the researcher. Both unfamiliar books were equated for length (i.e., approximately 25 pages in length and containing 50 independent clauses) and story structures (i.e., similar in plot development). There was no way to control for variation in the familiar storybooks, however; and thus, they differed with regard to structure, length, and linguistic complexity. Haden et al. (1996) attempted to control for this by using proportional data in their analyses; the problems with this approach were discussed earlier. The researchers acknowledged that differences in characteristics of the familiar books read might have affected the results, and they suggested caution in interpreting the results. Despite this, however, they proceeded with in-depth descriptions of the cluster characteristics for the familiar book condition, and conducted a number of two- and three-way analyses of variance. The combination of the small sample size with the variability in books made valid interpretations of the familiar book sharing sessions untenable and,



therefore, these results will not be discussed here. Only the unfamiliar book context will be considered.

Mothers' extratextual utterances were coded based on content (i.e., descriptions, predictions, general world knowledge, print knowledge, confirmations) and the Cohen's kappas reported by the researchers indicated adequate interrater agreement for all coding categories at each data collection time point (.89 to .91). These data were entered into a Ward's hierarchical cluster analysis, and visual inspection of the resulting dendrogram was used to choose the best cluster solution. Although the Ward method is considered the preferred hierarchical clustering method (Gore, 2000), determining the best cluster solution can be an entirely subjective decision when based on visual inspection alone. Other methods such as the cubic clustering criterion (CCC), or hit rates from a follow-up predictive discriminant analysis (PDA) can help in determining the most valid cluster solution, but because of their small sample size, these procedures were not an option.

These researchers used proportional data rather than raw data for each coding category in their analyses, claiming that they did not find substantial variability in parents' total frequency of extratextual utterances. However, their conclusion that parents did not vary substantially in total amount of talk was based on the finding that the three groups obtained in the cluster analysis did not differ significantly on this variable. Perhaps they did not find significant differences among the groups because of large standard deviations combined with their small sample size. They did not provide descriptive data on means and standard deviations for the entire sample or for individual clusters, so it is not possible to know whether this was the case.

Three distinct maternal styles were revealed in the cluster analyses at both time points: (a) describers, who used many descriptive utterances; (b) comprehenders, who used many print knowledge and prediction utterances, categories that were considered to be at high levels of abstraction; and (c) collaborators, who frequently elicited children's comments and provided confirmations of children's contributions during book sharing.

These results indicated that the parents in the sample did vary systematically, exhibiting several patterns. In addition, the patterns of utterance types for the three clusters remained fairly stable over time. At time two, describers continued to use predominantly low-level extratextual utterances, even though the children were 18-months older. Comprehenders continued to use many high-level utterances, but also increased their use of description. Collaborators were the least consistent over time, demonstrating an increase in their use of high-demand utterances and a decrease in their use of confirmations during the second data collection point 18 months after the first. The researchers speculated that this might be related to these parents' high degree of responsiveness to their children's abilities during book sharing. Such findings suggest that although child age and ability appear to influence parents' extratextual utterances during book sharing, parent style may interact with these variables.

Although Haden et al. (1996) provide an important initial contribution to the exploration of variability in parent style through the application of cluster analysis, three weaknesses in their design substantially limit the conclusions that can be made. The first was the small sample size ( $n = 19$ ), and Haden et al. (1996) acknowledged that this was problematic and suggested that their study should be viewed as exploratory in nature. Although the cluster analysis literature does not provide clear guidelines for determining appropriate sample sizes (as is discussed more thoroughly in Chapter 2), researchers who have explored the effects of various sample sizes on clustering outcomes have found that the stability and validity of cluster solutions increases as the sample size increases (Schweizer, 1994). All the clusters obtained by Haden et al. (1996) contained fewer than 10 parents. The small sample size did not allow the researchers to use procedures necessary to ensure the validity of their findings.

Second, Haden et al. (1996) followed their cluster analysis with analysis of variance (ANOVA). ANOVA was an appropriate method to interpret the cluster findings by identifying the variables on which the clusters differed; it is also an appropriate

method to compare clusters on variables not used to identify the clusters initially. However, many of the three-way ANOVAs conducted included data on the five types of utterances, which were originally entered into the cluster solution. Because cluster analysis procedures serve to maximize differences among the clusters created, these ANOVAs would likely always be significant and, therefore, were inappropriate to test statistical significance (Blashfield, 1980; Milligan & Cooper, 1987). In addition to being inappropriate, a large number of ANOVAs were conducted making the risk of Type I error quite high, and the cluster sizes were extremely small making the power of these tests low.

Third, Haden et al. (1996) relied on visual inspection of their hierarchical cluster analysis results to determine the validity of their findings. Although the small sample size would not allow for the types of additional analyses that could substantiate the results of the clustering procedures (e.g., predictive discriminant analysis, correlations among linear discriminant functions for half samples), this resulted in an entirely subjective judgment of their results. Although Haden et al. (1996) acknowledge that their analyses were exploratory in nature, the major weaknesses in design render the results of this study inadequate for understanding variability in parents' utterances during book sharing.

*Harte (1997)*

Harte (1997), as discussed in a chapter by Reese et al. (2003), conducted an investigation using cluster analysis methods to explore mothers' styles of book sharing in families of European descent living in New Zealand. The study was modeled after that of Haden et al. (1996), involving children at the same two ages, 3;4 years old and 4;10 years old. Harte's (1997) sample contained 40 mother-child dyads, and relied on a cross-sectional (i.e., 20 children at each age) rather than a longitudinal design. The mothers in this sample had lower levels of education compared to Haden et al. (1996), ranging from 10 years to 19 years of schooling, and included both low- and middle-income families. Because parents appear to vary in their interactions based on child age and on

sociocultural group, the patterns of parent style found in such a heterogeneous sample will be confounded by these other factors. Reese et al. (2003) did not provide any discussion regarding whether the results appeared to be influenced by income differences within the sample. They also accepted the finding that parents were equally likely to be in their comprehender cluster as in their describer cluster as evidence that children's age did not influence parents' styles, which may or may not be true. Because of the confounding effects of socioeconomic status and child age, this study is uninformative on the question of systematic patterns of interactions that are not due to these other factors, and as such, will not be further discussed.

*Hammett, van Kleeck, and Huberty (2003)*

Hammett et al. (2003) conducted a third cluster analysis study, exploring the patterns of extratextual utterances of 96 parents during book sharing with preschool-age children. This study provided the foundation for the current dissertation research study.

*Book sharing.* All parent-child dyads were visited in their home by a graduate student research assistant and videotaped on one occasion sharing an unfamiliar storybook. Parents were asked to share the book in the same way they typically would share books. Four books were provided to choose from, allowing the parent and child to find one that was unfamiliar to them both. They included the following: (a) *Mooncake* (Asch, 1983); (b) *Moongame* (Asch, 1984); (c) *Bear's Bargain* (Asch, 1985a); and (d) *Bear Shadow* (Asch, 1985b).

The Computerized Language Analysis programs (CLAN, MacWhinney, 1995) were used to analyze each book and ensure similarity (see Table 1.3). The four books were similar with regard to length (i.e., 28 pages each; 38 to 50 sentences long), linguistic complexity (i.e., mean length of utterance ranging from 11.62 to 12.79 morphemes across

the four books), and vocabulary diversity (i.e., type-token ratios<sup>1</sup> ranging from .390 to .397, vocabulary diversity<sup>2</sup> using the CLAN program VOCD ranging from 62 to 77). In addition, all the books revolved around the adventures of the same bear, and included concepts considered to be abstract (e.g., making a bargain with a friend, trying to escape from one's own shadow, playing hide and seek with the moon) that might warrant explanation from parents during book sharing. Controlling the book-sharing situation in this way ensured that the differences revealed in parents' types of extratextual utterances or differences in the overall amount of talk would not be attributable to substantial variation in the books shared.

Table 1.3

*Characteristics of Each of the Four Storybooks Used in Hammett et al. (2003).*

<b>Book</b>	<b>Number of Pages</b>	<b>Number of Sentences</b>	<b>Mean Length of Sentences</b>	<b>Type-Token Ratio<sup>a</sup></b>	<b>Vocabulary Diversity<sup>b</sup></b>
<i>Bear</i>	28				
<i>Shadow</i>		44	12.21	0.391	63
<i>Bear's Bargain</i>	28				
<i>Bear's Bargain</i>		38	12.79	0.397	68
<i>Mooncake</i>	28	50	11.62	0.394	77
<i>Moongame</i>	28	40	11.68	0.390	62

<sup>a</sup> See Footnote 1.

<sup>b</sup> See Footnote 2.

*Coding of parents' utterances.* Each book-sharing video was transcribed, including all interactions that occurred before, during, and after the book reading. All extratextual utterances, including both comments and questions, made by parents were coded based on their content (see Figure 1.1) into three categories: (a) print and book convention utterances; (b) behavior management and feedback utterances; and (c) story content related utterances. Utterances about the story content were coded further based on

<sup>1</sup>Type-token ratio is a measure of linguistic complexity that is calculated by dividing the number of total words in the sample. The sample in this case was the text from each story book.

<sup>2</sup>The vocabulary diversity measure, VOCD, reflects the variety of vocabulary used in the story. Higher values represent greater diversity, and these have been found to range from 5 in a sample from a 5-year-old child with language impairment to 120 in a sample of academic writing (Richards & Malvern, 1999).

the four levels of abstraction (Level I, Level II, Level III, Level IV) described earlier (Blank et al., 1978a; van Kleeck et al., 1997). This resulted in a coding system including six mutually exclusive categories that were entered into the cluster analyses: (1) print and book convention utterances (print/book); (2) behavior management and feedback utterances (behavior); (3) Level I utterances; (4) Level II utterances; (5) Level III utterances; and (6) Level IV utterances. As in the previous three studies described, the focus here was exclusively on parents' utterances during book sharing, consistent with the goal of describing systematic patterns of parents' use of extratextual utterances.

The parents in this study came from two samples and, therefore, inter-rater reliability was calculated on each sample. In the first sample ( $n = 68$ ), inter-rater reliability for the coding system was calculated on 10% of the transcripts and yielded a kappa coefficient of .76. In the second sample ( $n = 28$ ), point-by-point inter-rater agreement was 82% based on 43% of the transcripts. These data indicate good reliability in the coding of utterances.

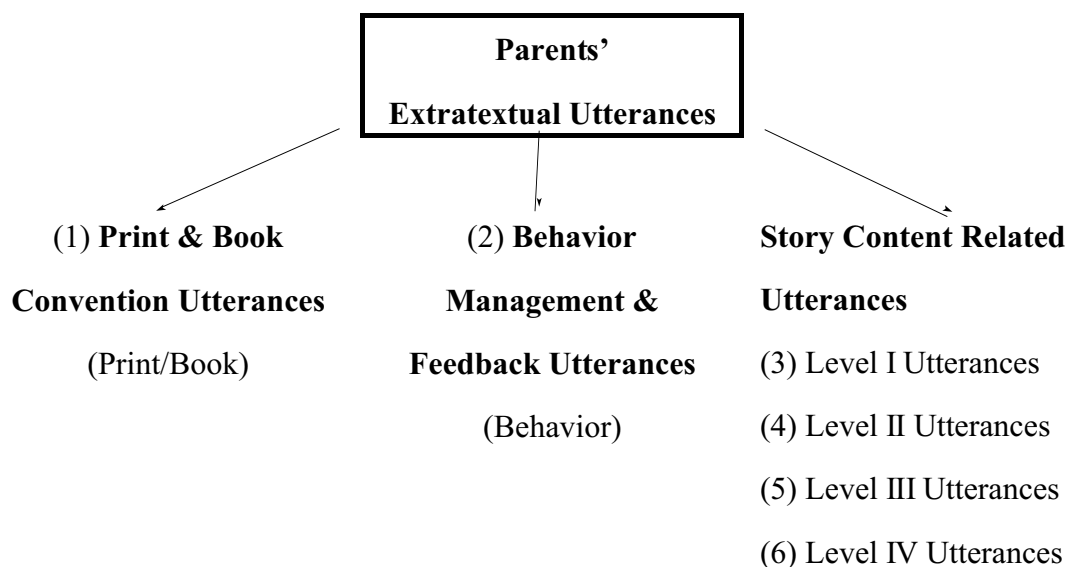


Figure 1.1: Six coding categories for parents' extratextual utterances during book sharing.

*Participant Sample.* Hammett et al. (2003) achieved a sample size of 96 parent-child dyads by pooling two extant data sets. All the families were middle- to upper-middle income (based on the parents' stated occupations and educational levels) and English-speaking. The mean age of the children was 3;6 years, with a range of 3;4 to 4;1. The children in sample 1 were deemed to be typically developing based on assessments of their non-verbal cognition and analysis of a language sample using the Index of Productive Syntax (IPSyn; Scarborough, 1990). The children in sample 2 were not formally assessed; however, they were reported to be developing typically by their parents and their preschool teachers, and they demonstrated age-appropriate interactions during the home visit. Several procedures were conducted to determine whether pooling of the two samples was appropriate.

Sample 1 contained 35 preschoolers, aged between 3;6 and 4;1 years, and their mothers and fathers ( $n = 70$ ; van Kleeck et al., 1997). Mothers and fathers were videotaped separately and on different occasions as they each shared an unfamiliar book with their child. Because children are active contributors during book sharing and may influence parents' interactions similarly, there was a question concerning whether the mother-child and father-child dyads could be considered independent units for analysis. Results of three analyses indicated that indeed it was appropriate to combine mothers and fathers in the clustering procedures. First, there were no significant differences between mothers and fathers on the six response variables ( $p$ -values ranged from .200 to .988) or in a multivariate analysis of variance ( $\Lambda = .965$ ;  $F[6, 63] = .376$ ;  $p = .891$ ). Second, in a cluster analysis on the 70 parents in sample 1, mothers and fathers of the same child were equally likely to belong to different clusters as they were to belong to the same cluster. Third, separate cluster analyses were conducted for mothers and fathers with similarities in cluster patterns revealed. Both cluster analyses revealed one large cluster of parents who used limited numbers of utterances across all six variables (20 mothers and 24 fathers), and smaller clusters of parents who contributed more utterances, with some

focusing primarily on behavior management and feedback utterances and story content related utterances at low levels of abstraction, and others who contributed more utterances at the highest levels of abstraction. Given these findings, it was deemed appropriate to collapse these data into one larger set.

Cluster analysis procedures consistently identified two parents in sample 1 (one father and one mother of different children) in clusters of their own because they differed substantially from all the other parents (i.e., three to five standard deviations above the mean on multiple variables). Because cluster analysis is sensitive to outliers (Hair & Black, 2000, p. 161), these two parents had the effect of obscuring meaningful patterns within the data; therefore, these units were deleted. The remaining 68 parents in sample 1 were included in the final analyses. As with the outliers found by Harte (1997), it is possible that the two parents omitted represented an additional cluster within the population that was underrepresented in this sample.

A second sample (see van Kleeck, 1998b) consisting of 28 mothers and their preschool children between the ages of 3;4 and 4;1 years also was analyzed to determine whether it could be pooled with Sample 1. A cluster analysis on Sample 2 indicated similar patterns to those of the mothers and fathers in Sample 1, and therefore, Sample 1 and Sample 2 were pooled. Although these procedures provided evidence that pooling the two samples was appropriate, one limitation of the study results from the fact that it relied on pooled extant data sets. However, this has been suggested as one method for increasing the sample sizes in book sharing research that involves such labor-intensive data collection, transcription, and coding (Hammett, van Kleeck et al., 2002).

*Cluster Analysis Methods.* Hammett et al. (2003) used the Ward method followed by the k-means iterative partitioning method, both using a Euclidean distance similarity measure, for all cluster analyses conducted in the study. The combination of the Ward method followed by the k-means method capitalized on the strengths of each method, relying on the Ward analysis for its power to identify cluster solutions that may be



interesting to explore, and the k-means analysis for its use of multiple passes through the data, reassigning units until all clusters contain units similar to each other (Aldenderfer & Blashfield, 1984, p. 46). Using the Euclidean distance measure allowed analyses that were sensitive to the shape of the clusters as well as the elevation (i.e., magnitude or mean levels of performance across the variables) and scatter (i.e., standard deviations across measures; Aldenderfer & Blashfield, 1984, p. 22-23; Speece, 1990, p. 204), all of which were of interest in the investigation. The use of raw data and standardized data resulted in similar cluster solutions. Because the standardized data allowed for easier comparisons within and among clusters on different variables, and enabled better interpretations of the patterns present (see Hair, Anderson, Tatham, & Black, 1998, p. 489), they were used to obtain the cluster solutions.

Although cluster analysis is designed to reveal multiple homogenous groups within a sample, determining the optimal number of clusters in a solution is not self-evident from the analysis. Three procedures were used to identify the most valid and meaningful solution. First, the Ward analysis revealed at least three clusters within the sample based on visual inspection of the resulting dendrogram. The cubic clustering criterion (CCC) indicated that three to six clusters could explain considerable variance in the sample, but additional clusters would not add to that explanation. Second, visual inspection of the types of utterances characteristic of the clusters in each of the 3-, 4-, 5-, and 6-cluster solutions allowed further interpretation of the results. Each of these analyses identified one large cluster of parents who contributed limited numbers of utterances across all the utterance types. The three-cluster solution also identified a cluster of parents who contributed moderate numbers of utterances and a cluster of parents who contributed high numbers of utterances. Although this was a meaningful set of clusters, the four-cluster solution uncovered two high-input clusters that revealed an additional distinction of interest. Specifically, the four cluster solution revealed one high-input cluster of parents who offered many print and book convention utterances and another high-input

cluster of parents who offered few print and book convention utterances and many story content related utterances at Level IV. The five- and six-cluster solutions continued to reveal a large limited-input cluster while making further subdivisions among the parents who offered higher numbers of utterances, resulting in additional clusters containing small numbers of parents (i.e., one to six). These small clusters did little to clarify the patterns that existed within the sample. Based on this examination of a variety of solutions, the four-cluster solution was considered to be the most descriptive and valid one.

Predictive discriminant analysis (PDA; using SAS 6.12 DISCRIMINANT), was a third procedure used to determine the better cluster solution for this sample (see Huberty, 1994, chap. V). The hit rates generated by a PDA indicated how reliably parents could be classified into the clusters they had been placed in by the cluster analysis. These observed hit rates are compared to the hit rates that would be obtained by chance using the improvement-over-chance index<sup>3</sup> (Huberty, 1994, p. 107). The results demonstrated that both the three-cluster solution and the four-cluster solutions resulted in fewer errors than chance indicating that both offer statistically valid groupings. Specifically, the hit rate for the three-cluster solution was 86.5% across the three clusters, which resulted in approximately 80% fewer errors than chance ( $I = .797$ ); the hit rate for the four-cluster solution was 80.21%, which resulted in approximately 74% fewer errors than chance ( $I = .736$ ). Because the four-cluster solution had a hit rate that was not substantially lower than that for the three-cluster solution, and because it offered an additional and conceptually meaningful distinction within the sample, it was selected for in-depth interpretation and discussion.

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<sup>3</sup>Improvement over chance index using the equation: " $I = (H_o - H_e) / (I - H_e)$ , where  $H_o$  is the observed hit rate and  $H_e$  is the hit rate expected by chance" (Huberty, 1994, p. 107)

*Results.* The analysis revealed four clusters that differed in terms of the relative number of utterances parents provided across variables and the patterns of utterance types within each cluster. Cluster 1 ( $n = 9$ ) and Cluster 2 ( $n = 8$ ) were small groups of parents who provided many extratextual utterances across most variables (mean of 69; range of 2 to 19 for each variable) compared to the remainder of the sample (see Table 1.4 and Figure 1.2). Parents in Cluster 1 emphasized print and book conventions ( $z = 2.210$ ;  $M = 11.11$  utterances) and story content related utterances at Levels II and III. On average, 60% of their story related utterances were at low levels of abstraction (Levels I and II) and 40% were at high levels of abstraction (Levels III and IV). Accordingly, this cluster was labeled the “high-input/print and story content” cluster to reflect both the high amount of overall input and, specifically, the high numbers of print and book convention utterances and story content related utterances across low and high levels of abstraction.

Although parents in Cluster 2 also contributed high numbers of utterances overall, the pattern of utterance types differed from that of Cluster 1. Parents in Cluster 2 offered few print and book convention utterances ( $z = -.597$ ;  $M = 2.25$  utterances) compared to parents in Cluster 1 ( $z = 2.210$ ;  $M = 11.11$ ). Instead, these parents provided numerous behavior management and feedback utterances ( $z = 1.636$ ;  $M = 19.25$ ) and story content related utterances at Level IV ( $z = 2.249$ ;  $M = 15.88$ ), showing an emphasis on managing behavior and providing feedback, and engaging the child in high-level thinking (e.g., dealing with predictions, explanations, and information beyond the text). They provided a balance between low and high-level utterances, with a ratio of 53% to 47%. This cluster was labeled the “high input/behavior and high abstraction” cluster to reflect both the high amount of overall input and, specifically, the high numbers of behavior management and feedback utterances and Level IV utterances.

Cluster 3 consisted of a larger group of parents ( $n = 19$ ) who provided moderate numbers of utterances across variables (see Table 1.4 and Figure 1.2). They averaged 52 extratextual utterances while sharing the unfamiliar book and they contributed more

Table 1.4

*Cluster Centers Using Standardized Data (z-score) and Raw Data for the Four Clusters Obtained in the Entire Hammett et al. (2003) Sample (n = 96).*

Variable	Cluster Centers, Standardized Data			
	1 High input/print and story content	2 High input/ behavior and high abstraction	3 Moderate input/low abstraction	4 Limite d input
Print/Book	2.21	-.60	0.29	-.36
Behavior Management & Feedback	.55	1.64	0.78	-.57
Level I: Match Perception	.50	.62	0.99	-.53
Level II: Integrate Perception	1.78	1.09	.36	-.56
Level III: Infer About	1.22	.51	.30	-.44
Level IV: Reason	.84	2.25	-.12	-.40
Variable	Cluster Centers, Raw Data Means			
	1	2	3	4
Print/Book	11.11	2.25	5.05	3.00
Behavior Management & Feedback	11.78	19.25	13.37	4.03
Level I: Match Perception	12.00	13.38	16.63	3.08
Level II: Integrate Perception	15.56	11.88	7.95	3.02
Level III: Infer About	9.56	6.50	5.58	2.42
Level IV: Reason	8.67	15.88	3.79	2.33
	<i>n</i> = 9	<i>n</i> = 8	<i>n</i> = 19	<i>n</i> = 60

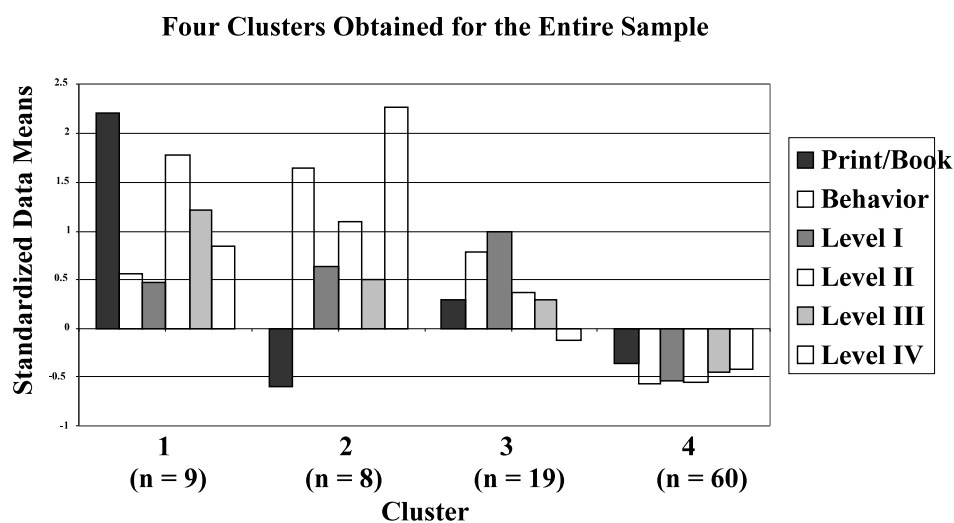


Figure 1.2: Four clusters obtained for the entire sample ( $n = 96$ ) based on data standardized to a z-score.

behavior management and feedback utterances ( $z = .783$ ;  $M = 13.37$ ) and Level I utterances ( $z = .990$ ;  $M = 16.63$ ) than they did utterances in other categories. The majority of their utterances were at low levels of abstraction (72%). Accordingly, this cluster was labeled the “moderate-input/low-abstraction” cluster. Although their primary focus was on low-level utterances, these parents also challenged their children’s abstract thinking with 28% of their story content related utterances at Levels III and IV.

Cluster 4 consisted of a large group of parents ( $n = 60$ ) who contributed limited numbers of utterances across all categories compared to the remainder of the sample (see Table 1.4 and Figure 1.2). These parents contributed a mean of 17.88 extratextual utterances (although they ranged from 4 to 37) while sharing the unfamiliar book, with two to four utterances for each variable. Their story content related utterances were fairly evenly split between low- (56%) and high-levels (44%) of abstraction. Compared to

parents in the other three clusters, parents in Cluster 4 tended to focus on reading the text when sharing the unfamiliar book, rather than discussing it at length.

In order to further explore the characteristics of this large, fairly homogenous cluster, Hammett et al. (2003) also conducted a separate cluster analysis using data from the 60 parents in Cluster 4. Data for each variable were standardized to a z-score, and cluster analysis was conducted using the same procedures reported for the entire sample (i.e., the Ward method followed by the k-means method). Even though the parents in this subgroup all demonstrated limited numbers of utterances across all utterance types, the re-clustering procedure revealed patterns that resembled those of clusters in the entire sample. Table 1.5 contains the standardized and raw data cluster centers for the four clusters obtained in this sub-sample and Figure 1.3 shows the pattern revealed. In this re-clustering, Sub-cluster 1 ( $n = 13$ ) evidenced relatively high numbers of print and book convention utterances ( $z = 1.170$ ) and Sub-cluster 2 ( $n = 4$ ) evidenced relatively high numbers of Level IV utterances ( $z = 2.347$ ) compared to other parents in this sub-sample. Sub-cluster 3 ( $n = 12$ ) contained parents who contributed primarily story content related utterances at Levels I and II. Finally, the largest sub-cluster (Sub-cluster 4;  $n = 31$ ) contained parents who contributed few utterances across all categories ( $z = -.355$  to  $-.543$ ;  $M = 1.42$  to  $2.55$ ).

Thus, as in the cluster solution for the entire sample, the largest cluster contained parents who contributed the least number of utterances during book sharing. The other three clusters of parents offered relatively more input and exhibited systematic patterns of utterance types that resembled those revealed in the cluster analysis on the entire sample. Although no previous application could be found in the literature of re-clustering a subset of units within a sample, and this procedure was considered exploratory, it did provide a method for determining the validity of the original solution (G.W. Milligan, personal communication, May 30, 2002).

*Post-Cluster Analyses.* Following a cluster analysis, further procedures can be helpful in interpreting the validity of the results. The PDA conducted to help select the appropriate cluster solution was also helpful in confirming the validity of the solution. Specifically, it provided separate hit rates for each cluster. Separate hit rates revealed that units in Cluster 3 (89.4%) and Cluster 4 (88.3%) were accurately assigned to these clusters, given the six predictor variables (see Table 1.6), and they were much higher than would have been obtained by chance alone ( $I = .79$  and  $.83$ , respectively). The hit rates for Cluster 1 (44.4%) and Cluster 2 (37.5%), on the other hand, were much lower, likely due to the higher variability among parents in these clusters and the small cluster sizes. However, the hit rates were still considerably better than chance,  $I = .37$  and  $.30$  respectively (Huberty & Lowman, 2000, P. 558), providing validation of the existence of such patterns.

The best method for validating a cluster analysis is replication in a new sample from the same population (McIntyre & Blashfield, 1980). The reclustering procedure conducted on Cluster 4 did provide one form of replication in the Hammett et al. (2003) study. The results of re-clustering parents in Cluster 4 revealed patterns similar to those found in the entire sample. Thus, despite differences in the overall amounts of extratextual utterances provided, similar patterns across the six variables were revealed. This offers some confirmation of the validity of the cluster solution in the current study (G.W. Milligan, personal communication, May 30, 2002).

*Conclusions.* The purpose of the Hammett et al. (2003) study was to systematically investigate the variability in middle-income parents' extratextual utterances during book sharing. Two important conclusions were made based on the results. First, although parents in this large, fairly homogenous sample did demonstrate considerable variability in their use of extratextual utterances during this activity, much of that variability was captured in the systematic ways in which four subgroups of parents differed from each other. Although previous research has often treated this variability as

though it is entirely random, these findings indicate that interactions during book sharing vary systematically across parents. Second, the most prevalent style of parent book-

Table 1.5

*Cluster Centers Using Standardized Data (z-score) for the Four Clusters Obtained in the Sub-Sample (n = 60)*

Variable	Cluster Centers, Standardized Data			
	1 High print	2 High abstraction	3 Moderate input	4 Limited input
Print/Book	1.17	.27	.05	-.54
Behavior Management & Feedback	.56	1.4	.21	-.50
Level I: Match Perception	-.25	.33	1.57	-.54
Level II: Integrate Perception	-.23	1.03	.82	-.36
Level III: Infer About	.30	1.56	.25	-.43
Level IV: Reason	.14	2.35	-.03	-.35

Variable	Cluster Centers, Raw Data Means			
	1	2	3	4
Print/Book	5.15	3.50	3.08	2.00
Behavior Management & Feedback	5.69	8.25	4.67	2.55
Level I: Match Perception	2.38	4.00	7.42	1.58
Level II: Integrate Perception	2.46	5.50	5.00	2.16
Level III: Infer About	3.00	5.50	2.92	1.58
Level IV: Reason	2.69	8.50	2.25	1.42
	n = 13	n = 4	n = 12	n = 31



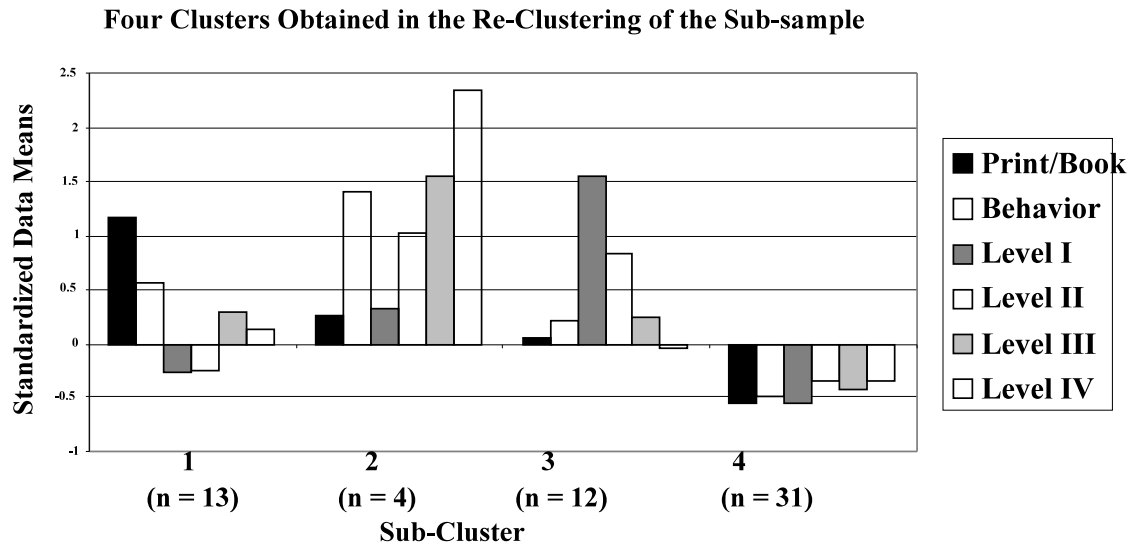


Figure 1.3: Four clusters obtained for the re-clustering of the sub-sample ( $n = 60$ ) based on data standardized to a z-score.

Table 1.6

*The Number of Units Classified by Quadratic External (Leave-One-Out) Predictive Discriminant Analysis (with Hit Rates in Parentheses)*

Actual Cluster	Predicted Cluster				$n$	Prior Probability
	1	2	3	4		
1	<b>4</b>	0	3	2	9	.10
	<b>(44.4)</b>	(0)	(33.3)	(22.2)		
2	1	<b>3</b>	4	0	8	.10
	(12.5)	<b>(37.5)</b>	(50)	(0)		
3	1	0	<b>17</b>	1	19	.50
	(5.3)	(0)	<b>(89.4)</b>	(5.3)		
4	0	0	7	<b>53</b>	60	.30
	(0)	(0)	(11.7)	<b>(88.3)</b>		
Total	6	3	31	56	$n =$ 96	

sharing interactions was characterized by the use of few extratextual utterances across all types during the reading of the story. This style contrasts with the prevailing notion, especially in book sharing intervention research, that this activity typically is highly interactive, with parents offering numerous explanations and scaffolds during book reading in order for the child to benefit from it (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Whitehurst et al., 1988).

Although the design and methods used by Hammett et al. (2003) were more rigorous than the previous three studies described, one criticism of the design is the fact that the styles revealed were based on one occurrence of book sharing using an unfamiliar storybook. Data collected from multiple occasions of book sharing would result in a larger sample of each parents' book sharing interactions, and might improve the stability of the cluster results. Additionally, storybooks represent only one genre available and of interest to preschool children, and styles of adult reading have been shown to differ depending on what genre of book is being read. Thus, the results of Hammett et al. (2003) indicate patterns of extratextual utterances used by parents during storybook reading, and these may or may not hold true if other genres of books were the context for book sharing. Alphabet books and expository books would be of particular interest given the evidence that parents and children engage in greater amounts of talk when sharing them (Pellegrini et al., 1990; Vander Woude, 1998).

#### *Conclusions Across Studies Exploring Patterns in Parents' Extratextual Utterances*

Together these four studies suggest the existence of several patterns of parent extratextual utterances, even when the samples studied were homogenous in terms of sociocultural group and child age. First, there appears to be a group of parents in middle-income samples that offers primarily low-level utterances during book sharing, focusing the child's attention on the pictures and actions of characters. Haden et al. (1996) called these parents describers; cluster 3 in the Hammett et al. (2003) study also exhibited these characteristics. Second, there appears to be a group of parents in middle-income samples

that offers many high-level utterances during book sharing, challenging the child to think and use language at abstract levels. Haden et al. (1996) called these parents comprehenders; both clusters 1 and 2 in the Hammett et al. (2003) study offered relatively large numbers of utterances at high levels of abstraction. Harte (1997) also found these two patterns in a sample that contained a mixture of low- and middle-income families. De Temple and Tabors (1994) did not explore their interactive subgroup sufficiently enough to determine whether these patterns might also exist in their particular low-income population (i.e., teenage mothers receiving public assistance). Together, these studies suggest two patterns that may be prevalent at least in middle-income samples.

Third, these studies have identified relatively small groups of parents who exhibit systematic patterns but who differ from the remainder of the sample. However, these smaller groups appear to be quite different in the studies to date. Haden et al. (1996) found a cluster of parents who demonstrated a collaborator style. Hammett et al. (2003) found two small groups of parents who offered substantially more input during book sharing, differing in the types of utterances used. Finally, De Temple and Tabors (1996) found three smaller groups of parents in their low-income sample who exhibited specific patterns related to how they used the story text (i.e., straight readers, non-readers, recitation readers) and who differed substantially from the majority of the sample. Given evidence that parents similar to those in the recitation group existed in other low-income and culturally diverse samples (e.g., Turkish-Dutch, Maori families in New Zealand), it may be related to sociocultural beliefs and practices.

Each of these small groups of parents was found in only one of these studies on patterns of extratextual utterances, and therefore, there is no evidence to indicate that they represent actual patterns present within the population; that is, they may have been unique to the sample studied. These findings do, however, suggest that in addition to the more prevalent patterns that appear to exist within a population, there are likely a number of small clusters of parent style that may or may not be captured in every sample because

they are less prevalent. For example, Harte (1997) had to omit four parents from their sample of 40, and Hammett et al. (2003) had to omit two parents from their sample of 96. Such outliers might represent parents from a small cluster that exists in the population but was not sufficiently represented in the sample obtained.

In order to confirm or disconfirm the patterns found to date in parents' extratextual utterances during book sharing, there is a need for replication of similar procedures in new samples. In fact, Muma (1993) has suggested that a lack of replication studies in a particular area should make us "question the scholarly base of the field" (p. 928) because replication is imperative for verifying or disconfirming previous research findings. The current literature on the variability found in parents' book sharing interactions that is not related to culture, age and ability, or text factors consists of only the four studies described here; however, differences among their methods limit the conclusions that can be made across samples. For example, the sample studied by De Temple and Tabors (1996) was drawn from a low-income population, specifically teenage mothers receiving welfare, while Haden et al. (1996) and Hammett et al. (2003) studied middle-income samples. Harte (1997) included both low- and middle-income families. Three of the studies used cluster analysis methods, but none specifically followed the same procedures. The Haden et al. (1996) and Harte (1997) studies were flawed or not described sufficiently to allow replication. Hammett et al. (2003), on the other hand, used rigorous cluster analysis procedures, but their results cannot be directly compared to the earlier studies because sample sizes and methods differed. If research is going to validate the existence of patterns of extratextual utterances used by parents during book sharing, future investigations need to be rigorous in design and provide systematic replication of previous research.

#### *Summary and Statement of the Problem*

During book sharing, many parents of preschool children often mediate their children's comprehension and verbal participation by discussing the content and the

illustrations (e.g., Ninio, 1983; Teale & Sulzby, 1987). Their extratextual utterances include those that provide praise or feedback to their children, discuss print and book conventions, and offer comments and questions about the story content that range from concrete to abstract in terms of their cognitive and linguistic demands.

The most prevalent finding in the research on parent interactions during book sharing, however, is large variability in both the number and type of extratextual utterances offered. Some of this variation has been explained by the age and abilities of the child, the sociocultural or socioeconomic status of the family, and text factors such as familiarity or genre. Nonetheless, even studies that have been designed to control for these various factors have revealed substantial variability in the amount of input parents provide and the types of utterances they use.

Despite this variability, researchers have focused on identifying central tendencies, rather than systematically exploring the variability in the number and types of parents' extratextual utterances. Amidst the vast and growing body of research on book sharing are three studies that have employed cluster analyses to begin to systematically describe and analyze the variability beyond that explained by age and abilities of the child, sociocultural group, and text factors (Haden et al., 1996; Hammett et al., 2003; Harte, 1997). These studies indicated that parents varied in systematic ways in terms of the numbers and types of extratextual utterances they provided in the context of storybook sharing. However, because of differences in methods across the three studies, few conclusions can be made beyond a recognition that the variability is likely systematic.

The best method for confirming or disconfirming the findings of the previous research is through replication using the same procedures with new samples (McIntyre & Blashfield, 1980; Muma, 1993). Therefore, the purpose of the current study is to both replicate and extend the cluster analysis study conducted by Hammett et al. (2003). The Hammett et al. (2003) study was chosen for replication for two reasons. First, the reporting of research methods by Haden et al. (1996) and Harte (1997) lacked sufficient

specificity to inform replication studies. Second, based on the information that was provided, it was apparent that both of these studies contained substantial flaws that compromised the validity of their results. Hammett et al. (2003), on the other hand, applied rigorous cluster analysis procedures and provided considerable detail regarding the methods applied at the various stages of data collection and analysis. Thus, the current study will provide information on the validity of the previous cluster solution.

In addition to replicating the methods of Hammett et al. (2003), the current study extended that research to include an investigation of the influence of book genre on parents' style of book sharing interactions by comparing storybook sharing to expository text sharing. Research has revealed that different book genres result in different amounts of interaction and different types of extratextual utterances. When sharing expository texts in particular, adults have been found to provide more extratextual talk (Pellegrini et al., 1990; Vander Woude, 1998), and to use more high-level utterances and metalinguistic verbs (Pellegrini et al., 1990). In addition, because expository texts typically include greater vocabulary diversity than storybooks and more highly salient print features (e.g., print embedded into illustrations and diagrams), they offer a context in which parents might provide definitions and explanations, and make more print references, compared to shared reading using storybooks. To date, parents' styles of interactions during expository book sharing have not been explored.

This research reported in the remainder of this dissertation, therefore, was designed to answer the following two sets of research questions.

#### Replication Questions

1. What patterns of extratextual utterances characterize subgroups of parents during the sharing of one storybook with their preschool child?
2. How do these clusters compare to those found in Hammett et al. (2003) in terms of relative cluster sizes and the types of extratextual utterances prevalent for each cluster?

### Extension Questions

3. How do the clusters obtained for one storybook sharing session compare to those obtained for two storybook sharing sessions?
4. What patterns of extratextual utterances characterize subgroups of parents during expository book sharing with their preschool child?
5. How do the clusters obtained for the expository book sharing sessions compare to those obtained for the storybook sharing sessions?

## CHAPTER 2

### METHOD

The methods used in the current study involved both replicating the Hammett et al. (2003) study in which only storybook sharing was analyzed, and extending that study to include two different genres of books. Three improvements to the previous design were made. First, the sample of parent-child dyads was obtained specifically for the purposes of this study rather than pooling two extant data sets. Second, data were collected with only one parent-child dyad from each family, which eliminated the question regarding the independence of units that existed in the 2003 study. Third, all children were given a test of receptive vocabulary, an expressive language screening, and a hearing screening to ensure that they demonstrated age-appropriate language abilities and adequate hearing.

#### *Participant Sample*

Parent-child dyads were recruited to participate from childcare centers and preschool programs in the Athens and Watkinsville, Georgia, areas. Specifically, a Letter to Parents (Appendix A) describing the study and an Informed Consent form (Appendix B) were sent home to parents. Those who returned the Informed Consent forms were contacted to arrange for participation. Several criteria were established for eligibility for participation in the current study.

#### *Participant Criteria*

The first research question involved replication of a previous study (Hammett et al., 2003) therefore, attempts were made to collect a sample for the current study that was consistent with the characteristics of the 2003 study sample. Families were included in the study if English was the primary language spoken in the home and if the parents' level of education and stated occupations indicated middle- to upper-middle socioeconomic status. In addition, families were only included if at least one parent was of European-American decent because this was consistent with the sample in the original study, and



because differences in book-sharing interactions have been found to be related to ethnicity and race (Anderson-Yockel & Hayens, 1994; Bus et al., 2000; Heath, 1982, 1983). Children were included in the sample if they met the following criteria: (a) aged between 3;4 and 4;2 years; (b) no history of significant hearing loss or current middle ear infection; (c) no history of any syndrome, neurological impairment, or head injury; (d) average to above average performance on two language measures, as described below; and (e) adequate hearing determined using a hearing screening. Information on parent education, language spoken in the home, and criteria (a) through (c) were obtained using a Participant Information Questionnaire (see Appendix C) completed during the Informed Consent process.

*Criteria for parents.* Because socioeconomic status has been found to be a factor in the interactions that take place during book sharing, and the goal of this study was to further explore variation within the middle and upper-middle income families, the parents included in the sample were from a middle- to upper-middle socioeconomic status based on their stated occupations and education levels. This was based on the evidence from research using the Two Factor Index of Social Position developed by Hollingshead and Redlich (1958). They found high correlations ( $r = .975$ ) among judgments of social position and the education level and occupation of the head of the household (Hollingshead, 1971, p. 565). Other studies have also revealed that maternal education is a good predictor of children's language skills (e.g., Bee et al., 1982; Durmazlar, Ozturk, Ural, Karaagaoglu, & Anlar, 1998) and the frequency of book sharing and early literacy activities in the home (Yarosz & Barnett, 2001). In fact, in one study of a sample of 7,566 families with preschool children, maternal education was much more highly associated with book sharing frequency than family income (Yarosz & Barnett, 2001). Education level has also been associated with the amount of language parents provide during conversation with their children (Hart & Risley, 1995; Wells, 1986), which is related to

preschool children's language and emerging literacy skills (Peterson & McCabe, 1992; Watson & Shapiro, 1988).

Parents' education and occupations were both used to determine whether families qualified for inclusion in the current sample. This information was requested on the Participant Information Sheet obtained during the informed consent process. Specifically, parents were asked to check the highest level of education completed from the following list: (a) some high school; (b) high school or GED; (c) some college or technical school; (d) associates degree; (e) bachelors degree; (f) some graduate school; (g) masters degree; (h) some doctoral coursework; (i) Ph.D., Ed.D., or other professional degree. Answers were used to calculate the number of years of education each parent had completed. The Participant Information Sheet also asked for each parent's current occupation or job title, or previous occupation if not currently employed. Each parent's occupation was coded using the major groupings from the Historical International Standard Classification of Occupations (van Leeuwen, Maas, & Miles, 2002). Table 2.1 outlines the major categories. Families were included in the sample if at least one parent's occupation was categorized between 0 and 4, and if both parents had at least some college or technical school.

Table 2.1

*Major Categories from the Historical International Standard Classification of Occupations (van Leeuwen et al., 2002, p. 39-41)*

	Major Category Name	Examples
0-1	Professional, Technical and Related Workers	Architects, engineers, medical professionals, dentist, veterinarian, systems analysts, teachers, journalists
2	Administrative and Managerial Workers	Legislative officials, government administrators, business managers, contractors, sales managers, research and development managers,
3	Clerical and Related Workers	Tax assessors, bookkeepers, bank teller, postal worker, finance clerk, data-processing machine operator, transport conductor, telephone operator, storeroom clerk,

		receptionist
4	Sales Workers	Purchasing agent, insurance agent, real estate agent, salesperson
5	Service Workers	Cook, waiter, bartender, domestic servant, building caretaker, janitor, hairdresser, fire-fighter, police officer, practical aid (pharmacy, veterinary)
6	Agricultural, Animal Husbandry and Forestry Workers, Fishermen and Hunters	Farmer, farm worker, nursery or garden worker, farm equipment operator
7-9	Production Workers, Transport Equipment Operators, Labourers	Logger, forestry worker, fisherman, miner, mill worker, wood worker, weaver, food and beverage processor, dressmaker, stone cutter, electrical equipment assembler, radio and tv repairperson, painter, printer, roofer

*Criteria for children.* To be included in the sample, children in the study needed to demonstrate adequate hearing and average- to above-average language abilities. In order to establish that children met the criteria, a hearing screening was administered during the first session at the frequencies of 1000, 2000, and 4000 Hz. Children passed this screening if they responded reliably at 30 dB HL or less for all frequencies in both ears. Although the ASHA guidelines for hearing screenings (American Speech-Language-Hearing Association Panel on Audiological Assessment, 1997) specify 20 db HL as the passing criterion, 30 db HL was adopted for this investigation due to the ambient noise typical of preschool environments and homes. Some researchers working in these settings have adopted an even less restrictive passing criteria; for example, Plante and Vance (1995) tested four frequencies at 35 dB.

In order to ensure that children were in fact developing language typically, two assessments were conducted. First, children were given a standardized test of receptive vocabulary ability, the *Peabody Picture Vocabulary Test – Third Edition*, Form A (PPVT-III). The PPVT-III is designed to measure a child's receptive vocabulary, or comprehension of spoken words. During this test, the examiner orally presents a word and the child must choose the picture that corresponds to the word from an array of four

pictures. The test was normed on a total of 908 people ranging from 2 years 6 months to over 90 years of age, including 300 children who were in the age range of the participants in the current investigation. Internal consistency for the PPVT-III was assessed using split-half reliability coefficients for persons at each age. These coefficients ranged from .86 to .97, with coefficients for three and four year olds ranging from .92 to .95. Test-retest reliability was determined to be .92 for 67 children between 2;6 and 5;11 given the test a second time approximately one month after the first administration.

Support for the construct validity of the PPVT-III came from evidence that children's raw scores successively increased with age, and that concurrent scores on the PPVT-III and the Wechsler Intelligence Scale for Children, 3<sup>rd</sup> Edition (WISC-III) were highly correlated. Specifically, the PPVT-III was correlated with the WISC-III verbal IQ ( $r = .91$ ) and performance IQ ( $r = .82$ ). In addition, moderately high correlations were found with the Oral and Written Language Scales (OWLS) in a sample of 41 3- to 5-year-olds (OWLS Listening comprehension,  $r = .66$ ; OWLS Oral expression,  $r = .83$ ). Because this test correlates strongly with measures of verbal intelligence and language ability, it served as a measure of general language ability in the current study for the purpose of ensuring that the children included in the sample have average to above-average language abilities. Children with standard scores above one standard deviation below the mean (i.e., greater than or equal to 85) were considered eligible for participation. Thus the sample contained children who demonstrated a range of language abilities but who were developing typically.

The children in the sample also were given a standardized assessment of expressive language, the *Structured Photographic Expressive Language Test – Preschool* (SPELT-P; Werner & Dresheck, 1983). This test was designed as a screening tool for use with children between 3 years, 0 months and 5 years, 11 months old to identify those who might be considered language impaired. The test consists of a set of pictures used to elicit specific syntactic and morphological features of the English language (e.g., present

progressive -ing, past tense -ed, copula is, pronouns he and she, possessive -s). The test was normed on a total of 732 Caucasian children between 3;0 and 5;11 years old who were monolingual English speakers. This included 408 children who were in the age range of the participants in the current investigation. Internal consistency for the SPELT-P was assessed using split-half reliability coefficients comparing the scores of all 732 children's performance on odd vs. even items. These coefficients ranged from .87 to .92 for children between 3;0 and 4;5. Test-retest reliability was determined to be .94 for 48 children in the normative sample who were given the test a second time by the same clinician within two weeks after the first administration. In addition, a test-retest correlation of .92 was attained for a group of 21 children with language disorders who were given the SPELT-P twice 10 days apart. Support for the construct validity of the SPELT-P came from evidence that children's raw scores successively increased with age. In addition, concurrent scores on the SPELT-P and the Preschool Language Scale were highly correlated for 26 children developing typically ( $r = .76$ ) and 16 children with language delays ( $r = .79$ ).

The test manual provided cutoff scores for passing the screening (see Table 2.2); however, no information was given regarding how these cutoff scores were determined nor whether they have predictive validity. A study by Plante and Vance (1995) revealed that the SPELT-P had 83% sensitivity (i.e., 83% accurate in identifying children with specific language impairment (SLI) who were in fact SLI), and 95% specificity (i.e., 95% accurate in identifying children with normal language) when cutoff scores were based on a z-score of -1.39. This represented fair to good accuracy in identifying children four- to six-years old with and without language disorders. The criteria for passing the SPELT-P were revised based on the evidence from the Plante and Vance (1995) study (see Table 2.2). For children in the current study who were 3;4 to 3;5 years old, a score of 13 was accepted as passing, representing a z-score of -1.42. This was the closest whole number score to the z-score of -1.39 suggested by Plante and Vance (1995), and was adopted so

as not to make the criteria for inclusion substantially more stringent for the younger children.

Table 2.2

*Cut-Off Scores Using the SPELT-P Manual vs. Plante & Vance (1995) and the Revised Cut-Off Scores Used in the Current Study.*

	Cut-Off Scores Using SPELT-P Manual	Revised Cut-Off Scores Based on Plante & Vance (1995)	Z-score for the Revised Cut-Off Scores
3;4 to 3;5	11	13	-1.42
3;6 to 3;11	13	16	-1.38
4;0-4;5 <i>Sample Size</i>	16	18	-1.24

In the current study, cluster analysis was applied to explore patterns in parents' book-sharing interactions presented by different subgroups of parents within a socio-economically homogenous sample. The literature does not provide well-established guidelines regarding adequate sample sizes for studies using cluster analysis. Informed judgments about the sample size needed for this study were based on the following information: (a) a power analysis using guidelines for a multivariate analysis of variance (MANOVA); (b) the literature on the effects of various sample sizes on clustering solutions; (c) the previous book sharing research that has used cluster analysis; and (d) the general guidelines available for sample sizes in multivariate statistical procedures.

*Power analysis.* Power analysis procedures were followed to determine what sample size could be considered adequate to answer the questions being asked. The relationships among the following four factors within the research design must be considered: (a) the sample size; (b) the level of risk a researcher is willing to take that she or he might mistakenly reject the null hypothesis (i.e., alpha); (c) the expected effect size given previous research findings; and (d) the power of a statistical test to reject the null (Cohen, 1992). To establish the necessary sample size, one must decide upon the alpha level, determine the effect size expected given past research findings, and choose how much power is needed given the statistical tests being used. Cohen (1990) stresses that

this process involves making informed judgments and compromises in order to establish a study design with specifications that are both “credible and viable” (p. 1310). He also emphasizes that this does not mean mindlessly accepting certain specifications, assuming they are appropriate because they have been used frequently in the past.

Accepting a 5% risk of Type I error (i.e., the variability in parent book sharing interactions is random variation rather than systematic variation), two additional factors had to be considered to determine a sample size for the current study. First, the expected effect size had to be determined. Cluster analysis, however, is not a statistical test resulting in significance and p-values; rather, groups of units are formed that are similar on the variables entered. In essence, cluster analysis creates groups that differ along some dimension(s). Traditional effect size measures based on the mean differences among the resulting groups likely would be quite large; thus, obtaining traditional effect size measures by comparing groups would be inappropriate.

Huberty and Lowman (2000) have suggested using group overlap as an alternative effect size measure, and this is appropriate in the context of cluster analysis. In cluster analysis, a high degree of group overlap would indicate that the clusters are not distinct from one another on the variables entered, signifying that the clustering algorithm simply served to partition a homogenous group of units rather than to identify true clusters exhibiting internal cohesion and external isolation (Everitt, Landau, & Leese, 2001, pp. 6-7). On the other hand, minimal group overlap (i.e., external isolation) would indicate that the clustering algorithm identified groups that were sufficiently isolated from one another and that differed along certain dimensions. Predictive discriminant analysis (PDA) procedures can be used to obtain a rule based on the variables entered, and to determine the rate at which the rule accurately assigned units to the cluster from which they came. This is called the hit rate, and it can serve as a measure of group overlap (Huberty & Lowman, 2000, p. 546). However, a high hit rate cannot be used alone as an effect size measure. Rather, one needs to determine whether the hit rate is actually better than what

would be achieved by chance alone. The improvement over chance index ( $I$ ; Huberty & Lowman, 2000, p. 547), then, can serve as the effect size measure.

In the previous study (Hammett et al., 2003), predictive discriminant analysis was used to obtain hit rates for the four clusters, and these were used to calculate the improvement over chance index values. The results revealed a high degree of group separation. In addition, the hit rates obtained were much greater than those expected by chance alone. Specifically, the hit rate of 87% for the three-cluster solution resulted in approximately 80% fewer errors than expected by chance ( $I=.797$ ); and the hit rate of 80% for the four-cluster solution resulted in approximately 74% fewer errors than chance ( $I=.736$ ). Huberty and Lowman (2000, p. 558) provided rules of thumb for interpreting  $I$  as a measure of effect size, and indicated that values of .35 or more represented a large effect. Based on the values obtained in the previous study ( $I=.797$  and  $.736$ ), a very large effect size was expected in the current study.

The second design feature to consider was the power to reject the null hypothesis. In behavioral research, a power value of .80 is the generally accepted convention (Cohen, 1992). Based on the power analysis for the current study, then, with alpha set at .05, power set at .80, a very large expected effect size, and 6 variables to be entered into the analysis, sample size tables for multivariate analysis of variance (Stevens, 2002) indicated the need for 18 participants per group for a three cluster solution, and 21 participants per group for a four cluster solution. Thus, traditional power analysis suggests that sample sizes of 54 (three-group scenario) to 84 (four-group scenario) would be needed for the current study. The cluster analysis in the original study, however, revealed that group sizes were not equal even in a large sample of 96; in fact, one group was considerably larger than the others containing over 50% of the units, and one group in the three-cluster solution and two groups in the four-cluster solution contained fewer than 10 parents. DeTemple and Tabors (1994) also found small groups of parents within their large ( $n =$



290) sample. Consequently, the smaller sample size of 54 will likely be sufficient for both three- and four-cluster solutions.

*Cluster analysis literature.* The cluster analysis literature also offered some information regarding sample size considerations. Several researchers have explored the effects of sample size on cluster analysis outcomes using Monte Carlo procedures to compare sample sizes ranging from 120 to 1500 or 3000 (Breckenridge, 2000; Finch & Huynh, 2000; Lathrop & Williams, 1989). These studies have demonstrated, not unexpectedly, that the stability and validity of the cluster solutions increase with larger sample sizes. One study, however, revealed that although there were statistically significant improvements in cluster recovery when sample sizes increased, comparisons of the cluster results in the smallest ( $n = 120$ ) and largest ( $n = 240$ ) samples did not suggest that this difference was of practical importance (Breckenridge, 2000). The smallest samples sizes used in these investigations, though, ranged from 120 to 170. While samples in the hundreds, and even the thousands, are common in the fields of biology, zoology, astronomy, and marketing where cluster analysis has been applied frequently, such large samples are less common in psychology and education-related fields. In book-sharing research, due to the labor-intensive transcribing and coding of videotaped data, sample sizes of 100 or more are very difficult to achieve.

One study on samples used in cluster analysis, though, suggests that samples of more than 100 are not imperative for this type of analysis. Milligan, Soon, and Sokol (1983) conducted a Monte Carlo study to investigate how well cluster analysis methods would identify the true cluster structure within a data set when cluster sizes and characteristics were varied. Thus, the underlying cluster structure of the data was known, and they explored how well cluster procedures could identify that structure. Their sample contained a fixed size of 50 units. Their results showed that clustering methods improved as the clusters became smaller in size and as the number of clusters in the solution increased, likely because the clustering algorithm had fewer chances to merge units into

the same cluster in error. Some of their solutions resulted in clusters containing as few as five units. They also found that the cluster analysis improved as the number of variables increased from four to eight because this provided more information with which to discern patterns within the data. However, the same was not true when irrelevant variables were added to the set; these interfered with the cluster analysis by increasing the error variance. This study suggests that other factors, such as the size of individual clusters, the number of clusters found, and the quality of the collective set of variables entered may be more important than overall sample size.

*Previous book sharing research using cluster analysis.* In addition to the advice found in the cluster analysis literature, information regarding adequate sample sizes was found by looking at previous book sharing research that used cluster analysis. Four book sharing studies used cluster analysis to explore parents' or teacher's book-sharing interactions. Three studies relied on sample sizes of less than 50. Specifically, Haden et al. (1996) analyzed 19 mothers; Dickinson and Smith (1994) analyzed 25 teachers; and Reese et al. (2003) analyzed 40 parents. These studies, though, exhibited substantial weaknesses in their research designs (as was discussed in Chapter I); and therefore, they do little to inform future research designs regarding sample size needs.

The fourth study using cluster analysis to explore parent book sharing interactions was the one replicated here (Hammett et al., 2003). The comparatively large sample investigated included 96 parent-child dyads, which was achieved by combining two extant data sets. Two results from that study suggest that samples of approximately 35 to 60 parent-child dyads are capable of revealing the patterns that exist within the data. First, the largest cluster found in the total sample of 96 contained 60 parents who offered comparatively less input during book sharing than parents in the other three clusters. The 60 parents in this particular cluster were then entered into another cluster analysis. The results of this reclustering revealed a cluster solution that was highly similar to that found in the entire sample of 96. Specifically, the four clusters were similar in the types of

utterances used by parents, and their relative amounts of interaction during book sharing. This similarity can be seen in Figure 1.2 and 1.3 in the previous chapter. Thus, the internal structure obtained for the entire sample of 96 was also present in this subgroup of 60, suggesting that the smaller sample of 60 was capable of revealing underlying patterns in the same way the sample of 96 did.

Second, the total sample of 96 included parents from two extant data sets. One of these included mothers and fathers from the same families ( $n = 68$ ) and one included mothers from a different study ( $n = 23$ ). Hammett et al. (2003) conducted cluster analyses on each of these samples prior to pooling the data. These analyses revealed similarities in overall cluster patterns, suggesting that these smaller sample sizes of 23 to 64 were sufficient to reveal underlying patterns. Further, separate analyses comparing mothers and fathers also revealed similar overall cluster solutions in samples of 34. These various cluster analyses conducted on sub-samples in Hammett et al. (2003) indicated that samples of 34 to 60 were capable of identifying underlying patterns of extratextual talk within the data. The primary problem in samples of 28 to 34, however, was that some clusters were extremely small ( $n < 5$ ). Within the field of cluster analysis, some researchers question whether clusters this small represent meaningful patterns within the sample (Everitt, 1980; Morris, Blashfield, & Satz, 1981). Milligan et al. (1983), however, found that smaller clusters (i.e., five to seven units) actually did a better job of revealing the true cluster structure within their sample of 50 compared to larger cluster sizes. To date, two book sharing studies have found clusters with very few parents in them, even when the overall sample sizes included 96 (Hammett et al., 2003) and 290 (De Temple & Tabors, 1994) parents. This suggests that there may be patterns of book sharing interactions that are in fact less prevalent in the population. Replication of such studies will help establish whether parents in these small clusters represent outliers within a data set or actual groups of parents exhibiting certain styles of interaction during book sharing.

*Multivariate sample size guidelines.* Finally, guidelines in the multivariate literature also inform decisions regarding sample size in cluster analysis studies. Two aspects of the research design must be considered: (a) the number of variables entered into the analyses; and (b) the number of groups under investigation. In the case of cluster analysis, it is the number of clusters anticipated that is important. In the context of predictive discriminant analysis, Huberty (1994, p. 96) recommended the formula  $N = 3kp$ , where  $N$  is the total sample size,  $k$  equals the number of groups, and  $p$  equals the number of variables. In the current study, six variables were entered into the cluster analysis and three to four clusters were anticipated based on the previous results (Hammett et al., 2003). Based on this recommendation, a sample size of 54 to 72 was considered adequate.

In summary, the power analysis suggested the need for 54 to 84 parent-child dyads, depending on the number of clusters likely to be revealed. The cluster analysis literature offered limited evidence regarding the use of fewer than 100 units, although one study suggested that the small clusters revealed within a sample of 50 were not problematic. The book sharing research, primarily from the study being replicated here indicated that clusters of 28 to 60 were capable of identifying underlying patterns within the sample. Finally, the guidelines for multivariate research suggested that 54 to 72 parent-child dyads would be adequate. Taken together, these sources of information indicated that a sample size of 54 to 60 parent-child dyads would provide good statistical power (i.e., .80), meet the guidelines for multivariate research for a three- to four-cluster solution, and be sufficient to allow the use of PDA as a follow-up procedure.

#### *Final Sample Characteristics*

Sixty-eight parent-child dyads participated in the study; however, 11 dyads did not meet all the participant criteria and were omitted from the sample. This included three children who failed to meet the criteria on one or both of the language assessments, one child who exhibited hyperlexia and characteristics of high-functioning Asperger's

syndrome, four families who were African-American, one family with parents from Spain and Germany and for whom English was not their native language, one family who spoke primarily Chinese in the home, and one family who did not meet the parent education and occupation requirements.

The final sample of 57 parent-child dyads included 50 mothers and 7 fathers, and 30 girls and 27 boys. The parents had completed a mean of 17.68 years of education, with a range of 13 to 22 years. Table 2.3 contains parents' education levels and occupations, obtained from the Participant Information Sheets. Questionnaire, Seventeen of the parents who did the book sharing were elementary, high school, or special education teachers; four were speech-language pathologists (SLPs); and seven were university professors. Thus, half the parents in this sample were educators of some sort, which might have affected the results. This will be discussed in the results chapter.

The sample included four families in which one of the parents was Hispanic, with three of these reporting that some Spanish is spoken with the child with extended family but that English was the language used in the home. In one family, the mother

Table 2.3

*Parent Education and Occupation Data*

Dyad Number	Mother's Education	Mother Occupation	Father's Education	Father Job
1	16	Research Technician	20	Coordinator of Technology at University
2	16	Elementary teacher	20	Physician
3	16	Elementary teacher	18	Director of Information Systems
4	17	Speech-Language Pathologist	18	Manages Nonprofit Organization
5	16	Stay At Home Mother	16	Vice President of Sales
6	16			
7	20	Professor	16	Webmaster
8	18	Pharmacist	19	
9	17	Speech-Language Pathologist	13	Student/Security Officer

10	18	Physical Therapist	18	Asst Dir Career Services
		Special Education Inclusion		
11	18	Coordinator	13	Store Clerk
				Associate Professor -
13	17	Environmental Engineer	20	Hydrologist
14	18	City Planner	20	University Professor
15	16	Accountant	17	
				Self-employed; Manage
16	18	Elementary Teacher	12	Construction Company
17	17	Elementary Teacher	14	Paramedic
				GIS manager
18	18	Elementary teacher	17	(Information Systems)
19	13	Sales Associate	17	Captain Air Force
				Manager Education
20	16	Apparel Designer	16	Program Specialist
				Foreign Systems
		Speech-Language		Interface/ Interface
21	18	Pathologist	14	Architect
		Clinical Research		
22	14	Coordinator	18	Chemist
				Supervisor/Vet
23	14	Radiologic Technologist	16	Technician
24	16		18	Forester
				Management
				Information Systems -
25	17	Elementary Teacher	18	Instructional technology
26	18	Social Worker	16	Graphic Designer
				Asst. Program Director
				and Morning show host
27	16	Insurance	14	at Radio station
28	18	Research Assistant	20	Asst. Professor
Dyad	Mother's		Father's	
Number	Education		Education	
		Mother Occupation		Father Job
		Human Performance		High school English
29	22	Technologist	17	teacher
				Professor of Veterinary
30	22	Veterinarian	22	Orthopedic surgery
31	22	Veterinarian	22	Veterinarian
		Assistant Direction of an		
32	16	Education Center	16	Sales
				Doctoral student,
		Speech-Language		Elementary school
34	18	Pathologist	19	teacher
35	18	Educational Program	21	Judicial liaison

		Specialist	assistantship/Doctoral student
36	17	Housewife	18 Self-Employed
37	16	Nurse RN	16 Management Associate
39	16	Publisher of Magazine	16 Lumber Company Sales
		Early Intervention	
40	18	Kindergarten teacher	16 Warehouse Manager
41	19	Writer/Housewife	22 Physician
43	16	Pharmacy Associate	17 Elementary Teacher
		Pharmacy Technician/	
44	16	Mother	13 Automotive Technician
45	22	Assistant Professor	19 Doctoral Student
		Research Scientist;	
46	22	University Administrator	18 Policy Analyst
47	22	Assistant professor	17 Elementary Teacher
			Communications
48	13	Sales Representative	16 Supervisor
			HVAC Service
49	13	Grants specialist	14 Technician
50	18	Elementary Teacher	14 Electrician
51	19	Doctoral student; Instructor	16 Graphic Designer
		Speech-Language	
53	18	Pathologist	13 Greenskeeper
			Sales Representative;
54	18	Early Intervention Teacher	16 Self-Employed
		High School Special	
58	18	Education Teacher	22 Professor
		Homemaker; Human	
60	18	Resources Manager	22 High School Teacher
63	22	Program specialist; Reading	16 Teacher
64	16	Pharmacist	22 Associate professor
		Research Laboratory	
65	16	Technician	16 Elementary Teacher
66	16	Massage Therapist	22 Professor
Dyad	Mother's		Father's
Number	Education		Education
		Mother Occupation	Father Job
67	22	Gifted Education Teacher	19 Program Coordinator for Grant
68	22	Assistant Professor	22 Assistant Professor

was Asian and the father Caucasian, with English being the only language spoken at home. Finally, in two families the children were adopted from China, and in one family

the parents were fluent in German and were teaching the child German along with English.

The mean age of the children who participated was 3 years, 8 months, with a range of 3;4 to 4;2. Table 2.4 reveals how the current sample compared to the sample in the Hammett et al. (2003) study. The two samples were highly similar with regard to the mean number of years of parent education, the range of years of parent education, the number of boys and girls in the sample, and the age of the children. The samples differed with respect to the number of mothers and fathers included. While the previous sample contained 34 fathers representing 35% of the sample, the current sample contained only 7 fathers representing 12% of the sample.

The children in the current sample all demonstrated average to above-average language skills. The average PPVT-III score was 112 with a range of 85 to 136 and a standard deviation of 10.5; and the average SPELT-P z-score was -.50 with a range of -1.42 to 2.39 and a standard deviation of .63. Table 2.5 provides details regarding the children's performance on the language assessments. One child (Dyad 25) was included in the sample despite the fact that she would not participate in the language assessments. Her parents and preschool teacher reported that she is very reluctant to talk with people she does not know, and The Temperament Assessment Battery for Children – Revised revealed that she was highly inhibited. Although scores on the two assessments were not obtained, the researcher, a certified speech-language pathologist, observed this child's language interactions with her mother in their home and on the videotapes of their book sharing sessions. Of the 70 utterances she contributed during the book sharing sessions (not including her one-word responses to her mother's direct questions), her mean length of utterance (MLU) was 6.07. During the book sharing interactions, she used 19 of the 25 morphemes tested on the SPELT-P, and 13 was the cutoff for her age. Therefore, this dyad was retained in the sample.



Two children who were included in the final sample did not pass the hearing screening on the first attempt at their preschools, but did pass it when administered again in their homes prior to the first book reading session. One child was not given a hearing screening due to researcher error, but behavioral observation did not suggest any reason for concern.

Table 2.4

*Characteristics of the Current Sample and the Sample Studied by Hammett et al. (2003)*

	Current Sample	Hammett et al. (2003)
Total parent-child dyads	57	96
Fathers	7	34
Mothers	50	62
Mean number of years of education	17.68 Range 13-22	16.77 Range 12-22
Boys	27	36
Girls	30	27
Mean Child Age	3;8	3;7
Dyads containing mother	12%	65%
Dyads containing father	88%	35%
Dyads containing boy	47%	58%
Dyads containing girl	53%	42%

Table 2.5

*Characteristics of Each Parent-Child Dyad in the Current Sample.*

Dyad Number	Parent	Child Gender	Child Age	Child's PPVT-III Standard Score	Child's SPELT-P Z-Score
1	Father	F	4;0	93	-1.38
2	Mother	F	3;6	85	-0.33
3	Mother	F	4;1	124	0.04
4	Mother	M	3;11	113	-0.07
5	Mother	F	3;10	101	-0.33
6	Mother	M	3;8	112	-1.38
7	Mother	M	3;4	132	0.54
8	Mother	M	3;4	114	-0.55
9	Mother	M	3;5	106	-0.55
10	Mother	F	3;5	110	-0.33

11	Mother	F	3;8	106	-0.85
13	Father	F	3;10	105	0.97
14	Mother	M	3;9	118	0.71
15	Mother	M	3;4	105	-1.42
16	Mother	M	3;10	111	-0.85
17	Mother	M	3;8	106	-0.85
18	Mother	F	3;5	110	0.32
19	Mother	M	3;4	118	-1.42
20	Mother	M	3;8	111	-0.85
21	Mother	F	3;4	119	-0.55
22	Mother	F	3;4	113	-0.76
23	Mother	M	3;6	107	-0.98
24	Mother	M	3;5	130	-0.11
25	Mother	F	3;5		-0.11
26	Mother	M	3;10	121	0.45
27	Mother	M	3;8	98	-1.38
28	Mother	F	4;1	121	-1.24
29	Father	F	3;11	107	-0.59
30	Mother	F	3;10	107	0.19
31	Mother	F	3;10	114	-0.59
32	Mother	F	3;6	105	-1.38
34	Father	M	3;6	110	-0.33
35	Mother	F	3;9	107	0.19
36	Mother	F	3;11	111	-0.59
37	Mother	M	3;7	107	-0.59
39	Mother	M	4;0	113	-1.24
40	Mother	M	4;1	128	0.04
41	Mother	M	3;6	115	-0.85
43	Mother	M	4;2	94	-1.24
Dyad Number	Parent	Child Gender	Child Age	Child's PPVT-III Standard Score	Child's SPELT-P Z- Score
44	Mother	M	3;6	113	-1.11
45	Mother	F	3;4	136	0.54
46	Mother	F	3;6	101	0.19
47	Mother	M	3;10	121	-0.33
48	Mother	F	3;11	124	0.19
49	Mother	F	3;9	117	-0.59
50	Father	M	4;2	118	0.04
51	Mother	M	3;7	101	-1.11
53	Mother	F	3;10	114	-0.85
54	Mother	M	3;4	112	-0.98
58	Mother	F	3;9	111	-0.07

60	Mother	F	3;9	132	0.19
63	Mother	F	3;11	106	-1.38
64	Mother	F	4;0	128	-0.92
65	Father	F	3;7	107	-0.85
66	Father	F	4;1	122	-0.60
67	Mother	F	4;1	117	0.37
68	Mother	M	3;4	89	-0.98

PPVT-III: *Peabody Picture Vocabulary Test (3<sup>rd</sup> edition)*

SPELT-P: *Structured Photographic Elicited Language Test – Preschool*

### *Data Collection Procedures*

#### *Parent Questionnaire*

Each parent who participated in the study completed a questionnaire developed by the researcher (see Appendix D). This questionnaire was designed to obtain information on the family's book sharing practices and their beliefs regarding emergent literacy learning. It was given to the parent during the first book sharing session to be completed prior to the second book sharing session.

#### *Child Assessment*

As described earlier, in order to be included in the sample, the children needed to demonstrate average to above-average language abilities. The current researcher, a certified speech-language pathologist, assessed children's language abilities prior to their participation in the book sharing. Two assessments were administered: (a) the *Peabody Picture Vocabulary Test – Third Edition*, Form A (PPVT-III; Dunn & Dunn, 1997); and (b) and the *Structured Photographic Expressive Language Test – Preschool* (SPELT-P; Werner & Dresheck, 1983). The order of the language assessments was counterbalanced, with children in even numbered dyads completing the SPELT-P first, and children in the odd numbered dyads completing the PPVT-III first. A hearing screening was administered bilaterally at 1000, 2000, and 4000 Hz during the same session using a Grason-Stadler, Inc., Model 1717 audiometer (GSI17).

These assessments were administered during one session of 25 to 35 minutes. For 23 children, these assessments were conducted at the child's preschool or daycare center; for 32 children, they were administered at the child's home. One child was assessed at the UGA Speech and Hearing clinic and one child was assessed at her mother's work where she spends time each morning before going to preschool. All children were asked whether they would be willing to "help me with my homework." A few children refused at their school sites, typically because they were engaged in play and occasionally because they were unsure about working with a stranger. In these cases, arrangements were made to conduct the assessments at the child's home.

### *Book Sharing Procedures*

Each parent-child dyad was videotaped sharing books during two sessions on two different days. In all cases, the child and parent settled themselves onto a couch, chair, the child's bed, or on a few occasions the floor. During each session, the parent shared two unfamiliar books with his or her child, one storybook and one expository book, resulting in a total of four books read by each dyad. In order to find unfamiliar books, parents and children were shown an array of 10 books and asked to identify any that were familiar to them; these were removed from the choices. The child was then asked to choose one expository book and one storybook to read, capitalizing on the child's interest and motivation to enhance cooperation during the session. During the second session, parents and children read the books that were matched with the original ones chosen (the matching procedures are discussed below), and typically the child had at least two books from which to choose.

The order of reading the story and expository books during the first session was reversed for the second session. This ensured that the order did not consistently and systematically affect the interactions that took place during one particular type of book. In addition, the order of reading the story and expository books was counterbalanced across the sample. That is, 34 parent-child dyads read the storybook first during the first session

and the expository book first during the second session; and 23 parent-child dyads read the expository book first during the first session and the storybook first during the second session. Eight of the eleven dyads who were not eligible for the study for various reasons read the expository book first during their first session. This resulted in more parent-child dyads reading the storybook first during the first book sharing session. Parents were given the order in which to read the books; however, on two occasions the parent did not read the books in the requested order, one reading the storybook first during both sessions, one reading the expository book first during both sessions. Sessions most often took place 7 days apart, but ranged from 1 to 35 days apart ( $M = 7.5$  days;  $SD = 8.0$ ).

Parents were told that the current researcher was interested in what takes place when parents and children share two kinds of books together, storybooks and informational books. Further details regarding what the researcher was investigating were withheld until after parents and children had completed the second session of book sharing. The specific instructions given to the parent were to “share the books just like you typically would when looking at these kinds of books at home.” The researcher went to another room in the house while the parent and child shared the books.

*Storybooks.* In the 2003 study, the researchers provided four storybooks so that parents and children could select one that was unfamiliar to both participants. The books included *Mooncake* (Asch, 1983), *Moongame* (Asch, 1984), *Bear's Bargain* (Asch, 1985a), and *Bear Shadow* (Asch, 1985b), and they were chosen because they were similar in length (i.e., 28 pages each; 38 to 50 sentences), story content (i.e., all adventures of the same bear), complexity of the language (i.e., mean length of sentences ranged from 11.62 to 12.79 morphemes), and vocabulary diversity (i.e., VOCD values ranging from 62 to 77). One major goal of the current investigation was to replicate the original study; for that reason, all the participants read at least one of these four stories during one of the book sharing sessions.

One criticism of much of the book sharing literature is that findings are most often based on only one session of book sharing between parent and child. Although there is some evidence that parents' book sharing styles remain consistent over time (Reese et al., 2003; van Kleeck, Vander Woude, McDonald, & Vigil, in preparation), multiple book sharing sessions for each dyad are beneficial to capture a more representative sample of parents' typical book sharing behaviors. Accordingly, parent-child dyads in the current study participated in two sessions that took place on different days, sharing one unfamiliar storybook and one unfamiliar expository book during each session, and this strengthened the design compared to the previous study.

The two book sharing sessions, however, needed to provide similar opportunities for interaction across all dyads. Therefore, text factors were analyzed by obtaining the following data for each book using the Computerized Language Analysis programs (CLAN, MacWhinney, 1995): (a) number of sentences; (b) the mean length of the sentences in morphemes; (c) the number of different words (NDW); and (d) the score on a measure of vocabulary diversity (VOCD). This information for the storybooks is provided in Table 2.6. In addition to the four books in the original study, two other books by Frank Asch, *Moondance* and *Moonbear's Dream*, were included in the set from which parents and children could choose. This was necessary to ensure that every dyad could find two storybooks that were unfamiliar to them. In fact, all dyads were able to find two storybooks that were unfamiliar to them.

Table 2.6

*Descriptive Data for Each Storybook using the Computerized Language Analysis Programs (CLAN, MacWhinney, 1995)*

Book Title	Number of Pages	Number of Sentences	Mean Length of Sentences	VOCD
Bear Shadow	28	44	12.21	63
Bear's Bargain	28	38	12.80	68
Mooncake	28	50	11.62	77
Moongame	28	40	11.68	62

Moonbear's Dream	28	57	9.25	91
Moondance	28	58	10.22	53

VOCD = Vocabulary diversity

Using the data on each book, four pairs of books were established (see Table 2.7) so that the combined book sharing sessions for each parent-child dyad would be equivalent. Thus, the pairs of books were similar with respect to the following: (a) the mean number of sentences read across two books (ranging from 45 to 50); (b) the mean syntactic complexity of the books (MLU = 10.46 to 11.65); and (c) the mean vocabulary diversity contained in the books (VOCD = 60.94 to 76.84; NDW = 177.5 to 192.5). In addition, all the books revolved around adventures of the same main characters, Bear and Little Bird, and included concepts that would potentially require some explanation from parents for a preschool child to understand. Therefore, differences revealed in parents' patterns of extratextual utterances during book sharing are not attributable to substantial variations in the texts shared.

Table 2.7

*Descriptive Data for the Sets of Two Storybooks*

Combined Sets of Two Books	Mean # of Sentences	Mean Length of Sentences	Mean VOCD	Mean NDW
Bear Shadow Moonbear's Dream	50.5	10.73	77	192.5
Bear's Bargain Moondance	48	11.51	61	177.5
Mooncake Moongame	45	11.65	69	187
Moongame Moonbear's Dream	48.5	10.46	76	178

VOCD = Vocabulary diversity

NDW = Number of different words

*Expository books.* Although the most common genre of text shared with preschool-age children is storybooks, research has demonstrated that genre does influence the interactions that take place (e.g., Bus & van IJzendoorn, 1988; Smolkin et al., 1992;

van Kleeck, 1998a; Vander Woude, 1998). Specifically, when parents share expository books, they tend to offer greater numbers of extratextual utterances, and particularly utterances at high levels of abstraction as they seek to explain aspects of the book beyond what is provided by the text (Pellegrini et al., 1990; Vander Woude, 1998). While the original cluster analysis study analyzed parents' patterns of extratextual talk during the sharing of storybooks, the current study sought to extend that research by conducting similar analyses on interactions that took place during expository book sharing.

As with the storybooks used in this study, it was important to ensure that the two expository books shared by each dyad were judged to be equivalent with regard to length and complexity. In addition, in order to compare the results of the expository condition to the storybook condition, the length and complexity of the expository book sets needed to match the length and complexity of the storybook sets.

Four books by Gail Gibbons (1996a; 1996b; 1999a; 1999b) were chosen for use in the expository text condition. They were selected for the following reasons: (a) each contained text of similar syntactic complexity (i.e., mean length of sentences in morphemes) to the storybooks; (b) the topics were likely of interest to preschoolers (e.g., pigs, bats, dogs, cats); (c) the pictures were engaging and comparable across books; (d) similar types of information were presented in each book and followed a similar sequence of presentation; and (e) the number of different words and VOCD scores were similar across the four expository books.

Two differences existed between the expository books and the storybooks. First, although the expository books each contained similar numbers of pages as the storybooks, they each contained 70 to 90 sentences. Because this was considerably longer than those in the storybook condition, approximately 30 to 40 sentences were deleted from each Gail Gibbons book. Because of the informational nature of expository books, making omissions of sentences was possible without detrimental effects on the flow of the text. Furthermore, in these particular Gail Gibbons books, each text contained similar types of



information presented in a similar sequence. Thus, it was possible to omit similar types of information from every book. All sentences that were embedded within the illustrations were retained; and careful attention was given to the contents of the illustrations when selecting sentences to omit so that the final texts contained sufficient information to understand the illustrations. Finally, the print in these books is located at the bottom of each page, making it easy to alter the text block without affecting the illustrations.

Two adults who had nine or more years of experience as classroom teachers with preschool-age children read these altered texts and judged whether the alterations created books that were consistent with typical children's expository books. They were able to compare the altered text to the original text, and they identified places in the altered texts that might be confusing. Three such places were identified and different choices were made. This process resulted in four expository books that were appropriate in length for children ages 3;6 to 4;1, and consistent with the storybooks used in the study. Each altered text was read with a child between 3;3 and 3;11 years old to assess their practicality with this age group. No difficulties were noted during these readings.

The second difference between the storybooks and expository books revolved around the vocabulary diversity contained in each. The expository books, even in their shortened form, contained larger numbers of different words and higher vocabulary diversity scores compared to the storybooks. Higher diversity of vocabulary is a characteristic of expository text, and therefore, any attempts to find or create expository books that would be comparable to the storybooks on this variable would result in texts unlike those found in the children's literature. Therefore, no attempt was made to match the number of different words or the vocabulary diversity scores in the expository book condition and the storybook condition.

As with the storybooks, CLAN was used to analyze the six altered expository books. These data are provided for each book in Table 2.8. These books were placed in pairs so that the combined book sharing sessions were based on similar mean number of

sentences read and similar mean syntactic complexity based on mean length of sentences in morphemes. The data for these pairs of books are provided in Table 2.9. Equivalent sets of books allowed parents and children to select books that were both unfamiliar to them and also of interest to the child. Although several parents mentioned being familiar with books by Gail Gibbons (all were educators), only two parents had previously read any of the expository texts chosen used in this study, and both able to find two that were unfamiliar.

Table 2.8

*Descriptive Data for Each Expository Book using the Computerized Language Analysis Programs (CLAN, MacWhinney, 1995)*

Book Title	Number of Pages	Number of Sentences	Mean Length of Sentences	VOCD
Pigs	24	45	12.29	82
Dogs	25	53	12.30	92
Cats	24	58	12.74	103
Bats	25	53	12.66	104

VOCD = Vocabulary diversity

Table 2.9

*Descriptive Data for the Sets of Two Expository Books*

Combined Sets of Two Books	Mean Number of Sentences	Mean Length of Sentences	Mean VOCD	Mean NDW
Pigs Dogs	49	12.30	87	234
Pigs Bats	49	12.47	93	247
Pigs Cats	52	12.52	92	248
Dogs Bats	53	12.48	98	256

VOCD = Vocabulary diversity

NDW = Number of different words

*Video and audio recording procedures.* All book-sharing episodes were recorded using a high-quality Sony Mini Digital Video (miniDV) camera (DCR-TRV900) mounted on a tripod. The camera was set up approximately 8 to 12 feet away from the parent and child in order to minimize attention on the camera, and the zoom feature was used to capture the parent, child, and their immediate surroundings (e.g., the chair or bed). If the child was likely to move about, a slightly wider angle was captured (e.g., the entire couch). The intent was to ensure that the parent and child would be visible throughout the book sharing session, and this was achieved for all dyads with momentary exceptions (e.g., when a child walked away to see where the researcher had gone).

In order to obtain the highest quality audio possible, an external Crown Soundgrabber II pressure zone microphone (PZM or table microphone) was used to input audio into the camera through a single channel (i.e., mono). It was placed on a surface approximately 2 to 3 feet from the parent and child. This microphone was preferable over an external lapel microphone because it was out of the child's immediate reach, reducing the chances the child would play with it and create noise, and it did not need to be attached directly to the parent or child, minimizing the intrusiveness of the equipment. Problems with lapel microphones had been noted in earlier book sharing studies (Hammett, Bradley et al., 2002; Vander Woude & Koole, 2000; Vander Woude, van Kleeck, & Hammett, 2002) and, therefore, the table microphone was determined to be preferable.

This combination of equipment and setup configuration was piloted with one adult-child dyad prior to data collection. It was determined to be feasible with parents and children of the targeted age and resulted in excellent audio and video quality in a moderately quiet home environment.

*Preparation of video data for analysis.* The current study involved a large quantity of videotaped data. Current video technologies provide methods for capturing and compressing digital video into computer formats that are reasonable in size, which

substantially increases the ease of management and access to the data. These technologies made it possible to manage the relatively large amount of video and audio data collected in this study.

All book-sharing sessions were captured into an iMac computer (1 Gz PowerPC G4) by connecting the camera to the computer through a firewire connection and using iMovie software (produced by Apple). The movies were then compressed using the Sorenson Codec in iMovie into a QuickTime movie (i.e., .mov) format at a high level of quality (with options of least, low, medium, high, or best). The following video compression settings were applied: (a) data rate of 29.97 frames per second; (b) one key frame every second; and (c) viewer size of 320 by 240 pixels. The mono audio remained uncompressed with a sampling rate of 44.1 kHz and 16-bit depth.

These procedures resulted in movies with high-quality audio and video that were also small enough to be burned onto CDs. QuickTime movies can be played on computers with both Macintosh and Windows operating systems using the latest open source version of QuickTime 6.0, and they can be edited easily using QuickTime Pro 6.0 software (an upgrade for purchase through Apple). This allowed considerable flexibility during the process of transcribing and coding, and it also enable the researcher to provide a CD to each parent that could be viewed regardless of the type of computer the family used. In addition, this format will allow flexibility in the future, with the ability to convert current files easily into .avi files without requiring recompression, which would result in a loss of quality. Although this was not necessary for the current investigation, it ensures that these data will be compatible with other software programs in the future that might be useful for additional analysis or presentation.

### *Transcription and Coding*

#### *Software Applications*

Parents' extratextual interactions that occurred immediately before, during, and after book sharing were transcribed and coded using Transcriber software, an open source

software application (<http://www ldc.upenn.edu/mirror/Transcriber>) designed to handle transcription and analysis of linguistic data. Transcriber software was used to parse the audio stream of each book-sharing episode into utterances and link the transcription of each utterance to the audio. Thus, the researcher could immediately access any utterance in the sample, viewing the transcription and listening to the audio segment. Codes were added to the end of each parent utterance in the Transcriber file while watching the QuickTime movies. The coding system is described in detail below. It is likely that this technology helped in achieving excellent interrater agreement in this study.

Transcriber software was chosen over other available programs for two reasons. First, the program is user-friendly and considerably reduces the time required to transcribe linguistic data. The first step in the process is segmenting the audio stream into utterance-length units, allowing the person transcribing to listen to each utterance any number of times while transcribing before moving on to the next utterance, all by using simple key strokes that allow the hands to remain on the keyboard. Klee, Membrino, and May (1991) estimated that each minute of a conversation between a preschool child and an adult takes approximately five to seven minutes to transcribe using traditional methods of listening to the sample on a tape player while typing. Using Transcriber, the students helping with this research were able to transcribe one minute of interaction between a parent and child in approximately 4 minutes.

Second, the program has an enormous amount of flexibility. The transcripts are saved in extensible markup language (XML), a highly versatile computer language. Using simple computer programs, XML can be transformed into any number of formats (e.g., html table, text file), searched for specific codes or words, or exported to other programs. For example, Transcriber can export files as CHAT files, the format required by CLAN software, making it easy in the future to analyze the book sharing sessions using CLAN (e.g., to obtain mean length of utterances, vocabulary diversity). For this investigation, an XML stylesheet written by the author was used to view transcripts in a table format. The

researcher paid a computer programmer to write a program in Python (a computer language) that would search each XML file, tally the number of each code found within the file, and input those numbers into an Excel 11.0 spreadsheet. This allowed all data from the 228 book-sharing episodes to be calculated and entered in a matter of seconds, and eliminated the data entry errors that would result from hand counting and hand entering data. In order to confirm the accuracy of this program, data from five parent-child dyads was hand counted and compared to the output of the computer program.

The one drawback to Transcriber is that it currently does not open video; it relies solely on the audio track of each book-sharing episode. Therefore, it was necessary to open the QuickTime movies and the Transcriber program simultaneously in order to use the video during the process of coding. This was a minor inconvenience and was offset by the enormous timesaving and data formatting benefits of using the Transcriber program.

#### *Transcription Procedures*

Five undergraduate students and one graduate student were recruited to assist with transcription and coding. All the students were trained to use the Transcriber software program, and two were trained to apply the coding system. Students transcribed all of the talk that occurred outside of the text reading using the audio files loaded in Transcriber. Segments of the audio stream that included text reading were not transcribed; however, they were labeled as text reading and could be listened to. All extratextual utterances spoken by the parents and children were transcribed using English orthography so that the content of the utterances could be coded. The Transcriber software connects each utterance with the corresponding segment of the audio stream such that anyone working with the transcript also has constant access to the actual recording. Thus, there was no need to mark intonation or prosodic features of the utterances; they could be heard in the recording. Copies of all the books were given to the students to refer to during transcription and coding.

Utterances were segmented using the guidelines provided by Owens (1999) for the preparation of language samples. He defined an utterance as “a complete thought that is divided from other utterances by sentence boundaries, pauses, and/or a drop in the voice” (p. 140). An utterance was only allowed to contain one coordinating conjunction (including for, and, nor, but, or, yet, so); portions of talk that contained more than one of these were segmented into multiple utterances at the most logical place based on the content of the thought. This occurred only occasionally in the parents’ extratextual talk. False starts and abandoned utterances were transcribed but not counted as extratextual utterances.

The duration of each book-sharing episode in seconds was calculated using the Transcriber transcript time codes. The duration of the session was calculated from the beginning of the first coded utterance to the end of the last coded utterance, subtracting any segments during which the parent and child left the room or were engaged in another activity lasting more than 5 seconds (e.g., attending to a sibling, nose blowing, getting child back to look at the book). The need to subtract time segments occurred infrequently.

#### *Coding Procedures*

All utterances included in the book sharing interactions were coded based on their content in the same manner as in the previous study (see Figure 1.1). Coding began when the parent and child began looking at and talking about the book itself. Coding ended with the last utterance that included talk about the book. Thus, talk that occurred before and after the book sharing that was not related to it was not included in the time calculated for the duration of the episode or coded for its content. For example, talk with the researcher, interactions about where to sit, and talk with siblings that occurred before or after the book sharing were not coded.

*Coding categories.* The coding system involved three main categories: (a) print and book convention utterances; (b) feedback and acknowledgment utterances; and (c) story content related utterances. Utterances coded as story content related were coded

further into four levels of abstraction (Levels 1, 2, 3, 4) based on the van Kleeck et al. (1997) adaptation of the levels of abstraction created by Blank, Rose, and Berlin (1978a; 1978b). This created a total of six mutually exclusive categories: (1) print and book convention utterances (print/book); (2) behavior management and acknowledgment utterances (feedback); (3) Level 1 utterances; (4) Level 2 utterances; (5) Level 3 utterances; and (6) Level 4 utterances. Utterances that served to manage children's behavior that were not related to the story content and utterances spoken to another adult or child were coded "other" and excluded from the data analysis. Utterances that were unintelligible or that would not fit into the system were coded "none" and were also excluded from the data analysis. However, the coding system was capable of handling virtually all the utterances contained in the transcripts; less than 1% of the 19,168 utterances (i.e., 29 or .2%) in the transcripts were coded "none." With this coding system, analysis was focused on the extratextual talk that related to the book reading. This was consistent with the coding procedures for the previous study. See Appendix E for coding category descriptions and examples.

*Procedures for coding agreement.* The students working on the current research learned to apply the coding system during a previous semester when they assisted with a different investigation. However, those who would be helping with coding met as a group with the researcher to review the procedures for coding. During this meeting, one book sharing session was coded as a group and each decision was discussed to reach agreement regarding the parameters of each coding category. The researcher and students conducted additional coding independently and met on two more occasions to review how the coding system was being applied and how to deal with particularly difficult utterances in order to achieve an acceptable level of interrater agreement. The procedures outlined by Bakeman and Quera (1997) were used to calculate point-by-point agreement (i.e., observed agreement) and the proportion of agreement expected by chance. These were entered into the formula for the Cohen's kappa statistic (Cohen, 1960), which corrects for



the agreement expected simply by chance. Bakeman and Gottman (1997, p. 66) suggest that kappas less than .70 be considered “with concern,” although they add that this is simply an informal rule of thumb. They refer to Fleiss (1981) who indicated that kappas between .40 and .60 are fair, kappas between .60 and .75 are good, and kappas above .75 are excellent. Thus, kappas above .70 would represent good to excellent agreement and were considered acceptable for the coding system in the current study.

Acceptable interrater agreement was achieved and documented through a four-part process. First, following the initial lab meeting during which the coding system was taught, practiced, and discussed, each coder independently completed coded four transcripts. These were then discussed during a group lab meeting. Discussion during this meeting led to a more thorough understanding of each code and decisions were made regarding how to deal with utterances that were not given the same code by all coders. Second, each student coded four additional transcripts independently, and these were then compared to the researcher’s coding of the same transcripts. The researcher met individually with each student, during which disagreements were identified and resolved through discussion. The students had considerable input during the first and second stage, identifying areas of confusion and asserting their opinions regarding how various utterances should be coded. This resulted in clarifications to the coding system and in some cases modifications to the categories. Third, each student coded an additional four transcripts with the final coding system (i.e., with all the final modifications), and Cohen’s kappas were calculated with the researcher’s coded transcripts. Table 2.10 provides the levels of agreement achieved at stage three in this process. Kappas above .70 were achieved by all coders. Student 2 did not continue to do coding; students 1 and 3 and the researcher coded the remaining book sharing sessions in the sample. Of the 228 transcripts coded, 164 (72%) were reviewed and checked by a second coder who corrected obvious errors, and identified disagreements, and these were resolved.

Table 2.10

*Point-by-Point Agreement and Kappa Statistics for Each Coder for Each Genre of Book.*

	Student 1 (BA)		Student 2 (CF)		Student 3 (AB)	
	Point-by-Point	Kappa	Point-by-Point	Kappa	Point-by-Point	Kappa
Stage 3 Expository	.79	.73	.81	.77	.84	.81
Stage 3 Storybook	.84	.81	.80	.75	.81	.77

Finally, 11% of the book sharing sessions from the entire sample (i.e., 12 storybook sessions and 12 expository book sessions) were randomly selected and coded independently by student 1 and the researcher. Interrater agreement was calculated to establish that acceptable levels of agreement were achieved across the sample. The 12 storybook sessions revealed a kappa of .76, and the 12 expository book sessions revealed a kappa of .70. Both of these were considered acceptable given the criteria outlined above.

#### *Cluster Analysis Methods*

##### *Cluster Analyses*

As explained earlier, cluster analysis methods provide a means for revealing patterns that exist on multiple variables obtained on each parent. Two cluster analyses were conducted to identify whether systematic patterns of parents' extratextual utterances existed within the data from the storybook condition (research question 1) and the expository condition (research question 3). However, there are many methods of conducting cluster analysis, and therefore, certain decisions had to be made regarding the most appropriate methods prior to conducting the analyses.

*Similarity measure.* In cluster analysis, units (i.e., parents in this study) are grouped based on some measure of similarity. Correlation coefficients and distance measures are the two most common similarity measures used in behavioral research, and the choice affects the cluster solution. Correlation coefficients cluster units based on the

shape, or the pattern of highs and lows across variables, and are not sensitive to the differences in magnitude on those variables (Aldenderfer & Blashfield, 1984, p. 22-23). Alternatively, distance measures cluster units based on the similarity in magnitudes across multiple variables, and they are sensitive to shape as well as elevation (i.e., magnitude or mean levels of performance across the variables) and scatter (i.e., standard deviations across measures; Aldenderfer & Blashfield, 1984, p. 22-23; Speece, 1990, p. 204). Of interest in the current study was both how parents varied with regard to their patterns of utterance types (shape) and also how they differed in terms of the numbers of utterances in each coding category (elevation). Therefore, the Euclidean distance similarity measure was applied.

Distance measures are affected by differences in standard deviations among variables (Hair et al., 1998, p. 489) and, therefore, a cluster analysis was conducted first using raw data for the six variables, and a second time using data standardized to a z-score (as suggested by Aldenderfer & Blashfield, 1984, p. 20). In the original study, these both resulted in similar cluster solutions, but the standardized option was chosen because comparisons within and across clusters on different variables were easier to make, enabling better interpretations of the patterns present (see Hair et al., 1998, p. 489). In the current study, both raw data means and standardized data means for the cluster solutions were examined in order to fully understand the results.

*Partitioning method.* Cluster analysis can be conducted using a variety of hierarchical or iterative partitioning methods. Several researchers recommend using a combination of methods in order to capitalize on the strengths of each (Milligan, 1980, p. 339). The Ward hierarchical method seeks to minimize the variance within the clusters and it provides good discriminatory power (Aldenderfer & Blashfield, 1984, p. 43; Morris, Blashfield, & Satz, 1983, p. 325; Speece, 1990, p. 207). It is also considered the best method when there is the possibility of overlap among clusters (Milligan & Cooper, 1987, p. 344), which was likely in the current study.

Though the Ward method is useful for identifying a logical cluster solution, it also has two weaknesses in the context of this study. First, it does not allow reassignment of units after their original placement in a cluster. Thus, a unit remains in the cluster to which it was originally assigned even if the characteristics of that cluster change substantially with the addition of more units. Thus, after the cluster analysis is complete, the unit might fit better into a different cluster, but the Ward method does not reassign it. Second, the Ward method is particularly sensitive to differences in elevation (Morey, Blashfield, & Skinner, 1983; Morris et al., 1983, p. 325). In the original study, parents varied considerably in the number of utterances they used (i.e., large differences in elevation). Therefore, the Ward method had the potential to bias the results in favor of elevation, and limit the influence of the standard deviations across variables (scatter) or the patterns of highs and lows across variables (shape).

The k-means iterative partitioning method, on the other hand, makes multiple passes through the data, assigning units to the cluster with the nearest centroid or cluster center, meaning the cluster with the most similar set of means for the six variables. These cluster centers are recomputed after each pass through the data, and the process continues until no units change cluster assignments. The k-means method eliminates the major drawback of hierarchical methods, which do not allow reassignment of units (Aldenderfer & Blashfield, 1984, p. 46). In order to capitalize on the strengths of both of these methods, a two-step process for cluster analysis has been recommended (Milligan, 1980; Morris et al., 1983) and was applied in the current study: (a) a Ward analysis for its power to identify cluster solutions that may be interesting to explore; and (b) a k-means analysis to improve the accuracy of the assignment of units to clusters. Both of these were conducted using the CLASSIFY program in SPSS version 11.0.

*Procedures to choose a cluster solution.* Although cluster analysis is designed to reveal multiple homogenous groups within a sample, determining the optimal number of clusters in a solution is not self-evident from the analysis. Three procedures were used to

identify the most valid and meaningful solutions. First, a Ward analysis was used to generate a dendrogram, that is, a tree graph that provides a visual representation of hierarchical clustering procedures (for examples see Aldenderfer & Blashfield, 1984, p. 55; Hair et al., 1998, p. 507; Hair & Black, 2000, p. 177). Visual inspection of the dendrogram was used to reveal the number of clusters that may be of interest. Second, the cubic clustering criterion (CCC) was obtained using the CLUSTER program in SAS. The CCC indicates the amount of variance in the sample that is explained by each cluster solution, making it possible to determine the point at which additional clusters do not add to the explanation of the variance within the sample.

A third procedure, predictive discriminant analysis (PDA; using SAS 8.0 DISCRIM or SPSS DISCRIMINANT), was used to explore cluster solutions that the Ward analysis and the CCC indicated might be appropriate (see Huberty, 1994, chap. V). PDA allowed exploration of the hit rates associated with each cluster solution, which were used to calculate the improvement-over-chance index (Huberty, 1994, p. 107) and provided evidence for which cluster solution was best. The application of PDA required consideration of two issues: the type of rule used and the designation of prior probabilities of group membership. First, based on the original results, it was likely that the group covariance matrices would not be equal. Indeed, the Box M statistics and the traces revealed that this was the case for all analyses. Therefore, rather than using a linear classification rule which is based on equal covariance matrices, a quadratic classification rule was used (via SAS 8.0) in order to account for the unequal covariance matrices found for these cluster solutions. Second, PDA procedures require the input of estimated prior probabilities for group membership in the population being studied. These reflect the proportion of parents in the population expected to be in each cluster. Because the sample obtained for this study was drawn from the same population as in the original study, the results of that study were used to estimate the prior probabilities. Thus, the following prior probabilities were entered for three- and four-cluster solutions in all PDA analyses:

(a) .65, .25, and .10 for a three-cluster solution; and (b) .60, .20, .10, and .10 for a four-cluster solution. Two-cluster solutions were explored using prior probabilities of .70 and .30; and five-cluster solutions were explored using .60, .25, .05, .05, .05. These were simply estimated from those found for three- and four-cluster solutions in the original study as there is no other solid confirmatory evidence in the literature to rely upon to estimate them.

#### *Post-Cluster Analyses*

The procedures described above ensured that results obtained were based on appropriate statistical methods. However, cluster analyses require additional follow-up procedures in order to evaluate the validity of the findings.

*Predictive discriminant analysis.* Predictive discriminant analysis, described earlier to assist in determining the appropriate number of clusters in the solution, was used to help validate the cluster findings. PDA was used to determine the extent of group separation in the final solutions, providing a measure of effect size for the cluster results. Considerable overlap among clusters was used to indicate that perhaps the clusters did not represent true differences between parents in those groups, which called into question the validity of the cluster solution. A low hit rate for a particular cluster within the solution indicated that it lacked sufficient evidence to consider it a valid group and would require further research to substantiate its existence and characteristics.

*Cluster comparisons.* After determining cluster solutions for the storybook and expository book sharing conditions, groups were compared on a set of variables not used in the cluster analyses. In separate analyses, each cluster solution (i.e., storybooks and expository books) served as the grouping variable. Comparisons between clusters were made to analyze differences on the following: (a) children's scores on the SPELT-P and the PPVT-III; (b) home literacy environment variables such as reported frequency of book sharing, the types of book typically shared at home, the number of books children's books owned, and the number of trips taken each month to the library; and (c) children's interest

in book sharing as measured by answers to questions about who typically initiates book reading (question 5), how often the child tries to read to him or herself (question 6), and how often the child appears to enjoy reading (question 13). These were each multivariate questions and, thus, MANOVA procedures were used.

#### *Comparisons Between Cluster Solutions*

Two of the research questions posed in this study required that two cluster solutions be compared. Research Question 2 asked whether the cluster results found in the current study compared to those found in the original study. Research Question 5 asked whether the patterns of parents' extratextual utterances differed as a function of text genre, and thus, the cluster solutions from the storybook and expository book conditions were compared. Two methods were used to compare cluster solutions.

First, the results of two cluster analyses were compared through visual inspection of the cluster solutions and their graphic representations (e.g., dendrograms, LDF plots). The number of clusters found, the number of parents assigned to each cluster, and the cluster centers (i.e., means on the six variables) were compared for similar patterns. The graphic displays aided in this process.

Second, it was possible to compare cluster solutions for Research Question 2 statistically (Breckenridge, 1989; McIntyre & Blashfield, 1980; Milligan & Cooper, 1986; Morey et al., 1983). Breckenridge (1989) studied cluster replication and found that it was not advisable to rely on visual inspection alone in order to compare a two cluster solutions. In fact, he suggested that using subjective methods alone defeats "the aim of an empirical approach" (Breckenridge, 1989, p. 147). He proposed the following series of five steps as a means for statistically comparing two data sets (arbitrarily referred to as samples A and B):

- (1) Sample A is clustered into  $k$  groups;
- (2) A classification rule is determined for sample A using predictive discriminant analysis (sample A rule);

- (3) Sample B is clustered into  $k$  groups using the same clustering procedures as applied to sample A;
- (4) Units in sample B are reassigned to groups using the classification rule found for sample A (sample A rule), with results referred to a  $B_A$ ;
- (5) Unit assignments for the sample B cluster solution and the  $B_A$  solution are compared statistically for the amount of agreement between them using Cohen's kappa (Breckenridge, 1989, p. 148).

Breckenridge (1989) also provides the following guidelines for interpreting the kappa in the context of cluster replication: "replication kappas greater than .30 are associated with excellent recovery of true clusters, and replication kappas greater than .60 indicate near complete recovery" (p. 157).

These procedures were applied to the original sample and the current sample to answer Research Question 2 related to storybook sharing. Although Research Question 5 also involved comparing two cluster solutions, those for storybooks and expository books, this was a comparison between two different conditions as opposed to being a replication comparison. Therefore, it was not appropriate to apply the above approach of statistical comparison and visual inspection methods and description were used to answer that research question.



## CHAPTER 3

### RESULTS

#### *Descriptive Statistics*

##### *Book Sharing Questionnaire*

A book sharing questionnaire was used to collect data on the home literacy practices of each family. Parents in this sample reported that they began sharing books with their children when they were infants ( $M = 3.8$  months of age;  $SD = 4$  months; range = 0-12 months). They reported sharing books with their child a mean of five to six times per week, with a range of once or twice a week to more than once per day. One question requested the number of minutes the child was read to at home each week by various people (i.e., mother, father, siblings, grandparents, others). Parents read to the children in this sample for a mean of 196 minutes per week ( $SD = 165$  minutes; range = 20 – 840 minutes), and they typically read three books at a time ( $M = 3.04$ ;  $SD = 1.4$ ; range = 1 to 10). They owned a mean of 160 children's books ( $SD = 114$ ; range = 30 to 700). Twenty-one parents reported that their child did not use the library; 18 reported using the library one to two times per month; and 17 reported going three or more times per month. Parents overwhelmingly reported reading storybooks with their children over other types of books.

Table 3.1

*Types of Books Read by Parent-Child Dyads in the Current Study as Reported in the Parent Questionnaire*

Type of Book	M	SD	Range
Storybooks	51%	18%	10 – 80%
Alphabet Books	11%	6%	0 – 30%
Rhyming Books	14%	6%	0 – 60%
Counting Books	10%	6%	0 – 30%
Nonfiction or Fact Books	14%	12%	0 – 60%

#### *Storybook and Expository Book Sharing Sessions*

*Proportion of text read.* When sharing storybooks, 54 out of 57 parents read all the text contained in the book. The other three parents read 44%, 100%, and 6% of storybook one, and 70%, 40%, and 65% of storybook two, respectively. Thus, the mean percent of text read in the storybook condition was 98% ( $SD = 12\%$ ). When sharing expository books, 39 parents read all the text contained in both books, while 18 parents during at least one session did not read the entire text. In these instances, they read 0 to 94% of the text. Seven parents read less than 60% of the expository text during both of their sessions, tending to talk about the pictures and tell their children some of the information rather than reading the text as written. As a result, the mean percent of the text read in the expository book condition was 89% ( $SD = 25\%$ ). There was a high correlation between the proportion of expository book 1 read and the proportion of expository book 2 read ( $r = .86; p = .000$ ). A paired sample t-test revealed that parents did not differ significantly from one session to the next with regard to the proportion of the text read within book conditions (story 1 and story 2:  $t(56) = -.28; p = .78$ ; expository 1 and expository 2:  $t(56) = 1.42; p = .16$ ). This was not true across book conditions, however; there was a significant difference between the proportion of all storybook text read and the proportion of all expository text read ( $t(56) = 3.46; p = .001$ ), with parents much more likely to read the entire storybook text to their child.

*Duration of the book sharing sessions.* Table 3.2 contains the descriptive statistics for the duration in seconds for each book and each session. Paired sample t-tests revealed no significant differences between the duration of the book sharing sessions (i.e., both books during session 1 compared to both books during session 2), nor were there significant differences between the duration of story 1 and story 2, or the duration of expository book 1 and expository book 2. However, there were significant differences in all cases across book sharing conditions (i.e., story versus expository; see Table 3.3) and the approximate p-values were considered small even in the context of multiple tests (i.e., Bonferonni correction for multiple tests,  $= .05/3 = .017$ ). The duration of the expository book sharing was significantly longer than the duration of the storybook sharing, despite the fact that the two types of books were equated in length and sentence complexity. In addition, the order of the books was counterbalanced across sessions so that participants read the story first during one session and the expository book first during the other session. Thus, this difference in duration across conditions cannot be accounted for by order of book sharing or differences in the lengths of the texts.

Table 3.2

*Duration of Book Sharing Sessions in Seconds and Results of Paired Samples t-Tests Comparing Duration Within Book Conditions*

Comparison	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Story 1 Duration	344	134	.504	.616
Story 2 Duration	338	107		
Expository 1 Duration	506	162	1.31	.194
Expository 2 Duration	480	168		
Session 1 Duration (story 1 plus expository 1)	850	269	1.34	.186
Session 2 Duration (story 2 plus expository 2)	818	246		

Table 3.3

*Results of Paired Samples T-Tests Comparing Duration Across Book Conditions*

Comparison	<i>t</i>	<i>p</i>
Story 1 Duration Expository 1 Duration	-9.61	.000
Story 2 Duration Expository 2 Duration	-7.90	.000
Total Story 1 and 2 Duration Total Expository 1 and 2 Duration	-11.29	.000

*Extratextual utterances during book sharing.* All parents extratextual utterances were coded for their content (see Appendix E for coding system). As shown in Table 3.4 parents did not differ across sessions either in the expository condition ( $\eta^2 = .920$ ;  $F(6, 107) = 1.55$ ;  $p = .171$ ) or in the storybook condition ( $\eta^2 = .945$ ;  $F(6, 107) = 1.04$ ;  $p = .404$ ).

Table 3.4

*Mean Number of Parents' Extratextual Utterances and the Standard Deviations in Each Coding Category for Each Book Sharing Session*

Variable	Expository Book 1		Expository Book 2	
	M	SD	M	SD
Print/Book Conventions	5.74	4.99	6.51	7.08
Feedback	24.56	17.19	21.67	16.21
Level 1	25.89	14.93	22.79	12.70
Level 2	13.56	7.06	10.95	6.48
Level 3	21.21	12.46	20.14	12.25
Level 4	13.54	10.12	16.46	13.56

	Storybook 1		Storybook 2	
	M	SD	M	SD
Print/Book Conventions	3.30	3.28	3.42	2.61
Feedback	12.86	11.76	11.19	8.03
Level 1	10.72	11.43	12.09	9.99
Level 2	9.12	7.84	8.04	6.40
Level 3	9.11	8.74	8.93	6.98
Level 4	5.46	6.96	4.63	6.99

Separate paired samples t-tests revealed no significant differences between storybook session 1 and storybook session 2 on any coding category ( $p$ -values ranged from .151 to .880). Parents were consistent from one session to the next in their use of each type of utterance during storybook sharing. When comparing expository book session 1 to expository book session 2, however, there was a significant difference between the sessions for Level 2 utterances ( $t(56) = 3.31$ ;  $p = .002$ ), while all other coding categories were not significant ( $p$ -values ranged from .060 to .451). Paired samples t-tests also revealed no significant differences between parents' total number of utterances for each book within both the storybook (storybook 1 compared to storybook 2:  $t(56) = .64$ ;  $p = .523$ ) and the expository book (expository book 1 compared to expository book 2:  $t(56) = 1.23$ ;  $p = .223$ ) conditions.

Because parents did not differ significantly in their use of utterances in the coding categories from one session to the next within each condition, except for one category in one condition (i.e., Level 2 expository), data from story 1 and story 2 were collapsed for certain analyses and data from expository book 1 and expository book 2 were collapsed for certain analyses. One criticism in the book sharing research has been analyses based on the reading of only one book. The current results indicate that parents did not differ significantly across sessions except in one instance (i.e., Level 2 during the expository books), which suggests that the criticism regarding one observation of book sharing interactions may be unjustified. However, cluster analysis results based on data from one storybook were compared to cluster analysis results based on data from two storybooks and those results suggested that two sessions might have certain benefits. Those results are presented later in this chapter.

Although parents were consistent in their use of most of the utterance types within each book sharing condition, comparisons across conditions revealed significant differences between the storybook and expository book conditions. Specifically, a multivariate analysis of variance revealed a significant difference between parents'

extratextual utterances in the six coding categories during storybook sharing compared to expository book sharing ( $\eta^2 = .586$ ;  $F(6, 107) = 12.60$ ;  $p = .000$ ). Likewise, paired sample t-tests on each coding category revealed that all were significantly different ( $p = .000$ ) across conditions. In all coding categories, parents contributed significantly greater numbers of extratextual utterances in the expository book condition compared to the storybook condition.

The current sample contained 50 mothers and 7 fathers sharing books with their children; therefore, it was important to determine whether mothers and fathers differed significantly in their use of extratextual talk during book sharing. Multivariate analyses of variance revealed that mothers and fathers did not differ significantly on the six coding categories in either the storybook condition ( $\eta^2 = .892$ ;  $F(6, 50) = 1.01$ ;  $p = .430$ ) or the expository book condition ( $L = .801$ ;  $F(6, 50) = 2.08$ ;  $p = .073$ ). Independent samples t-tests on each code separately also did not reveal any significant differences between mothers and fathers ( $p = .02$  to  $.66$ ). This was consistent with the findings of van Kleeck et al. (1997) who found no differences between 35 mothers and 35 fathers on the same six variables. Based on these results, it was appropriate to collapse data for mothers and fathers for the remaining analyses. Potential differences between mothers and fathers were explored within the cluster analysis results as well.

*Research Question 1: What Patterns of Extratextual Utterances*

*Characterize Subgroups of Parents During the Sharing of One Storybook?*

As in the 2003 study, there was considerable variability within the current sample in terms of the numbers of extratextual utterances parents offered in each coding category during the book sharing session (see Table 3.5). For all of the six variables, the ranges were large and the standard deviations were almost equal to and, in the case of Level 4 utterances, greater than, the means.

Table 3.5

*Mean Number of Extratextual Utterances, and the Standard Deviations and Ranges, in Each Coding Category During the Sharing of One Storybook for the Current Sample of 57 Parents.*

Variable	M	SD	Range
Print & Book Conventions	3.35	3.17	0 - 20
Feedback	12.63	11.25	0 - 62
Level 1	12.51	11.44	0 - 56
Level 2	8.32	7.23	0 - 30
Level 3	7.05	5.59	0 - 26
Level 4	5.58	8.49	0 - 43
Mean Total Utterances	49.4	37.0	3 - 183

*Choosing a Cluster Solution for the Replication Subset (One Storybook) of the Current Data*

The dendrograms obtained from the Ward method cluster analysis on the sample of 57 dyads revealed three to five clusters of parents, and potentially one to three outliers. The k-means cluster analyses were used to explore three-, four-, and five-cluster solutions. These analyses revealed two parents who were consistently assigned to a cluster of one because they differed from the remainder of the sample. Specifically, the father in Dyad 29, a high school English teacher, used 43 Level 4 utterances, which included many that were part of an explanation of how the “countdown” worked in the story *Mooncake*. He also provided facts (e.g., about snow, junkyards, shooting stars, birds migrating) during the reading of the story. This father also used 20 print and book convention utterances during the story, including discussions about what the author and illustrators jobs were, who the book was dedicated to, and asking what letters certain words began with. The second parent who was an outlier was the mother from Dyad 23. This mother used 11 print and book utterances, most often showing the child where the words were in the book and prefacing her reading of passages by saying “this here says...” or “these words say....” She used 56 Level 1 utterances during the story reading as well, sometimes to label pictures (e.g., there’s bear) but more frequently in a routine in

which she asked her son to locate items in the pictures (e.g., where's his shadow?, where are the trees? Do you see the mountains?). These two parents clearly differed from the rest of the sample and, therefore, they were omitted for the remainder of the analyses for Research Question 1.

Following the deletion of these two outliers, the 55 remaining dyads were entered into Ward and k-means cluster analyses. The Ward dendrogram revealed that three to six clusters were likely present within the data. The cubic clustering criterion indicated that the three-cluster solution could explain considerable variance in the sample, and the four- and five-cluster solutions were also viable options. Thus, the three-, four-, and five-cluster solutions were explored further using the k-means method.

The three-cluster solution using raw data identified one large cluster of parents ( $n = 34$ ) who used relatively low numbers of extratextual utterances across all coding categories ( $M = 28$  total utterances), a smaller cluster ( $n = 17$ ) of parents who contributed moderate numbers of utterances ( $M = 65$  total utterances) with emphasis on low-level input (i.e., Levels 1 and 2), and a small cluster of parents ( $n = 4$ ) who offered high numbers of utterances ( $M = 113$  total utterances) with particular emphasis on Level 4 compared to the rest of the sample. Although raw data were used to obtain the cluster solution, standardized data assist in making comparisons among the clusters, and therefore, Table 3.6 contains the cluster centers using data standardized to a z-score. The parents in the smallest cluster used considerably higher numbers of utterances compared to parents in the other two clusters, and they were much more likely to differ from one another than parents within the other clusters. This higher degree of variance on the six coding categories compared to the other two clusters resulted in a lack of equality of the covariance matrices (Box M statistic:  $F(21, 3930) = 5.00; p = .000$ ). Therefore, the PDA was conducted using a quadratic classification rule (i.e., one that uses separate covariance matrices rather than the pooled covariance matrix; SAS DISCRIM). The prior probabilities entered for the three clusters were .65 for the largest cluster, .25 for the



midsized cluster, and .10 for the smallest cluster. The overall hit rate was 80%; that is, the cluster membership of 80% of the parents was accurately predicted by the classification rule obtained from the data. The improvement over chance index ( $I$ ; Huberty, 1994, p. 107) of .61 indicated that the rule resulted in prediction that was 61% better than chance. Recall that values of  $I$  over .35 represent a large effect size (Huberty & Lowman, 2000). Thus, the three-cluster solution was supported by the Ward dendrogram, the CCC, and the PDA hit rates, and the cluster characteristics indicated clear distinctions among the clusters identified.

Table 3.6

*Mean Number of Extratextual Utterances During the Sharing of One Storybook for Parents in Each of the Clusters in the Three-Cluster Solution Using Standardized Data (z-Score)*

Variable	3-Cluster Solution		
	Cluster 1	Cluster 2	Cluster 3
Print/Book Conventions	.67	.25	-.20
Feedback	2.11	.47	-.49
Level 1	1.87	.77	-.60
Level 2	.57	.92	-.53
Level 3	1.14	.51	-.39
Level 4	2.92	-.23	-.23
Mean Total Utterances	113	65	28
Cluster Size	$n = 4$	$n = 17$	$n = 34$

A four-cluster solution was also explored (see Table 3.7). The large cluster of 34 parents found in the three-cluster solution remained unchanged in the four-cluster solution. Another cluster ( $n = 12$ ) was characterized by moderate amounts of input ( $M = 65$  total utterances) with emphasis on low-level extratextual talk (i.e., Levels 1 and 2). Two smaller groups of parents included one cluster of seven parents who offered moderate amounts of input ( $M = 71$  total utterances) with an emphasis on Levels 2 and 3 compared to the rest of the sample; and a cluster of two parents who contributed high amounts of input ( $M = 141$  total utterances) across all six categories ( $z = .79$  to 3.68). The four-cluster solution compared to the three-cluster solution, then, appeared to have

maintained the limited-input cluster and a high-input cluster, while reorganizing parents in the sample who offered moderate numbers of utterances. Specifically, these parents were divided into two clusters, with those in Cluster 2 offering more Level 2 and 3 utterances, and those in Cluster 4 offering more Level 1 utterances. A cluster containing fewer than four parents presents problems for a quadratic PDA. In order to use this procedure, then, only three out of the four clusters were entered into the PDA, excluding the cluster of two parents. The prior probabilities entered were .65 for the largest cluster, .25 for the midsized cluster, and .10 for the smallest cluster. Assuming that the 2 parents in cluster 1 would not have been accurately assigned, the hit rate for the solution was 71%, which was 49% better than expected by chance. This was lower than that achieved in the three-cluster solution (i.e., 61% better than chance).

Table 3.7

*Mean Number of Extratextual Utterances During the Sharing of One Storybook for Parents in Each of the Clusters in the Four-Cluster Solution Using Standardized Data (z-Score).*

Variable	4-Cluster Solution			
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Print/Book Conventions	0.79	0.33	-0.2	0.25
Feedback	2.7	0.74	-0.49	0.79
Level 1	2.48	0.25	-0.6	1.15
Level 2	1.07	1.46	-0.53	0.47
Level 3	2.42	1.17	-0.39	0.01
Level 4	3.7	0.01	-0.23	0.03
Mean Total Utterances	141	71	28	65
Cluster Size	$n = 2$	$n = 7$	$n = 34$	$n = 12$

The Ward cluster analysis and the CCC indicated that five groups might also be present within the data and, therefore, a five-cluster solution was also explored. This solution continued to reveal the large group of parents who offered lower amounts of input ( $n = 33$ ), and a smaller group who offered moderate amounts of input ( $n = 12$ ). This solution, though, made additional subdivisions among the parents who offered moderate to high numbers of extratextual utterances, which resulted in two clusters containing four

parents and one cluster containing 2 parents. Parents in these small clusters differed from other clusters often on only one variable making it difficult to find a conceptual difference between clusters. Therefore, although this solution confirmed the existence of a limited-input cluster, it did not offer clear distinctions in the patterns that existed within the remainder of the sample. For this reason, this solution was not considered further.

Both the three-cluster and the four-cluster solutions were determined to be valid for these data; however, the three-cluster solution was chosen as the most meaningful and valid for two reasons. First, the clusters identified in the three-cluster solution were clearly different from one another in more than one respect (e.g., total numbers of extratextual utterances, differences in the types of utterances used by parents in each cluster). Conversely, in the four-cluster solution, the differences between Clusters 2 and 4 did not represent a clear conceptual distinction. Second, the hit rates and improvement over chance index values were higher for the three-cluster solution. Given the low prevalence in this population of parents who offer the highest numbers of extratextual utterances, the size of this sample ( $n = 55$ ) possibly affected these results. It is possible that with a larger sample, the four-cluster solution might reflect an improvement over the three-cluster solution. This was true in the original study which contained 96 parents.

#### *Cluster Characteristics in the Three-Cluster Solution*

The raw data cluster centers (i.e., the centroids or vectors of means for the six variables) resulting from the k-means analysis for the three-cluster solution are presented in Table 3.8. These represent the mean number of utterances parents in each cluster offered in each coding category. These data are also presented using standardized data to facilitate comparisons across clusters. Figure 3.1 illustrates the characteristics of each cluster using the standardized data means, and Figure 3.2 illustrates the characteristics of each cluster using the raw data means. To better understand the characteristics of each cluster, the following data were analyzed: (a) the total numbers of extratextual utterances offered by parents in each cluster; (b) the numbers of utterances parents offered in each

coding category; and (c) the proportions of utterances at low and high levels of abstraction.

Table 3.8

*Mean Number of Extratextual Utterances During the Sharing of One Storybook for Parents in Each of the Clusters in the Three-Cluster Solution Using Standardized Data (z-Score) and Raw Data.*

Variable	Cluster means, standardized data		
	1 High Input Across All Categories	2 Moderate Input/ Low Abstraction	3 Limited Input Across All Categories
Print/Book Conventions	.67 (1.03)	.25 (1.21)	-.20 (.84)
Feedback	2.11 (1.32)	.47 (.71)	-.49 (.58)
Level 1: Matching perception	1.87 (.88)	.77 (.74)	-.60 (.44)
Level 2: Integration of perception	.57 (1.44)	.92 (1.04)	-.53 (.41)
Level 3: Infer about perception	1.14 (1.50)	.51 (1.12)	-.39 (.62)
Level 4: Reasoning about perception	2.92 (1.33)	-.23 (.38)	-.23 (.54)
Variable	Cluster means, raw data means		
	1	2	3
Print/Book Conventions	4 (2.1)	3 (2.4)	3 (1.7)
Feedback	28 (10.7)	15 (5.7)	7 (4.7)
Level 1: Matching perception	30 (8.7)	19 (7.3)	6 (4.4)
Level 2: Integration of perception	12 (10.2)	15 (7.3)	4 (2.9)
Level 3: Infer about perception	13 (8.2)	10 (6.1)	5 (3.4)
Level 4: Reasoning about perception	25 (9.3)	3 (2.6)	3 (3.7)
Mean Total Utterances	113 (31.9)	65 (14.8)	28 (13.5)
Cluster Size	$n = 4$	$n = 17$	$n = 34$

Note: Standard deviations in parentheses.

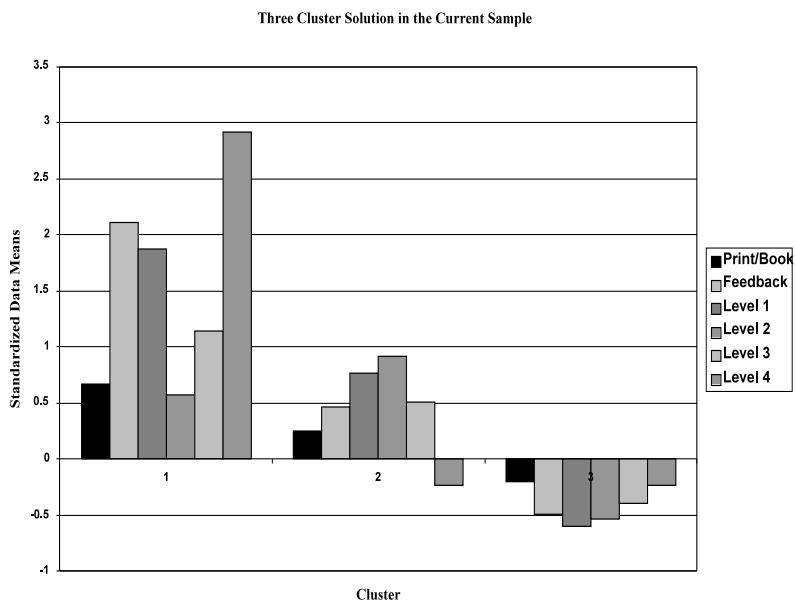


Figure 3.1. Standardized data means (z score) for each of the three clusters obtained for the sample of 55 parents sharing one unfamiliar storybook.

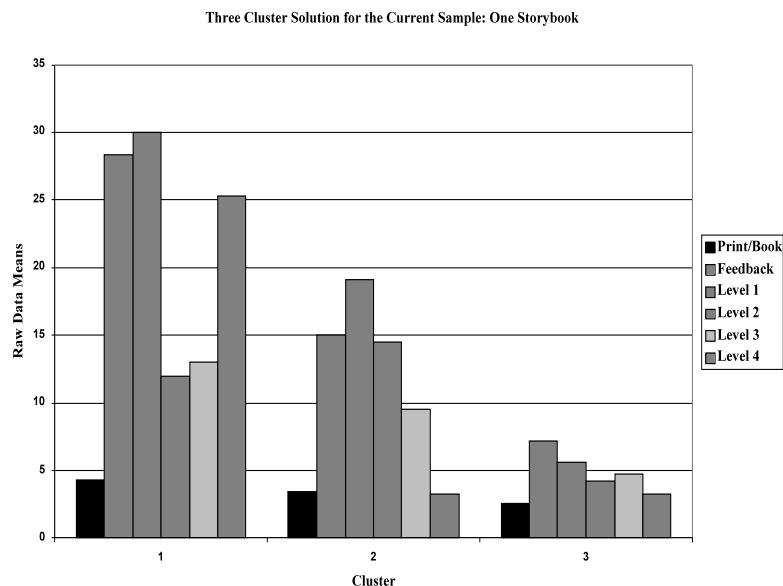


Figure 3.2. Raw data means for each of the three clusters obtained for the sample of 55 parents sharing one unfamiliar storybook.

*Cluster 1.* Cluster 1 consisted of four parents who provided a mean of 113 extratextual utterances (range = 85 – 149) during the sharing of one unfamiliar storybook. The numbers of utterances these parents provided across all coding categories were above the mean for the sample ( $z = .57$  to  $2.92$ ), with a range of 4 to 30 utterances per coding category. Their use of feedback ( $z = 2.1$ ,  $M = 28$ ), Level 1 ( $z = 1.9$ ,  $M = 30$ ), and Level 4 ( $z = 2.9$ ,  $M = 25$ ) utterances was much higher than other parents in the sample, and their use of Level 3 ( $z = 1.1$ ,  $M = 13$ ) utterances was also well above the mean. These parents used comparatively less extratextual talk about print and book conventions ( $z = .67$ ,  $M =$

4) and story-related talk at Level 2 ( $z = .57$ ,  $M = 12$ ), although these were still above the mean for the sample. Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 52% was at low levels of abstraction (Levels 1 and 2), and 48% was at high levels of abstraction (Levels 3 and 4). Because these parents offered numerous utterances across all coding categories, this cluster was labeled the “high input across all categories” cluster.

*Cluster 2.* Cluster 2 contained 17 parents who provided a mean of 65 extratextual utterances (range = 42 – 97) during the sharing of the unfamiliar storybook. This was approximately half the mean number of utterances provided by parents in Cluster 1. These parents contributed 3 to 19 utterances in each coding category, and all categories except Level 4 ( $z = -.23$ ) were within one standard deviation above the mean for the sample ( $z = .25 - .92$ ). The parents in this cluster appeared to focus their extratextual talk on feedback ( $z = .47$ ,  $M = 15$ ), Level 1 ( $z = .77$ ,  $M = 19$ ), Level 2 ( $z = .92$ ,  $M = 15$ ), and Level 3 ( $z = .51$ ,  $M = 10$ ), but rarely contributed utterances at Level 4 ( $z = -.23$ ,  $M = 3$ ). Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 72% was at low levels of abstraction (Levels 1 and 2), and 28% was at high levels of abstraction (Levels 3 and 4). The majority of the high level utterances was at Level 3. Because parents in this cluster offered a moderate amount of input relative to the entire sample, with an emphasis on low-level utterances, this cluster was labeled the “moderate input/low abstraction” cluster.

*Cluster 3.* Cluster 3 was the largest cluster in the three-cluster solution, containing 34 parents. These parents provided a mean of 28 extratextual utterances (range = 3 – 57) during the sharing of the unfamiliar storybook. This was approximately half the mean number of utterances provided by parents in Cluster 2, and one-fourth of the mean number of utterances provided by parents in Cluster 1. Parents in this cluster offered 3 to 7 utterances per coding category. They were least likely to talk about print and book conventions ( $z = -.20$ ,  $M = 3$ ) or offer input at Level 4 ( $z = -.23$ ,  $M = 3$ ), and they were

more likely to provide feedback ( $z = -.49$ ,  $M = 7$ ) or Level 1 ( $z = -.60$ ,  $M = 6$ ) utterances. Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 56% was at low levels of abstraction (Levels 1 and 2), and 44% was at high levels of abstraction (Levels 3 and 4). Because parents in this cluster offered the least extratextual talk during the sharing of the book compared to the entire sample, this cluster was labeled the “limited input” cluster.

*Cluster variability.* The three clusters revealed by this analysis varied in size, shape, and scatter (see Figure 3.3). Because the parents in Cluster 3 ( $n = 34$ ) all offered relatively low numbers of utterances across categories, they were more tightly packed around the cluster center. Cluster 2 ( $n = 17$ ) consisted of parents who contributed moderate numbers of utterances during book sharing, and they were less tightly packed around the cluster center, illustrating the greater amount of variability found among these parents. Cluster 1 ( $n = 4$ ) consisted of parents who contributed the highest numbers of extratextual utterances and, for this reason, they had considerably more room for variability among them. In fact, the variability in this cluster was significantly different from the other two, as revealed by the Box M statistic ( $F(21, 3930) = 5.00$ ,  $p = .000$ ). The log determinants of the covariance matrices (Cluster 1 = -82.5, Cluster 2 = -37.7; Cluster 3 = -42.1) and the traces for the covariance matrices (Cluster 1 = 451; Cluster 2 = 191; Cluster 3 = 78) also illustrated these differences in variability.

The plot in Figure 3.3 provides a visual representation of the units within the three clusters based on the two linear discriminant functions (LDFs) generated through a descriptive discriminant analysis (DDA; using SPSS DISCRIMINANT). DDA is based on the assumption of equality of the covariance matrices, which may be challenged for these data. Therefore, the plot and the two LDFs obtained were used here to supplement the cluster descriptions and to assist in describing the dimensions along which the three clusters may differ, but this was done knowing that one of the assumptions was violated. LDF 1 (represented on the x-axis) explained 62% of the variance among groups and



separated clusters by the numbers of utterances at Levels 1 and 4, and the number of feedback utterances. This distinguished Cluster 1 from the other clusters. LDF 2 (represented on the y-axis) explained 38% of the variance and separated clusters by the numbers of Level 2 utterances parents offered. This distinguished Cluster 2 from the other clusters.

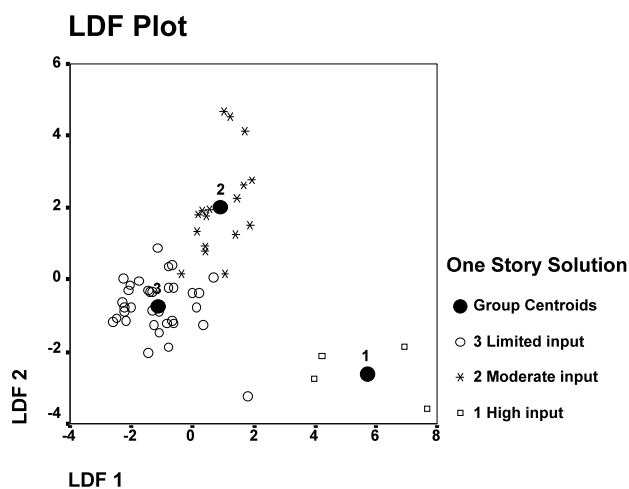


Figure 3.3. Linear discriminant function plot generated through a descriptive discriminant analysis for the cluster analysis solution for one storybook. LDF 1 separated clusters on the numbers of utterances at Levels 1 and 4, and the number of feedback utterances. LDF 2 separated clusters on the numbers of Level 2 utterances parents offered.

*Post-Cluster Analyses*

*Predictive discriminant analysis.* A quadratic PDA (SAS DISCRIM) was used as a method for choosing the appropriate cluster solution, and this analysis also provided information that was useful in interpreting the results. The quadratic rather than the linear PDA was used due to the judged lack of equality among the covariance matrices. The prior probabilities used were based on the sizes of the clusters found in the original solution, .10, .25, and .65 for Clusters 1 through 3, respectively. In choosing a cluster solution, the focus was on the overall hit rate for the solution; in evaluating the validity of the clusters within the solution, the attention was on the separate group hit rates. These revealed how accurately parents would be assigned to each cluster based on the classification rule generated by the six predictor variables (see Table 3.9). As Huberty (1994, pp. 88-90) recommended, these hit rates were obtained using the leave-one-out method. In this procedure, each parent was removed from the analysis one at a time, a classification rule was obtained using the remaining parents, and then the deleted parent was assigned to a cluster based on that rule. This eliminated the hit rate inflation that occurs when units are used to develop the rule that also assigns them to groups.

The overall hit rate for the three-cluster solution was 80%, representing 61% better than that expected by chance ( $I = .61$ ). However, in the smallest cluster, Cluster 1, zero parents were accurately assigned to that cluster by the quadratic classification rule (see Table 3.9). Thus, there is no evidence to validate this cluster within the solution. Separate group hit rates for the other two clusters revealed that the 76% of parents in Cluster 2 were accurately assigned to that cluster given the six predictor variables, which was 68% better than expected by chance ( $I = .68$ ). Likewise, 91% of the parents in Cluster 3 were accurately assigned to that cluster given the six predictor variables, which was 74% better than expected by chance ( $I = .74$ ). Thus, the hit rates for Clusters 2 and 3 provide evidence for their validity.

Table 3.9

*The Number of Units Classified by Quadratic External (Leave-One-Out) Predictive Discriminant Analysis (with Hit Rates in Parentheses) for the Three-Cluster Solution for One Storybook*

Actual Cluster	Predicted Cluster			<i>n</i>	Prior Probability
	1	2	3		
1	0 (0)	0 (0)	(100)		.10
2	0 (0)	13 (76.5)	4 (23.5)	17	.25
3	0 (0)	3 (8.8)	<b>31</b> <b>(91.2)</b>	34	.65
Total	0	16	39	<i>n</i> = 55	

*Validation procedures.* Because cluster analysis procedures will generate a solution regardless of whether distinctions exist among subgroups within the data, it is important to also perform analyses that can validate the cluster findings. Replication is the best method for determining whether a cluster solution is valid (McIntyre & Blashfield, 1980). The purpose of Research Question 1 in the current study was to determine whether the original cluster findings reported in Hammett et al. (2003) would be replicated in a new sample and those results are presented in the next section.

*Research Question 2: How Do the Clusters Obtained in the Current Sample Using Data on One Storybook Compare to the Clusters Obtained in Hammett et al. (2003)?*

In order to answer Research Question 2, the clusters obtained using data from one storybook described in the previous section were compared to the clusters obtained by Hammett et al. (2003). The sample obtained in the current study was intentionally drawn from the same population, and the same data collection methods and cluster analysis procedures were applied. Therefore, it was possible to compare the three-cluster solution (*n* = 55) obtained in the current study using data from one storybook to the four-cluster solution (*n* = 96) obtained in the original study using data from one storybook in terms of the relative sizes of the clusters and the types of extratextual utterances characteristic of parents in each cluster. Two methods were used to compare the cluster analysis solutions:

(a) visual inspection of the cluster solutions, the characteristics of each cluster within the solutions, and the graphic illustrations of the results; and (b) statistical comparison of the two results using a kappa statistic as outlined in Chapter 2. These will be discussed in turn. Clusters found in the original study will be referred to with the subscript (a), and clusters found within the current study will be referred to with the subscript (b).

Prior to analyzing the cluster solutions, however, the two samples were compared on the six variables entered into the cluster analysis. The means for each variable revealed that parents in the current sample offered more utterances in each category except for print and book conventions (see Table 3.10). A multivariate analysis of variance revealed that the parents in the two samples differed significantly ( $\eta^2 = .810$ ,  $F(6, 144) = 5.62$ ,  $p = .000$ ). Independent-sample t-tests revealed that the parents in the current sample offered significantly greater numbers of Level 1 and Level 3 utterances compared to parents in the original study, even after accommodating for multiple tests ( $\alpha = .05/7 = .007$ ).

Table 3.10

*Comparison Between the Current Sample and the Original Sample (Hammett et al., (2003) in the Mean Number of Extratextual Utterances in Each Coding Category During the Sharing of One Storybook..*

Variable	Hammett et al. (2003)	Current Study	<i>t</i>	<i>p</i>
Print/Book Conventions	4.10 (3.16)	2.91 (2.00)	2.53	.013
Feedback	7.87 (6.87)	11.16 (8.10)	-2.65	.009
Level 1	7.46 (8.17)	11.51 (9.87)	-2.72	.007*
Level 2	5.91 (5.30)	7.95 (7.09)	-1.86	.067
Level 3	4.05 (3.50)	6.76 (5.47)	-3.31	.001*
Level 4	4.34 (5.11)	4.91 (6.96)	-.57	.568
Mean Total Utterances	33.74 (23.82) n = 96	45.20 (29.83) n = 55	-2.59	.011

Note: Standard deviations in parentheses.

\*Significant at  $p = .007$  level of significance.

In addition to differing in terms of the numbers of extratextual utterances during book sharing, the cluster analysis solutions determined to be most valid and meaningful for each sample differed in the numbers of clusters within them. In the original sample, a four-cluster solution was chosen as the most valid and meaningful solution to explain the underlying patterns within the data, whereas in the current sample, the three-cluster solution was determined to be the most valid and meaningful. Despite these differences between the cluster solutions for each sample in the amount of extratextual talk and the numbers of clusters obtained, there also were substantial similarities in terms of the numbers of parents in each cluster, the patterns of utterance types used by parents in each cluster, and the proportions of story-related utterances offered at low and high levels of abstraction.

#### *Visual Comparison of the Cluster Solutions*

Comparison of the cluster characteristics across cluster solutions revealed a high degree of similarity between the clusters obtained in the original study and the clusters obtained in the current replication study. Clusters were compared on the following data: (a) the proportion of the sample in each cluster; (b) the total numbers of utterances offered by parents in each cluster; (c) the profile of utterance types used by parents in each cluster; and (d) the PDA hit rates for separate groups. Based on these characteristics, the clusters in the current study were matched to the cluster they most resembled in the original study. Table 3.11 outlines the clusters identified within each solution and the clusters that resembled each other across solutions. Figure 3.4 contains the bar graphs based on standardized data means for both cluster solutions for visual comparison.

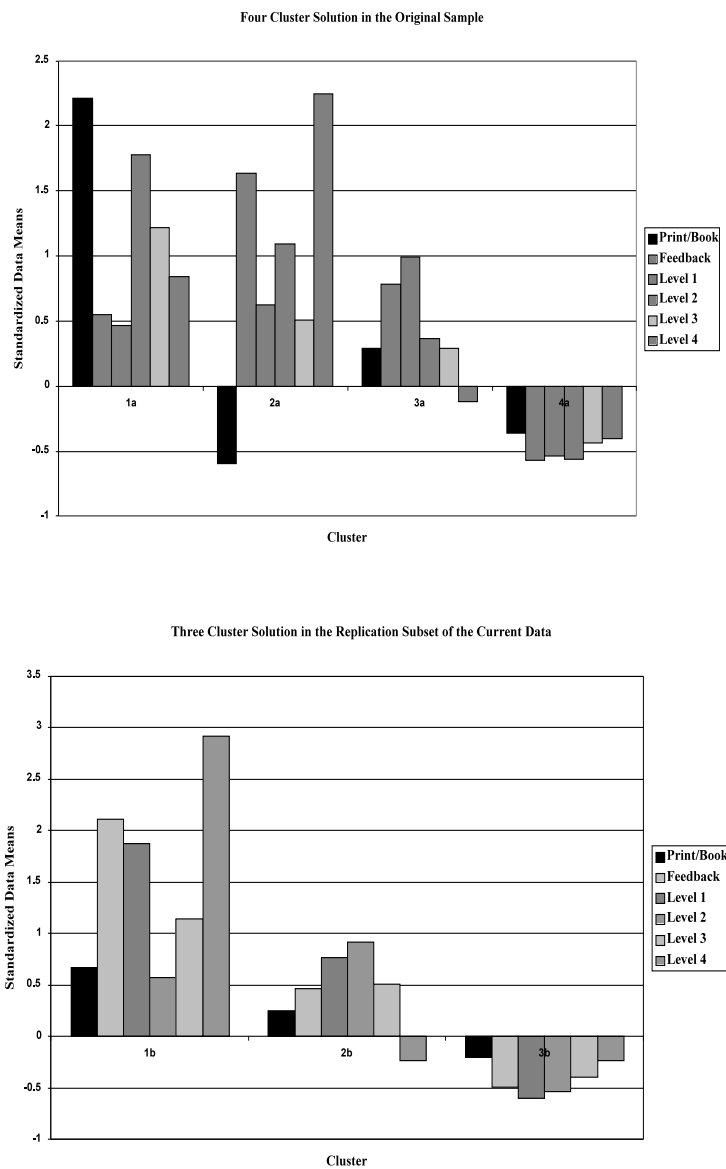


Figure 3.4. Bar charts for the four-cluster solution in the original sample and the three-cluster solution in the current sample. Clusters 2<sub>a</sub>, 3<sub>a</sub>, and 4<sub>a</sub> in the original sample (top) are being compared to Clusters 1<sub>b</sub>, 2<sub>b</sub>, and 3<sub>b</sub> respectively in the replication data of the current sample (bottom).

Table 3.11

*Comparison Between the Clusters Obtained in the Original Study (Hammett et al., 2003) and the Clusters Obtained in the Current Study for Data on One Storybook.*

Four-Cluster Original Solution	Name of Cluster in Original Solution	Three-Cluster Current Solution	Name of Cluster in Current Solution
Cluster 1 <sub>a</sub>	High Input/Print and Story Content		
Cluster 2 <sub>a</sub>	High Input/Feedback and High Abstraction	Cluster 1 <sub>b</sub>	High Input Across All Categories
Cluster 3 <sub>a</sub>	Moderate Input/Low Abstraction	Cluster 2 <sub>b</sub>	Moderate Input/Low Abstraction
Cluster 4 <sub>a</sub>	Limited Input	Cluster 3 <sub>b</sub>	Limited Input

*High input clusters.* In both solutions, the cluster analyses identified a small number of parents who contributed high overall numbers of extratextual utterances relative to the other parents in their respective samples. In the original sample, two such clusters were identified, each containing 9% and 8% of the 96 parents in the sample. Parents in these clusters contributed a mean of 69 utterances during the book sharing session but they differed in the types of utterances used. Parents in Cluster 1<sub>a</sub> ( $n = 9$ ) contributed especially high numbers of print and book convention utterances ( $z = 2.21$ ,  $M = 11$ ) and utterances at Level 2 ( $z = 1.77$ ,  $M = 16$ ) and Level 3 ( $z = 1.22$ ,  $M = 10$ ); parents in Cluster 2<sub>a</sub> ( $n = 8$ ) contributed especially high numbers of feedback utterances ( $z = 1.64$ ,  $M = 19$ ) and utterances at Level 4 ( $z = 2.25$ ,  $M = 16$ ), but few utterances in the category of print and book conventions ( $z = -.60$ ,  $M = 2$ ).

In the current sample, one small cluster (Cluster 1<sub>b</sub>;  $n = 4$ ) of parents was identified who contributed high numbers of extratextual utterances. This cluster contained

7% of the sample, and these parents contributed a mean of 113 utterances during the book sharing session. This was considerably higher than either of the high input clusters in the original sample; however, there were some similarities in the types of utterances these parents used compared to parents in Cluster 2<sub>a</sub> (see Table 3.12). Specifically, the four parents in Cluster 1<sub>b</sub> contributed especially high numbers of feedback ( $z = 2.11$ ,  $M = 28$ ) and Level 4 ( $z = 2.92$ ,  $M = 25$ ) utterances, while offering few in the category of print and book conventions ( $z = .67$ ,  $M = 4$ ). This profile of utterance types was directly comparable to that of Cluster 2<sub>a</sub>. Therefore, during the remainder of the comparisons of the cluster solutions, Cluster 1<sub>b</sub> was compared to Cluster 2<sub>a</sub>. While the parents in Clusters 1<sub>b</sub> and 2<sub>a</sub> were similar in their high use of feedback and Level 4 utterances, and lower use of print and book convention utterances, they differed in their use of Levels 1, 2, and 3 utterances. Cluster 1<sub>b</sub> offered comparatively more Level 1 and 3 utterances, and Cluster 2<sub>a</sub> offered comparatively more Level 2 utterances. No clusters in the current solution resembled the parents in Cluster 1<sub>a</sub>.

Table 3.12

*Comparison Between the High-Input Clusters in the Original Sample (Cluster 2<sub>a</sub>) and the Current Sample (Cluster 1<sub>b</sub>) on Mean Number of Extratextual Utterances During One Storybook using Raw Data and Standardized Data (z-score).*

Variable	High Input Cluster Raw Data	
	Cluster 2 <sub>a</sub> High Input/Feedback and High Abstraction	Cluster 1 <sub>b</sub> High Input Across All Categories
Print/Book Conventions	2	4
Feedback	19	28
Level 1: Matching perception	13	30
Level 2: Integration of perception	12	12
Level 3: Infer about perception	7	13
Level 4: Reasoning about perception	16	25
	High Input Cluster Standardized Data	
Print/Book Conventions	-.60	.67
Feedback	1.64	2.11
Level 1: Matching perception	.62	1.87
Level 2: Integration of perception	1.09	.57



Level 3: Infer about perception	.51	1.14
Level 4: Reasoning about perception	2.25	2.92
Mean Total Utterances	69	113
Range of Total Utterances	40 – 97	85 – 149
Proportion of Low-Level Utterances	53%	53%
Proportion of High-Level Utterances	47%	47%
Cluster Size	$n = 8$	$n = 4$
Proportion of the sample	8%	7%
PDA Hit Rates	38%	0
<i>I</i>	.30	.11

In addition to the similarities in cluster size, the amount of input during the session relative to the rest of the sample, and the profile of the types of utterances used, the parents in Clusters 1<sub>b</sub> and 2<sub>a</sub> also were similar with respect to the proportions of talk at low versus high levels of abstraction. Of the story content related utterances that these parents offered (i.e., their utterances at Levels 1, 2, 3, and 4), parents in Cluster 1<sub>b</sub> and parents in Cluster 2<sub>a</sub> both provided 53% low-level talk (i.e., utterances at Levels 1 and 2) and 47% high-level talk (i.e., utterances at Levels 3 and 4). This is illustrated in the top portion of Figure 3.5.

Although the characteristics of these two clusters were similar, the hit rates obtained for each were low. In the original study, 38% of the parents in Cluster 2<sub>a</sub> were accurately classified in the PDA. This represented a rate of 30% better than chance. In the current study, the hit rate was zero. Thus, although the data on the cluster characteristics suggested that Cluster 1<sub>b</sub> replicated Cluster 2<sub>a</sub>, the PDA did not provide evidence for that.

*Moderate input clusters.* In both solutions, the cluster analyses identified one cluster of parents who contributed moderate numbers of extratextual utterances across most coding categories relative to the other parents in their respective samples (see Table 3.13). In the original sample, 20% of the 96 parents were assigned to this cluster (Cluster 3<sub>a</sub>,  $n = 19$ ). They contributed a mean of 52 extratextual utterances while sharing the unfamiliar book, and they contributed relatively more feedback utterances ( $z = .78$ ,  $M =$

13) and Level 1 utterances ( $z = .99$ ,  $M = 17$ ) than they did utterances in other categories. Their input at Level 4 was below the mean for the sample ( $z = -.12$ ,  $M = 4$ ).

In the current sample, 31% of the 55 parents were assigned to this moderate input cluster (Cluster 2<sub>b</sub>;  $n = 17$ ). They contributed a mean of 65 utterances during the book sharing session, slightly higher than the mean of 52 for the Cluster 3<sub>a</sub>. Parents in Cluster 2<sub>b</sub> offered more Level 1 ( $z = .77$ ,  $M = 19$ ) and Level 2 ( $z = .92$ ,  $M = 15$ ) utterances, and fewer utterances at Level 4 ( $z = -.23$ ,  $M = 3$ ) compared to the rest of the sample. Of their story content related utterances, parents in Cluster 3<sub>a</sub> provided 72% low-level talk and parents Cluster 2<sub>b</sub> provided 71% low-level talk, with their proportions of high-level talk at 28% and 29% respectively (see middle portion of Figure 3.5). Thus, parents in Clusters 3<sub>a</sub> and 2<sub>b</sub> resembled one another in their numbers of extratextual utterances during book sharing, as well as in their greater use of low-level utterances compared to high level utterances. Parents in these clusters rarely used utterances at Level 4. These two clusters differed somewhat in that parents in Cluster 2<sub>b</sub> in the current sample contributed higher numbers of Level 2 ( $z = .92$ ,  $M = 15$ ) and Level 3 ( $z = .51$ ,  $M = 10$ ) utterances compared to parents in Cluster 3<sub>a</sub>.

The PDA hit rates for Clusters 3<sub>a</sub> and 2<sub>b</sub> were both relatively high (90% and 76%, respectively). Both were much higher than would be expected by chance ( $I = .79$  and  $.68$ , respectively). The hit rate and improvement of chance index for Cluster 2<sub>b</sub> validated the original findings of a cluster of parents who offered moderate amounts of input with emphasis on low-levels of abstraction.

*Limited input.* In both solutions, the cluster analyses identified a large cluster of parents who contributed fewer extratextual utterances across all coding categories relative to the other parents in their respective samples (see Table 3.14). In the original sample, 63% of the 96 parents were assigned to this cluster (Cluster 4<sub>a</sub>,  $n = 60$ ), they contributed a

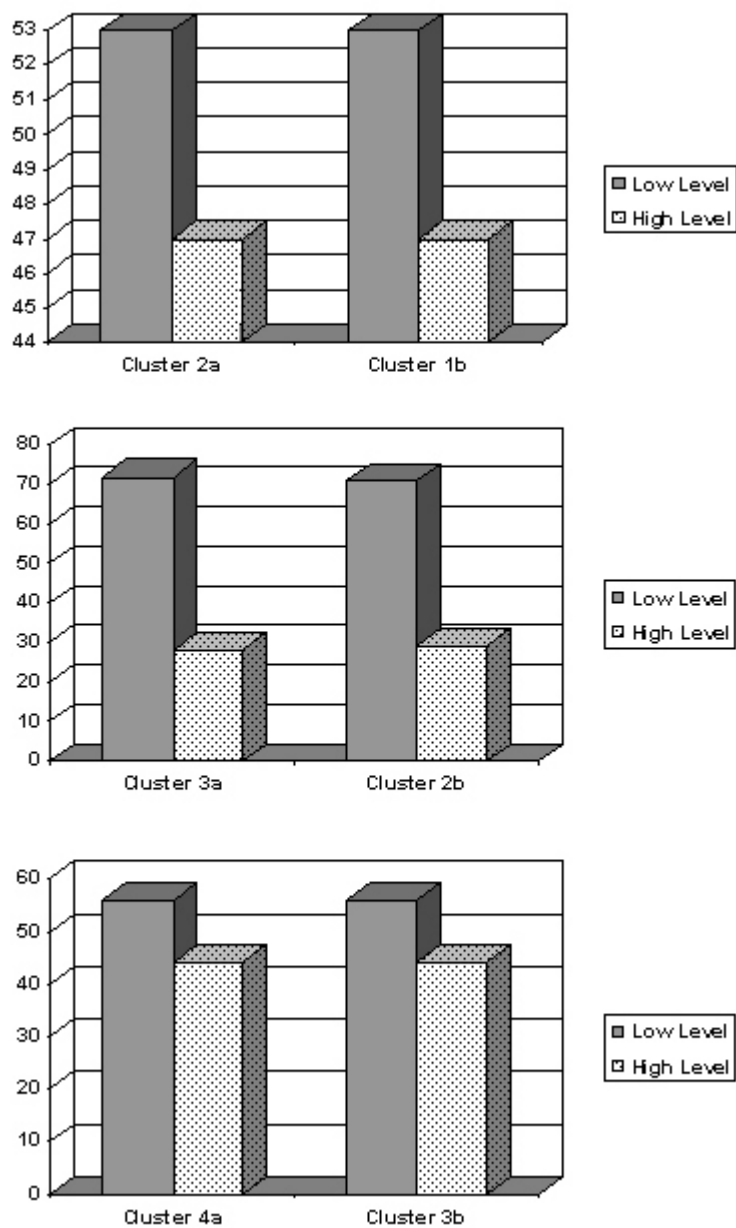


Figure 3.5. Comparison between clusters in the original sample and the clusters in the current sample on the proportions of utterances at low versus high levels of abstraction.

Table 3.13

*Comparison Between the Moderate-Input Clusters in the Original Sample (Cluster 3<sub>a</sub>) and the Current Sample (Cluster 2<sub>b</sub>) on Mean Number of Extratextual Utterances During One Storybook using Raw Data and Standardized Data (z-score)*

Variable	Moderate Input Clusters Raw Data	
	Cluster 3 <sub>a</sub> Moderate Input	Cluster 2 <sub>b</sub> Moderate Input/ Low Abstraction
Print/Book Conventions	5	3
Feedback	13	15
Level 1: Matching perception	17	19
Level 2: Integration of perception	8	15
Level 3: Infer about perception	6	10
Level 4: Reasoning about perception	4	3
	Moderate Input Clusters Standardized Data	
Print/Book Conventions	.29	.25
Feedback	.78	.47
Level 1: Matching perception	.99	.77
Level 2: Integration of perception	.36	.92
Level 3: Infer about perception	.30	.51
Level 4: Reasoning about perception	-.12	-.23
Mean Total Utterances	52	65
Range of total utterances	37 – 78	42 – 97
Proportion of Low-Level Utterances	72%	71%
Proportion of High-Level Utterances	28%	29%
Cluster Size	<i>n</i> = 19	<i>N</i> = 17
Proportion of sample	20%	31%
PDA Hit Rates	90%	76%
<i>I</i>	.79	.68

mean of 18 extratextual utterances while sharing the unfamiliar book. They averaged two to four utterances for each variable, with the higher means in the categories of feedback and Level 1 utterances.

In the current sample, 62% of the 55 parents were assigned to this low input cluster (Cluster 3<sub>b</sub>;  $n = 34$ ). They contributed a mean of 28 utterances during the book sharing session, which was somewhat higher than the mean for Cluster 4<sub>a</sub>. Parents in Cluster 3<sub>b</sub> offered a mean of two to seven utterances for each variable, with the higher means in the categories of feedback and Level 1 utterances. Thus, parents in Clusters 4<sub>a</sub> and 3<sub>b</sub> resembled one another in that they contributed few extratextual utterances relative to other parents in their respective samples and they tended to use feedback and Level 1 utterances. They differed slightly in that parents in Cluster 3<sub>b</sub> offered greater total numbers of extratextual utterances than parents in Cluster 4<sub>a</sub>.

In addition to their similarities in cluster size, and the evidence that they offer lower numbers of utterances compared to the parents in their respective samples, the parents in Clusters 4<sub>a</sub> and 3<sub>b</sub> also were similar with respect to the proportions of talk at low versus high levels of abstraction. Of the story content related utterances that these parents offered, parents in Clusters 4<sub>a</sub> and 3<sub>b</sub> both provided 56% low-level talk and 44% high-level talk (see bottom portion of Figure 3.5).

The PDA hit rates for Clusters 4<sub>a</sub> and 3<sub>b</sub> were the highest obtained in both studies (88% and 91%, respectively). Both were substantially higher than would be expected by chance ( $I = .83$  and  $.74$ , respectively) and the results in the current study provide validation of the findings in the original study.

Table 3.14

*Comparison Between the Limited-Input Clusters in the Original Sample (Cluster 4<sub>a</sub>) and the Current Sample (Cluster 3<sub>b</sub>) on Mean Number of Extratextual Utterances During One Storybook using Raw Data and Standardized Data (z-score).*

Variable	High Input Cluster Raw Data	
	Cluster 4 <sub>a</sub> Limited Input	Cluster 3 <sub>b</sub> Limited Input
Print/Book Conventions	3	3
Feedback	4	7
Level 1: Matching perception	3	6
Level 2: Integration of perception	3	4
Level 3: Infer about perception	2	5

Level 4: Reasoning about perception	2	3
	High Input Cluster Standardized	
	Data	
Print/Book Conventions	-.36	-.20
Feedback	-.57	-.49
Level 1: Matching perception	-.53	-.60
Level 2: Integration of perception	-.56	-.53
Level 3: Infer about perception	-.44	-.39
Level 4: Reasoning about perception	-.40	-.23
Mean Total Utterances	18	28
Range of total utterances	4 – 37	3 – 57
Proportion of Low-Level Utterances	56%	56%
Proportion of High-Level Utterances	44%	44%
Cluster Size	$n = 60$	$n = 34$
Proportion of sample	63%	62%
Hit Rates	88%	91%
<i>I</i>	.83	.74

#### *Statistical Comparison of the Cluster Solutions*

The visual inspection of these two cluster solutions provided substantial evidence for similarity between them. To add to this evidence, a statistical approach for comparing the two cluster solutions was also applied. The procedures described by Breckenridge (1989) were adapted for the current study. First, each of the 55 parents in the current study was assigned to a cluster through the cluster analysis procedures described earlier. These results were referred to as the sample B solution. Second, each of the 55 parents in the current study was assigned to a cluster using the quadratic classification rule from the original study. That is, the classification rule from the predictive discriminant analysis on the original sample was used to predict the group membership of the 55 parents in the current sample. This placed the parents in the current sample into the four clusters obtained in the original solution. These results were referred to as  $B_a$ , that is, sample B assigned to clusters using the results from sample A. Third, each parents' cluster assignment in the current study (B) was compared to his or her assignment using the classification rule from the original study ( $B_a$ ). The statistic used to compare these two

results was the kappa statistic, which corrects for the agreement that would be obtained simply by chance given the sizes of the groups. The purpose was to see whether each parent was assigned to the same cluster in both analyses, which would indicate whether the two cluster solutions were statistically similar.

Standardized data were used in this procedure for two reasons. First, in the original study, standardized data were used to obtain the cluster solution. Second, the parents in the two studies differed statistically in the numbers of extratextual utterances in two of the six coding categories, with the parents in the current sample contributing greater numbers of extratextual utterances during the sharing of the unfamiliar book. Therefore, standardized data allowed comparison of the cluster solutions based on the talk they contributed relative to the parents in their respective samples.

Table 3.15 contains the number of parents assigned to each cluster in the current study solution (B) and using the classification rule from the original study ( $B_a$ ). The cluster solution for the current sample revealed three clusters, with Cluster 1<sub>b</sub> containing 4 parents, Cluster 2<sub>b</sub> containing 17 parents, and Cluster 3<sub>b</sub> containing 34 parents. When these parents were assigned to clusters using the classification rule from the original study ( $B_a$ ), none of the parents were assigned to Cluster 1<sub>a</sub>, 5 were assigned to Cluster 2<sub>a</sub>, 22 were assigned to Cluster 3<sub>a</sub>, and 28 were assigned to Cluster 4<sub>a</sub>. The kappa statistic obtained when these two sets of results were compared was .738; that is, 74% of the parents were assigned to the corresponding cluster in both procedures, correcting for chance. Breckenridge (1989) indicated that “replication kappas greater than .30 are associated with excellent recovery of true clusters, and replication kappas greater than .60 indicate near complete recovery,” (p. 157). However, he also suggested that replication is compromised in populations in which there are disproportionately small clusters, which was true for the population under investigation here.

Of the 34 parents assigned to Cluster 3<sub>b</sub>, 28 (82%) were also assigned to this low-input cluster by the classification rule in the original study (see Table 3.16). Sixteen of the

17 parents (94%) in Cluster 2<sub>b</sub> and 3 out of the 4 parents (75%) in Cluster 1<sub>b</sub> were assigned to the corresponding clusters in the original solution. No parents in the current study were assigned to Cluster 1<sub>a</sub>. Although this provides additional support for the three-cluster solution obtained in the current study, it also fails to provide evidence to support the existence of Cluster 1<sub>a</sub>.

Table 3.15

*Number of Parents Assigned to Each Cluster Using the Current Study Solution (B) and the Original Study Classification Rule (B<sub>a</sub>)*

Clusters	Cluster Description	Assignment B	Assignment B <sub>a</sub>
Cluster 1 <sub>a</sub>	High Input/Print and Story Content		0
Cluster 2 <sub>a</sub> and Cluster 1 <sub>b</sub>	High Input/Feedback and High Abstraction	4	5
Cluster 3 <sub>a</sub> and Cluster 2 <sub>b</sub>	Moderate Input/Low Abstraction	17	22
Cluster 4 <sub>a</sub> and Cluster 3 <sub>b</sub>	Limited Input	34	28

Table 3.16

*Kappa Table Obtained for the Comparison of Cluster Membership in the Two Procedures*

Assignment Based on Original Sample Solution	Assignment Based on Current Sample Solution			Totals
	Cluster 1 <sub>b</sub>	Cluster 2 <sub>b</sub>	Cluster 3 <sub>b</sub>	
Cluster 1 <sub>a</sub>	0	0	0	0
Cluster 2 <sub>a</sub>	3	1	1	5
Cluster 3 <sub>a</sub>	1	16	5	22
Cluster 4 <sub>a</sub>	0	0	28	28
Totals	4	17	34	55

*Research Question 3: How Do the Clusters Obtained for One Storybook Sharing Session Compare to Those Obtained for Two Storybook Sharing Sessions?*

As in the data for one storybook, there was considerable variability within the sample in terms of the ranges in numbers of extratextual utterances parents offered in



each coding category during the two storybook sharing sessions. For Level 4 utterances, the standard deviation was higher than the mean; however, for all other variables, the standard deviations were not equivalent to the means as was the case for the data on one storybook (see Table 3.17).

Table 3.17

*Mean Number of Extratextual Utterances, and the Standard Deviations and Ranges, for Each Coding Category During the Sharing of Two Storybooks for the Current Sample of 57 Parents.*

Variable	<i>M</i>	<i>SD</i>	Range
Print & Book Conventions	6.72	4.70	1-26
Feedback	24.05	18.19	3-95
Level 1	22.81	17.41	0-77
Level 2	17.16	12.70	1-56
Level 3	18.04	13.17	0-59
Level 4	10.09	11.54	0-53
Mean Total Utterances	98.90	65.5	15-289

### *Choosing a Cluster Solution*

The dendrograms obtained from the Ward cluster analysis on the sample of 57 dyads revealed three to seven clusters of parents within the data and one potential outlier. The k-means cluster analyses were used to explore this range of solutions and one parent was identified as differing from the remainder of the sample. As in the analysis using one storybook, the father in Dyad 29 was substantially different in his extratextual talk compared to the remainder of the parents and he was again removed from the sample. The remaining 56 dyads were entered into the Ward and k-means cluster analyses. Again, the Ward dendrogram revealed that three to seven clusters were likely present within the data. The cubic clustering criterion (CCC; using SAS CLUSTER) indicated that the two-, three-, and four-cluster solutions could explain a considerable amount of the variance among parents in the sample. Thus, the three- and four-cluster solutions were explored further using the k-means method.

The three-cluster solution for the sample of 56 parents using raw data combined from two storybooks was highly similar to the three-cluster solution found for the raw data from one storybook presented earlier. Although the solution was obtained using raw data, standardized data is helpful in comparing across clusters. Therefore, the results of this solution are presented in Table 3.18 using data standardized to a z-score. Specifically, this solution identified one large cluster of parents ( $n = 35$ ) who used relatively low numbers of utterances across all coding categories ( $M = 59$  total utterances), a smaller cluster ( $n = 16$ ) of parents who contributed a moderate number of utterances during the two storybook sharing sessions ( $M = 130$ ) with greater emphasis on feedback and Level 1 utterances, and a small cluster of parents ( $n = 5$ ) who offered high numbers of utterances ( $M = 248$ ) across all coding categories. Although the Box M statistic did not indicate a lack of equality of the covariance matrices ( $F = .629$ ;  $p = .818$ ), and the natural log of the determinants of the covariance matrix were similar across the three clusters (Cluster 1 = -59; Cluster 2 = -33; Cluster 3 = -35), the traces indicated greater variability among units in Cluster 1 compared to the other clusters in the solution (Cluster 1 = 949; Cluster 2 = 340; Cluster 3 = 261). Therefore, a conservative approach was considered appropriate for obtaining hit rates and a quadratic rather than a linear PDA (SAS DISCRIM) was used. The overall hit rate obtained was 84%, and this was 69% better than expected by chance ( $I = .69$ ). Thus, the three-cluster solution was supported by the Ward dendrogram, the CCC, and the PDA hit rate, and the cluster characteristics indicated clear distinctions among the clusters.

Table 3.18

*Mean Number of Extratextual Utterances During the Sharing of Two Storybooks for Parents in Each of the Clusters in the Three-Cluster Solution Using Standardized Data (z-Score).*

Variable	3-Cluster Solution		
	Cluster 1	Cluster 2	Cluster 3
Print/Book Conventions	1.01	.21	-.24
Feedback	2.24	.51	-.55

Level 1	2.28	.50	-.55
Level 2	2.09	.45	-.50
Level 3	2.35	.44	-.53
Level 4	1.57	.51	-.46
Mean Total Utterances	248	130	59
Cluster Size	$n = 5$	$n = 16$	$n = 35$

A four-cluster solution was also explored and Table 3.19 contains these cluster centers presented as  $z$  scores. Two clusters from the three-cluster solution remained unchanged, specifically Cluster 4, including 35 parents who offered limited numbers of utterances, and Cluster 3, including 16 parents who offered moderate numbers of utterances. The four-cluster solution, though, made a further distinction among the five parents who offered the highest numbers of utterances. Three of those parents (Cluster 1) used relatively more input at Levels 1, 2, and 3 ( $z = 2.29$  to  $2.60$ ) with less input at Level 4 ( $z = .30$ ); two of these high-input parents (Cluster 2) used relatively more feedback utterances ( $z = 2.61$ ) and utterances at Levels 3 and 4 ( $z = 2.45 - 3.49$ ). Although this represented an additional distinction among the parents who offered the highest amounts of input, it also resulted in cluster sizes too small to use PDA as a means for exploring their validity. Therefore, the three-cluster solution was chosen as the most valid and meaningful one for these data.

Table 3.19

*Mean Number of Extratextual Utterances During the Sharing of Two Storybooks for Parents in Each of the Clusters in the Four-Cluster Solution Using Standardized Data (z-Score).*

Variable	4-Cluster Solution			
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Print/Book Conventions	1	1.04	0.21	-0.24
Feedback	2	2.61	0.51	-0.55
Level 1	2.59	1.82	0.5	-0.55
Level 2	2.37	1.68	0.45	-0.5
Level 3	2.29	2.45	0.44	-0.53
Level 4	0.3	3.49	0.51	-0.46
Mean Total Utterances	238	264	130	59
Cluster Size	$n = 3$	$n = 2$	$n = 16$	$n = 35$

### Cluster Characteristics

The raw data cluster centers obtained using a k-means cluster analysis for the three-cluster solution, as well as the standardized z-scores for these cluster centers, are presented in Table 3.20. Figure 3.6 illustrates the characteristics of each cluster using the standardized data means and Figure 3.7 illustrates the characteristics of each cluster using raw data.

Table 3.20

*Mean Number of Extratextual Utterances During the Sharing of Two Storybooks for Parents in Each of the Clusters in the Three-Cluster Solution Using Standardized Data (z-Score) and Raw Data.*

Variable	Cluster means, standardized data		
	1 High Input Across All Categories	2 Moderate Input/ Low Abstraction	3 Limited Input
Print/Book Conventions	1.01 (.67)	.21 (.85)	-.24 (.86)
Feedback	2.24 (.79)	.51 (.51)	-.55 (.51)
Level 1: Matching perception	2.28 (.62)	.50 (.48)	-.55 (.53)
Level 2: Integration of perception	2.09 (1.14)	.45 (.57)	-.50 (.57)
Level 3: Infer about perception	2.35 (.70)	.44 (.59)	-.54 (.45)
Level 4: Reasoning about perception	1.57 (1.84)	.51 (.91)	-.46 (.38)
	Cluster means, raw data means		
	1	2	3
Print/Book Conventions	10 (6.6)	7 (3.4)	5 (3.4)
Feedback	58 (12.3)	31 (8.0)	14 (7.9)
Level 1: Matching perception	63 (10.8)	31 (8.3)	13 (9.2)
Level 2: Integration of perception	44 (14.6)	23 (7.3)	11 (7.3)
Level 3: Infer about perception	48 (9.0)	23 (7.7)	11 (5.9)
Level 4: Reasoning about perception	25 (18.6)	15 (9.2)	5 (3.8)
Mean Total Utterances	248	130	59
Cluster Size	$n = 5$	$n = 16$	$n = 35$

Note: Standard deviations in parentheses.

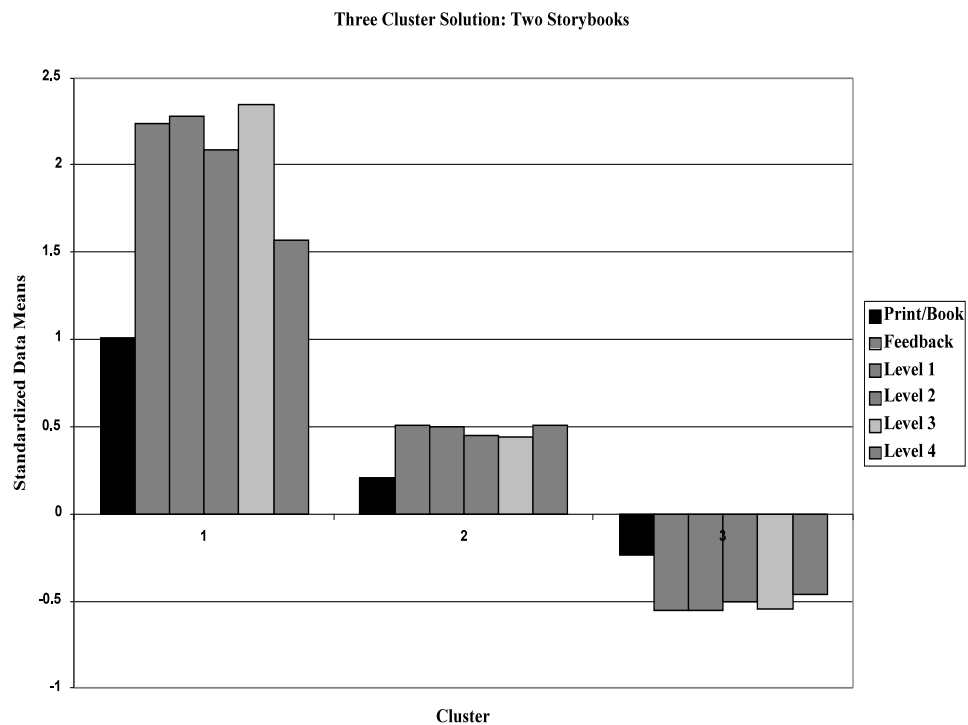


Figure 3.6. Standardized data means (z score) for each of the three clusters obtained for the sample of 56 parents sharing two unfamiliar storybooks.

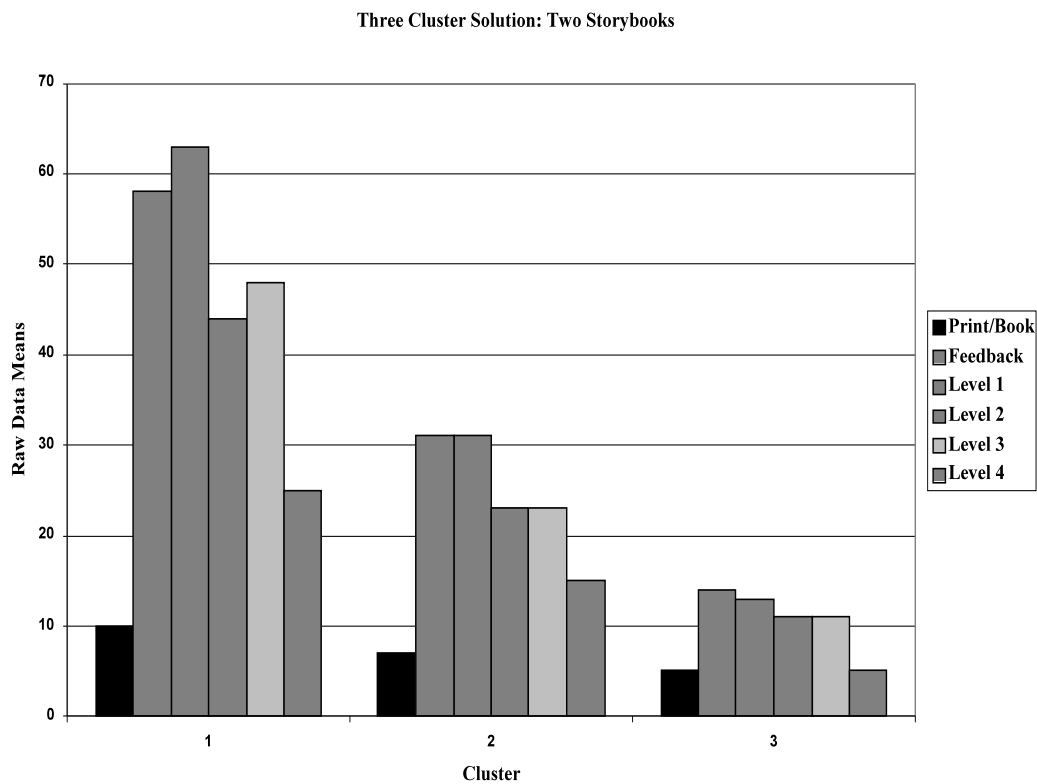


Figure 3.7. Raw data means for each of the three clusters obtained for the sample of 56 parents sharing two unfamiliar storybooks.

*Cluster 1.* Cluster 1 consisted of five parents who provided a mean of 248 extratextual utterances (range = 203 – 289) during the sharing of two unfamiliar storybooks. The numbers of utterances these parents provided in each coding category ranged from 10 to 63 ( $z = 1.01$  to  $2.35$ ). Although their input in all coding categories was above the mean for the sample, they used relatively greater numbers of feedback ( $z = 2.24$ ,  $M = 58$ ), Level 1 ( $z = 2.28$ ,  $M = 63$ ), Level 2 ( $z = 2.09$ ,  $M = 44$ ), and Level 3 ( $z = 2.35$ ,  $M = 48$ ) utterances compared to their use of print and book convention ( $z = 1.01$ ,  $M = 10$ ) and Level 4 ( $z = 1.57$ ,  $M = 25$ ) utterances. Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 59% was at low levels of abstraction (Levels 1 and 2), and 41% was at high levels of abstraction (Levels 3 and 4). This ratio between low and high level utterances was similar to that found in Cluster 1 in the analyses for one storybook presented earlier (i.e., 53% low level, 47% high level). Because these parents offered high numbers of extratextual utterances, this cluster was labeled the “high input across all categories” cluster.

*Cluster 2.* Cluster 2 contained 16 parents who provided a mean of 130 extratextual utterances (range = 98 – 172) during the sharing of the two unfamiliar storybooks. This was approximately half the mean number of utterances provided by parents in Cluster 1. These parents contributed 7 to 31 utterances in each coding category, and all of these were within one standard deviation above the means for the sample ( $z = .21$  to  $.51$ ). Compared to the remainder of the sample, these parents appeared to focus their extratextual talk on feedback ( $z = .51$ ,  $M = 31$ ), Level 1 ( $z = .50$ ,  $M = 31$ ), Level 2 ( $z = .45$ ,  $M = 23$ ), and Level 3 ( $z = .44$ ,  $M = 23$ ) utterances. Utterances at Level 4 were less frequent ( $M = 15$ ) but this was still above the mean for the entire sample ( $z = .51$ ). Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 59% was at low levels of abstraction (Levels 1 and 2), and 41% was at high levels of abstraction (Levels 3 and 4). This ratio differed somewhat from the solution based on only one storybook in which parents in this cluster contributed 72% low-level input and

28% high-level input. Because these parents offered moderate amounts of input across most categories, this cluster was labeled the “moderate input” cluster.

*Cluster 3.* Cluster 3 was again the largest cluster in the solution, containing 35 parents. These parents provided a mean of 59 extratextual utterances (range = 15 – 91) during the sharing of the two unfamiliar storybooks. As was found in the cluster results on one storybook session, this mean number of utterances was approximately half the mean number of utterances provided by parents in Cluster 2, and one-fourth of the mean number of utterances provided by parents in Cluster 1. These parents offered 5 to 14 utterances per coding category, and all of these were within one standard deviation below the means for the sample ( $z = -.24$  to  $-.55$ ). They were least likely to talk about print and book conventions ( $z = -.24$ ,  $M = 5$ ) or offer input at Level 4 ( $z = -.46$ ,  $M = 5$ ), and they were most likely to provide feedback ( $z = -.55$ ,  $M = 14$ ) or Level 1 ( $z = -.55$ ,  $M = 13$ ) utterances. Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 60% was at low levels of abstraction (Levels 1 and 2), and 40% was at high levels of abstraction (Levels 3 and 4). This ratio of input at low and high levels of abstraction was similar to that found in this cluster in the results for one storybook. Because parents in this cluster offered the least extratextual talk during the sharing of the book compared to the entire sample, this cluster was labeled the “limited input” cluster.

*Cluster variability.* The three clusters revealed by this analysis varied in size, shape, and scatter (see Figure 3.8). Because the parents in Cluster 3 all offered relatively low numbers of utterances across categories, they exhibited less variability within the group compared to the other clusters. Parents in Cluster 2 contributed more talk and exhibited more variability, and parents in Cluster 1 contributed the most talk and exhibited the most variability. As in all other solutions obtained, the Box M statistic ( $F(21, 3329) = 4.807$ ;  $p = .000$ ) revealed a lack of equality of the covariance matrices. The log determinants of the covariance matrices (Cluster 1 =  $-.60$ ; Cluster 2 =  $-.33$ ; Cluster 3 =  $-.35$ ) and the traces for the covariance matrices (Cluster 1 = 949; Cluster 2 = 340; Cluster



3 = 261) also suggested greater variability in Cluster 1. Therefore, a quadratic PDA was used to obtain the hit rates.

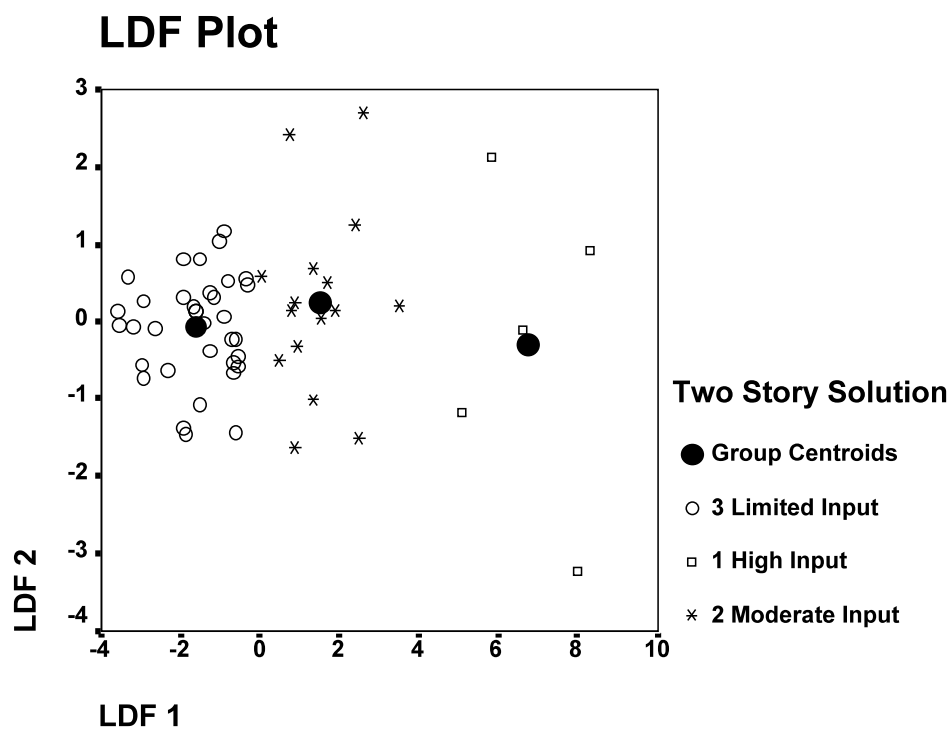


Figure 3.8. Linear discriminant function plot generated through a descriptive discriminant analysis for the cluster analysis solution for two storybooks. LDF 1 explained 99% of the variance based on the numbers of feedback, Level 1, and Level 3 utterances.

Figure 3.8 provides a visual representation of the units within the three clusters, their size, shape, and scatter. As explained in the analysis of the results for one storybook, this plot is based on the two LDFs generated through a DDA (SPSS DISCRIMINANT), which is based on an assumption of equality of the covariance matrices, which may be challenged for these data. It was used here to supplement the description of the clusters. LDF 1 explained 99% of the variance based on the numbers of feedback, Level 1, and Level 3 utterances.

#### *Post-Cluster Analyses*

*Predictive discriminant analysis.* The hit rates obtained through a quadratic PDA (SAS DISCRIM) that informed the decision regarding the appropriate cluster solution were also useful in interpreting the results. Using the same procedures as described earlier (i.e., quadratic rather than linear; leave-one-out classification, prior probabilities of .10, .25, and .65 for Clusters 1 through 3, respectively), the results were highly similar to the results for one storybook. Table 3.21 contains the classification table. The overall hit rate for the three-cluster solution was 84%, which was 69% better than that expected by chance ( $I = .69$ ). Separate hit rates offer a measure of validity for each cluster in a solution (see Table 3.21). Cluster 1 contained five parents and none were accurately assigned to the cluster by the quadratic classification rule. Therefore, there was not sufficient evidence to validate this small cluster within the solution.

This was true for the results on one storybook as well; it appears that additional data on parents' interactions did not improve the prediction of group membership for this small cluster. Separate group hit rates for the other two clusters revealed that 75% of the parents in Cluster 2 were accurately assigned to that cluster given the six predictor variables, which was 67% better than expected by chance ( $I = .67$ ). Likewise, 100% of the parents in Cluster 3 were accurately assigned to that cluster given the six predictor variables, which was 100% better than expected by chance ( $I = 1.0$ ). As in the results for

one storybook, the hit rates for Clusters 2 and 3 in this solution provided evidence for their validity.

Table 3.21

*The Number of Units Classified by Quadratic External (Leave-One-Out) Predictive Discriminant Analysis (with Hit Rates in Parentheses) for the Three-Cluster Solution for Two Storybooks*

Actual Cluster	Predicted Cluster			<i>n</i>	Prior Probability
	1	2	3		
1	<b>0</b> (0)	5 (100)	0 (0)	5	.10
2	0 (0)	<b>12</b> (75)	4 (25)	16	.25
3	0 (0)	0 (0)	<b>35</b> (100)	35	.65
Total	0	17	39	<i>n</i> = 55	

*Validation procedures.* In order to explore these clusters further, they were compared using multivariate ANOVA and t-tests on a number of other variables, all collected concurrently with the storybook sharing data. No significant differences were revealed between clusters on the children's language assessment scores ( $\eta^2 = .971, F(4, 102) = .376, p = .825$ ). To compare the clusters on the emphasis placed on literacy in the home, parents' responses to four questions were entered together. These included the number of minutes the mother and father read to the child each week, the total numbers of children's books in the home, the number of trips to the library each month, and the age at which parents began reading with the child. The MANOVA revealed no significant differences between clusters ( $\eta^2 = .930, F(8, 98) = .449, p = .888$ ). There was also no difference between clusters on the proportions of each of the five types of books that parents read with their child ( $\eta^2 = .939, F(10, 96) = .308, p = .977$ ).

Because the current sample contained a high number of parents who were teachers or speech-language pathologists, and these parents might be more likely than other parents to contribute high amounts of extratextual utterances during book sharing,

clusters were analyzed for parent occupations. The results revealed that 60% of parents in Cluster 1 (3 out of 5) and 44% of parents in Cluster 2 (7 out of 16) were teachers or speech-language pathologists, while this was true for only 29% of parents in Cluster 3 (10 out of 35). Thus, educators were overrepresented in the moderate- and high-input clusters. From another perspective, of the 20 parents in the sample who were teachers or speech-language pathologists, 15% were assigned to Cluster 1, 35% were assigned to Cluster 2, and 50% were assigned to Cluster 3. Thus, parents who were teachers or speech-language pathologists were equally likely to be placed in the moderate- and high-input clusters (i.e., Clusters 2 and 1, respectively) as they were to be placed in the limited-input cluster (i.e., Cluster 3).

*Research Question 4: What Patterns of Extratextual Utterances Characterize Subgroups of Parents During Expository Book Sharing?*

As in the data for the storybooks, there was considerable variability within the sample in terms of the numbers of extratextual utterances parents offered in each coding category. The ranges for each variable were large, and the standard deviations were all at least half of the value of the mean or greater (see Table 3.22). Parents provided significantly greater numbers of extratextual utterances during expository book sharing compared to storybook sharing in all six coding categories ( $L = .586$ ;  $F(6, 107) = 12.60$ ;  $p = .000$ ;  $t(56) = 4.01$  to  $9.17$ ,  $p = .000$  for all variables).

Table 3.22

*Mean Number of Extratextual Utterances, and the Standard Deviations and Ranges for Each Coding Category During the Sharing of Two Expository Books for the Current Sample of 57 Parents.*

Variable	<i>M</i>	<i>SD</i>	Range
Print & Book Conventions	12.25	10.39	1 – 52
Feedback	46.23	31.10	4 – 187
Level 1	48.68	24.36	11 – 135
Level 2	24.51	12.18	4 – 59
Level 3	41.35	22.29	9 – 132
Level 4	30.00	20.92	0 – 118
Mean Total Utterances	203	84	54 – 447

*Choosing a Cluster Solution for the Expository Book Data*

As in the analyses of the storybook data, the data from the two expository book sharing sessions initially were entered into an exploratory process to both identify outliers and determine the most valid and meaningful cluster solution. As in all previous analyses, the same four pieces of information were used to inform the decision-making process: (a) dendrograms obtained through Ward hierarchical cluster analyses; (b) the cubic clustering criterion (CCC); (c) characteristics of the cluster solutions themselves in terms of the numbers of utterances offered for each variable by parents in each cluster; and (d) hit rates from a predictive discriminant analysis.

The dendrograms obtained from the Ward cluster analysis on the sample of 57 dyads for expository book sharing revealed three to six clusters of parents within the data and three potential outliers. The k-means cluster analyses were used to explore this range of solutions and two parents were consistently identified in clusters by themselves. These two parents were the same two identified in the analyses of the data from one storybook sharing session; that is, the father in Dyad 29 and the mother in Dyad 23 were substantially different in their extratextual talk compared to the remainder of the sample. Hence, they were removed from the sample. The remaining 55 dyads were entered into Ward and k-means cluster analyses. The Ward dendrogram revealed that three to six clusters likely present within the data. The cubic clustering criterion (CCC) indicated that the three- to five-cluster solutions could explain considerable variance in the sample. Thus, the three-, four-, and five-cluster solutions were explored further using the k-means method.

Raw data for the sample of 55 parents entered into a three-cluster solution revealed one large cluster of parents ( $n = 32$ ) who used a mean of 145 extratextual utterances during the sharing of the two expository books (see Table 3.23). Although this was a high number of utterances compared to the storybook condition, the number of utterances in each coding category was within one standard deviation below the mean for

the sample, ranging from 10 to 35 ( $z = -.25$  to  $-.59$ ). These parents used relatively more feedback ( $z = -.49$ ,  $M = 32$ ) and Level 1 ( $z = -.57$ ,  $M = 35$ ) utterances. A second and smaller cluster ( $n = 19$ ) of parents contributed a mean of 262 extratextual utterances during the two expository books. The numbers of utterances they offered in each coding category ranged from 17 to 64 ( $z = .35$  to  $.97$ ). Parents in this cluster emphasized feedback ( $z = .97$ ,  $M = 62$ ), Level 1 ( $z = .78$ ,  $M = 64$ ), and Level 3 ( $z = .74$ ,  $M = 54$ ) utterances. Finally, a small cluster of parents ( $n = 4$ ) also contributed a high number of extratextual utterances, with a mean of 278; however, they differed from the second cluster with respect to the types of utterances they used most often. The numbers of utterances they offered in each coding category ranged from 10 to 77 ( $z = -.68$  to  $2.21$ ). Parents in this cluster contributed the greatest numbers of utterances at Level 3 ( $z = 1.19$ ,  $M = 63$ ) and Level 4 ( $z = 2.21$ ,  $M = 77$ ), with utterances at Level 2 ( $z = .87$ ,  $M = 34$ ) also high compared to the remainder of the sample. They used fewer utterances in the categories of print and book conventions ( $z = -.26$ ,  $M = 10$ ) and feedback ( $z = -.68$ ,  $M = 28$ ).

Table 3.23

*Mean Number of Extratextual Utterances During the Sharing of Two Expository Books for Parents in Each of the Clusters in the Three-Cluster Solution Using Standardized Data (z-Score).*

Variable	3-Cluster Solution		
	Cluster 1	Cluster 2	Cluster 3
Print/Book Conventions	-.26	.48	-.25
Feedback	-.68	.97	-.49
Level 1	.87	.78	-.57
Level 2	.87	.36	-.32
Level 3	1.19	.74	-.59
Level 4	2.21	.35	-.48
Mean Total Utterances	278	262	145
Cluster Size	$n = 4$	$n = 19$	$n = 32$

The Box M statistic indicated a lack of equality of the covariance matrices ( $F(21, 5306) = 2.06; p = .003$ ); therefore, a quadratic rather than a linear PDA (SAS DISCRIM) was used to obtain the hit rate for the solution. The prior probabilities entered were .10, .25, and .65 for Clusters 1 through 3, respectively. The overall hit rate obtained was 80%, and this was 62% better than expected by chance ( $I = .62$ ). Thus, the three-cluster solution was supported by the Ward dendrogram, the CCC, and the PDA hit rates, and the cluster characteristics indicated clear distinctions among the clusters.

A four-cluster solution was also explored using raw data for the two expository books, and Table 3.24 contains the cluster centers presented as  $z$  scores. This solution again identified a large cluster of parents ( $n = 31$ ) who used lower numbers of utterances compared to the remainder of the sample. This solution also identified a smaller cluster of parents ( $n = 18$ ) who contributed high numbers of extratextual utterances. The four-cluster solution, however, made further distinctions among the parents in the sample who offered the highest amounts of input, revealing a cluster containing five parents and a cluster containing one parent. The fact that this solution identified a cluster containing only one parent suggested that this parent was perhaps another outlier. However, when she was excluded from the analysis, the solution again identified a cluster of one. A similar scenario was revealed for the five-cluster solution. Findings such as these did little to help clarify the underlying patterns across parents within the sample, nor did it contribute to the understanding of the variability. Therefore, the four- and five-cluster solutions were not considered further. The three-cluster solution was the only solution for which the data converged to indicate that it was valid. Accordingly, the three-cluster solution was chosen as the most valid and meaningful solution for the expository book sharing condition.

*Cluster Characteristics for the Three Cluster Solution for the Combined Expository Data*

The raw data cluster centers (i.e., the centroids or vectors of means for the six variables), resulting from the k-means analysis for the three-cluster solution for the

combined expository book data are presented in Table 3.24. Standardized data means are also provided to facilitate comparisons across clusters. Figure 3.9 illustrates the characteristics of each cluster using the standardized data means; Figure 3.10 illustrates the characteristics of each cluster using raw data means. To better understand the characteristics of each cluster, the following data were analyzed: (a) the total numbers of extratextual utterances offered by parents in each cluster; (b) the numbers of utterances parents offered in each coding category; and (c) the proportions of utterances at low and high levels of abstraction.

Table 3.24

*Mean Number of Extratextual Utterances During the Sharing of Two Expository Books for Parents in Each of the Clusters in the Three-Cluster Solution Using Standardized Data (z-Score) and Raw Data.*

Variable	Cluster means, standardized data		
	1 High Input/High Abstraction	2 High Input Across All Categories	3 Lower Input
Print/Book Conventions	-.26 (.35)	.48 (1.22)	-.25 (.81)
Feedback	-.68 (.50)	.97 (.86)	-.49 (.64)
Level 1: Matching perception	.87 (.34)	.78 (.93)	-.57 (.64)
Level 2: Integration of perception	.87 (.98)	.36 (.88)	-.32 (.96)
Level 3: Infer about perception	1.19 (.40)	.74 (.90)	-.59 (.62)
Level 4: Reasoning about perception	2.21 (1.31)	.35 (.69)	-.48 (.60)
	Cluster means, raw data means		
	1	2	3
Print/Book Conventions	10 (3.7)	17 (12.8)	10 (8.5)
Feedback	28 (10.4)	62 (17.9)	32 (13.3)
Level 1: Matching perception	66 (7.3)	64 (20.2)	35 (14.0)
Level 2: Integration of perception	34 (11.1)	28 (10.0)	20 (10.8)
Level 3: Infer about perception	63 (7.6)	54 (17.1)	29 (11.8)
Level 4: Reasoning about perception	77 (27.9)	37 (14.6)	19 (12.6)
Mean Total Utterances	278	262	145
Cluster Size	$n = 4$	$n = 19$	$n = 32$

Note: Standard deviations in parentheses.



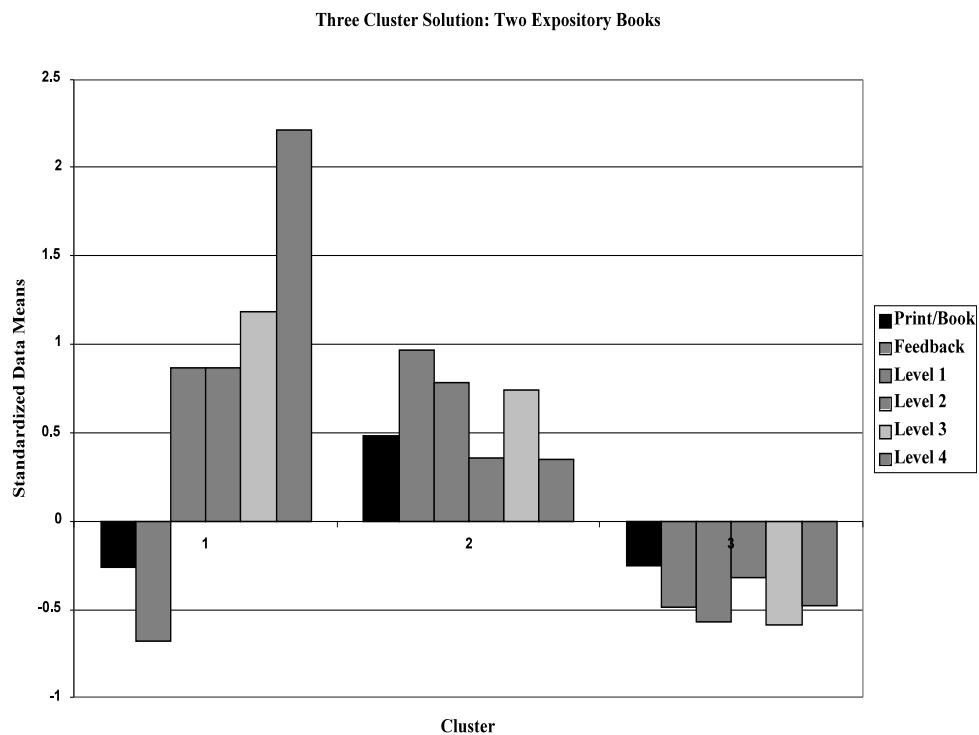


Figure 3.9. Standardized data means ( $z$  score) for each of the three clusters obtained for the sample of 55 parents sharing two unfamiliar expository books.

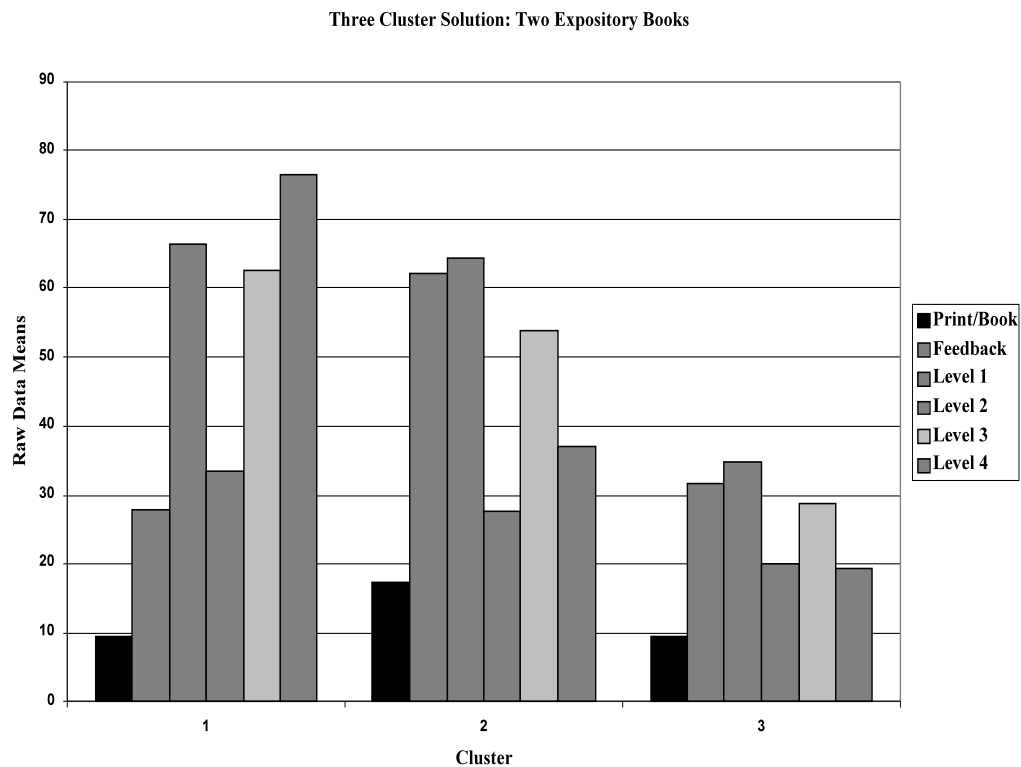


Figure 3.10. Raw data means for each of the three clusters obtained for the sample of 55 parents sharing two unfamiliar expository books.

*Cluster 1.* Cluster 1 consisted of four parents who provided a mean of 278 extratextual utterances (range = 241 – 322) during the sharing of two unfamiliar expository books. These parents offered a range of 10 to 77 utterances ( $z = -.26$  to  $2.21$ ) per coding category, with relatively greater numbers of utterances at Level 3 ( $z = 1.19$ ,  $M = 63$ ) and Level 4 ( $z = 2.21$ ,  $M = 77$ ). Their use of utterances at Level 2 ( $z = .87$ ,  $M = 34$ ) was also high compared to the remainder of the sample. These parents used fewer utterances in the categories of print and book conventions ( $z = -.26$ ,  $M = 10$ ) and feedback ( $z = -.68$ ,  $M = 28$ ) utterances compared to their input in other categories, and compared to the parents in the rest of the sample. Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 42% was at low levels of abstraction (Levels 1 and 2), and 58% was at high levels of abstraction (Levels 3 and 4). Because parents in this cluster contributed high numbers of extratextual utterances during the sharing of the expository books, and a large number were at the highest levels of abstraction, this cluster was labeled the “high input/high abstraction” cluster.

*Cluster 2.* Cluster 2 contained 19 parents who provided a mean of 262 extratextual utterances (range = 191 – 345) during the sharing of the two unfamiliar expository books. This was only slightly less than the mean number of utterances used by parents in Cluster 1. These parents contributed 17 to 64 utterances in each coding category, and all categories were within one standard deviation above the mean for the sample ( $z = .35$  to  $.97$ ). Compared to the remainder of the sample, these parents appeared to focus their extratextual talk on feedback ( $z = .97$ ,  $M = 62$ ), Level 1 ( $z = .78$ ,  $M = 64$ ), and Level 3 ( $z = .74$ ,  $M = 54$ ) utterances. In addition, these parents were more likely to provide print and book convention utterances ( $z = .48$ ,  $M = 17$ ) than the parents in any other cluster. Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 50% was at low levels of abstraction (Levels 1 and 2), and 50% was at high levels of abstraction (Levels 3 and 4). Because these parents contributed high numbers of utterances during expository book sharing, and this input was high across

most coding categories, this cluster was labeled the “high input across all categories” cluster.

*Cluster 3.* As in all the previous results, Cluster 3 was the largest cluster in the three-cluster solution, containing 32 parents. These parents provided a mean of 145 extratextual utterances (range = 54 – 211) during the sharing of the two unfamiliar expository books. This number was substantially lower than the parents in either of the other two clusters, whose means were 278 and 262, respectively. Parents in this cluster offered 10 to 35 utterances per coding category, and these were all within one standard deviation below the mean for the sample ( $z = -.35$  to  $-.59$ ). These parents offered more feedback ( $z = -.49$ ,  $M = 32$ ) and Level 1 ( $z = -.57$ ,  $M = 35$ ) utterances compared to their input in other coding categories. Of the extratextual talk related to the story content (i.e., utterances coded Levels 1 through 4), 53% was at low levels of abstraction (Levels 1 and 2), and 47% was at high levels of abstraction (Levels 3 and 4). This cluster was labeled the “lower input” cluster to reflect the fact that these parents offered fewer extratextual utterances during expository book sharing relative to parents in other clusters.

*Cluster variability.* The three clusters revealed by this analysis varied in size, shape, and scatter (see Figure 3.10). A significant Box M statistic (SPSS DISCRIMINANT) revealed a lack of equality among the covariance matrices ( $F(21, 5306) = 2.1, p = .003$ ). The log determinants (Cluster 1 =  $-.86$ ; Cluster 2 =  $-.32$ ; Cluster 3 =  $-.36$ ) identified Cluster 1 as exhibiting more variability compared to the other clusters, while the traces (Cluster 1 = 1133; Cluster 2 = 1497; Cluster 3 = 860) identified Cluster 2 as exhibiting more variability.

Figure 3.11 provides a visual representation of the units within the three clusters, their size, shape, and scatter. Recall that this plot is based on the two LDFs generated through a DDA (SPSS DISCRIMINANT), which is based on an assumption of equality of the covariance matrices, and this was challenged in these data. However, the LDFs helped to identify the constructs along which the three clusters differed. LDF 1

(represented along the x-axis) accounted for 78% of the variance and separated Clusters 1 and 2 from Cluster 3 with regard to the numbers of Level 1, Level 2, and Level 3 utterances. LDF 2 (represented along the y-axis) accounted for 22% of the variance and separated Clusters 1 and 3 from Cluster 2 with regard to the numbers of feedback and Level 4 utterances.

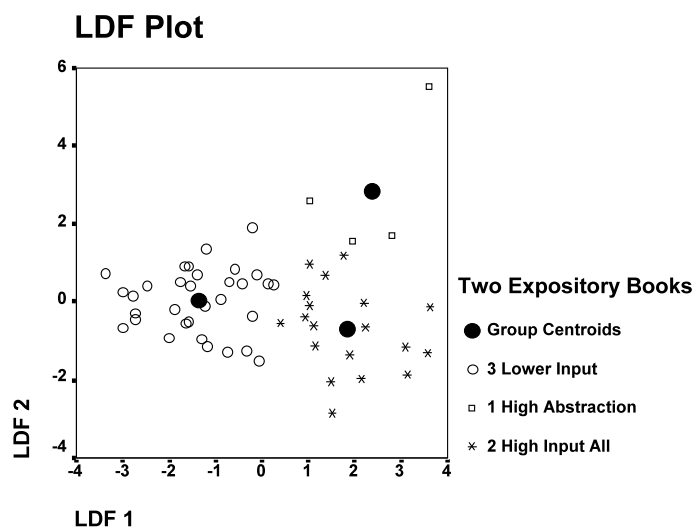


Figure 3.11. Linear discriminant function plot generated through a descriptive discriminant analysis for the cluster analysis solution for two expository books. LDF 1 separated clusters on the basis of the number of Level 1, Level 2, and Level 3 utterances. LDF 2 separated clusters on the basis of the number of feedback and Level 4 utterances.

*Post-Cluster Analyses*

*Predictive discriminant analysis.* The quadratic PDA hit rates (SAS DISCRIM) obtained to inform the decision regarding the appropriate cluster solution were also useful in interpreting the results for the expository book condition. The prior probabilities entered for Clusters 1 through 3 were .10, .25, and .65, respectively (see Table 3.25). The overall hit rate for the three-cluster solution was 80%, which was 62% better than that expected by chance ( $I = .62$ ). Cluster 1 contained only four parents and, as with the small groups found in the other solutions described, none were accurately assigned to the cluster by the quadratic classification rule. Thus, there was little evidence to indicate the validity of this small cluster. Separate group hit rates for the other two clusters revealed that the 79% of parents in Cluster 2 were accurately assigned to that cluster given the six predictor variables, which was 72% better than expected by chance ( $I = .72$ ). Similarly, 91% of the parents in Cluster 3 were accurately assigned to that cluster, which was 74% better than expected by chance ( $I = .74$ ). Therefore, the hit rates for Clusters 2 and 3 provide evidence for their validity.

Table 3.25

*The Number of Units Classified by Quadratic External (Leave-One-Out) Predictive Discriminant Analysis (with Hit Rates in Parentheses) for the Three-Cluster Solution for Expository Book Sharing*

Actual Cluster	Predicted Cluster			<i>n</i>	Prior Probability
	1	2	3		
1	<b>0</b> (0)	4 (100)	0 (0)	4	.10
2	0 (0)	<b>15</b> (79)	4 (21)	19	.25
3	0 (0)	3 (9)	<b>29</b> (91)	32	.65
Total	0	22	33	<i>n</i> = 55	

*Validation procedures.* The current study represents the first investigation within the related research literature that has explored patterns in parents' use of extratextual

utterances during expository book sharing. Consequently, it is not possible to compare these findings to any previous results to assess their validity. The best method for validating cluster analysis results is through replication with a new sample or comparing the results of cluster analyses on two half samples of a larger data set, neither of which is possible in the current investigation.

It was possible, however, to compare the three clusters for differences on variables not used to determine the cluster solution. As in the analyses of the clusters found in the storybook condition, no significant differences were revealed among clusters on the children's language assessment scores ( $\eta^2 = .936$ ,  $F(4, 100) = .841$ ,  $p = .502$ ). Parent responses to four questions were entered together to reflect the emphasis placed on literacy at home. These included the number of minutes the mother and father read to the child each week, the total numbers of children's books in the home, the number of trips to the library each month, and the age at which parents began reading with the child. The MANOVA revealed no significant differences between clusters ( $L = .835$ ,  $F(8, 96) = 1.13$ ,  $p = .349$ ). There was also no difference between clusters on the proportions of each of the five types of books parents read with their child ( $L = .891$ ,  $F(10, 94) = .561$ ,  $p = .842$ ).

As was done following the cluster analysis for the storybook condition, each of the clusters found in the expository condition was analyzed for parent occupation. The results indicated that teachers and speech-language pathologists comprised 25% of parents in Cluster 1 (1 out of 4), 47% of parents in Cluster 2 (9 out of 19), and 31% of parents in Cluster 3 (10 out of 32). Thus, educators were overrepresented in Cluster 2. However, as was found in the storybook condition, teachers and speech-language pathologists were equally as likely to be in one of the high-input clusters (i.e., Clusters 1 and 2) as they were to be in the lower-input cluster (i.e., Cluster 3). Specifically, of the

20 parents in the sample who were teachers or speech-language pathologists, 5% were assigned to Cluster 1, 45% were assigned to Cluster 2, and 50% were assigned to Cluster 3.

*Research Question 5: How do the Clusters Obtained for Expository Book Sharing Compare to the Clusters Obtained for Storybook Sharing?*

Almost all research on parent-child book sharing with preschool children has been conducted using storybooks. The current study sought to extend the research on styles of parent interactions during book sharing using storybooks to book sharing using expository books. In both the storybook and expository book conditions, the three-cluster solutions were deemed the most valid and meaningful. Therefore, to answer Research Question 5, comparisons were made between these two cluster analysis solutions, exploring the similarities and differences in the cluster characteristics.

*Cluster Characteristics Across Storybook and Expository Book Conditions*

In both the storybook cluster solution and the expository book cluster solution, the sizes of the three clusters revealed were similar (see Table 3.26). Both analyses revealed a large cluster containing 58 to 62% of the parents from the sample, a smaller cluster containing 29 to 35% of the parents, and a very small cluster containing 7 to 9% of the parents. In addition, in both cluster solutions, the larger group contained parents who contributed relatively fewer numbers of extratextual utterances when compared to the other clusters within their respective solutions. While these similarities existed in the cluster solutions, there were also differences between them with respect to the numbers and types of extratextual utterances offered in the two book conditions. Parents contributed larger numbers of utterances in the expository book condition, with larger proportions of input at high levels of abstraction. In order to make specific comparisons between the cluster solutions for the two conditions, each cluster will be analyzed in turn. Figure 3.12 provides the bar graphs based on standardized data for each solution to allow visual comparison.



Table 3.26

*Comparisons Across the Cluster Solutions for the Storybook Condition and Expository Book Condition.*

Variable	Storybook Solution		
	Cluster 1 High Input Across All	Cluster 2 Moderate Input	Cluster 3 Limited Input
	Categories		
Number in Cluster	5	16	35
Proportion of Sample	9%	29%	62%
Mean Total Number of Extratextual Utterances	248	130	59
Proportion of Low Level Utterances	59%	59%	60%
Proportion of High Level Utterances	41%	41%	40%
	Expository Book Solution		
Variable	Cluster 1 High Input/High	Cluster 2 High Input Across All	Cluster 3 Lower Input
	Abstraction		Categories
Number in Cluster	4	19	32
Proportion of Sample	7%	35%	58%
Mean Total Number of Extratextual Utterances	278	262	145
Proportion of Low Level Utterances	42%	50%	53%
Proportion of High Level Utterances	58%	50%	47%

*Cluster 1.* The storybook and expository book solutions each identified a very small cluster that included approximately 7 to 9% of the parents in the sample. These were parents whose mean total number of extratextual utterances was higher than that of parents in any other cluster within the solution (see Table 3.27). Cluster 1 parents in the

storybook condition ( $n = 5$ ) contributed a mean of 248 utterances (range = 203 – 289); Cluster 1 parents in the expository condition ( $n = 4$ ) contributed a mean of 278 utterances (range = 241 – 322).

These clusters differed in two respects. First, they differed in terms of the types of utterances they emphasized during book sharing. In the storybook condition, parents in this cluster used higher numbers of feedback and Level 1 utterances, and their input across all categories was higher than that of parents in the other clusters. In contrast, in the expository book condition parents in this cluster used higher numbers of Level 1, Level 3, and Level 4 utterances, and their input across Levels 1 through 4 was higher than the mean for the sample. Conversely, their use of print and book utterances and feedback utterances was lower than the mean for the sample. Second, in the storybook condition, parents tended to offer more input at the low levels of abstraction (59%) and less at the high levels of abstraction (41%). In the expository condition, these were reversed with more input at high levels (58%) of abstraction and less input at low levels (42%) of abstraction.

In both the storybook solution and the expository book solution, the PDA correctly classified zero parents in these clusters. Although this was another characteristic on which the two solutions were similar, it indicated that there was little evidence to validate such clusters. This was likely due to the small numbers of parents in these clusters and the high degree of variability among them.

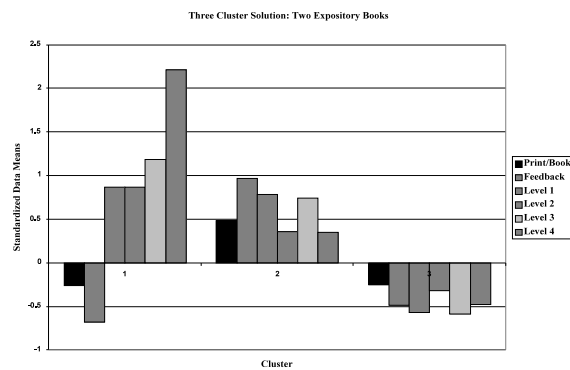
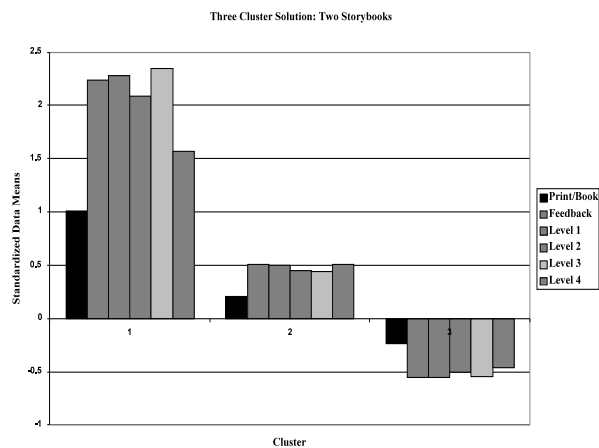


Figure 3.12. Standardized data means (z score) for the storybook and expository book cluster solutions, each based on data for two books.

Table 3.27

*Cluster 1 Characteristics in the Storybook and Expository Book Conditions.*

Variable	Cluster 1 Raw Data	
	Storybook High Input Across All Categories	Expository High Input/High Abstraction
Print/Book Conventions	10	10
Feedback	58	28
Level 1: Matching perception	63	66
Level 2: Integration of perception	44	34
Level 3: Infer about perception	48	63
Level 4: Reasoning about perception	25	77
	Cluster 1 Standardized Data	
Print/Book Conventions	1.01	-.26
Feedback	2.24	-.68
Level 1: Matching perception	2.28	.87
Level 2: Integration of perception	2.09	.87
Level 3: Infer about perception	2.35	1.19
Level 4: Reasoning about perception	1.57	2.21
Mean Total Utterances	248	278
Range of total utterances	203 – 289	241 – 322
Proportion of Low-Level Utterances	59%	42%
Proportion of High-Level Utterances	41%	58%
Cluster Size	$n = 5$	$n = 4$
Proportion of sample	9%	7%
Hit Rates	0	0

*Cluster 2.* The storybook and expository book solutions also each identified a cluster that included approximately 28% to 35% of the parents in the sample (see Table 3.28). The parents in these clusters were similar in that their mean numbers of extratextual utterances across all categories were within one standard deviation above the means for their respective samples. In both solutions, these parents tended to use greater numbers of feedback and Level 1 utterances compared to other coding categories, although in the expository condition the parents contributed a large number of Level 3 utterances as well.

These clusters differed in two respects. First, in the storybook condition, the mean total number of utterances was 130, and this was considered a moderate amount of input compared to the other two clusters in the storybook solution. In contrast, in the expository condition the mean total number of utterances was 262, which was a relatively high amount of input compared to the other two clusters in the expository book solution. Second, in the storybook condition, parents tended to offer more input at the low levels of abstraction (59%) and less at the high levels of abstraction (41%). In the expository condition, parents contributed a balance of low (50%) and high (50%) level utterances during book sharing.

The hit rates for these clusters were similar (75% and 79%) and they represented good improvement over chance within their solutions ( $I = .67$  and  $.72$ ). These data provided evidence supporting the validity of the cluster findings.

Table 3.28

*Cluster 2 Characteristics in the Storybook and Expository Book Conditions.*

Variable	Cluster 2 Raw Data	
	Storybook Moderate Input	Expository High Input Across All Categories
Print/Book Conventions	7	17
Feedback	31	62
Level 1: Matching perception	31	64
Level 2: Integration of perception	23	28
Level 3: Infer about perception	23	54
Level 4: Reasoning about perception	15	37
	Cluster 2 Standardized Data	
Print/Book Conventions	.21	.48
Feedback	.51	.97
Level 1: Matching perception	.50	.78
Level 2: Integration of perception	.45	.36
Level 3: Infer about perception	.44	.74
Level 4: Reasoning about perception	.51	.35
Mean Total Utterances	130	262
Range of total utterances	98 – 172	191 – 345
Proportion of Low-Level Utterances	59%	50%
Proportion of High-Level Utterances	41%	50%

Cluster Size	$n = 16$	$n = 19$
Proportion of sample	28%	35%
Hit Rates	75%	79%
$I$	.67	.72

*Cluster 3.* Both the storybook and the expository book solutions identified relatively large groups of parents ( $n = 35$  and  $n = 32$ , respectively) who offered the lowest numbers of extratextual utterances compared to the remainder of the parents in their respective samples (see Table 3.29). The standardized data revealed means within one standard deviation below the means for their respective samples. These clusters were also similar in the emphasis placed on feedback and Level 1 utterances during book sharing.

These clusters differed in two respects. First, in the expository condition, the mean total number of utterances was more than double that of the storybook condition. Thus, although parents in both of these clusters offered the least amount of input relative to the other parents in the sample within each book condition, the clusters differed substantially across book conditions. Second, although parents in both clusters emphasized feedback and Level 1 utterances, during expository book sharing, parents' mean numbers of utterances at Levels 3 and 4 were greater ( $M = 48$ ) than in the storybook condition ( $M = 16$ ). Hence, in the storybook condition, parents tended to offer more input at the low levels of abstraction (60%) and less at the high levels of abstraction (40%); in the expository condition, parents' extratextual utterances approached a balance between low (53%) and high (47%) level utterances during book sharing.

The hit rates obtained for these clusters were both high, with 100% for Cluster 3 in the storybook condition and 91% for Cluster 3 in the expository book condition, representing good improvement over chance ( $I = 1.0$  and  $.74$ , respectively). These data provided evidence supporting the validity of the cluster findings.

Table 3.29

*Cluster 3 Characteristics in the Storybook and Expository Book Conditions*

Variable	Cluster 3 Raw Data	
	Storybook Limited Input	Expository Lower Input
Print/Book Conventions	5	10
Feedback	14	32
Level 1: Matching perception	13	35
Level 2: Integration of perception	11	20
Level 3: Infer about perception	11	29
Level 4: Reasoning about perception	5	19
	Cluster 3 Standardized Data	
Print/Book Conventions	.24	-.25
Feedback	-.55	-.49
Level 1: Matching perception	-.55	-.57
Level 2: Integration of perception	-.50	-.32
Level 3: Infer about perception	-.54	-.59
Level 4: Reasoning about perception	-.46	-.48
Mean Total Utterances	59	145
Range of total utterances	15 – 91	54 – 211
Proportion of Low-Level Utterances	60%	53%
Proportion of High-Level Utterances	40%	47%
Cluster Size	$n = 35$	$n = 32$
Proportion of sample	63%	58%
Hit Rates	100%	91%
<i>I</i>	1.0	.74

## CHAPTER 4

### DISCUSSION

During book sharing, many parents of preschool children mediate their children's comprehension and verbal participation by discussing the content and the illustrations of the book (e.g., Ninio, 1983; Teale & Sulzby, 1987). This extratextual talk includes utterances that provide feedback to children, utterances about print or book conventions, and utterances about the book's content. Research on parents' use of these different types of utterances during book sharing has revealed substantial variability across parents. Some of this variation has been explained by the age and abilities of the child, the sociocultural or socioeconomic status of the family, and text factors such as book familiarity or genre. Nonetheless, even studies that have been designed to control for these various factors have revealed substantial variability in both the overall amount of input parents provide and the types of utterances they use.

Although few studies to date have attempted to explore this variability, three studies used cluster analysis as a tool to explore the variability and identify patterns of parent style that were not explained by the child's age and abilities, sociocultural group, or text factors (De Temple & Tabors, 1994; Haden et al., 1996; Hammett et al., 2003; Reese et al., 2003). These studies revealed that parents varied in systematic ways in terms of the number and types of extratextual utterances they provided in the context of storybook sharing. However, because of differences in methods across the three studies, few conclusions can be made beyond a recognition that the variability is likely systematic.



The best method for confirming or disconfirming the patterns of extratextual utterances found in previous studies is through replication of procedures in new samples (McIntyre & Blashfield, 1980; Muma, 1993). One primary purpose of the current study was to replicate the cluster analysis study conducted by Hammett et al. (2003) by collecting a new sample using the same data collection methods and applying the same analysis procedures. Accordingly, parents and their three- to four-year-old children were videotaped sharing one of the same four storybooks used in the original study, and the parents' extratextual talk was transcribed and coded for its content. The same cluster analysis procedures were applied, which made it possible to determine whether similar clusters of parent style existed in the new sample, thereby confirming or disconfirming the original results.

In addition to replicating the Hammett et al. (2003) investigation, the current study also extended that research to include an exploration of the influence of text genre on parents' styles of book sharing interactions by comparing storybook sharing to expository book sharing. Although most of the research on expository book sharing has been done with classroom teachers, two studies reported on parents and revealed that different text genres resulted in different amounts of interaction and different types of extratextual utterances (Pellegrini et al., 1990; Vander Woude, 1998). When sharing expository texts in particular, parents were found to use greater numbers of extratextual utterances (Pellegrini et al., 1990; Vander Woude, 1998), and to use more high-level utterances and metalinguistic verbs (Pellegrini et al., 1990). In addition, expository texts typically include greater vocabulary diversity than storybooks due to the use of technical language specific to the topic (Kamberelis, 1999; Pappas, 1991) and more highly salient print features (e.g., print embedded into illustrations, diagrams, charts; Duke & Bennett-Armistead, 2003). Because of this, they offer a context in which parents might provide definitions and explanations, and make more print references, compared to shared reading using storybooks.

The remainder of this chapter provides a discussion of the results presented in Chapter 3 and the implications of the findings. The chapter concludes with the possible future directions for this line of research given the current findings and the limitations of the investigation.

*Research Question 1: What Patterns of Extratextual Utterances Characterized Subgroups of Parents During the Sharing of One Storybook?*

During the analysis of the obtained three-cluster results for parents sharing one storybook with their child, three distinct styles of parent interactions emerged (see Table 3.8 and Figures 3.1 and 3.2). A large cluster of parents (Cluster 3,  $n = 34$ ) contributed lower numbers of utterances across all coding categories compared to the remainder of the sample. More of their extratextual utterances were in the categories of feedback and Level 1, while few were in the categories of Level 4 and print and book conventions. More generally regarding abstraction, their story-content related utterances were almost evenly divided between low levels of abstraction (56% at Levels 1 and 2) and high levels of abstraction (44% at Levels 3 and 4). Thus, just over half of their utterances were focused on objects and actions presented in the pictures, while just under half of their utterances were focused on non-present concepts and ideas, such as making inferences, judgments, comparisons, or explanations.

Although these parents offered lower amounts of talk compared to other parents in the sample, they still provided a mean of 28 extratextual utterances during the sharing of the unfamiliar storybook. These books contained a mean of 41 sentences of text, and the mean duration of the book sharing for dyads in this cluster was five minutes. Therefore, although these parents offered less input compared to parents in other clusters, they did not simply read the text; rather, they contributed approximately one extratextual utterance for every 1.5 sentences of text and 5.6 utterances per minute of book sharing. Their mean of 28 extratextual utterances was only slightly lower than those reported for two samples of low-income parents (  $M = 36$ , Anderson-Yockel & Haynes, 1994;  $M = 35$ , De Temple

& Tabors, 1994) and one sample of low- and middle-income parents ( $M = 34$ , van Kleeck, DeTemple et al., 1996) during the sharing of books roughly comparable in length to those used in the current study.

Another cluster of parents (Cluster 2,  $n = 17$ ) offered moderate numbers of extratextual utterances, averaging 64 during the sharing of the book. The majority of their extratextual talk was in the categories of feedback and Levels 1, 2, and 3, with their high use of Level 2 utterances distinguishing them from the other two clusters. They rarely used print and book convention or Level 4 utterances. Thus, these parents were more likely to provide feedback, encourage their children to notice and locate objects in the pictures (Level 1), talk about the actions of characters (Level 2), and make inferences and comparisons (Level 3), and less likely to offer explanations, predictions, or definitions (Level 4). It might be that these parents placed emphasis on creating a positive and successful book sharing experience by focusing the majority (i.e., 71%) of their story-content related utterances at low levels of abstraction, which these children would likely handle with ease. This kept children's attention on the book itself, providing opportunities for verbally displaying their knowledge, a skill that will be of great importance in their school careers (see van Kleeck, 2004, for a discussion of this point).

The parents in Cluster 2 were labeled the moderate input/low abstraction group because of the predominance of their use of low-level utterances. However, these parents also provided some input at high levels of abstraction (30%). Their ratio of low level talk and high level talk was consistent with the guidelines Blank et al. (1978a) gave for preschool teachers (i.e., 70% low-level to 30% high-level) to create an environment that ensures success but also challenges children to think beyond what is perceptually present. Additional research is needed to determine whether this ratio does in fact have specific benefits for children's development of abstract or literate-style language. The results of the current cluster analysis (in which one storybook session was analyzed in order to more directly replicate Hammett et al, 2003) indicate that this ratio is a characteristic of

one particular style of parent interactions during shared storybook reading. However, the cluster results for two storybook sharing sessions that are discussed later in this chapter revealed that this ratio is characteristic of all three clusters of parents when sharing storybooks.

The results of this analysis also revealed a very small cluster of parents (Cluster 1,  $n = 4$ ) who contributed many more extratextual utterances during book sharing compared to the remainder of the sample. They averaged 113 utterances during the sharing of the book, with many utterances in the categories of feedback, Level 1, and Level 4, and it was their contributions in these categories that distinguished them from the other two clusters. Thus, compared to other parents in the sample, parents in Cluster 1 offered more feedback, they used more utterances to draw attention to the pictures (Level 1), and they offered many more predictions, explanations of concepts, and meanings of words (Level 4). Despite the fact that these parents provided an average of 12 to 28 utterances in all other categories, they focused little on print or book conventions, with an average of only four during the sharing of the book. These parents offered many story-content related utterances and, as in the large limited-input cluster, these were fairly evenly divided between low levels of abstraction (53% at Levels 1 and 2) and high levels of abstraction (47% at Levels 3 and 4).

Parents in all three clusters overwhelmingly focused their extratextual talk on the meaning aspects of the story, only offering an average of two to four utterances about print and book conventions. Even when they did use utterances about print and book conventions, these were most often about book conventions (e.g, title, author, dedication), which are also meaning-focused, rather than utterances about letters or sounds that focus attention on print form. This was consistent with previous research findings indicating that parents rarely focused on print form during storybook sharing (Ezell & Justice, 1997, 1998; Justice & Ezell, 2000a; Phillips & McNaughton, 1990; van Kleeck et al., 1997); instead parents focused almost entirely on story meaning (Shapiro et al., 1997; Snow &

Ninio, 1986; van Kleeck, 1998a; Yaden & McGee, 1984). Research by van Kleeck (1998a) indicated that middle-income parents tended to focus on meaning when sharing storybooks with younger children, but they began to devote attention to print within the context of alphabet books as their children approached preschool and kindergarten entry. Based on van Kleeck's findings, then, it is very possible that the parents in the current sample might have engaged in more talk about the print in the context of an alphabet book rather than the storybook used in the investigation.

As in the original study, the parents in this sample exhibited considerable variability with regard to the number and types of extratextual utterances offered during the sharing of an unfamiliar storybook with their child. This variability was not entirely random, however, and the current cluster analysis findings support the conclusion that parents' interactions during book sharing vary systematically. The parents in this sample demonstrated three consistent patterns of interactions, varying with regard to the numbers of utterances offered during storybook sharing as well as the prevalence of certain utterance types. The most prevalent style of parent book sharing interactions in this sample of middle- to upper-middle income parents, demonstrated by 62% of the parents, was one of limiting extratextual utterances to an average of 28 during the reading of one storybook. This was approximately half of the mean of 49 for the entire sample. Thus, the parents in this cluster offered some degree of extratextual talk during storybook sharing, but limited their input compared to other parents in the sample.

One possible explanation might be that this lower amount of input reflects their ideas about how long their children can reasonably attend, or their beliefs about how much talk is beneficial during storybook sharing. Yet, the current findings for expository books indicated that this was not the case. In that condition, these same parents used greater numbers of extratextual utterances and they kept the interactions going for a longer duration, and therefore, at least during expository book sharing they believed their child could in fact attend longer and that more talk was appropriate. This suggests that

parents' beliefs about the duration and amount of talk during this activity are influenced by text genre.

*Research Question 2: How Do the Clusters Obtained in the Current Sample for Data on One Storybook Compare to the Clusters Obtained in Hammett et al. (2003)?*

The primary purpose of the current study was to determine whether the results obtained with a new sample would replicate the results found in the original study. In order to accomplish this, the two cluster solutions were compared both through visual inspection and statistical comparison of the two cluster solutions. As in Chapter 3, the clusters found in the original study will be referred to with the subscript (<sub>a</sub>) and the clusters found in the current study will be referred to with the subscript (<sub>b</sub>).

#### *Cluster Solution Characteristics Across the Two Studies*

The cluster analysis solutions chosen in the original study and the current study differed in the number of clusters that each contained. In the sample of 96 parent-child dyads, Hammett et al. (2003) found four clusters of parent style; in the current sample of 55 parent-child dyads, three clusters of parent style were identified. Despite this difference, the underlying patterns within the two sets of data were highly similar. When the cluster characteristics were compared, it was apparent that Clusters 2<sub>a</sub>, 3<sub>a</sub>, and 4<sub>a</sub> in the original sample matched closely with Clusters 1<sub>b</sub>, 2<sub>b</sub>, and 3<sub>b</sub> in the current sample in their cluster sizes and cluster characteristics (see Figure 3.4). Thus, the solutions differed in that parents exhibiting book sharing interactions characteristic of Cluster 1<sub>a</sub> were not found in the new sample. In five other respects, though, the cluster solutions for each sample were highly similar.

First, comparisons between Clusters 2<sub>a</sub>, 3<sub>a</sub>, and 4<sub>a</sub> in the original sample and Clusters 1<sub>b</sub>, 2<sub>b</sub>, and 3<sub>b</sub> in the current sample revealed clusters similar in size. The largest clusters (Clusters 4<sub>a</sub> and 3<sub>b</sub>, see Table 3.14) contained approximately 63% of the parents in their respective samples; the next largest clusters (Clusters 3<sub>a</sub> and 2<sub>b</sub>, see Table 3.13) contained approximately 20-30% of the parents in their respective samples; and the

smallest clusters (Clusters 2<sub>a</sub> and 1<sub>b</sub>, see Table 3.12) contained 7-8% of the parents in their respective samples. These cluster sizes across solutions are almost identical providing evidence for validity of three out of the four clusters found in the original study.

Second, parents in these three clusters in each solution were comparable in terms of the amount of extratextual talk offered during the sharing of the storybook relative to other parents in their samples (see Figure 3.4). Each cluster solution identified a large cluster of parents who offered fewer extratextual utterances across all coding categories relative to the other parents in their respective samples, with utterances in each coding category all within one standard deviation below their sample means. Each cluster solution also identified a cluster of parents who offered moderate amounts of input across most coding categories, with utterances in each coding category all within one standard deviation above their sample means. And finally, each cluster solution identified a very small cluster of parents who offered high amounts of input during book sharing, with the numbers of utterances in some coding categories as high as two to three standard deviations above their sample means. Again, the cluster solutions for the original sample and the current sample revealed clusters that were highly similar with regard to the amounts of extratextual talk parents contributed during book sharing, providing a second piece of evidence for the validity of these three clusters in the original results.

Third, the types of utterances characteristic of parents in these clusters were comparable across solutions. Parents in the high input clusters (Clusters 2<sub>a</sub> and 1<sub>b</sub>) used especially high numbers of feedback and Level 4 utterances, and comparatively low numbers of print and book convention utterances. Parents in the moderate input clusters (Clusters 3<sub>a</sub> and 2<sub>b</sub>) used especially high numbers of utterances at low levels of abstraction and few utterances at Level 4. They differed, however, in that Cluster 3<sub>a</sub> used relatively more feedback utterances, and Cluster 2<sub>b</sub> used relatively more Level 2 utterances. Parents in the limited input clusters (Clusters 4<sub>a</sub> and 3<sub>b</sub>) used several

utterances in each coding category, with higher mean numbers of utterances in the categories of feedback and Level 1 compared to their use of other utterance types. The similarities in the types of utterances used most and least often by parents in each cluster provide a third piece of evidence for the validity of these three clusters in the original study.

Fourth, the ratio of utterances at low levels of abstraction to utterances at high levels of abstraction was virtually identical for each of these three clusters across solutions. Parents in the high input clusters in both studies demonstrated a ratio of 53% low level input and 47% high level input; parents in the moderate input clusters in both studies demonstrated a ratio of approximately 70% low level input and 30% high level input; and parents in the limited input clusters in both studies demonstrated a ratio of 56% low level input and 44% high level input (see Figure 3.5). Thus, parents in these three clusters in each solution exhibited similar patterns with respect to their use of low levels and high levels of abstraction, providing a fourth piece of evidence for the validity of these three clusters in the original study.

Fifth, the hit rates obtained through the quadratic predictive discriminant analyses revealed similar hit rates for two clusters in these solutions. Specifically, in each sample, parents in the moderate input clusters (Clusters 3<sub>a</sub> and 2<sub>b</sub>) were accurately assigned to those clusters 90% and 76% of the time, respectively, and these rates were substantially better than chance ( $I = .79$  and  $.68$ , respectively). Parents in the limited input clusters (Clusters 4<sub>a</sub> and 3<sub>b</sub>) were accurately assigned to those clusters 88% and 91% of the time, respectively, and these rates were also substantially better than chance ( $I = .83$  and  $.74$ , respectively). This provided validation of these two clusters within each solution, and validation that the findings for two clusters in the current study replicate the findings in the original study. The hit rates for parents in the high input clusters (Clusters 2<sub>a</sub> and 1<sub>b</sub>), on the other hand, were much lower. In Cluster 2<sub>a</sub>, 38% of the parents were accurately assigned to that cluster, which was better than expected by chance ( $I = .30$ ). In the



equivalent cluster in the current solution (Cluster 1<sub>b</sub>), however, none of the four parents were accurately assigned to this cluster in the PDA. Thus, although Clusters 2<sub>a</sub> and 1<sub>b</sub> resembled each other in terms of their size and the characteristics of parents' utterance types, the hit rate in the current sample failed to provide evidence to validate this high input cluster in the original solution.

In summary, the three clusters found within the new sample were similar to three out of the four clusters found in the original solution with respect to the cluster sizes, the amounts of extratextual talk parents in each cluster offered, the utterance types characteristic of parents in each cluster, and the ratio of low level and high level utterances. Two out of four of the clusters in the original study were validated through the high hit rates found for the corresponding clusters in the current solution, with the improvement over chance index values indicating good group separation for those particular clusters.

Although the cluster analysis solution in the current sample provides sufficient evidence for the validity of two of the clusters in the original solution, it failed to validate parents in Clusters 1<sub>a</sub> and 2<sub>a</sub>. Cluster 1<sub>a</sub> contained nine parents who contributed high numbers of utterances during book sharing, with particular emphasis on print and book convention utterances and utterances at Levels 2 and 3. None of the parents in the current sample resembled parents in Cluster 1<sub>a</sub>. In addition, although the cluster characteristics of Clusters 2<sub>a</sub> and 1<sub>b</sub> indicated similarities between the parents identified in each, the hit rates and improvement over chance index values did not provide sufficient evidence for the validity of the original findings.

#### *Differences in the Amount of Extratextual Talk Across the Two Studies*

Although the cluster analysis results indicated many similarities between the two cluster solutions, one significant difference existed between the two samples. Comparisons of the raw data revealed that parents in the current sample contributed greater numbers of utterances in all coding categories during the sharing of the unfamiliar

storybook, with the exception of print and book conventions. These differences were significant for Levels 1 and 3. The cluster solutions also revealed the differences in overall amounts of extratextual talk. In all three of the clusters in the current solution, the mean number of total utterances was substantially higher than the means for the corresponding clusters in the original sample. The limited input clusters in the original sample and the current sample offered mean totals of 18 and 28 utterances, respectively. Thus, although both contained parents who offered fewer utterances than other parents in their respective samples, the parents in the current sample offered more extratextual talk during book sharing. Similarly, the moderate input clusters in the original sample and the current sample offered mean totals of 52 and 64 utterances, respectively; and the high input clusters offered mean totals of 69 and 113 utterances, respectively. In the current solution, then, parents in the moderate input cluster resembled parents in the high input cluster in the original solution in terms of their total numbers of extratextual utterances.

Because of these differences in overall amount of input, the standardized data from each sample was used in order to compare the two cluster solutions statistically. This was not problematic given that the original cluster findings were based on data standardized to a z score. However, it raises the question of why the parents in the current sample used more extratextual talk compared to the parents in the original sample.

One explanation might be the number of years between when the two samples were collected. The data in the original sample were collected in the early 1990s; the data in the current study were collected in 2003 and 2004. In the intervening decade between the collection of the two samples, the message to parents to “read to your child” has become one of the primary pieces of advice given to prepare preschool children for school entry, and for ensuring children’s success in learning to read. Several reports for parents published by various governmental agencies (Armbruster, Lehr, & Osborn, 2003; US Department of Education, 2002) make recommendations such as “the single most important way for children to develop the knowledge they need to become successful

readers later on is for you to read aloud to them often – beginning when they are babies” (US Department of Education, 2002, p. 28). In addition, in the last several years, there has been much discussion and debate in the popular media regarding the failure of American children in learning to read. In fact, reading education has become highly politicized with legislation like the *No Child Left Behind Act*. What is perceived as a “reading crisis” in this country has become part of the campaign platforms of many elected officials, including those vying for the office of president of the United States. This type of media attention likely has increased the awareness of the general population of the educational value of sharing books with children. Perhaps this message has reached the parents in the current sample and influenced them to view the activity as an opportunity for teaching and coaching in ways that parents a decade ago did not. Alternatively, half of the parents in the current sample were educators, and therefore, they might be more likely to offer greater amounts of extratextual talk during book sharing.

#### *Statistical Comparison of Cluster Solutions*

The results of visual inspection of the cluster characteristics presented in the previous section suggest that the cluster solution in the current sample replicates the findings of the original study for three out of four clusters. The hit rates obtained for each cluster, however, substantiated only two of the original clusters. In order to provide further empirical evidence for whether or not the original findings were valid, a statistical approach was also used to compare the cluster solutions.

In this statistical procedure, parents in the current sample were assigned to groups in two different ways: (a) using the PDA classification rule from the cluster analysis solution obtained in the original study; and (b) using the independent cluster analysis methods including the Ward and k-means procedures described earlier. Therefore, parents in the current sample received two cluster assignments, one based on the results of the original study containing four clusters, and one based on the cluster analysis procedures to create the current cluster solution containing three clusters. These assignments to

clusters were then compared to determine whether the different procedures placed parents into the same clusters. The results revealed three important findings.

First, the statistical comparison revealed a kappa statistic of ( $\kappa = .74$ ) indicating to what degree the two procedures resulted in similar cluster assignments. This indicated that 74% of the parents were assigned to the same cluster in both procedures. Based on guidelines given by Breckenridge (1989), kappas greater than .60 indicate “near complete” replication of the original cluster results. Thus, there is strong evidence to support the conclusion that the current cluster solution replicates the original results.

Second, the statistical comparison found that three out of the four parents in Cluster 1<sub>b</sub> were accurately assigned to the corresponding high input cluster in the original solution (Cluster 2<sub>a</sub>; see Table 3.16). Thus, 75% of the parents in that particular high input cluster were identified by both procedures. Although the hit rates did not provide evidence for the validity of this cluster in the current solution, the results of this statistical comparison between the two cluster solutions did provide support for the validity of this cluster. Because this cluster was small, and the parents exhibited a high degree of variability requiring that a quadratic PDA be used, it is not surprising that the hit rates were low. It is likely that the statistical comparison and resulting kappa statistic are more valid. Yet, caution is still necessary in interpreting these two conflicting pieces of evidence. Taking a conservative stance, these results indicate that indeed a high input cluster likely exists in the population, however, because of the small number of parents contained in the cluster, there is not sufficient evidence at this point to confirm or validate the characteristics of these parents’ extratextual talk beyond the fact that they contribute higher numbers of utterances during book sharing.

Third, no parents in the current sample were placed into Cluster 1<sub>a</sub> (see Table 3.15). This substantiated that there were in fact no parents in the current sample exhibiting the same characteristics as the parents in Cluster 1<sub>a</sub> and it confirmed statistically that the current study fails to provide evidence to indicate that Cluster 1<sub>a</sub>

exists in the population. One way to interpret this is that this subgroup does exist in the population but was not sufficiently represented in the current sample. Alternatively, this result could indicate that the parents in Cluster 1<sub>a</sub> do not represent a true subgroup of parents within the population. The fact that these parents who offered high amounts of input during storybook sharing are relatively rare even in large samples makes it difficult to interpret the current findings. What is likely is that these parents do in fact exist as a subgroup in the population, but each sample obtained logically only contains a handful of them. Because their numbers are small, the characteristics of the cluster are based on only a few parents, and this may or may not capture the true characteristics of the subgroup. With additional research in much larger samples or evidence of the existence of this subgroup across multiple replication studies, it might be possible to elucidate the characteristics of these high-input parents.

Combining the findings of the visual inspection of the cluster solutions and the statistical comparison of the cluster solutions, it is possible to conclude with confidence that the current cluster solution does indeed replicate the findings in the original sample. In both samples, the three clusters obtained differed from one another in the amounts of extratextual talk contributed during book sharing, ranging from low amounts of input to high amounts. Also, in both samples, the three clusters obtained differed in the patterns of utterance types used, and similar patterns were found across the two solutions. Parents in the limited-input clusters used more feedback and Level 1 utterances than other utterance types; parents in the moderate-input clusters used more Level 1 utterances and fewer Level 4 utterances compared to other utterance types; and parents in the high-input clusters used more feedback and Level 4 utterances and few print and book convention utterances compared to other utterance types. Thus, the findings using data from one storybook revealed differences between clusters on both their amounts of extratextual utterances and the types of utterances parents used. As will be discussed later in this chapter, the results of the cluster analysis conducted on the data from two storybook

sharing sessions combined provided further evidence for differences among the subgroups of parents in the amounts of extratextual utterances contributed. However, they do not substantiate the finding of differences in the types of extratextual utterances used. The possible reasons for such conflicting evidence will be discussed later in the chapter.

Replication is the primary method for validating the findings of a cluster analysis. The current findings indicate that the patterns of parents' styles of interaction during storybook reading are robust enough to be found in two different samples, confirming that the variability parents exhibit is systematic rather than random. This finding has implications for future research on parent-child book sharing. First, it indicates that researchers can no longer simply ignore the variability and rely solely on mean tendencies of groups. Even within samples that are homogenous with regard to socioeconomic status and parent education levels, such as the two samples compared in the current study, parents within subgroups differ substantially. Second, it is possible that the variability found in other populations (e.g., low-income families, culturally-diverse families) is systematic as well. Future research will need to investigate the patterns that may exist in other populations. Third, the current findings emphasize the need to investigate parents' interactions during book sharing and how different styles might affect children's language and literacy outcomes.

Much of the research on whether book sharing has an effect on children's later language and/or literacy abilities has focused solely on how often parents read to their children, ignoring the interactions that occur during book sharing. Although frequency of book sharing has been shown to be an important variable (Bus et al., 1995), it does not tell the whole story. Indeed, the current results suggest that it might be equally, if not more, important to consider the interactions that take place during the activity, because parents differ in their styles.

Research that has in fact considered the interactions that take place during the activity, though, has typically focused on the mean tendencies of groups, despite huge

variability within the samples in the amounts and types of utterances contributed. The current findings confirm that subgroups of parents differ in their styles of interactions, and therefore, focusing on mean tendencies of groups limits what can be learned about the activity. Future research needs to explore whether the styles found in subgroups of parents are associated with different outcomes in children's language and literacy skills, or their interest and engagement in book sharing.

*Research Question 3: How Do the Clusters Obtained for One Storybook Sharing Session Compare to Those Obtained for Two Storybook Sharing Sessions?*

In much of the book sharing research, parent-child dyads are observed on only one occasion. Although there is some evidence indicating that parents are relatively consistent in their interactions across sessions (van Kleeck et al., in preparation), concerns remain over the collection of only one book sharing session in this research. For example, Yaden (2003) discusses the fact that many dimensions of the storybook sharing context interact online as well as over longer periods of time and result in dynamic patterns of interactions that are always evolving. Therefore, capturing one book sharing session is similar to taking a still photograph as opposed to a video recording, and this snapshot can create a false illusion of stability in parents' interaction patterns when in reality these patterns are constantly changing in response to a myriad of variables, such as the time of day, location of book sharing, purpose of reading, child's attention and interest, and so on.

In response to such concerns, the parents and children in the current study read two storybooks, each on a different day. Comparisons of these two book sharing sessions using the typical univariate and multivariate comparisons across the two sessions did not reveal significant differences in either their total amount of talk or the use of utterances in each of the six coding categories. Such findings are in direct conflict with the notion that single book sharing sessions are inadequate for revealing stable patterns in interactions. On the contrary, the two sessions obtained in the current study suggest that parents do in fact exhibit stable tendencies in the amounts and types of extratextual utterances they

contribute despite the wide range of factors that might influence their interactions. In fact, the current findings suggest that one session is perhaps sufficient, and the extra effort of collecting multiple book sharing sessions with each dyad is unnecessary.

Although such statistical comparisons between the two sessions are highly typical of those used in this type of research, and they are very convincing regarding the similarities of findings when using only one book sharing session as compared to two, the cluster analysis conducted on data from two storybooks did reveal differences from the cluster analysis conducted on just one storybook. Specifically, the clusters obtained using data from two storybooks revealed that subgroups of parents differed primarily in the amounts of extratextual talk offered during book sharing, but not in their patterns of use of certain utterance types. Such a finding challenges the idea that one book sharing session is sufficient.

*Solution for Two Storybooks: Amount of Talk as the Foundation of Parent Style*

Data from the two storybook sharing sessions was combined and submitted to the same procedures described for the analyses on one storybook. The ranges for each coding category continued to be large (see Table 3.17); however, the standard deviations suggested that the additional data provided by two book sharing sessions did reduce some of the variability. The cluster analysis for the data from two storybook sessions again revealed three clusters of parents (see Table 3.20 and Figures 3.6 and 3.7). These clusters were highly similar to the ones obtained for one storybook in terms of the numbers of parents in each cluster, and in the amounts of input parents in each cluster provide.

Again, one large cluster of parents (Cluster 3,  $n = 35$ ) contributed lower numbers of utterances across all coding categories compared to the remainder of the sample. They averaged 59 extratextual utterances during the sharing of the two stories. Another cluster of parents (Cluster 2,  $n = 16$ ) offered moderate numbers of extratextual utterances, averaging 130 during the sharing of the two stories. The majority of their extratextual talk was in the categories of feedback and Levels 1, 2, and 3. They rarely used print and book



convention utterances and their input at Level 4 was lower than other story-content related categories. Finally, a very small cluster of parents (Cluster 1,  $n = 5$ ) was identified who contributed many more extratextual utterances during book sharing compared to the remainder of the sample. They averaged 248 utterances during the sharing of the two stories, with many utterances in the categories of feedback, and Levels 1, 2, and 3, but fewer at Level 4. Their mean number of print and book convention utterances also was low compared to their input in other coding categories. Parents in all three clusters were similar with respect to the ratios of utterances provided at low and high levels of abstraction. Across all three clusters, approximately 60% of parents' story-content related utterances were at low levels of abstraction, and approximately 40% were at high levels of abstraction.

These cluster results using data from two storybooks confirm the finding based on data from one storybook that the variability in these parents' extratextual utterances during book sharing was systematic rather than random. The primary distinguishing factor among the clusters, though, was the overall number of utterances provided during book sharing, with few differences across clusters in the patterns of highs and lows for specific coding categories. That is, parents in these clusters provided either high, moderate, or low numbers of utterances and this pattern was pervasive across all coding categories. Parents in each cluster exhibited a similar profile of highs and lows across the six utterance types. Specifically, despite differences in overall amount of talk, parents in all three clusters provided their highest numbers of extratextual utterances in the categories of feedback and Level 1, somewhat fewer utterances in the categories of Level 2 and 3, fewer still at Level 4, and the fewest utterances in the category of print and book conventions. Thus, parents focused primarily on providing feedback and acknowledgement utterances, and drawing attention to the pictures (Level 1). To a lesser degree, they provided Level 2 descriptions of objects (i.e., size, shape, color, number) and scenes (i.e., actions, events), and Level 3 inferences based on the pictures, judgments

about characters internal states and points of view, and comparisons. Finally, with much less frequency, they offered utterances to predict, provide facts or definitions, or explain (Level 4), and utterances about print and book conventions. This profile was consistent across all three clusters, with each differing only in terms of the overall numbers of extratextual utterances.

The findings related to the ratios of utterances at low and high levels of abstraction also revealed consistency across the three clusters, supporting the conclusion that amount of interaction was the primary distinguishing factor among the three groups. For parents in all three clusters, the ratio of low input to high input was approximately 60% to 40%, indicating that regardless of the amount of talk parents offered, more than half of their story-content related input was at Levels 1 and 2 and less than half was at Levels 3 and 4. Consequently, for the parents who talked the most and the parents who talked the least, the majority of their story-content related utterances were about the present, the here-and-now, such as labeling objects and actions, and providing descriptions, and these would be easy for typically developing children at this age to understand. Additionally, for parents in all three clusters, more than one-third of their extratextual talk was about topics beyond the immediate context, sometimes called decontextualized language (Denny, 1991; Heath, 1982, 1983; Olson, 1994; Pellegrini, 2001), which is somewhat more challenging for children at this age (Blank et al., 2003; Girolametto, Wiigs, Smyth, Weitzman, & Pearce, 2001; Lehrer & deBernard, 1987; Skarakis-Doyle et al., 2000). The consistency across the three clusters in the ratio of types of talk provided further support for the conclusion that in this cluster solution, the amount of talk was the primary stylistic factor distinguishing parents in each cluster.

This finding that parent style is related primarily to the amount of talk during book sharing is consistent with the findings of Hart and Risley (1995; 1999) who studied maternal interactions in everyday contexts not including book sharing. They recorded observations of a target child within 42 American families in the context of everyday

interactions over the first three years of the child's life. Their findings revealed "staggering contrasts in the amount of interaction between parents and children" and these "translated into striking disparities in the children's accomplishments at age 3" in vocabulary and verbal skills (Hart & Risley, 1995, p. 169). Comparing parents' talk over time, they found high correlations ( $r > .70$ ) between parents' amount of talk across eight month periods of time (Hart & Risley, 1995, p. 66). Thus, the parents who talked the least continued to talk the least over the course of the study; the parents who talked the most continued to talk the most over the course of the study. Hart and Risley (1999) also identified a point in the children's language development around 28 months of age when children "began talking as much as their parents talked to them" (p. 187). Within the environment of the family, then, children were socialized in the amount of talk considered to be appropriate. Because amount of talk was identified as the variable that established the children's trajectory of language learning, Hart and Risley (1999) deemed it to be "the most important aspect of parent talk" (p. 193) as it relates to children's language development. Their results also indicated that although parents at the extremes of the continuum of socioeconomic status differed significantly in the amount of talk they offered during everyday interactions, parents within middle-income families also exhibited a wide range of variability. Van Kleeck, Alexander, Vigil, and Templeton (1996) also found considerable variability in the frequency with which parents in their middle-income sample provided scaffolding for their infants during book sharing.

Similar to Hart and Risley's findings, parents in the current study evidenced distinct differences in style characterized primarily by the amount of extratextual interaction provided during book sharing. They demonstrated tendencies toward providing either high, moderate, or low numbers of extratextual utterances. In fact, this held true across the storybook and expository book conditions. There was a significant and high correlation ( $r = .68, p < .0001$ ) between parents' total number of utterances in the storybook condition and total number of utterances in the expository book condition,

indicating that although parents consistently used greater numbers of extratextual utterances in the expository context, parents who offered the lowest numbers during storybook sharing also offered the lowest numbers in the expository book sharing, and vice versa.

Another consideration, though, relates to the specific context studied here, that is, book sharing. These findings might reflect parents' tendencies toward amount of talk in general, as found by Hart and Risley (1995, 1999), or tendencies influenced by their beliefs regarding how much talk should occur during this particular literacy activity, or perhaps both. Without additional information on the parents in this study with regard to their amount of talk in other contexts (e.g., mealtime, play), it is impossible to know whether their amount of talk during book sharing in this study reflected the amount of talk they use across a range of interaction contexts. It is possible that some parents see the activity of book sharing as one in which the primary focus ought to be on the text and book, and talk outside the text ought to be minimized. As described in Chapter 1, there is evidence that as children approach kindergarten entry, parents tend to decrease their amount of extratextual talk (De Temple & Snow, 1996; Goodsitt et al., 1988; Sulzby & Teale, 1987; van Kleeck & Beckley-McCall, 2002). In one qualitative study (Hammett, Bradley et al., 2002), one parent indicated during an interview that although she typically asked her twin sons questions and talked about the story during book sharing, she also wanted to make sure that in school they could sit and listen to a book being read without interrupting the teacher. Therefore, she talked less during storybook sharing with her four year old twins compared to when they were younger. Thus, parents' beliefs about what should occur during literacy-related activities might be influencing their interactions during book sharing.

#### *Comparing the Three Subgroups on Additional Variables*

As part of their participation in the current study, the children were given two assessments of their language abilities, and the parents completed a book sharing

questionnaire on their book sharing practices at home. The parents in the three clusters were compared on these variables in order to determine if the groups differed, which could help reveal factors that might be influencing parents' styles of interactions. The results revealed that in fact the groups did not differ on any of these variables. Such findings might be due to the homogeneity of the sample, but they are more likely explained by the mismatch between the methods applied in such analyses and the theory that provides a basis for the current research (van Kleeck, 2003).

Using the three clusters as the grouping variable, parents and children were compared on three combinations of variables. First, the three clusters did not differ with regard to the children's performance on the two language measures, the PPVT-III, a measure of general vocabulary ability, and the SPELT-III, a screening measure of syntax and morphological skills. These measures were sufficient for distinguishing between children with language disorders and children without language disorders. However, given the narrow range of abilities for the children in the current study, these measures were not likely sensitive enough to reveal subtle differences in children's language abilities that might influence how parents interact during book sharing. More important, however, is the fact that these assessments were obtained concurrently with the book sharing data. If children's language abilities affect parents interactions, it would be important to measure children's abilities and collect data on parents' interactions longitudinally in order to capture how parents might be responding to their children's increasing abilities. Such an approach is consistent with Vygotskian theory, which proposes that more competent members of a society (in this case, parents) transmit knowledge to less competent members (in this case, children) through supportive social interactions within the cultural context (for further discussion, see van Kleeck, 2003). In the current scenario, then, as parents perceive that their children are becoming more competent, they might slowly change the kinds of support and scaffolding they provide. In the current study, all that can be concluded is that there is no relationship between

concurrent language abilities and parents' interactions during book sharing, and this finding is expected given a Vygotskian theoretical foundation.

Second, comparisons were also made between clusters on a set of variables that represented the emphasis placed on literacy in the home. It is possible that parents' styles of interaction during book sharing could be influenced by how highly they value literacy activities, and how often they provide literacy-related experiences for their child. The set of variables included the number of minutes the mother and father read to the child each week, the total numbers of children's books in the home, the number of trips to the library each month, and the age at which parents began reading with the child. Again no significant differences were found, which likely can be explained by the homogeneity of the sample. This sample was chosen to be highly homogenous in terms of socioeconomic status, cultural group, and level of parent education, and this made it likely that parents were also highly similar with regard to the emphasis placed on literacy.

Third, it was possible that parents' style might be influenced by the types of books they typically shared with their child. For example, if parents typically shared alphabet books or rhyming books, they might be more likely to reference print and book conventions during book sharing; parents who typically shared non-fiction books might tend to use more high level explanations. Parents in each cluster were compared on the frequency with which they reported reading five different types of books. No differences were revealed between groups. Because storybooks were the book of choice, there was again a problem with the ranges on the five variables entered.

Because the goal in the current study was to explore variability within a homogenous sample of parents, it was expected that analyses on these additional variables would not reveal significant differences. In addition, the method of concurrent measurement of book sharing interactions, children's language abilities, and families' home book sharing practices was not consistent with a Vygotskian theoretical foundation, which would suggest that current behaviors or abilities might be related to previous or

future behaviors or abilities but not likely concurrent ones. In order to explore such relationships among variables, a longitudinal design will need to be used.

The clusters did differ, however, in the proportions of parents in each who were teachers and speech-language pathologists. Because there were fewer parents in the moderate- to high-input groups, parents in these education occupations were over represented in those groups. Thus, the higher amounts of talk by parents in these two groups might be explained by the fact that parents in these teaching fields are likely to talk a great deal with children. However, because 50% of the parents who were teachers or SLPs were placed in the limited-input cluster, their occupation cannot entirely explain the cluster results.

#### *Comparing Cluster Solutions for One Versus Two Storybooks*

The cluster analysis results based on data from one storybook and the cluster analysis results based on data from two storybooks differed in two ways. First, while the solution based on data from one storybook revealed clusters that differed on two factors, amount of talk and the patterns of utterance types used, the solution based on data from two storybooks revealed clusters that were distinguished on only one factor, amount of talk. Second, the clusters in the two solutions differed in the ratios of low and high level utterances provided by parents. Specifically, in the results using data from one storybook, parents in Cluster 2 differed from the other clusters, providing a larger proportion of low level utterances (71%). Parents in Clusters 1 and 3 provided more of a balance between low and high input. In the results using data from two storybooks, on the other hand, parents in the three clusters did not vary; each cluster was characterized by a ratio of 60% low level talk and 40% high level talk, despite differences in the clusters on overall amount of talk.

One explanation for both of these differences between the cluster solutions is consistent with Yaden's (2003) view of book sharing as a dynamic system. It may be that one storybook sharing session alone is more likely to reflect the subtle or not so subtle

adaptations parents make to the particular circumstances of that session, including the book being read, the time of day, the location of book sharing, the child's attentiveness and interest, and the level of familiarity with the presence of the camera. Thus, the cluster results for one storybook perhaps were more influenced by how the parent chose to interact in response to all these conditions. The combination of two book sharing sessions may have reduced some of the effects of such influences, resulting in a sample that was more likely to reflect the parents' tendencies toward a certain amount of talk and proclivity toward certain types of utterances

Although the cluster analysis solutions differed in the two ways just described, two similarities between them provide additional evidence for the validity of the cluster results obtained for one storybook and also the cluster results obtained in the original study. First, the cluster solutions were almost identical in the numbers of parents in each cluster, with only a few parents changing cluster membership given the additional data on two storybooks. Second, the three clusters obtained in these solutions revealed the same pattern of differences in the overall amounts of extratextual talk used by the parents in each cluster. Both cluster solutions revealed a large group of parents who offered lower numbers of utterances, a smaller cluster of parents who offered moderate numbers of utterances, and a very small cluster of parents who offered very high numbers of utterances. This confirmed the previous finding that parents exhibit stylistic differences based on how much extratextual talk they contribute during storybook sharing (Hammett et al., 2003).

*Research Question 4: What Patterns of Extratextual Utterances Characterized Subgroups of Parents During Expository Book Sharing?*

The research on parent-child book sharing has been almost entirely focused on what occurs during storybook reading, with very few studies exploring other genres of books. This is perhaps because storybooks are by far the most common type of book read to preschool children (De Temple & Snow, 1996; Dickinson et al., 1992; Duke, 1999;



Phillips & McNaughton, 1990), which was confirmed by the parents in the current study through their reports on the types of books shared at home. However, research has also suggested that expository texts help teach children specific grammar and referencing skills (e.g., Pappas, 1993), as well as exposing children to various written registers that are important later in school (Smolkin & Donovan, 2002). The current investigation sought to extend the research on the naturally-occurring parent styles of interactions during book sharing to include expository books in addition to storybooks. Therefore, parents and children shared two expository books during their participation in the current study, each on a different day, and parents' extratextual utterances were analyzed using the same cluster analysis methods as with the storybook data.

#### *Characteristics of the Three Clusters in the Expository Book Condition*

The analyses conducted for the expository book condition were based on data obtained during two book sharing sessions on different days. Parents in this sample contributed a mean of 203 extratextual utterances while sharing the two expository books, although there was substantial variability across parents. The cluster analysis revealed three clusters of parents, representing three distinct styles of parent interactions (see Table 3.24 and Figures 3.9 and 3.10). A large cluster of parents (Cluster 3,  $n = 32$ ) contributed lower numbers of utterances across most coding categories compared to the remainder of the sample. Nevertheless, it is important to emphasize that their mean number of extratextual utterances was 145 during the sharing of two expository books. Thus, although these parents used lower numbers of utterances relative to other parents in the expository book sample, they actually talked a great deal during the book sharing sessions. These books included a mean of 52 sentences, and thus, parents contributed a mean of 2.8 utterances for every one sentence of text. They used relatively more feedback, Level 1, and Level 3 utterances compared to their input in other categories. These parents tended, then, to provide feedback, encourage their children to notice and locate objects in the pictures (Level 1), and make inferences, judgments, and comparisons

(Level 3). Their book-content related utterances were almost evenly divided between low levels of abstraction (53% at Levels 1 and 2) and high levels of abstraction (47% at Levels 3 and 4). The majority of their extratextual utterances revolved around the book content, with occasional references to print and book conventions.

Another cluster of parents (Cluster 2,  $n = 19$ ) offered much higher numbers of extratextual utterances compared to parents in Cluster 3, averaging 262 extratextual utterances during the sharing of the two expository books. The pattern of utterance types used, however, was similar to the parents in Cluster 3; that is, these parents contributed relatively greater numbers of feedback utterances and utterances at Levels 1 and 3 compared to their input in other categories. Parents in Cluster 2 also resembled parents in Cluster 3 in their ratios of utterances at low and high levels of abstraction, with book-content related talk evenly divided between low (50%) and high (50%) levels. Cluster 2 was distinguished from other clusters, however, in that these parents used twice as many utterances about print and book conventions. Thus, Clusters 2 and 3 were highly similar in the types of book-content related extratextual utterances they contributed, but differed with respect to their use of print and book convention utterances (i.e., Cluster 2 used substantially more) and in their overall amount of talk during expository book sharing (i.e., Cluster 3 used substantially less overall input).

The expository book condition results also revealed a very small cluster of parents (Cluster 1,  $n = 4$ ) who contributed high numbers of extratextual utterances during book sharing, offering a mean of 278 utterances during the sharing of the two books. This average was only slightly higher than the mean of 262 for Cluster 2. Parents in Cluster 1 focused primarily on book-content related utterances, with the fewest utterances in the categories of feedback or print and book conventions. Similar to parents in the other clusters, these parents used relatively more Level 1 and Level 3 utterances. However, the parents in Cluster 1 differed from parents in the other two clusters in that they used their highest numbers of utterances in the category of Level 4. Thus, these parents offered high

numbers of utterances to make predictions, explain facts and concepts, and provide definitions of words (Level 4). Their ratios of utterances at low and high levels of abstraction reflected this emphasis on Level 4, with 58% of their book-content related utterances at high levels and 42% at low levels of abstraction. This represented a somewhat greater emphasis on high levels of abstraction compared to parents in the other two clusters.

The results of analysis of the expository book sharing data revealed three clusters that differed in two ways, that is, in the amount of extratextual talk used during book sharing, and in the types of extratextual utterances characteristic of parents in each cluster. First, parents' styles of interactions were related to the amount of extratextual talk they offered during expository book sharing. Specifically, the number of extratextual utterances used during book sharing distinguished parents in Clusters 1 and 2 from parents in Cluster 3. Parents in Cluster 3 offered substantially lower numbers of utterances compared to the high numbers of utterances offered by parents in Clusters 1 and 2. Cluster 3 was the largest group of parents, indicating that the most prevalent style for the expository condition was one of offering a mean of 73 extratextual utterances per book, compared to parents in the other two clusters who offered almost twice that, a mean of 135 per book.

Second, the parent interaction styles that characterized subgroups within this sample differed with regard to the types of utterances used during expository book sharing. Parents in Clusters 2 and 3 offered more feedback utterances and utterances at Levels 1 and 3 than utterances in other categories, and their book-content related talk was evenly divided between low and high levels of abstraction. This pattern was evident in both clusters despite the fact that parents in Cluster 2 exhibited higher numbers of extratextual utterances across all categories compared to parents in Cluster 3. However, parents in Cluster 2 were distinguished from all other parents in that they used much higher numbers of utterances in the category of print and book conventions.

The parents in Cluster 1 also contributed high numbers of utterances during expository book sharing with particularly high numbers at Levels 1 and 3. They differed from other parents in the sample, though, by offering substantially more input at Level 4. Thus, these parents offered many explanations of information contained in the books, and definitions of words or concepts. Consequently, a greater proportion of these parents' book-content related utterances was at high levels of abstraction (58%) and a smaller proportion was at low levels of abstraction (42%).

#### *Comparing Subgroups on Additional Variables*

As in the comparisons of the clusters obtained using data from two storybooks, the comparisons among the three expository clusters revealed no significant differences in children's abilities, children's level of interest in book sharing, the value placed on literacy at home, or the types of books typically shared at home. Again, this was expected given the homogeneity of the parents and children in the current sample, and the use of concurrent measurements. Parent styles of interaction during expository book sharing might be influenced by these variables; however, this will need to be studied further as style is explored in a variety of populations and using a longitudinal design.

Again, examining parents' occupations revealed that a greater proportion of parents in Cluster 2 (47%) were teachers or speech-language pathologists compared to the parents in Cluster 1 (25%) or Cluster 3 (31%). Thus, the fact that parents in these education fields are more likely than parents in other fields to talk a considerable amount with children during book sharing might help explain the current findings. Given that half of the parents in the sample who were teachers or speech-language pathologists were assigned to Cluster 3 indicates, though, that this does not entirely explain the cluster results.

#### *Expository Text Factors that Explain Parents' Styles of Interactions*

Analysis of the content of expository books, and in particular the expository books by Gail Gibbons used in the current study, helps to explain the prevalence of certain types of extratextual utterances exhibited by parents in this sample during book sharing. These

four books each contained information about a particular animal (i.e., pigs, bats, cats, and dogs). All of the books were organized in a similar fashion, presenting the same types of information in a consistent sequence (see Table 4.1). In this way, they were typical of the genre of informational expository texts described by Kamberelis (1999) and Pappas (1991; 1993). Analysis of these characteristics reveal that these books provided numerous opportunities for three kinds of extratextual talk prevalent in the current sample. First, the books presented many opportunities to provide Level 1 utterances, including labeling and locating objects in the pictures, labeling the contents of diagrams, and making animal sounds. Research by Vander Woude (1998) also revealed that object labeling routines were prevalent between parents and their preschool children with language delays when sharing unfamiliar expository books.

Table 4.1

*Examples of the Types of Information Contained in the Expository Books*

Type of Information	Pigs	Cats
Introduction of the animal	Many people think pigs are smelly and dirty. They think pigs aren't very smart. That's because they don't know pigs!	Cats can be good pets. It's fun to watch them play, pet their soft fur, or curl up next to one.
Description of its characteristics	... all pigs have the same basic characteristics. They have a heavy, round, bristly-skinned body with a round, flat nose called a snout.	Cats all have the same basic characteristics.
Diagram with body parts labeled	Ear, eye, snout, nostril, mouth, leg, toe, hoof	Ear, eye, nose, whiskers, claws, toes, leg, paw
Names for males and females	After a female pig has babies, she is called a sow. Male pigs are called boars.	The father is called a tom. The mother is called a queen.
Examples of different breeds	Landrace pig, Gloucester old spot pig, Duroc pig, Berkshire pig	There are two main groups of breeds, the longhair and the shorthair.
Facts specific to this particular	Pigs are the smartest of all farm animals. Pigs are tidy creatures and would much rather be clean all the time. When it gets too hot, pigs need to moisten their skin	Cats have thirty teeth that are designed for hunting.... Cats are wonderful hunters because of their strong legs,

type of animal	or they will get sick. They need to roll around in water or mud to lower their body temperature.	sharp claws, and flexible bodies.
Information about their senses	Pigs have good hearing. They have small eyes and poor eyesight.	They have excellent sight. At night, cats can see six times better than people.
Information about how they communicate	Oink! Pigs make sounds to communicate. They make grunting sounds to show pleasure or give a warning.	Meow. Hiss. Cats make many sounds that mean different things. A meow can mean they want to be noticed. A hiss or a growl means they are angry.
Information about their babies	The female pig gives birth to a litter of six to fifteen piglets.... By the time they are six months old, they will be really heavy...	Baby cats are called kittens. Mother cats usually give birth to one in six kittens in a group called a litter.
Closing statements	It's fun to watch piglets romp about! They are cute and lovable with their curly tails, their flat pink snouts, and their noisy squeals and grunts. Soon they will grow to be big, big pigs.	Kittens are so much fun to play with... but, best of all, they are wonderful pets.

Second, the expository books used in this study also provided many opportunities to use utterances at Level 3. These include utterances to infer about the pictures or text, infer what characters might be thinking or feeling, provide a judgment or point of view, compare or contrast between two things, relate the text to the child's life experiences, or connect the text to another text that the child is familiar with. For example, parents often related the text to the child's own experiences through comparisons (e.g., "pigs get hot and roll in the mud just like you get in your swimming pool to cool off", "the pig weighs more than daddy does!"). Their utterances often inferred what characters might be thinking (e.g., "...the judges are saying Hmmm, I think your pig is the best one here", "see the dog is making him feel scared and he's hissing"), or provided a judgment or evaluation (e.g., "that's a silly looking nose!", "that's really neat how she catches the baby"). Parents also made connections between the expository books and other books or movies with which the child was familiar (e.g., "remember in Charlotte's Web?", "We read another book with a bat in it, Stella Luna").

Although one might expect expository books to also elicit substantial numbers of Level 2 utterances given all the descriptive information presented (e.g., size and color of the animals), this was not the case in this sample. This was due to the fact that these parents often talked about descriptive features of the animals within the context of making a Level 3 comparison (e.g., “see how this cat’s hair is longer than this cat’s hair?”, “this pig is different than that one cuz it has spots and that one has a stripe”, or referring to the funnel-eared bat “it sorta looks like a tornado or something”). Therefore, many of their comments relating to the size, shape, or color of the animals were coded Level 3 rather than Level 2 because they were indeed more abstract than simple descriptions, and this contributed to the high numbers of Level 3 utterances these parents used.

Third, these expository texts also provided many opportunities for Level 4 utterances, including those in which parents make predictions, provide definitions or explanations, or convey factual knowledge. Informational expository books contain text which explains facts and concepts, and one characteristic feature is the prevalence of technical vocabulary (Duke & Bennett-Armistead, 2003; Kamberelis, 1999). Because of this, they are often viewed by adults as more challenging for young children than typical narrative storybooks (Duke & Bennett-Armistead, 2003). Yet, this might also explain why parents provided more Level 4 utterances in the context of expository books, as they attempted to support their child’s comprehension and engagement during book sharing. Indeed, the parents in the current study tended to provide extratextual utterances to expand on and explain the information presented (e.g., “and then sometimes pollution from big plants makes it so bats can’t live healthy anymore”, “so when the baby bat’s only three months old, it flies by itself”, “you know we eat ham or bacon? It comes from pigs”). They also provided definitions of unfamiliar words (e.g., “that means they sleep during the day and they’re awake at night”, “so their nose is called a snout”, “bristly-skinned – you know what that means? Means they’re sorta prickly”). Although parents

used more Level 4 utterances during the expository condition compared to the storybook condition, parents in one subgroup (expository Cluster 1) used especially high numbers of Level 4 utterances (i.e., 39 per expository book compared to 10 per book for parents in Cluster 2, and 10 per book for parents in Cluster 3). This particular subgroup of parents saw these books as a good context for direct teaching of information and words. Thus, although genre does influence parents' use of this type of utterance, style of book sharing is also a factor.

In summary, features specific to expository text help explain the prevalence of certain types of extratextual utterances used during book sharing in this condition. These books provide many opportunities to label and locate objects in the pictures (Level 1), make comparisons, judgments, and inferences (Level 3), and provide definitions and explanations of facts (Level 4).

#### *Validity of the Expository Book Cluster Solution*

The validity of the expository book cluster solution was evaluated using the results of the predictive discriminant analysis. These indicated that parents in two of the clusters, Clusters 2 and 3, were reliably assigned to their clusters by the PDA classification rule given the six predictor variables, and their hit rates were well above what would be expected by chance. This was not true for the four parents in Cluster 1. As was true in all the other cluster analysis solutions, the PDA failed to accurately assign the parents in this small, highly variable cluster and, thus, failed to provide evidence for the validity of this particular cluster.

In the context of storybook sharing, both the original study (Hammett et al., 2003) and the results for the storybook condition in the current investigation revealed the existence of small subgroups of parents who differed from other parents in their respective samples on some aspect of the amount and/or types of extratextual utterances they used. Such findings suggest that within the population there are small subgroups that



differ in some way from the majority regardless of the type of text being shared; however, these clusters are small even within relatively large samples (e.g., clusters of less than 10 in the sample of 96 in Hammett et al., 2003). Because these parents offer high numbers of extratextual utterances, they also tend to exhibit a high degree of variability among them in the numbers of utterances they contribute in different coding categories. The characteristics of these small clusters in each sample, then, are highly influenced by certain parents within the subgroup. The combination of small numbers and high variability results in poor classification in the predictive discriminant analyses, which makes it difficult to substantiate the validity of these small subgroups. Future replication of the findings in the expository condition is likely the best method for determining whether such a small cluster is indeed a valid subgroup within the population. The only conclusion that can be drawn for the current results is that at least one small cluster of parents is likely that differs in the profile of utterance types used, and this small cluster might represent parents who use the expository book context to teach information and the meanings of words to a far greater extent than other middle-income parents.

*Research Question 5: How do the Clusters Obtained for Expository Book Sharing Compare to the Clusters Obtained for Storybook Sharing?*

One purpose of the current investigation was to compare the clusters of parent interaction styles that occur during storybook sharing to the clusters of parent interaction styles that occur during expository book sharing, exploring the similarities and differences across the two conditions. Indeed, there were both similarities and differences in parents' styles. These are described below and the possible reasons for them are discussed.

*Similarities and Differences Between Storybook and Expository Book Conditions*

*Similarities across conditions.* The cluster analysis results revealed that in both the storybook condition and the expository book condition, the cluster solutions containing three subgroups were the most valid and meaningful (see Table 3.26 and

Figure 3.12). Two other aspects of the cluster solutions were similar. First, the numbers of parents in each cluster were almost identical. Both solutions revealed a large cluster of 32 to 35 parents, a somewhat smaller cluster containing 16 to 19 parents, and a very small cluster containing 4 to 5 parents. The largest cluster in both solutions contained parents who used lower amounts of extratextual talk compared to the remainder of the sample. Thus, each cluster contained a similar proportion of the sample.

Second, in both the storybook cluster solution and the expository book cluster solution, one factor on which the clusters differed was the amount of extratextual talk parents provided during book sharing. This was true despite the fact that parents exhibited substantially greater amounts of talk when sharing expository books. In the storybook condition, parents exhibited three styles related to amount of talk (i.e., low, moderate, and high amounts); in the expository condition, parents exhibited two styles in terms of amount (i.e., low versus high numbers of utterances). This similarity across the two conditions further substantiates that middle-income parents demonstrate tendencies toward more or less talk, and that these tendencies are pervasive across at least the two genres studied here. However, if these parents hold beliefs about how much talk is appropriate during this particular literacy activity, this finding suggests that their beliefs differ for storybooks and expository books, with all parents believing more talk is appropriate during the expository condition. These results provide support for the idea that amount of talk might be related to general tendencies toward more or less talk across all activities, as Hart and Risley's (1995, 1999) research revealed; however, the results also suggest that something about the difference between these two text genres also plays a role in how much extratextual talk parents contribute during book sharing. The differences between expository texts and storybook texts will be discussed in depth further on.

*Differences across conditions.* The analyses of these data also revealed five differences between storybook sharing and expository book sharing. First, there were

significant differences between the two conditions in terms of the proportion of the text read. In the storybook condition, virtually all parents read the entire text of the book, while in the expository book condition over 30% of the parents read only a portion of the text. Parents who did not read the entire text, however, did use the book to provide a context for verbal interactions about the topic presented. They often talked about the pictures and paraphrased and explained specific information, teaching their children about the animals without reading the text itself. These parents were perhaps more flexible in following their child's lead during the interactions, moving through the book based on the child's interests rather than being bound by the text. Further explorations of the differences between parents who did and did not read the entire text are warranted in future analyses.

Second, the interactions around expository books were longer in duration than the interactions around storybooks, and this was true despite the fact that some parents did not read all of the text in the expository books. This cannot be explained by the length of the books because the sets of two books in the storybook condition were equated with the sets of books in the expository book condition on the numbers of pages they contained and the numbers of sentences in each. In addition, the longer duration cannot be explained by the complexity of the grammar, as the sets of books were also equated on syntax by ensuring similarity in mean length of the sentences. The content and text structure of expository texts, and the relative unfamiliarity of these types of books compared to stories, both might explain the differences in the duration of the interactions, and these are discussed further on.

Third, there were differences between conditions on the numbers of extratextual utterances parents offered. Parents contributed significantly higher numbers of extratextual utterances in the expository book condition. Even parents who used the lowest numbers of extratextual utterances in the storybook condition offered substantially more during expository book sharing. This was consistent with the findings of the two

previous studies, one with preschoolers who were typically developing (Pelligrini et al., 1990) and one with preschoolers who had language delays (Vander Woude, 1998) that investigated parents' use of extratextual talk during interactions around expository and narrative texts in which parents were found to use greater numbers of extratextual utterances during expository contexts.

The difference in overall numbers of extratextual utterances across the two contexts was also revealed in the cluster analysis results. Parents in all three clusters in the expository book condition used substantially greater numbers of extratextual utterances compared to parents in the three clusters obtained in the storybook condition. Even parents in expository Cluster 3, whose numbers of utterances were below the mean for parents in that condition, provided an average of 145 utterances during the sharing of two expository books, and this contrasted with the parents in the storybook Cluster 3 who offered an average of 59 utterances during the sharing of two storybooks.

Fourth, the storybook and expository book cluster solutions differed in terms of what characteristics distinguished among the three clusters. The primary factor distinguishing between clusters in the storybook condition was the underlying difference in amount of extratextual talk, whereas the clusters in the expository book condition were distinguished from one another on both the amount of extratextual talk and the patterns of utterance types used by parents in each cluster. Specifically, parents in all clusters in the storybook condition provided the most utterances in the categories of feedback and Level 1; they provided somewhat fewer utterances in the categories of Levels 2 and 3; and they provided the fewest utterances in the categories of print and book conventions and Level 4. The same profile of highs and lows was apparent across all three storybook clusters. The primary difference between clusters in the story book condition, then, was in the amount of extratextual talk offered by parents in each cluster.

Conversely, in the expository book condition, two factors distinguished among parents in the three clusters: (a) their amounts of extratextual talk; and (b) the utterance

types characteristic of each cluster. Namely, parents in expository Clusters 2 and 3 were both characterized by their greater use of feedback, Level 1, and Level 3 utterances even though they differed in their amounts of talk, with parents in Cluster 2 averaging two times more talk than parents in Cluster 3. Parents in expository Clusters 1 and 2 both provided high numbers of utterances compared to the remainder of the parents; however, they were different from one another in the types of utterances used. Parents in expository Cluster 1 provided substantially greater numbers of Level 4 utterances compared to parents in other clusters; and parents in expository Cluster 2 provided substantially greater numbers of print and book convention utterances compared to parents in other clusters. Based on these results, subgroups of parent styles of extratextual talk during storybook sharing vary on amount of talk, while subgroups of parent styles during expository book sharing vary in both amount and the patterns of utterance types parents tend to use.

Fifth, the cluster solutions revealed differences in the proportions of book-content related utterances that were at low levels of abstraction and at high levels of abstraction during storybook and expository book sharing. During storybook sharing, approximately 60% of parents' utterances were at low levels of abstraction and approximately 40% were at high levels of abstraction, and this was true regardless of the cluster to which parents were assigned. During expository book sharing, the majority of parents offered an equal amount of low and high levels of abstraction; that is, approximately 50% of the book-content related utterances was at low levels of abstraction and approximately 50% was at high levels. The exception to this was the four parents in expository Cluster 1 for whom an even greater proportion (i.e., 58%) was at high levels of abstraction. Therefore, in addition to talking substantially more during expository book sharing, a greater proportion of parents' extratextual talk was at high levels of abstraction regardless of the cluster to which parents were assigned. The raw data also illustrate these striking differences between the amount of high level talk in each condition, with parents

averaging eighteen Level 3 utterances and ten Level 4 utterances while reading the two storybooks, compared to forty-one Level 3 utterances and thirty Level 4 utterances while reading the two expository books.

In summary, compared to storybook sharing, parents in the expository book sharing condition read less of the text, interacted around the books for longer durations, offered substantially higher numbers of extratextual utterances, provided a greater proportion of their talk at high levels of abstraction, and differed in their styles not just in amount of talk but also in the types of utterances that characterized each subgroup. Potential explanations for these differences across conditions are discussed in the next section.

#### *What Explains these Differences Between Storybook Sharing and Expository Book Sharing?*

It is possible that the research design itself influenced or exacerbated the differences in parent interactions in the storybook and expository book conditions. Parents were told during the informed consent process that they would be reading two types of books, stories and information books. This might have suggested to them that they were supposed to read them differently. There are three reasons why parents' styles might differ across the storybook and expository book conditions: (a) parents and children have less experience with the expository genre; (b) differences in the content of the books influence the amounts and types of utterances used; and (c) differences in the text structures of the storybooks and expository books influence parents' styles.

*Less experience with the expository genre.* The parents in the current study reported that over 50% of their book sharing at home involved storybooks, while sharing expository or informational books occurred only about 15% of the time. Because expository books were a less frequent part of the book sharing routine, the parents had much less practice in reading this genre of book, and the children were less familiar with sharing this genre of book, and this might have influenced parents' interactions. When the

type of text genre is unfamiliar, the children and/or the parents might perceive it to be more challenging or less interesting. Some parents commented that these books were harder to read with their child, they were too detailed or long, or that their child was less interested in the expository books than in the storybooks. The idea that expository books are too challenging for young children is a common concern among some teachers who are reluctant to use expository texts in primary classrooms (Duke & Bennett-Armistead, 2003).

The parents' lower degree of familiarity and experience with sharing this particular genre, and/or a perception that it is more challenging, might explain some of the differences in their styles in the expository book condition. This factor might have influenced them to read less of the text, skipping portions they believed to be too difficult, time-consuming, or of less interest to their child. It also might explain why their interactions around these books were longer in duration. Parents might have perceived these books to be more challenging than storybooks because they differed from the books they typically read with their child. This might have influenced parents to provide more scaffolding and support in order to help their child be successful, which would contribute to the longer duration and the higher numbers of extratextual utterances. Thus, parents' use of higher numbers of utterances at Level 1 in the expository condition might have been an attempt to increase their child's successful participation, and perhaps parents in Cluster 2, who offered substantially more Level 1 utterances compared to parents in other clusters, were particularly motivated by an attempt to help their child experience more success in a less familiar book sharing situation.

*Content of the text.* The content of the expository books differed from the storybooks in three ways. First, although the length and sentence complexity of the storybooks and expository books was controlled in the current study, the amount of vocabulary diversity contained in each was not controlled. Because this is a text feature of the expository genre, it was intentionally not controlled. Therefore, the technical

vocabulary included in these expository books resulted in greater vocabulary diversity than in the storybooks. However, the greater vocabulary diversity might explain the differences parents exhibited in the expository condition compared to the storybook condition. Parents used greater numbers of utterances at high levels of abstraction, and these included utterances used to define words. Indeed, parents were much more likely to define words during expository book sharing. This feature of the content also interacted with parent style with parents in expository Cluster 1 exhibiting many more Level 4 utterances than other parents.

Second, the expository books contained factual information, including descriptions, explanations, definitions of terms, and descriptions of similarities and differences across different breeds of the animal. In contrast, the storybooks did not contain a high density of information, which was consistent with the narrative storybook genre. Thus, the content of the books provided many more opportunities for parents to offer utterances at high levels of abstraction, including Level 3 utterances, such as making comparisons, text-to-life connections, and judgments, and Level 4 utterances, such as providing explanations or facts. Thus, the content of the books themselves likely influenced parents' styles of interaction in terms of the types of utterances they chose to contribute. In addition, parents might have perceived some of this information to be difficult or challenging for their child to comprehend, and this might have influenced them to read less of the text and/or to provide greater amounts of extratextual talk to support their child's understanding.

Third, the content of the expository books differed from the storybooks in the amount of print embedded within the illustrations and the inclusion of diagrams within the books. Some illustrations contained sentences printed within them rather than in a text block at the bottom of the page; many pages contained embedded labels of objects; and each book contained at least two diagrams that included printed labels. The storybooks did not contain embedded print or diagrams. Embedded print likely influenced parents'



use of print and book convention utterances and their use of Level 1 utterances. Parents contributed, on average, twice as many print and book convention utterances and twice as many Level 1 utterances during expository book sharing compared to storybook sharing. All parents used at least some utterances about the print in response to the embedded text during expository book sharing. Parents also responded to the embedded print by drawing their child's attention to the illustrations through labeling routines, which would influence the numbers of Level 1 utterances.

The embedded print and diagrams included in the expository books likely influenced parents' use of print and book convention utterances and Level 1 utterances; however, it was evident that parents' style of interacting also was a contributing factor. Specifically, parents in expository Cluster 2 used substantially greater numbers of print and book convention utterances and substantially greater numbers of Level 1 utterances compared to parents in the other two clusters. The finding that parents in Cluster 2 used substantially more of these types of utterances compared to parents in Clusters 1 and 3 indicates that although all parents were influenced by the content of the expository books, parents also exhibited stylistic differences or tendencies in response to the content of the books. Cluster 2 parents might have been responding specifically to the differences in the content of the illustrations in expository books.

*Text structures.* Differences in text structures are one of the primary distinguishing features between genres. Text structures are the patterns in how texts are organized (McKenna & Stahl, 2003). The structure of an informational expository text differs substantially from the structure of a narrative story. Narrative texts, at least those common to Western cultures and that are most prevalent in American classrooms, typically contain an introduction of characters along with their goals or motivations, a description of the setting, an initiating event which establishes the problem, attempts by the main character(s) to resolve the problem, and a resolution to the problem (Kamberelis, 1999; McKenna & Stahl, 2003; Pappas, 1991, 1993). In contrast,

informational texts do not contain characters with goals and motivations; rather, they consist of the presentation of a topic, description of attributes, events or activities characteristic of or related to the topic, comparisons and contrasts between members of the class, and a final summary (Kamberelis, 1999; Pappas, 1991, 1993).

Expository texts, then, contain an objective presentation of facts; and although there are similarities across expository texts in how the information is sequenced, the information on one page typically is not imperative for comprehension of the information on the next page. Thus, they do not necessarily need to be read in order from front to back, nor do they need to be read in their entirety. This contrasts with storybooks where skipped pages typically cause confusion. To illustrate this, during the current study, when parents accidentally skipped a page in a storybook, they almost always recognized this immediately and returned to the missed page. When parents accidentally skipped a page in an expository book, however, they rarely noticed the omission. This feature of expository text might explain the fact that some parents read less of the text than they did in the storybook condition. Realizing that the text structure would allow such omissions of text, parents who did not read the entire text might have focused only on what they believed to be most interesting or understandable to their child. Text structures that do not depend on recall of previously presented information might also explain the greater amounts of extratextual talk. Discussions of the topic embedded during the reading of an expository book likely would not interrupt the flow of the text as they could in narrative storybook sharing. This might free parents from feeling bound to the text, allowing more room for conversation during book sharing without the concern that it would interfere with the child's comprehension. In storybooks, it is important to recall the characters motivations and attempts and the consequences of those attempts in order to continue to understand the text; therefore, interruptions to the text reading to talk about the story or make connections to the child's life might actually interfere with the child's comprehension of the story. Consequently, the parents in the current study might have

responded to these specific text features by minimizing extratextual talk during storybook sharing and increasing their extratextual talk during expository book sharing. In this way, the text structure of expository books allows more extratextual talk compared to the text structure of stories.

#### *Implications of These Differences During Expository Book Sharing*

The results of the current study revealed substantial differences in parents' use of extratextual utterances when sharing expository books and storybooks. The text structures and content of expository books, and/or the fact that parents and children typically had less experience with this genre, resulted in differences in the interactions that took place during the activity. All parents exhibited a tendency to continue the book sharing activity for longer duration of time and to provide more extratextual talk. In addition, more of the talk that occurred during expository book sharing was at high levels of abstraction compared to the talk during storybook sharing. Some parents chose to read less of the expository text than the storybook text, and although all parents differed on the amount of talk they contributed, they also exhibited different styles related to the types of utterances they typically used. The finding of robust differences across the two genres within the same sample of parents has four important implications for families, educators, and researchers.

First, the fact that parents naturally vary their styles of interactions when reading these two types of book genres reveals that simply changing the type of book used during the activity can have a dramatic impact on the types of interactions that occur, at least within families who have already existing book sharing routines. This certainly has ramifications for intervention programs that seek to change the amounts and/or types of extratextual talk that occurs during book sharing. Numerous studies have been conducted in which parents and teachers are taught to use interactive book reading strategies, called dialogic reading (Whitehurst et al., 1988). The strategies typically taught include having adults ask "what" questions to elicit labels, ask open-ended questions to elicit multiword

responses, expand and extend upon children's utterances, and provide praise and encouragement. These types of strategies have been found to result in short-term gains in children's language abilities (Lonigan, Anthony, Bloomfield, Dyer, & Samwel, 1999; Whitehurst, Arnold et al., 1994; Whitehurst, Epstein et al., 1994; Whitehurst et al., 1988). All of these studies have used storybooks as the text genre. The parents in the current study exhibited substantially more of these types of utterances simply by interacting around an expository book rather than a storybook. They were not coached or taught to provide more of these extratextual utterances. If the goal is to increase these types of interaction during book sharing, it is possible that simply changing the genre of book would result in such increases. This may or may not be true for families in different sociocultural populations or for families who do not already participate in book sharing at home. Further research will be needed to determine how parents in other populations are influenced by differences in the book genre during book sharing.

Second, parents naturally exhibit differences in the amounts and types of talk used during storybook and expository book sharing and, therefore, if the goal of an intervention is to alter their interaction patterns, it could be beneficial to teach those interaction patterns within the context that already appears to elicit them. For example, teaching parents to use greater numbers of book-content related utterances at high levels of abstraction might best be done in the context of expository books, where the text structure and book content actually encourage the use of these types of utterances. Although more research is needed to explore this, teaching parents to be mindful of the types of utterances they use within a book context that encourages those utterances might actually influence their book sharing across genres. For example, parents who learn to use greater numbers of utterances or utterances that elicit labeling within book sharing around expository texts might begin using more of these types of utterances during storybook sharing.

Third, the content and text structure of expository texts provide more opportunities to use high levels of abstraction, and parents appear to naturally provide greater amounts of this type of talk. Children who need more exposure to this type of talk, such as children with language disorders and children from low-income backgrounds, might benefit from increased exposure to expository texts. A number of studies have found that exposure to talk at high levels of abstraction is related to children's ability to handle such decontextualized language (Gentner & Medina, 1997; Heath, 1982; Leseman & de Jong, 1998; Peterson & McCabe, 1994; Sigel, 1979; van Kleeck et al., 1997; Wells, 1986). Children from low-income backgrounds typically receive less exposure to language at Levels 3 and 4, both at home and once they enter school (e.g., Heath, 1982; Wells, 1986), and this is believed to contribute to difficulties they experience with the types of activities and text comprehension required in schools, especially after about the third grade. Children who have language disorders also tend to have lower ability to handle language at the high levels of abstraction (Blank et al., 2003; Lehrer & deBernard, 1987; Skarakis-Doyle et al., 2000; Vander Woude et al., 2002) and they are at high risk for difficulties with literacy development.

There is some evidence that increasing such exposure has a positive effect on children's abstract language and literacy abilities (Peterson & McCabe, 1994; Taylor, Peterson, Rodriguez, & Pearson, 2002; van Kleeck et al., 1997). For example, teachers who make substantial gains with low-income children in the area of literacy have been found to use more high-level language compared to teachers who are less successful with these children (Taylor et al., 2002). Similarly, children whose parents use prompts and scaffolding to elicit information at high levels of abstraction during children's retellings of personal narratives demonstrate better use of this type of language later (Peterson & McCabe, 1994). If exposure to talk at high levels of abstraction can result in gains in children's ability to handle this type of language and/or gains in their literacy skills, then interactions around books that encourage/facilitate the use of such language might prove

beneficial for children. However, the results of the current study indicate that parents differ systematically in how they structure their interactions during expository book sharing. It will be important for future research to explore what effects these particular styles might have on children's language and literacy skills. Experimental designs will be necessary to determine this.

Fourth, if these two genres elicit different styles of interactions from parents, it is possible that other genres do as well. For example, alphabet books provide a context that allows opportunities to emphasize letter knowledge and phonological awareness, and indeed there is evidence that parents use more utterances about print and book conventions during interactions around alphabet books than storybooks, especially as children approach kindergarten age (Smolkin et al., 1992; van Kleeck, 1998a). Research is needed that explores how other genres might influence the interactions between parents and children during book sharing, and also how these interactions influence what children learn from book sharing using such texts. Until we better understand the effects of genre on interactions during book sharing, it may be beneficial to encourage parents to share books from a variety of genres to expose children to multiple text structures and contents, and perhaps a variety of interaction styles from their parents.

#### *The Infrequent Use of Expository Books During Book Sharing*

Despite the fact that expository books have potential benefits as a context for book sharing interactions, parents reported reading them infrequently. There are three reasons why parents might choose storybooks almost exclusively with children three to four years of age.

First, storybooks are by far the most well-known genre of book for children. In fact, the image of parent and child nestled together reading has become a symbol of white, middle-class American parenting, and this image typically includes a bedtime story rather than any other sort of text. The prevalence of storybooks in our image of parent-child (and even teacher-child) book sharing is reinforced in the literature on early literacy

learning. Pappas (1993), in her article entitled “Is narrative ‘primary’?”, reviews literature that illustrates how stories dominate the field of literacy education. For example, she described a position put forth by Egan (Egan, 1988) that children make sense of their world through stories, and how Wells (1986) views stories as the foundation of all areas within school curriculum. She points out that Adams (Adams, 1990) rarely mentions any genre other than stories in her seminal book about early literacy learning. If literacy educators rarely discuss genres other than stories, it is not surprising that parents also equate “reading to my child” with “reading stories to my child.” Certainly there are benefits to reading stories and this discussion is not meant to suggest that we should stop reading stories with children. However, parents likely read stories with their children because they are seen as the “primary” genre available and beneficial for young children. Indeed, many parents in the current study were interested in where to find the Gail Gibbons books, commenting that they were not aware these books were available.

Second, parents may believe their children are too young for expository books and that this genre is too difficult for young children. Some parents in the current study expressed this belief. Certainly, these books contain more sophisticated vocabulary, which does make them more challenging. Yet, research by Weizman and Snow (2001) and Beals and Tabors (1995) has revealed that amount of exposure to rare or sophisticated lexical items was related to children’s later vocabulary abilities. In fact, the density of children’s exposure to rare lexical items during everyday conversations predicted their later vocabulary even more than the quantity of lexical input (Weizman & Snow, 2001). Beals and Tabors (1995) studied rare vocabulary exposure in a variety of contexts, including book sharing, and their results showed that parents’ use of rare words varied substantially depending on the context. Mealtimes were more likely to contain greater proportions of rare vocabulary, and during book sharing parents’ use of rare words depended on what book was used. These studies demonstrate that exposure to rare words does have an effect on later vocabulary abilities, and some situations facilitate greater

proportion of such words. The results of the current study indicate that expository book sharing provides a context likely to result in greater use of rare words, along with scaffolding that can facilitate knowledge of them, and other research suggests that this has potential benefits for children's vocabulary development.

Expository texts might initially be challenging, especially for children who do not demonstrate any interest in them. There is some evidence that exposure to book reading increases interest in the activity (Neuman, 1986), especially exposure at a young age (Arnold et al., 1994). Perhaps exposure to expository texts in itself can increase children's level of interest in such books. Some researchers are convinced that access to quality children's literature, especially for entertainment purposes, influences children's motivation and interest in reading (Baker, Scher, & Mackler, 1997; Neuman, 1996; Neuman & Celano, 2001). The affective nature of the interactions during book sharing also appears to contribute to children's motivation to participate (Kaderavek & Sulzby, 1998; Snow, 1994). Such research suggests that access to good children's literature along with the nature of the parent interactions around those books together can affect children's interest during the activity and motivation to seek out the activity in the future. For children who find expository texts difficult, there are also mixed genres available that might make expository texts more accessible, such as narrative expository books that contain information but present it in a narrative style. These are becoming more common in textbooks for young children and they might serve to bridge the gap between narrative stories and informational expository texts for young children (Duke, 1999).

Third, access to quality expository books written for the young child is limited, even for parents who place a high value on literacy. This became apparent in the process of identifying books for the current study. The two largest local bookstores (both large chain stores) had no expository books of the sort used in the study. What was available was a small selection of books on emergency vehicles, which primarily contained pictures with labels and perhaps a few lines of text, or nonfiction books appropriate for children



eight years or older. A search of the public library shelves specifically designed for the youngest children revealed two Gail Gibbons books about holidays (i.e., Thanksgiving, Halloween) that fit into the category of narrative expository texts. The Gail Gibbons books ultimately used in the current study and others that were appropriate for children three to four years old were eventually located in the nonfiction stacks that shelved mainly books for older children (e.g., encyclopedia-type books, chapter books) and were not accessible to young children. Some parents who asked where to find the books used in the study mentioned that they would never have thought to look in the stacks for books for their three-year-old.

It is not surprising given anecdotal evidence like this that parents rarely access the expository genre through typical avenues such as the public library or local bookstores. The parents in the current study were highly literate parents with the resources to obtain reading materials for their children. Neuman and Celano (2001) have shown that children from low-income families have substantially less access to children's books, and the quality of what is available to them is poor at best. Their research also suggests that access to children's books influences the frequency of book sharing. Thus, low-income children are likely to have even less access to expository books. If parents are going to become aware of expository books and their benefits, and if low-income families are going to have the same opportunities as other families, it will be necessary to rethink where and how these books are made available to them.

#### *Limitations of the Current Investigation and Future Directions*

The current study design represented a substantial improvement over two previous cluster analysis studies (Haden et al., 1996; Harte, 1997), and refined the methods used in Hammett et al. (2003). Six limitations in the design remained, however. These limitations help identify future directions for this line of research. First, a sample size of 57 is considered small for the use of cluster analysis. Research in other fields using cluster analysis has achieved large sample sizes that are simply not possible in book sharing

research. The fact that the sample of 57 in the current study replicated the original findings suggests that this small sample was at least large enough to reveal that the underlying patterns were similar. However, one of the three clusters was very small, making it difficult to reach conclusions regarding the characteristics of the extratextual utterances used by those parents. There is a continuing need for research using larger samples of parents and children; however, because this will be difficult, it will also be important to explore the effects of different sample sizes on cluster solutions obtained in book sharing studies. It will be possible to pool the sample obtained in the current study with the two samples analyzed in Hammett et al. (2003), creating a sample of 153. Such a study can compare the cluster solution obtained using all 153 parents to the cluster solutions obtained using smaller, randomly selected subsets of the total sample. Such an investigation will inform the question of adequate sample sizes in the area of book sharing.

Second, one common criticism in the book sharing literature is that most studies rely on only one sample of book sharing between parent and child. This study represented an improvement over this previous research in that each dyad shared two books in each genre, across two sessions on different days. Although the results of comparisons between the two sessions provided evidence that in fact parents exhibit a high degree of stability over two sessions, the cluster results suggested that two sessions provided a more representative sample of the parents' interactions. Further investigations are needed that specifically explore whether parents' interactions around unfamiliar books are stable or variable over a larger number of sessions when the length and complexity of the texts are controlled.

Third, the focus of the current study was on parents' extratextual utterances during book sharing, despite the fact that the child was an active member of the dyad, and was likely influencing the interactions (e.g., see Yaden, 2003, for a discussion). Most of the research on book sharing interactions has looked at parents' extratextual utterances, and

in order for the results of the current investigation to add to that body of literature, it was important to keep the focus on parents' utterances. The current study used unfamiliar books as stimuli in an attempt to provide some control for children's participation. Previous research indicates that unfamiliar books create a context in which the children's participation is minimized and the parents' participation is maximized. Thus, providing unfamiliar books biased the amount of interaction in favor of the parent. This offered the best possible design for analyzing parents' interactions during book sharing.

In the past research, even when both parents' and children's extratextual utterances during book sharing have been analyzed, the analyses were most often done separately. Thus, even studies that have looked at both partners in the dyad, the sequential nature of the interactions was not explored. Hammett et al. (2002; 2003) have suggested, however, that conceptually, it will be important to study the reciprocal effects of adults' and children's utterances during online interactions. In order to consider such online effects, methods other than cluster analysis will be needed. Sequential analysis methods (see Bakeman & Gottman, 1997; Bakeman & Quera, 1995) would be most appropriate, and would enable researchers to determine whether certain sequences of interactions occur more than would be expected by chance.

A fourth limitation of the current study arises from the composition of the sample. The sample of parents and children who participated in this study represented families of middle- to upper-middle socioeconomic status. Also, the children were all typically developing. The goals of the current study required that the sample be homogenous with respect to socioeconomic status, parent education level, and child ability so that the variability within such a sample could be explored. However, this substantially limits the external validity of the current results, and it will be important to extend the line of investigation to study other populations, including economically and culturally diverse families, and dyads including a child with a language disorder or developmental delay. Previous research has revealed variability within and across sociocultural groups (e.g.,

Baker, Sonnenschein, Serpell, Fernandez-Fein, & Scher, 1994; Leseman & de Jong, 1998; van Kleeck, Alexander et al., 1996). Research is needed that explores how cultural group, economic status, and children's language and developmental abilities may be related to parents' style of interacting during book sharing, and whether differences in parent styles are related to parents' beliefs about literacy learning in preschoolers or characteristics of the child (e.g., child temperament, interest and engagement in book sharing).

A fifth limitation arises from a design involving concurrent measurements. It is not possible with such a design to make any conclusions regarding the directions of the relationships among book sharing interactions and other variables. Research is needed that can provide evidence about whether different styles of parent interactions during book sharing influence later development of language and literacy skills in particular ways.

Finally, the current study explored two specific genres of books, narrative storybooks and information expository books. The results indicate that parents' styles are influenced by the characteristics of the texts. However, the findings cannot be generalized to other types of books. Future research needs to explore parent interactions in the context of other types of storybooks and expository texts, as well as texts of other genres, such as alphabet books and rhyming books.

Further inquiry into these areas will help correct the limitations of the current investigation and provide a better understanding of the interactions that take place during book sharing and the affect they have on children's development.

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APPENDIX A  
LETTER TO PARENT



Research on Reading Books with Preschool Children

Dear Parents,

I am a speech-language pathologist and a doctoral student in the Department of Communication Sciences and Disorders, and I am conducting a study entitled “Parents and Preschoolers Sharing Stories and Information Books.” The purpose of the study is to analyse what takes place when parents and children read two kinds of books together, storybooks and information books. I am looking for children between the ages of 3 and 4 years of age, who are developing language without difficulty, to participate with one of their parents.

Parents and children who participate in this study would be asked to do the following:

- Parents will fill out 2 questionnaires – one on your child's interest in books and the family's book sharing practices, the other on your child's temperament. These will take about 20-30 minutes to complete.
- Children will have their hearing screened, and take a vocabulary test made for preschool children.
- On two different occasions convenient for you, the researcher will come to your house and videotape you and your child sharing two books. Each of these two reading sessions will take approximately 30 to 45 minutes depending on how long it takes for your child to become comfortable with the camera and how long you are involved in sharing the books.

If you are interested in participating, please read and sign the attached consent forms and return them to your child's school. If you have any questions, please do not hesitate to call me at (706) 542-1203. Thank you very much for your interest in this research.

Sincerely,

Lisa A. Hammett  
Doctoral Student  
Communication Sciences & Disorders  
The University of Georgia

APPENDIX B  
CONSENT FORM

## Consent Form

I, \_\_\_\_\_ (name of parent) , agree to participate in the study entitled "Parents and preschoolers sharing stories and information books." I also give consent for my child, \_\_\_\_\_ (child's name) born on \_\_\_\_\_ (child's birth date) to participate in this research. This study is being conducted by Lisa A. Hammett (Doctoral student) in the Department of Communication Sciences and Disorders, (706) 542-1203. My child and I do not have to be in this study if we do not want to. We can stop taking part at any time without giving any reason, and without penalty. I can also request that all data from our participation be returned to me, removed from the research records, or destroyed.

### Purpose of the Study

The purpose of this study is to observe what takes place when parents and children share two kinds of books together, storybooks and information books. In order to make this study a valid one, some information about my participation will be withheld until completion of the study.

### Benefits

I may benefit from participation in this study because I will receive information regarding my child's language development and temperament characteristics, and this may be helpful in future educational planning. Also, we may enjoy sharing some different books together.

### Procedures

As participants in this study, my child and I will do the following:

1. I will fill out a questionnaire regarding my child's interest in books and our family's book sharing practices. This questionnaire will take approximately 15 minutes to complete. I will also complete the Temperament Assessment Battery for Children (TABC) – Parent Form. It takes about 15 minutes to complete.
2. The researcher will administer the following set of assessments to my child at my child's school, at the speech and hearing clinic at UGA, or in our home:
  - Hearing Screening (5 minutes)
  - Peabody Picture Vocabulary Test – III (PPVT-III) – This is a receptive vocabulary test. The researcher presents a word, and the child must point to the picture on the page that matches it. This test takes approximately 15 minutes to administer.

One session of approximately 20-minutes will be necessary to complete the hearing screening and PPVT-III. The researcher will provide me with a written summary of my child's performance.



3. On two different occasions, the researcher will come to my house and video and audiotape me and my child sharing books together. The researcher will provide 2 books each time. Each session will take approximately 30 to 45 minutes. Then I will complete a short questionnaire about whether the camera affected the book sharing. This take about 5 minutes.

### **Discomforts or Stresses**

- Discomforts or stresses for the child: The researchers' experience with the vocabulary test has shown that most children participate willingly and enjoy the task. Verbal praise and incentives such as stickers will be used to help encourage and motivate the child as needed. However, should my child become distressed or wish to stop, the session will be discontinued and finished at a later time.
- Discomforts or stresses for the parent: No discomforts or stresses are expected.

### **Risks**

No risks are expected for myself or for my child.

### **Confidentiality**

My identity and my child's identity will be kept confidential unless otherwise required by law. We will be assigned a number and all information obtained during our participation will be identified only by that number, not by our names. The researcher may present the results of this study at state and national conferences and may publish the results in research journals; however, my identity and my child's identity will not be revealed. Audiotapes will be used by the researcher only if the videotape fails. Videotapes will not be played for educational purposes or at conferences without my written consent (see next page). The results of my child's performance on the hearing screening and vocabulary test will be shared with me after they are administered and scored. All test results, videotapes, and audiotapes will be kept confidential and in a locked office.

### **Further Questions**

Lisa Hammett, the researcher, will answer any questions about the research, now or during the course of the project, and can be reached by telephone at 706-542-1203. I may also contact the professor supervising the research, Dr. Anne van Kleeck, Department of Communication Sciences and Disorders, at 542-2413.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I also give permission for my child to participate. I have been given a copy of this form.

---

Name of Researcher  
Telephone: 706-542-1203  
Email: lhammett@coe.uga.edu

---

Signature Date

---

Name of Parent or Guardian

---

Signature Date

**Please sign both copies, keep one and return one to the researcher.**

Additional questions or problems regarding your rights or your child's rights as a research participant should be addressed to Chris A. Joseph, Ph.D. Human Subjects Office, University of Georgia, 606A Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address [IRB@uga.edu](mailto:IRB@uga.edu)

### **Consent for Use of Videotapes**

The results of your participation in this study will be kept confidential. If you are comfortable allowing videotapes of you and your child reading together to be used for educational purposes, please sign below. "Educational purposes" includes sharing short segments of the tapes during conference presentations and professional workshops, or to illustrate concepts presented in undergraduate and graduate classes. Real names would not be used during presentations. Instead, pseudonyms would be used. Any names spoken on the videotapes will be masked (deleted or scrambled) using audio editing software.

I give permission for the videotapes collected during this study to be used for educational purposes described above. I understand that my name and my child's name will not be revealed.

\_\_\_\_\_  
Signature of Parent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Researcher

Telephone: 706-542-1203

Email: [lhammett@coe.uga.edu](mailto:lhammett@coe.uga.edu)

\_\_\_\_\_  
Date

APPENDIX C

PARTICIPANT INFORMATION QUESTIONNAIRE

### Participant Information Sheet

All the data collected during this study will be identified using a participant number rather than by name. This information sheet will be used in order to contact you while you are a participant in the study to set up appointments and provide you with a summary of your child's assessment results. It will be kept in a locked office separate from the data collected during the study.

Parent(s) Name \_\_\_\_\_

Child's Name \_\_\_\_\_

Child's Gender      M      F

Child's Date of Birth \_\_\_\_\_

Family's Ethnicity \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Telephone Number \_\_\_\_\_

Completed by                      Mother                      Father

Date \_\_\_\_\_

1. Mother's highest level of education completed

- Some High School
- Completed High School or GED
- Some College or Technical School
- Associates degree
- Bachelors degree
- Some Graduate School
- Masters Degree
- Some Doctoral coursework
- Ph.D., Ed.D., or other Professional Degree

2. Mother's current occupation/job title (or previous is not currently working)

3. Father's highest level of education completed

- Some High School
- Completed High School or GED
- Some College or Technical School
- Associates degree
- Bachelors degree
- Some Graduate School
- Masters Degree
- Some Doctoral coursework
- Ph.D., Ed.D., or other Professional Degree

4. Father's current occupation/job title (or previous is not currently working)

5. Number of children in the family and their ages

6. What is the language spoken in the home most often?

7. Is your child learning a language other than English? If so, describe.

8. Has your child experienced any of the following? If yes, please describe.

Hearing Difficulties	Yes	No
Any Syndrome	Yes	No
Head or Brain Injury	Yes	No
Epilepsy, Attention Deficit, Excessive Clumsiness, Vision Problems	Yes	No

9. Have you ever been concerned about your child's speech or language development?

Yes No

If yes, please describe.

APPENDIX D  
BOOK SHARING QUESTIONNAIRE

## Book Sharing Questionnaire

This form is to be completed by the parent who will be doing the book sharing during the researcher's visit to your home.

Parent-Child Participant Number \_\_\_\_\_

Completed by                      Mother                      Father

Date \_\_\_\_\_

1. How many times per week is your child read to at home?

- Less than once per week
- Once or twice
- Three or four times
- Five or six times
- Daily
- More than once a day

14. How many books does your child typically listen to in one sitting at home?

15. Approximately how many **minutes** per week does each of the following people spend reading with your child?

Mother                      \_\_\_\_\_                      minutes per week

Father                      \_\_\_\_\_                      minutes per week

Siblings                      \_\_\_\_\_                      minutes per week

Grandparents                      \_\_\_\_\_                      minutes per week

Other (specify)                      \_\_\_\_\_                      minutes per week

16. Who else typically participates when you read books (for example, other children in the family)? \_\_\_\_\_

17. Who typically initiates reading?

- o Parent
- o Child
- o Siblings

24. Does your child try to read to him or herself?    Yes    No



If so, about how many times per week? \_\_\_\_\_

25. Approximately how many children's books do you own? \_\_\_\_\_

26. Does your child use the library? Yes No

If so, about how many trips to the library does your family make each month?

\_\_\_\_\_

27. I want to know the types of books that you and your child read together. For every ten books that you share, how many are the following types of books?

Type of Book	Number
Storybooks	
Alphabet books	
Rhyming books	
Counting books	
Non-fiction books (for example, a book that provides information about tigers or fire engines)	
<b>Total</b>	10

28. How old was your child when you started reading to him or her? \_\_\_years  
\_\_\_months old

29. How many hours per week is your child in daycare and/or preschool? \_\_\_\_\_

30. Does the daycare or preschool program include regular book reading as an activity?  
Yes No Not sure

31. When you sit down to read together, does your child enjoy the activity:

Rarely

Sometimes

Usually

Often

Almost Always

37. How does your child typically involve himself or herself in book sharing? (mark all that apply)

Makes comments

Turns pages

Listens

Asks questions about the story or characters

- Talks about the pictures
  - Labels objects or characters in the pictures
  - Repeats words/phrases from the story
  - Makes up stories about the pictures
  - Likes to tell parts of the story
  - Talks about personal experiences similar to those occurring in the book
  - Appears to follow and comprehend the story line
  - Tells what will or what might happen next
  - Names letters
  - Notices and points to the print at times
  - Asks questions about what the words say
68. What do you believe your child has learned from book sharing so far?
69. Why do you read to your child?

Questions Regarding Literacy Learning in Children  
(from Anderson, 1995)

1. A child learns to read by first learning the letters of the alphabet and their sounds, then words, then sentences and then stories.	Agree	Disagree	Neither
2. Teaching a child to recognize isolated words on sight is a suitable technique for teaching him or her to read.	Agree	Disagree	Neither
3. A child needs workbooks and school-like reading books to learn how to read.	Agree	Disagree	Neither
4. A child benefits from hearing favorite stories that he or she has memorized read again and again.	Agree	Disagree	Neither
5. You should not encourage children to join in when you read a familiar book; it is better for them to listen to the story without interruption.	Agree	Disagree	Neither
6. You will be teaching your child a bad habit if you point to the print as you read.	Agree	Disagree	Neither
7. You are helping a child learn to read by encouraging him or her to discuss what is being read.	Agree	Disagree	Neither
8. It is necessary to check a child's understanding by asking questions at the end of the story.	Agree	Disagree	Neither
9. You should allow your child to read familiar books by retelling the story from memory using the pictures.	Agree	Disagree	Neither
10. Reading begins only when a child begins to say the words as they are printed on the page.	Agree	Disagree	Neither
11. Schools should be totally responsible for teaching children to learn to read and write.	Agree	Disagree	Neither
12. It is very important children see their parents reading and writing.	Agree	Disagree	Neither
13. Children have to be a certain age before they can begin to learn to read and write.	Agree	Disagree	Neither
14. Children need training in hand-eye coordination, recognizing shapes, and so forth, before they begin to learn to read and write.	Agree	Disagree	Neither

Writing sometimes refers to handwriting or penmanship. In the following questions, "writing" refers to the process of composing or getting ideas onto the paper, such as writing notes or stories.

15. It is necessary for a child to know the letters of the alphabet, and the sounds of the letters, before he or she begins to write.	Agree	Disagree	Neither
16. A child should learn to print neatly the letters of the alphabet before attempting to print messages, notes, stories, and so forth.	Agree	Disagree	Neither
17. It is necessary for a child to have lots of experience copying words, then sentences, and finally stories before he or she attempts to write on her own.	Agree	Disagree	Neither
18. A child should be encouraged to write only easy words and short sentences when beginning to write.	Agree	Disagree	Neither
19. A child's early scribbles are related to later development in writing stories, messages, etc.	Agree	Disagree	Neither
20. A child needs workbooks to learn how to write.	Agree	Disagree	Neither
21. A child can begin to write before she has learned the correct spelling of the words.	Agree	Disagree	Neither
22. You should correct your child if he or she writes "kt" for the word "cat."	Agree	Disagree	Neither
23. A child's confusion of "b" and "d" or "p" and "q" in printing indicates a major problem.	Agree	Disagree	Neither
24. A child can begin to write (e.g., notes, stories) before she knows how to read.	Agree	Disagree	Neither
25. Learning to read and learning to write are similar to learning to talk in that children learn these skills gradually.	Agree	Disagree	Neither
26. Only gifted children learn to read and write before receiving formal instruction to preschool or elementary school.	Agree	Disagree	Neither
27. Reading to and with children helps them learn to write.	Agree	Disagree	Neither
28. Children learn important things about reading and writing before they begin formal reading programs at preschool or elementary school.	Agree	Disagree	Neither

The following activities help children learn to read and write:

29. Talking to them.	Agree	Disagree	Neither
30. Taking them on outings.	Agree	Disagree	Neither
31. Having them pretend to write grocery lists with you.	Agree	Disagree	Neither

32. Reading to them.	Agree	Disagree	Neither
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APPENDIX E  
CODING SYSTEM



FEEDBACK AND ACKNOWLEDGMENT UTTERANCES	
Description	Examples
Utterances that serve to continue the interaction.	You're very smart.
	Good job. Nice counting.
	That's right.
Utterances that acknowledge the child's verbal or nonverbal contributions.	Very good you named all those.
	Okay.
	You do?
Utterances that do not contain story-related content but are on-topic.	Yes, it is.
	You know what?
	Sorta.
	Uh huh.
	Yeah, I think so.
	Looks like it, yeah.
	What?
	Hmm?
	We did that one already.
	No way.
	Oh.
	I don't know.



<b>OTHER</b>	
Description	Examples
Utterances that have nothing to do with the book or the book sharing routine.	Okay, take that outta your mouth please.
	Do you need a tissue?
Utterances directed to some other adult or child, not the child participating in the study.	Okay run to the bathroom.
	Oh, bless you.
	Oh no, there is water on the floor.
	Child: I don't want my socks. I want my socks off. Mom: Okay.
	What's wrong, honey? (This was not related to the story – she then asked if child was sleepy.)
	Lisa, do you mind if I get the phone?
	Go back upstairs, please. (To sibling)

<b>NOT CODEABLE</b>	
Description	Examples
Utterances that cannot be coded because they do not fit within the coding system as it is structured.	
Utterances that are unintelligible.	

LEVEL 1	
Description	Examples
<p><b>Label:</b> Name an object or person; request the name of an object or person</p> <ul style="list-style-type: none"> <li>o Who did ___?</li> <li>o You know what this is called?</li> <li>o That's called a ___.</li> <li>o What do you think that is?</li> <li>o Includes negative labels (It's not a X.)</li> <li>o Includes labeling types of dogs (pigs, etc) where parent is labeling the pictures.</li> </ul> <p>(However, if synonyms are provided in the utterance, it is an attempt to define or explain and would be coded L4. Those are called hooves or toes.)</p> <p><b>Locate:</b> Describe the location of an object or character; ask a question regarding location.</p> <p><b>Rote counting &amp; animal sounds</b></p> <p><b>Notice.</b> Direct attention to a pictured object</p> <p><b>Imitations.</b> Parent asking for direct imitation of a word.</p>	Look here!
	And lookit.
	Look at this guy.
	A Dawn bat. A Jamaican fruit bat.
	See her thumbs?
	Anything else you want to look at?
	Those are called hooves.
	Do you know what that is?
	What does a dog say?
	1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
	That's his rocketship.
	Do you see that in his hand?
	Do you see his space boots?
	Look.
	See that?
	You see it?
	No, that's not a butterfly, it's a moth.
Oink oink.	
When he stepped out from behind the tree the first thing he saw was ... (cloze request for "shadow").	
Can you say hoof?	

<b>LEVEL 2</b>	
Description	Examples
<p><b>Describe characteristics:</b> Focus on perceptual properties (size, shape, color) or parts of objects or characters. This includes colors or numbers if there is a referent. Specify the type of object (“what kind of X?”), quantity of something, or possession.</p> <p><b>Describe/notice scene:</b> Describe or notice actions that are immediately perceptual in text or pictures. (single picture)</p>	He has funnel-shaped ears.
	Is this one a furry one?
	He has 4 toes.
	Ten inches.
	These are all different kinds of pigs, look.
	Look at all the babies the mommy has.
	These are all the different parts of the pig.
	That’s pretty big.
	That’s a lot, isn’t it?
	There’s a pink one and that one has a stripe.
	These pigs are at a fair.
	What’s that bat eating?
	Look at what this one’s doing.
	Look, now they don’t drink from their mommy. They drink the...they eat the stuff the mommy eats.
	This is the mommy giving birth.
	See, they are eating out of the trough.
	Look what the zookeeper’s doing.
	She’s putting a bat in her potion, isn’t she?
	Uh oh, look what happened.
	Well it looks like they’re playing with them.

<b>LEVEL 3</b>	
Description	Examples
<p><b>Infer:</b> Based on pictures/text and not explicitly stated/shown in pictures, e.g., “he tried.” Infer what character might think or say.</p> <p><b>Recall information:</b> Focus on prior information presented in book during current or previous reading; Summarize or synthesize information from a series of pictures. Recall factual information already presented.</p> <p><b>Judgment/Evaluation:</b> about characters, objects, or ideas, including nonperceptual qualities and internal states (sad, hungry); sometimes introduced by epistemic verbs (I think, I bet); judgments (beautiful, funny, etc.); providing point of view: an interpretation of what a character is thinking or feeling. Includes evaluating one’s own knowledge.</p> <p><b>Identify similarities:</b> Compare and/or contrast between things, e.g., “that looks like an X.”</p> <p><b>Text to Life Utterances:</b> making a comparison between the child’s life and the book. These do not add explanatory information, however, as those would be coded L4.</p> <p><b>Text-to-text connections:</b> comparing current text to another text.</p>	<p><b>INFERENCES</b></p> <p>And I bet ya there was bats that were living in there and they blocked it up and the bats didn’t have a home anymore, did they?</p> <p>I hope they...they find a new place, though. Look, I bet you they went to this nature preserve to live. Or maybe in someone’s backyard where they gave them a bat house?</p> <p>Maybe that’s what he eats.</p> <p>Look they cleaned up their pig and they took it and the judges are saying, “Hmmm, I think your pig is the best one here.”</p> <p><b>RECALL</b></p> <p>See it says its body is three inches and it says its wingspan is how many?</p> <p>Who’s Sophie?</p> <p>How much do you weigh?</p> <p><b>JUDGMENTS/EVALUATIONS</b></p> <p>Yeah, I like sows and boars.</p> <p>Do you think that’s heavy?</p> <p>Did you know that bats are really shy and they’re gentle.</p> <p>Did you like that story?</p> <p>Do you think they’re scary?</p> <p>Wonder what that is.</p> <p>That’s silly looking nose, doesn’t he?</p> <p>Isn’t that neat how she catches the baby?</p> <p>So we like to have bats around.</p> <p>Do you think pigs are smart?</p> <p>That’s a lot of dogs to keep up with, isn’t it?</p> <p>What does that look like to you? Like a dog?</p> <p>Did you like that book?</p> <p>I didn’t know that! Did you know that?</p> <p>Isn’t that funny?</p> <p>Bear is sad when the moon goes away.</p> <p><b>COMPARISONS</b></p> <p>Do we have four toes on each foot?</p> <p>How many do we have?</p> <p>They weigh thirty-five pounds so they weigh almost as much as you do.</p>



<b>LEVEL 4</b>	
Description	Examples
<p><b>Predict:</b> Offer or request what will happen next in the story. Used when the child doesn't know (or seem to know) the story, otherwise it is Level 3 recall.</p> <p><b>Factual knowledge:</b> Provide general information that is not directly given in the book. Distinguishing between fantasy and reality.</p> <p><b>Definitions:</b> Providing or requesting definitions, word meanings, synonyms; proving a definition to elicit a label.</p> <p><b>Explain:</b> Going beyond story or actions to provide an explanation, often indicated with words like "because," "so that," "since," or asking "why" questions.</p> <p><b>Text to Life utterances</b> – if they seem to go beyond comparing the book to the child's life. For example, if the utterance suggests something they could do in the future.</p> <p><b>Paraphrasing the text:</b> If the utterance also adds explanatory information like facts or definitions.</p>	DEFINITIONS
	That means they sleep during the day and they're awake at night.
	Do you know what endangered means?
	And so bats are endangered. Means there's not as many bats around anymore.
	So their home is called a roost.
	What's a baby dog called?
	Their nose is called a snout.
	You know what that means? Means they're sorta prickly?
	The baby pigs are called piglets.
	Nocturnal is when they sleep during the day and stay awake all night.
	What is it called when bears sleep all through the winter?
	Those are called hooves or toes.
	You know how you look in the mirror sometimes and see yourself? Or you see shadows when we're playing outside? When you look down on the concrete? You can see your shadow?
	FACTS/EXPLAIN
	Their bat skin is so thin it's called a membrane.
	And it...these are little bones and it stretches between those bones.
	I guess they need that (good vision) for nighttime, don't they?
	Look, they're...they're um destroying the bats' habitats or where they live by blocking up the cave because bats like to live in dark places like caves.
	And then sometimes pollution from big plants...um...makes it so bats can't live healthy anymore.
	And sometimes the pesticides that we use to make our foods grow better kills the bats, too.
They eat insects and stuff.	
He beeps and the sound goes out and hits the bug and comes back. And then the bats knows how far away that bug is.	

So when the baby bat's only three months old it flies by itself.
Here's where we get a ham. You know when we eat ham? Or bacon?
FANTASY vs. REALITY
Can the bear really fly?
Are they really dreaming?
TEXT-TO-LIFE
Did you know we used to have a bat?(L4) In our house?(L4) A long time ago?(L4) We had to figure out how to get him out to find a new home.(L4)
We need to go to the zoo and see if we can see some bats, don't we?