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Young Children With ASD: Parent Strategies for Interaction During Adapted Book Reading Activity

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Abstract

The purpose of this study was to identify how parents' use of language and literacy strategies during an adapted shared book reading activity relate to social, behavioral, and cognitive skills for their children with autism spectrum disorder (ASD). Participants were 111 young children (ages 4–7 years) with ASD and their mothers. A factor analysis of the items used in the coding system, yielded a four-factor model of parent-led behaviors during the shared book reading activity: clarification, feedback, teaching, and evocative techniques. In regression analyses, the frequency of parents' use of clarification, feedback, and evocative strategies used during the shared reading task were related to certain demographic and child factors. Results have implications for the types of structure and support that parents might provide their young children with ASD during informal reading sessions.

Parent–child shared book reading is believed to enhance child literacy outcomes and to develop positive interaction through the use of questions and discussion (Anderson, Anderson, Friedrich, & Kim, 2010; Britto & Brooks-Gunn, 2001; Mucchetti, 2013). Shared book reading or the act of reading a book together, incorporates the relationship aspect of a joint activity, while fostering a model of parents as teachers of emergent language and literacy skills through the use of scaffolding and interactive dialogue (Mucchetti, 2013). With repeated practice, and even in the absence of direct intervention or instruction around how to interact with one's child while reading, this activity can create more opportunities for language and social development (Ruble, McDuffie, King, & Lorenz, 2008). However, earlier work documenting these outcomes has focused on typically developing (TD) children. The focus of this study is on how parents of young children with autism spectrum disorder (ASD) use literacy-related strategies in a brief, adapted shared book interaction. Furthermore, this study examines how child characteristics (e.g., IQ, social skills, communication, behavior problems) relate to the parent strategies used.

Children enter school with a range of reading skills, due in part to differences in preschool or early educational experiences and in home literacy environments. In a study of the home literacy environment of 4- to 5-year-old children, Burgess, Hecht, and Lonigan (2002) found that families' degree of engagement in a range of literacy practices, from passive family activities (e.g., having magazines at home) to active practices (e.g., reading together) were all positively associated with child literacy skills. Increasing a child's knowledge of textual language and vocabulary sets the stage for children's early school success (Anderson et al., 2010). Meta-analyses with TD children have indicated that parent-preschooler shared book reading was beneficial to children's outcomes (Bus, van Ijzendoorn, & Pellegrini, 1995; Mol, Bus, de Jong, & Smeets, 2008).

In a review of the literature on pre-academic skills and parent–child reading experiences, Scarborough and Dobrich (1994) found that, on average, parents read to their children 4.5 to 10.5 times per week. The frequency of these shared book reading activities accounted for 7% of the variance in preschool children's outcomes of emergent literacy skills (by beginning of kindergarten), 7% of the variance in oral language development, and 8% of the variance in reading achievement (Scarborough & Dobrich, 1994). Importantly,

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the benefits of shared book reading depended upon the quality of the social context between the adult and the child, such as the use of adult supports to encourage child language during the activity (Mol et al., 2008).

In addition, for children with ASD, there is significant heterogeneity of early literacy skill development. Children with ASD have been shown to perform typically in word decoding skills but below average in reading comprehension (Nation, Clarke, Wright, & Williams, 2006; Newman et al., 2007). Evidence has shown that many school-age children on the spectrum, older than those in this study, may have trouble understanding inferences made in stories and struggle with grade-level material unless supplemented by concrete visual supports and social scaffolding (Whalon & Hanline, 2008). Thus, this study aims to connect previous foundational research on shared book reading with the related characteristics of children with ASD to explore some of the contributing factors that influence the dynamic within a shared book reading context.

Parent strategies that are observable and measureable in shared reading include those that elicit and/or direct child language (i.e., questions and elaborations) and provide feedback (i.e., comments and corrections). Both strategies are necessary for not only teaching new language but also for creating meaning of words, expanding upon current language, and encouraging and reinforcing the use of novel and complex utterances. In situationally derived settings, in which the parents are not provided direct intervention or specific instructions for reading with their child, observational coding schemes document the ways in which parents interact with their child.

In their early study of the effects of shared book reading, Whitehurst and colleagues (1988) focused on three general principles of dialogic reading: evocative techniques, feedback, and progressive change. Although this original study, and the more recent intervention studies, did not include a factor analysis of the different components involved in dialogic reading exercises, these three main principles emerged as part of a high-quality shared book reading paradigm. Evocative techniques were those that encouraged the child to talk about the book (i.e., questions); feedback included directions from the parent to expand or correctly model appropriate language, and progressive change was defined as demonstrating sensitivity to the child's skill (i.e., using appropriate variation to the child's language level; Whitehurst et al., 1988). With minimal instruction over a 4-week period, parents of TD toddlers (21–35 months old) increased their use of feedback, and children increased their communication efforts, with greater mean length of utterances during shared reading.

Influence of ASD-Related Symptomatology

Children's social communication skills and problem behaviors can significantly affect and influence the parent–child interaction. Diagnostically, children with ASD display persistent deficits in areas of social communication and social interaction, as well as restricted, repetitive, patterns of behavior, or interests (*Diagnostic and Statistical Manual of Mental Disorders* [5th ed.; *DSM-5*; American Psychiatric Association, 2013]). The behavioral phenotype of ASD can vary greatly, but social skill deficits (e.g., reduced or unusual eye gaze, difficulties with social interaction, decreased joint attention, and lack of social-emotional reciprocity) are considered to be of the greatest concerns to most parents (Lord & Risi, 1998). Especially noteworthy are the social communication deficits (e.g., showing, initiating joint attention), which are considered to be universal across ASD, despite the heterogeneity of oral language skills (Tager-Flusberg, Joseph, & Folstein, 2001). When opportunities for sharing experiences or activities are reduced due to lack of social communication, children with ASD may miss critical social opportunities (Sigman, Dijamco, Gratier, & Rozga, 2004). The shared book reading context may be especially critical to children with ASD because it allows parents to provide support for developing social interaction and communication skills.

There is emerging research on the reading skills of children with ASD that highlights some important differences in performance. For example, Gabig (2010) compared TD children and those with ASD on early phonological awareness measures. In this study, children with autism (ages 5–8) were matched to a control group of TD children. The children with ASD scored comparably with TD children on word recognition, but there were no significant correlations between word recognition and phonological awareness as is the case in typical reading achievement. Other researchers have found that emergent literacy skill development of children with ASD is asynchronous (Nation et al., 2006; Newman et al., 2007). Mucchetti (2013) began to explore an adapted shared book reading model in a multiple-baseline design with four low-functioning students (IQ < 55) with autism ages 6 to 8. In this study, the focus of the intervention was for students to respond to teacher-directed comprehension questions and demonstrate ability to point to and label-related pictures and vocabulary words in the text. Whalon, Martinez, Shannon, Butcher, and Hanline (2015) further demonstrated the use of a single-subject research design in implementing the dialogic reading model to students with ASD by using picture supports with structured question prompts. Without a high demand on reading specifically, these interventions were able to demonstrate the nature of such an activity to increase students' early language and literacy skills despite adaptations for language delays or behavioral challenges. Thus, research has shown that shared book reading activities with higher parental engagement have resulted in increases in children's early language and literacy skills, in addition to teaching students how to interact with the book and share in the storytelling nature of book reading

Table 1. Demographics (N = 111).

Variable	% of sample	M (SD)	Median	Range
Child demographic variables				
Child age	—	5.14 (1.01)	5	4–7
Male	82.9	—	—	—
FSIQ > 85	70	89.93 (17.15)	90	52–123
Child race (White)	65.8	—	—	—
Early intervention	90.1	—	—	—
Special ed services	89.2	—	—	—
CBCL Total ≥ 64	55.9	63.45 (10.12)	64.50	36–87
SRS Raw > 75	76.4	95.01 (29.42)	93.50	25–166
CASL PJ. ≥ 2 SD	33.3	81.62 (18.41)	82	43–142
CCC-2 SIDI % ≤ −11	25.2	−4.27 (10.15)	−4	−26–21
Parent demographic variables				
Parent age	—	38.30 (5.50)	38	24–52
Family income > 50k	75.2	—	—	—
Not working outside home	43.2	—	—	—
4 year college degree+	71.7	—	—	—

Note. FSIQ = Full Scale Intelligence Quotient; CBCL Total = Child Behavior Checklist Total Behavior Problems ≥ Clinical Cutoff; SRS Raw = Social Responsiveness Scale raw score; CASL PJ = Comprehensive Assessment of Spoken Language Pragmatic Judgment subscale; CCC-2 SIDI = Children's Communication Checklist Social Interaction Difference index.

(Evans, Williamson, & Pursoo, 2008; Mucchetti, 2013; Teale, 1988).

Purpose of the Study

As much of the literature has demonstrated the positive effects of shared book reading on TD child outcomes, the overall purpose of this study was to examine parents' language and literacy strategies used during an adapted shared book reading activity in a large sample of children with ASD. The following questions were of interest: (a) What types of language and literacy strategies do parents of children with ASD provide during a shared reading task? (b) Can a two-factor model of language elicitation techniques (evocative and feedback strategies) previously used with TD children be replicated in a context with parents and their children with ASD? (c) To what extent do spoken language, behavior problems, and social skills of children with ASD relate to parental language and literacy strategies during a shared book reading task?

Method

Participants

Participants were selected from a larger, longitudinal study of children with ASD and their parents. The larger research study was developed to assess the factors related to successful school entry for children on the autism spectrum. Participating families were from urban and suburban locations in the Los Angeles and greater Boston regions; the

children with ASD were between the ages of 4 and 7 years, 3 months at the time of enrollment. Families were recruited through flyers via school districts, regional center providers, and local clinic settings. All children were required to meet criteria for ASD on the Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, & Risi, 1999). In cases where children had not already received a diagnosis of ASD from a non-school clinical evaluation, the Autism Diagnostic Interview–Revised (ADI-R; Rutter, Le Couteur, & Lord, 2003) was also administered to the parent. An additional requirement for eligibility was that all children have a minimum IQ of at least 50 as measured by a short form of the *Wechsler Preschool and Primary Scales of Intelligence– Third Edition* (WPPSI-3; Wechsler, 2002).

There were 114 families eligible from the larger current study; 111 were included in the current study that had complete data and provided video consent. A summary of demographic data appears in Table 1. Most children had received some form of early intervention (90%), and the majority of children (89%) were currently receiving some form of special education services (i.e., speech, occupational therapy, special day class). Child race was based on an open-ended parent-report item later aggregated into categories; children were 4% Asian American, 4% Black/African American, 65% White, non-Hispanic, 5% Latino/Hispanic, 19% bi-/multi-racial, and 3% Other.

Screening and Descriptive Measures

ADOS. The ADOS is a classification system involving standard activities that allow an examiner to observe behaviors

that have been identified as important to the diagnosis of ASDs (Lord et al., 1999). The ADOS has adequate interrater reliability with exact agreement on scoring $r = .80$. The ADOS was used primarily to determine eligibility. We note that most of the children had joint attention skills; 88.2% of children demonstrated no, or few, deficits on ADOS codes of "Response to Joint Attention on Modules 1 and 2," or "Shared enjoyment on Module 3."

ADI-R. The ADI-R is a semi-structured interview with the child's primary caregiver to elicit accurate and detailed descriptions of behavior, social skills, and developmental functioning (Rutter et al., 2003). The ADI-R has intraclass correlation coefficients > .90. Furthermore, discrimination between autism spectrum versus non-autistic subjects is almost perfect with sensitivity = 1.0, and specificity > .97.

WPPSI-3. The WPPSI is a norm-referenced cognitive assessment that is widely used with children ages 2 year 6 months to 7 years 3 months that has high subtest and scale reliability (Wechsler, 2002). Three subtests were administered, including Matrix Reasoning, Picture Completion, and Vocabulary. The three subtest version has demonstrated strong predictive validity ($r = .90$) and internal consistency ($r = .95$) as an indicator of cognitive ability (Sattler & Dumont, 2004).

Dependent Measures

CBCL. The CBCL is a norm-referenced questionnaire that assesses behavior problems in children with or without developmental delays (Achenbach & Rescorla, 2001). The appropriate aged version of the CBCL (form for ages 1½–5 years or 6–18 years) was completed by parents. Alpha coefficients from composite and subscale scores ranged from .69 to .97 and reliability from .82 to .94 across both forms. Here, the CBCL total problem behavior score ($M = 50$, $SD = 10$) was used. A *T*-score ≥ 64 was the clinical cut-off for total behavior problems. In this sample, 55.9% had total level of behavior problems in the clinical range.

SRS. The SRS is a 65-item norm-referenced questionnaire that covers dimensions of interpersonal behavior, communication, and repetitive/stereotypic behaviors that are characteristic of ASDs (Constantino & Gruber, 2005). The parent rating form (ages 4–18) was completed; Cronbach's alpha = .94. The total raw scores were used for subsequent analyses. *T*-scores above 76 are in the clinical range for children with ASD; 76.4% of this sample was in the clinical range.

Children's Communication Checklist–2 (CCC-2). The CCC-2 (aged 4.0–16.11) is a rating scale of child language functioning completed by parents with 70 items divided into 10

subscales (Bishop, 2006). A significantly depressed communicative competence score, or overall low language skills, coupled with a score of less than −11 on the social interaction difference score (SIDI), suggests a profile of ASD. The SIDI score, which was used in this study, is derived by subtracting the language scaled scores from the pragmatic scaled scores to provide a summary score of pragmatic language deficits. The CCC-2 reports a sensitivity value = .89 and a specificity value = .97 for identifying children with autistic symptomatology and social impairment (Bishop, 2006). Twenty-five percent of children in this sample had scores representing the ASD profile.

Comprehensive Assessment of Spoken Language–Second Edition (CASL-2). The CASL-2 is an orally administered, standardized assessment of language skills in children aged 3 to 21 years (Carrow-Woolfolk, 1999). The CASL-2 provides an assessment of semantic, syntactic, and pragmatic language. The CASL-2 has good construct validity and strong reliabilities of .90 to .96 on each of the three indices that were used in this study ($M = 50$, $SD = 10$); this measure has been widely used among children with autism, as well as children with language delays, aphasia, and intellectual disabilities. The Pragmatic Judgment subscale was used in analyses, as it most closely reflects the social pragmatic deficits of individuals with ASD.

Procedures

When parents came to the research center for their child's eligibility assessment, staff reviewed all informed consent procedures with the parent and answered any questions; doctoral students or project staff then administered the ADOS (and ADI-R if necessary) and WPPSI to determine eligibility. The ADOS administrators were research-reliable and trained by certified ADOS trainers. Parents also completed a questionnaire packet containing a demographic questionnaire and parent-reported measures of child communication. Children and parents who met eligibility criteria—including scoring in the autism or spectrum range on the ADOS, having an estimated IQ of 50 or above, and having either a previous out-of-school autism diagnosis or a positive ADI-R—were then scheduled for their first visit to the lab, at which time they completed the rest of the measures described above.

At this subsequent visit (roughly 2–3 months after the eligibility visit), parents were asked to participate in an adapted shared book reading activity, during which the parent and child were instructed to sit next to each other. They were given four storybooks involving adventures of a frog that were written and illustrated by Mercer Meyer. Due to the variance in emergent reading skills of the participants in this current study, story books without words were selected as a means of adapting the shared book reading to maintain

the child's level of engagement, parent–child interaction, and to reduce the reading demands on the child, regardless of reading or verbal ability (Evans et al., 2008; Mucchetti, 2013). These books were age appropriate for the selected sample (*M* = 5.14) and were chosen to enable an observation of the parent–child dyads' use of language, communication, and story development. Parents were directed to "read" the books to their children in whatever manner they felt comfortable, and to read the books in numerical order from one to four, although it did not matter how many they read. The parent and child were then left alone to read the stories for 8 min. During the observation, the parent–child interactions were videotaped for later coding.

Coding of parent behaviors during shared reading task. The coding system used in the current study was derived from previous work by Whitehurst et al. (1988). This observational system was used to code parental language elicitation strategies during the adapted shared reading activity to determine the applicability of this coding, in the absence of any intervention. The coding system created by Whitehurst and colleagues (1988) was applied and tested via a pilot model because the children in the original study were TD and did not have the language deficits of children with ASD. The Whitehurst dialogic reading model involves evocative techniques (parent behaviors that encourage the child to talk about the story portrayed via pictures in the book) and feedback techniques (parent directions to the child to expand his communicative attempt, or parent attempts to correctly model appropriate language). There were 12 items drawn from the original Whitehurst et al. (1988) system for coding evocative and feedback techniques (i.e., Yes/No Questions, Simple What Questions, Function/Attribute Questions, Open-Ended Questions, Reading/Conversation, Labeling, Basic Repetition, Repetition With Expansion, Imitative Direction, Criticism/Correction, Praise/Confirmation, Directions) based on the pilot sample below. Parent behaviors were measured as a frequency count during the 8-min task.

To confirm whether the observational coding scheme described by Whitehurst et al. (1988) was applicable to this sample, approximately 10% of the parent–child dyads (*n* = 10) was randomly selected from the larger study. The pilot sample included eight male children, and nine of the 10 parents were mothers. There were five 4-year-olds, one 5-year-old, one 6-year-old, and three 7-year-olds. Twelve of the 14 parent behaviors and accompanying codes were observed, suggesting that these strategies were relevant for this sample of children with ASD. Two items, "pointing request" and "other talk not directed to the child" were not present. In the original article, the same 12/14 items were also found to be most useful (Whitehurst et al., 1988). Thus, the Whitehurst literacy measure indicated that it was appropriate for use with parents and their children with ASD. Three

graduate students subsequently coded videotaped book reading interactions and reliability met 89% exact agreement (range = 86%–100%) on a sample of 20% of the entire sample. (The coding dictionary is available from the authors upon request.)

The following data analyses aim to first explore the literacy-related behaviors of the parents by conducting an exploratory factor analysis (EFA) of the coding scheme. Following that parent language elicitation strategies were coded. Regression analyses then examined the extent to which child communication, behavior problems, and social skills related to parents' use of literacy strategies.

Results

The first research question aimed to describe the parent language and literacy strategies that parents of children with ASD demonstrated during the shared book reading interaction. An EFA, with oblique rotation, was conducted on the 12-item coding system for the shared literacy task (SLT). Raykov and Marcoulides (2008) recommended oblique rotations when using the maximum likelihood method because the factors are assumed to be correlated to some extent (Whitehurst et al., 1988) and because the oblique rotation maximizes the factor loadings for each factor. The Kaiser–Meyer–Olkin (KMO) statistic verified the sampling adequacy for the analysis, with KMO = .75 ("good" according to Kaiser's [1974], criteria,), and Bartlett's test of Sphericity was significant, $\chi^2(66) = 348.49$, $p < .05$. An initial analysis was run to obtain eigenvalues for each factor. Four factors had eigenvalues over Kaiser's criterion of 1. In combination, the four factors explained 62.8% of the variance. Finally, the chi-square statistic ($\chi^2 = .27$) indicated that the model is a good fit as it is greater than or equal to 0.05 (Raykov & Marcoulides, 2008).

The pattern matrix showing the factor loadings after rotation is displayed in Table 2. The structure matrix was analyzed to examine the correlation coefficients between each variable and factor. Only loadings greater in absolute value than .3 were included, to assure at least minimally stable factor loadings. For this four-factor model, the items that clustered on Factor 1 represented "clarification techniques" (i.e., questions about functions/attributes and praise/confirmation); Factor 2 represented "feedback techniques" (i.e., giving directions, reading and criticism/corrections); Factor 3 represented "teaching techniques" (i.e., basic repetition, repetition with expansion, and simple "what" questions); and Factor 4 represented "evocative techniques" (i.e., open-ended questions, yes/no questions, and imitative directions). One item (labeling), was endorsed infrequently, and did not load onto any factor and was thus removed from the model.

A summary of the descriptive statistics for individual items is provided in Table 3. There were no observable

Table 2. Exploratory Factor Analysis With Oblique Rotation for the Shared Literacy Task (*N* = 111).

	Factor			
	Clarification	Feedback	Teaching	Evocative
	1	2	3	4
Questions function/ attribute	1.01			
Praise/confirmation	0.48			
Directions		0.98		
Reading/conversation		0.47		
Criticism/correction		0.33		
Repetition basic			0.80	0.36
Repetition with expansion			0.62	
Questions simple what			0.37	
Questions open ended				0.51
Questions simple yes/no				0.46
Imitative direction				0.45
Labeling (dropped)				

Note. Factor loadings < .3 are suppressed.

Table 3. Descriptive Statistics for the Shared-Literacy Task Items (*N* = 111).

Items	Percentage used > 1	*M* (SD)	Median	Range
1. Clarification				
Questions function/ attribute	81.1	9.76 (7.62)	8	0–33
Praise/confirmation	89.2	8.22 (6.56)	7	0–33
2. Feedback				
Directions	89.2	11.59 (10.48)	8	0–57
Reading/conversation	100	33.50 (10.68)	34	5–58
Criticism/correction	59.5	2.60 (2.50)	2	0–11
3. Teaching				
Repetition basic	76.6	5.85 (4.80)	5	0–20
Repetition with expansion	67.6	3.70 (3.37)	3	0–15
Questions simple what	93.7	11.09 (7.76)	10	0–39
4. Evocative				
Questions open ended	79.3	5.84 (4.76)	5	0–22
Questions simple yes/no	99.1	17.74 (10.62)	15	1–51
Imitative direction	27.9	1.18 (1.77)	1	0–10

outliers in the item-level scores of the SLT or on the newly created factors; three of the four factors were normally distributed, while the "feedback" factor was positively skewed. This factor consisted of two items in which some parents provided a lot of reading/conversation with their child (up to 58 times) or a high level of direction to their child (up to 57 times). Internal consistency for each factor was examined using Cronbach's alpha. The alphas were moderate with clarification techniques having the highest (two items, α = .71), followed by teaching techniques (three items, α = .67), feedback techniques (three items, α = .55), and evocative techniques having the lowest (three items, α = .41).

Finally, Pearson correlations were used to identify significant correlations among the four factors (identified from the EFA) and child and parent demographic variables (child age, race, gender, IQ, special education, and intervention; parent income, education, and income) to identify any potential factors to control for in subsequent analyses. Three of the four factors were positively correlated with parent education: clarification ($r = .21, p < .05$), teaching ($r = -.19, p < .05$), and evocative strategies ($r = .22, p < .05$). In addition, child IQ was correlated with the feedback factor ($r = -.33, p < .01$). Thus, parent education and IQ were co-varied, in subsequent regression analyses of parent language and literacy strategies when correlated with the independent and dependent variables.

The third research question investigated the extent to which child communication, behavior problems, and social skills related to parent language and literacy strategies. Three of the four factors identified from the EFA correlated with child characteristics, including social interaction (CCC-2), pragmatic language (CASL), or behavior problems (CBCL); social responsiveness (SRS) did not correlate with any of the parent strategies nor did child joint attention (as measured by the ADOS). The clarification factor was positively correlated with child social interaction skills (CCC-2 SIDI; $r = .20, p < .05$). The feedback factor was negatively correlated with child pragmatic language (CASL; $r = -.23, p < .05$). The evocative factor was negatively correlated with child behavior problems (CBCL; $r = -.23, p < .05$). There were no significant associations of child characteristics with the teaching factor.

To examine the link between parent language and literacy strategies and child characteristics, three hierarchical regression analyses of parent strategies were conducted, shown in Table 4. The first regression model demonstrated that both factors, parent education and child social interaction, accounted for significant variance (10%) in parent clarification techniques ($F = 5.55, p < .01$). In a second hierarchical regression when child IQ and pragmatic language skills were entered into the model, only child IQ was significantly related to parent feedback techniques ($p < .05$). The model accounted for 8% of the variance ($F = 4.95, p < .01$). In the third hierarchical regression, involving evocative techniques, parent education, and child behavior problems were related to parents' use of evocative techniques during the SLT. Both factors were significant in the final model, and overall, accounted for 9% of the variance ($F = 5.33, p < .01$).

Table 4. Hierarchical Linear Regressions of Parent Techniques During Shared Literacy Task.

Block	Clarification	B	SE B	β	R^2	Block	Feedback	B	SE B	β	R^2	Block	Evocative	B	SE B	β	R^2
1	Parent's education	.18	.08	.22*	.05	1	Child IQ	−.02	.01	−.29**	.08	1	Parent education	.15	.06	.23*	.05
2	Parent's education	.19	.08	.24*	.10	2	Child IQ	−.01	.01	−.24*	.08	2	Parent education	.14	.06	.21*	
	SocInt	.02	.01	.22*			Prag	−.01	.01	−.08			Beh Probs	−.02	.01	−.20*	.09

Note. SocInt = CCC-2 social interaction difference index; Prag = Comprehensive Assessment of Spoken Language Pragmatic Judgment subscale; Beh Probs = Child Behavior Checklist Total Behavior Problem.
$*p < .05. **p < .01.$

Discussion

This study examined the literacy-related strategies that parents of young children with ASD used during an adapted shared book reading activity and explored the relationship of ASD-related child characteristics to strategies employed. It demonstrated the feasibility of coding parent language and literacy strategies during shared reading. The study included the use of an EFA to identify the types of language and literacy strategies parents used during a shared reading task, thus revealing a statistically measured set of factors explored from the original Whitehurst et al. (1988) article. In addition, this study identified the extent to which social language and behavior problems of children with ASD related to parents' language and literacy-related strategies as demonstrated during an adapted shared book reading task. The most pertinent findings revealed considerable variance in child outcomes, such that the link between parent–child reading and developmental outcomes in ASD may not be linear. This was particularly the case when the child was not a responsive reading partner, suggesting little impact on child-related outcomes (Scarborough & Dobrich, 1994). Furthermore, when restricted to studies that assessed child language outcomes, not only did the shared book reading task affect the behavior of the child, but also the parent was viewed as an active and quality facilitator, capable of producing greater language development in the child (Mol et al., 2008).

The factor analysis utilized here was instructive and revealed that parents of young children with ASD used a range of instructional techniques naturally, as this study did not involve direct intervention. Ideally, parents are able to combine skills that elicit more child language, such as evocative and clarification techniques that involve asking questions, providing feedback regarding the child's language and literacy skills, and teaching novel and more complex language skills. One might expect parents of TD children to do these things, but parents of children with ASD face numerous challenges due to child deficits in language and the social use of language, as well as child excesses in the area of behavior problems. By incorporating teaching, feedback, evocative techniques, and clarification, parents may naturally target story comprehension, which is a core deficit among reading skills in ASD (Newman et al., 2007). As the storybooks utilized in the task had no words, mothers—and sometimes their children—made up the story, providing a context for language expansion and the demonstration of early skills related to literacy.

To identify the extent to which child ASD symptomatology affected parents' shared literacy strategies, we examined variables that related to parenting responses. Regression analyses showed that children who had better social interaction skills had parents who used more clarification techniques as a means of fine-tuning reading and conversation skills. Parent language and literacy strategies as well as child IQ were both associated with child emergent social language skills. For example, many parents asked questions or provided expanded responses to the child to elicit a verbal response from him or her, a strategy for expanding on child language, vocabulary, and interaction that has been shown by others to predict improved literacy outcomes (Anderson et al., 2010; Ruble et al., 2008). To underscore the point in this study, child IQ was negatively correlated with parenting feedback, so that children with lower IQs received more feedback. Thus, for a child with a lower IQ, parent support is needed to structure the activity through scaffolding techniques (Pellegrini, Brody, & Sigel, 1985).

Although our non-experimental design cannot confirm the direction of causality here, it is possible that parents' use of clarification techniques enhances their children's development of social communication skills. With repeated practice, shared book reading can create more opportunities for language and social development (Ruble et al., 2008). Children in this study, whose parents used more teaching and clarification techniques, may have been able to model more language, develop the story, and practice the social and emotional control necessary to attend and maintain the social interaction required by the activity (Bus et al., 1995; Evans et al., 2008; Ruble et al., 2008). Importantly, parents who used more evocative and clarification techniques also had children with fewer behavior problems, although as noted, the directionality of these effects could not be examined here. Others have shown that children with problem behaviors are at an increased risk for poor social development due in part to the impact their behavior has upon others, including their parents (Hastings & Brown, 2002; Horner, Carr, Strain, Todd, & Reed, 2002). With 55.9% of

the current sample displaying clinically elevated problem behaviors, it was impressive that the parents were able to use evocative and clarification techniques without child disruptions. Parents seemed to modulate their behaviors to the level of their child by increasing or decreasing the amount of parent-directed talk (e.g., questions, directions, feedback) during shared-book reading, demonstrating the importance of understanding the parents' role in these early literacy activities.

Parent education was also related to language and literacy strategy use in this study. Indeed, higher parent education has repeatedly been found to be advantageous in the development of early literacy in TD or high-risk children (e.g., Britto & Brooks-Gunn, 2001; Buhs, Welch, Burt, & Knoche, 2011). In other intervention-based research, the impact of parent–child dynamics is significant where more variance in child outcome was accounted for by socioeconomic status (SES) than by differences in shared book reading alone, suggesting that broader home literacy environment, family background, and parent education were also contributing factors (Scarborough & Dobrich, 1994). Rich early parenting practices and exposure to education activities such as book reading have been related to increases in pre-academic skills such as phonological awareness and communication skills, albeit with TD young children (Burgess et al., 2002).

Limitations

As in every study, there are limitations to consider when interpreting the results. As this was a non-experimental study by design, the results are limited to the sample and can only be considered correlational. The participants had a higher educational level than the population norm that may have influenced results, as both higher SES families and parents with higher income had noticeably more favorable child outcomes. Due to the nature of the sample included in this study, many of the children had elevated levels of problems behaviors or significant social skill deficits; thus, it is possible that some parents enrolled in this study simply to seek additional support. However, the high level of co-morbid behavior problems in children with ASD has been reported by many others (e.g., Baker & Blacher, 2015; Lundstrom et al., 2015; Mannion, Leader, & Healy, 2013). In addition, with respect to the observed adapted book reading, fewer parents than expected provided criticism or corrections in response to their child's language attempts. It is possible that they were somewhat self-conscious because they were being videotaped and were hesitant to correct their child and instead responded in a more socially desirable fashion. Future researchers might consider more naturalistic observation methods to measure parent–child interactions in home settings to capture more "typical" parenting behaviors.

Implications

As Anderson and colleagues (2010) noted, shared book reading encourages dialogue between parent and child, which subsequently increases the child's knowledge of textual language and vocabulary. Because declines in comprehension skills relative to their peers have been demonstrated in older children with ASD (Davidson & Weismer, 2014; Gabig, 2010), it is especially important to enhance these skills during the preschool and early school years in the hopes of curbing such declines. The present study expands upon work with low-functioning and minimally verbal children (Mucchetti, 2013), by including a sample of young children with higher cognitive and language skills who are often participating in general education classes with varying level of school support. Considering some of these "good learning behaviors" that are requisite pre-reading skills, many of which are social in nature (e.g., joint attention, reciprocal commenting), it is especially important to consider the dynamics of both parent and teacher supports for high-functioning children with autism, as early-literacy can be a particular area of strength of children with ASD, particularly those in the average IQ range (Davidson & Weismer, 2014; Gabig, 2010; Nation et al., 2006; Newman et al., 2007). Emergent literacy strategies that both parents and teachers can target include building semantic knowledge, developing understanding and the meaning of words, and increasing both expressive and receptive language skills through activities such as shared book reading (Davidson & Weismer, 2014; Mucchetti, 2013; Whalon et al., 2015).

As both parents and teachers play a critical role in early literacy and language development, small-scale comprehension interventions with children with ASD have begun to demonstrate the effectiveness of targeted direct instruction using picture analogies, induction techniques, and reciprocal questioning (Flores & Ganz, 2009; Mucchetti, 2013; Whalon & Hanline, 2008; Whalon et al., 2015). Unfortunately, many of these intervention studies are still small-scale in nature, and generalizability is limited without more group experimental designs. Future research might build upon the foundational study of Whitehurst et al. (1988), as well as on the role of parents of children with ASD as identified in this study, in developing more naturalistic parent-mediated reading interventions.

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