



Measuring preschool children's engagement behaviors during classroom shared reading: Construct and concurrent validity of the shared reading engagement rating scale

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ABSTRACT

Young children's engagement in shared reading refers to the extent of children's attention, behavioral involvement, and enjoyment during shared reading and has been treated as an indicator of reading-related motivation. In this study, we examined the Shared Reading Engagement Rating Scale, a measure of young children's engagement in classroom shared reading, and tested its validity using data collected from Head Start children ($n = 263$). We conducted explorative factor analysis and identified two factors, active and interactive engagement. Confirmatory factor analysis validated the proposed constructs of children's shared reading engagement. Multilevel simultaneous modeling showed that children's interactive engagement (not active engagement) significantly predicted early literacy skills in letter-word identification, picture vocabulary, sound awareness, and print awareness. The levels of shared reading engagement and their predictability of early literacy did not differ by children's gender or their home language.

Shared book reading is an interactive reading experience between adults and children, which has been established as an important context for early reading and literacy development (Bus et al., 1995). During shared book reading, adults often read aloud a book and jointly discuss its story with children, which exposes children to rich written language, print, and content knowledge. Adult-child verbal interactions during shared reading positively affect young children's early literacy in vocabulary, story comprehension, and print skills (Flack et al., 2018; Mol et al., 2009). However, the benefits of shared reading may not be the same for all children; benefits may depend on children and their behavioral or psychological characteristics. For example, children who are not engaged in shared reading are less likely to understand and learn from teachers' reading practices, whereas children who are engaged and involved in shared reading are more likely to learn and benefit from shared reading by having more opportunities to develop and practice early literacy skills (Son & Tineo, 2016; van Kleeck, 2003).

Engagement indicates an umbrella term of behavioral participation and psychological involvement in a task that reflects student enjoyment, interest, motivation, attention, or self-regulation (Finn & Zimmer, 2012). Previous studies have shown that young children's engagement in literacy activities as indicated by their behavioral participation and enjoyment were significantly related to their early literacy

skills (Baroody & Diamond, 2016; Bracken & Fischel, 2008; Morgan & Fuchs, 2007). Especially, children's engagement in shared book reading activities was demonstrated to predict early literacy skills and learning (Deckner et al., 2006; Sénéchal et al., 1995).

Young learners exhibit their engagement in shared reading with various behaviors, in emotional (Deckner et al., 2006), attentional (Evans & Saint-Aubin, 2013; Son & Tineo, 2016), and cognitive forms (Hutton et al., 2017). These behaviors may represent different functional patterns or components of engagement, such as active (Lee & Smith, 1999) and interactive engagement (Son & Tineo, 2016). Engagement patterns may be a relatively stable individual characteristic. It may also be the case that different engagement components make differential contributions to early learning.

However, existing evidence is limited because few validated and efficient measures are available for young children's engagement behaviors in shared book reading. A few existing studies have focused on measures of the global rating or a simple frequency of literacy activity participation (e.g., Baroody & Diamond, 2013, 2016). Very few studies examined patterns or components in shared reading engagement, nor considered various reading behaviors reflecting the components. The current study attempted to develop a measure of young children's engagement in shared book reading reflecting activity components and test its construct and predictive validity. The study also attempted to examine the

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measure's validity by comparing scale scores of shared reading engagement across different groups, including children with different gender and home language.

1. The role of reading engagement in young children

According to Fredricks et al. (2004), engagement supports learning since engagement reflects children's commitment to or investment in learning corresponding to the demands of learning activities. Engaged children are likely to exhibit behaviors that promote learning and, as a result, demonstrate higher academic achievement (Ponitz et al., 2009; Rimm-Kaufman et al., 2002).

For young, pre-reading children, high levels of engagement in shared reading may allow children deeper information processing (Craig & Tuling, 1975), thus supporting children's understanding and learning of literacy during shared reading. Engaged children are likely to involve in a more meaningful analysis of information, by linking new story-related information with previous knowledge or giving the new information meaning, to understand and remember better.

Further, engagement may stimulate student-teacher dialectical process and interactions (Reeve, 2012), which can support learning. Children highly engaged in shared reading reinforce teachers' literacy involvement, which in turn leads to more opportunities for learning, resulting in children's learning. More learning generates more interest and more engagement for children, generating cyclical processes of engagement and learning. Existing research studies demonstrated some associations between shared reading engagement and various early literacy skills, especially between engagement in home shared reading and early literacy in letter and word identification (Bracken & Fischel, 2008; Deckner et al., 2006; Laakso et al., 2004), vocabulary (Deckner et al., 2006; Lyytinen et al., 1998), and sound awareness (Bracken & Fischel, 2008;), and between experimental training of shared reading engagement and early literacy in vocabulary (Mol et al., 2009; Sénéchal et al., 1995), sound awareness (Mol et al., 2009), and print-related skills (Mol et al., 2009).

In this sense, children's engagement in shared book reading may explain individual differences in literacy learning (e.g., as a contributor to a literacy gap between boys and girls, or between dual language learners (DLLs) and English monolinguals, etc.). Children's engagement in shared book reading may also explain mechanisms through which classroom reading activities contribute to student literacy learning (Guo et al., 2011; McLean et al., 2016; Ponitz et al., 2009; Wigfield et al., 2008). However, it is not clear if shared reading engagement-literacy skills associations hold true in young emergent readers in preschool classrooms and if the associations are constant across various groups of children including gender and home language groups.

2. Gender and home language differences

Existing research studies have documented differences in early literacy skills across gender groups (McTigue et al., 2021) and children's home language groups (Hammer et al. 2014), and attempted to explain at-risk groups' (e.g., boys and DLLs) underachievement in reading based on their lack of engagement in reading activities. Specifically, gender differences in reading engagement have been identified across multiple cultures (Kirsch et al., 2002), and boys' low reading engagement has been connected to lower reading achievement (Brozo et al., 2014; Lynn & Mikk, 2009). Reading engagement has also been found to mediate the effect of gender on reading achievement (Chiu & McBride-Change, 2006).

Gender differences in reading engagement emerge early in school years. Longitudinal studies showed that significantly lower reading interest and engagement appeared early on for boys in lower elementary grades than for girls (Jacobs et al., 2002; Smith et al., 2012). Studies of kindergartners showed some evidence of gender differences in reading enjoyment (Ozturk et al., 2016a), although results were mixed with

other studies reporting no gender differences (Mata, 2011; Ozturk et al., 2016b). While gender and reading engagement has been extensively studied in samples of school-aged children, research on emergent readers attending preschool is limited. A few related studies tested gender differences among preschoolers with girls having higher scores in literacy interest (Alexander et al., 2008; Baroody & Diamond, 2013), but the studies did not examine gender differences in shared reading engagement.

Similarly, DLLs may show some differences, from English monolinguals, in behaviors related to shared reading engagement. Children with home languages other than English may show different patterns of shared reading engagement, due to potential cultural differences and expectations related to shared reading practices (Casper, 2009). Although only a few studies are available, existing studies reported that DLLs were less engaged in classroom learning. For example, preschool-aged DLLs were less engaged in general classroom learning (Rojas et al., 2021) and elementary-aged DLLs were less engaged in reading activities than English monolinguals (Barber et al., 2020). Given the evidence of lower early language and literacy skills among DLLs (Hammer et al., 2014), it is of interest to confirm whether the level of young DLLs' shared reading engagement differs from that of English monolinguals.

Given the limited literature on engagement among different groups of preschoolers, it is not easy to hypothesize the role of gender and home language in shared reading engagement. Available studies have examined overall participation or interest levels across various literacy activities in classrooms, thus not specifically targeting group differences in preschoolers' engagement in shared reading activities. Differences in shared reading engagement across gender groups and home language groups warrant further research.

3. Components of shared reading engagement: active and interactive engagement

Researchers have viewed student engagement as a concept comprising multiple components (Finn & Zimmer, 2012). The current study adopted the multi-component framework of engagement, where children display involvement behaviors in interactive and active components of engagement (Chi, 2009; Hall et al., 1986). Interactive engagement occurs when children show dynamic engagement in shared reading by socially, verbally and cognitively interacting with teachers and other children. Active engagement occurs when children show non-interactive but overt engagement behaviors by participating in and enjoying reading. Children may show similar or different levels of involvement across active and interactive engagement.

Traditional engagement studies often utilized a typology of engagement, where children's overall level of engagement is to be identified (i.e., passive or active) and categorized as one type of engagement (Hall et al., 1986). Children are identified as actively engaging, when they show expressive or overt behaviors, such as manipulating materials and participating in discussions. In contrast, children are classified as less actively engaging, or passively engaging, when they exhibit non-expressive or non-interactive behaviors, such as looking, listening, or silently reading (Lee & Smith, 1999).

Cognitive and learning scientists further refined the conceptual definition of active engagement. For instance, Chi (2009) categorized types of learning activity engagement into low versus high levels of engagement, based on whether or not a behavior is overt and what its underlying learning process is. Low levels would be no engagement or passive engagement (not showing overt behaviors) as well as active engagement (showing physical behaviors, such as looking, attending, manipulating, and pointing). Chi also detailed higher levels of engagement as constructive (showing self-regulating behaviors of connecting, reflecting, and planning) and interactive engagement (dialoguing and jointly creating understanding).

Chi's (2009) overall concept of engagement is applicable to the current study with its focus on observable engagement behaviors. His differ-

entiation of interactive versus active engagement is especially relevant to engagement in early childhood learning, where most learning activities are social in nature (Appleton et al., 2008), requiring interactive verbal exchanges for high-level engagement (Dale et al., 1996; Haden et al., 2001). Specifically, shared book reading in preschool classrooms is considered a social-cognitive activity, often involving social and verbal interactions between children and adults to share understanding and make meaning together (van Kleeck, 2003).

The current study posits that young children's shared reading engagement can be characterized by active and interactive engagement patterns where children simultaneously display characteristics of both components of engagement (rather than showing one component over the other). This multi-component concept suggests that young children may show high or low interactive engagement in shared book reading, represented by the level of interactive participation in reading discussions. At the same time, young children may also show high or low active engagement based on the level of non-interactive engagement behaviors of sitting still, attending to the story, manipulating props, and enjoying read-aloud. Together, the combined patterns of interactive and active engagement can characterize children's engagement (Finn & Zimermer, 2012).

The active and interactive components of shared reading engagement may imply differential involvement in learning and the differential extent of influence on literacy outcomes. For example, active engagement behaviors likely help learners attend to and remember knowledge and lessons while reading (Estigarribia & Clark, 2007). Interactive engagement behaviors in shared reading likely promote semantic information processing (Hargrave & Sénéchal, 2000; Sipe, 1998; 2002) and enable deeper processing and learning (Kuhn, 2015), which may have a stronger impact on literacy learning, compared to active engagement.

Identifying and characterizing components of shared reading engagement may suggest which component of shared reading engagement needs to be encouraged to support early literacy development. It may also help describe characteristics of young children as they engage in shared reading, specifying where the difference lies in between groups of children, such as between boys and girls, or between DLLs and English monolinguals. The potential differences between groups of children might appear in multiple ways, either in every component or one component of engagement, thus these components need to be examined to determine specific patterns of shared reading engagement characteristics and differences across groups of children.

4. Measuring preschool children's shared reading engagement

The construct of reading engagement is complex, as is measuring it. The complexity of measuring reading engagement is exacerbated when assessment involves young children, due to the difficulty of assessing them (McWilliam, & Ware, 1994; Winsler & Wallace, 2002). Accordingly, existing studies have used diverse approaches to measure young children's reading engagement. For example, previous studies have utilized engagement measures at different levels of specificity, from measures evaluating a child's overall level of literacy engagement to measures rating components of engagement in a specific literacy activity, shared book reading, with numerous engagement indicators. Previous studies also utilized various data collection methods, including direct observations and survey reports from teachers, parents, or children. It is unclear whether these methods measure a similar construct or have comparable validity; comparing these approaches may suggest better measurement practices.

5. Measuring global versus specific aspects of engagement

Young children's engagement has often been assessed using a measure that evaluates the overall involvement in classroom activities. This kind of measure assumes that engagement is one overarching concept

and often assesses global levels of engagement indirectly by asking respondents about their perception of individual children's general engagement during class time, such as the overall level of behavior engagement in the classroom (McWilliam, 1991), or the overall frequency of participation in classroom literacy activities (Weigel et al., 2006). Additionally, engagement measures have tracked the overall amount of on-task time (Ponitz et al., 2009), and participatory or attentive task time (de Kruif & McWilliam, 1999; McWilliam, & Ware, 1994; Powell et al., 2008).

While these global measures are convenient and straightforward to use, they do not consider components of engagement and do not fully represent the complex patterns in children's reading engagement characteristics. In fact, these measures assess the general engagement level throughout the school day across learning activities and subjects. Global engagement measures often have a limited number of items and a high risk for measurement error (Nunnally & Bernstein, 1994) and rater bias (Hoyt, 2000).

In contrast, there have been some measures that specifically target engagement in shared reading. For example, the Rating of Orientation to Book Reading is a tool for researchers to assess shared reading engagement with eight items tapping persistence and engagement in reading (Kaderavek et al., 2014). Another measure is the Kindergarten Reading Engagement Scale (Clarke et al. 2004), for teachers to rate five items on reading participation, efforts, learning, emotion, and attention. Scores of both measures were found to be related to children's early reading skills.

Recent studies further examined measures of shared reading engagement that consider specific engagement components, indicated by items of various detailed reading behaviors. For example, the Adult/Child Interactive Reading Inventory (ACIRI; DeBruin-Parecki, 2006) was developed to rate diverse behaviors or strategies that children use to engage in shared reading. Behaviors included children's talking about print, discussing stories, manipulating books, pursuing close proximity to the reader, and sustaining motivation. Son and Tineo's (2016) measure targeted interactive engagement in shared reading. Using verbal behaviors during book discussions, the engagement measure rated children's verbal responsivity and their participation in shared book discussions in describing, inferring, and extending stories. The verbal behaviors did not show significant associations with early literacy.

Overall, the existing shared reading engagement measures range from global rating to rating of aspects of reading engagement with various behavioral engagement indicators. While global measures are convenient to use, measures focusing on specified components of shared reading engagement can reflect the complexity of engagement characteristics (Fredricks, Blumenfeld, & Paris, 2004; Linnenbrink, & Pintrich, 2003) and depict detailed characteristics of children's shared reading engagement. Further, when measures utilize diverse behavioral indicators, especially explicit, observable, and quantifiable ones, this leads to less guesswork and rater bias, making the measures methodologically strong (Hoyt & Kerns, 1999). However, existing measures tend to target engagement behaviors in one component of reading engagement (e.g., interactive engagement) without considering other components of engagement (e.g., active engagement). They often lack specific quantifiable behavioral indicators; when they have addressed specific behavioral indicators, the indicators tend to use one type of behavior (e.g., verbal) but not others (e.g., physical or emotional). Additional measures need to be developed that inclusively assess multiple components of shared reading engagement, and active and interactive engagement, with various types of behavioral indicators.

6. Methods of reporting reading engagement

Children's reading engagement has been measured through various methods, such as observation, parent-reports, teacher-reports, and child self-reports. Observation is often conducted by a researcher who rates engagement based on observing children's behaviors as they occur dur-

ing shared book reading. Observing and rating the frequency of specific engagement behaviors is viewed as less subject to bias (Ortiz et al., 2001), but it may illustrate short snapshots of reading engagement that are context- or event-specific instances (Powell et al., 2008), not capturing context-general engagement levels of children based on ecological understanding.

In contrast, survey reports from adults familiar with children can be time-efficient and provide a cumulative perspective on children's engagement over extended periods (Loughran, 2003). Teachers especially have a normative perspective from extensive experience interacting with same-aged children (Evans et al., 2005). Teachers tended to provide reliable ratings of children's behavior (Konold et al., 2010) and their rating predicted children's early literacy skills with a stronger effect size than observed reports by researchers (Baroody & Diamond, 2013). However, teacher-reports are subject to bias. For example, teachers' gender-related beliefs may present bias when teachers perceive girls as being more engaged and putting more efforts into reading (Retelsdorf et al., 2015; Robinson & Lubienski, 2011; Upadyaya & Eccles, 2014; Wolter et al., 2015). Previous literature suggest that teacher bias is more likely to occur when teachers are asked to report children's engagement level on a global measure without clarifying specific observable engagement behaviors (Baroody & Diamond, 2013).

Similarly, parent-reports have been used as an efficient measure of their child's reading engagement in home settings. However, parents may not be the ideal raters of children's academic-related behaviors in school settings since children may behave differently at school than at home. Further, parents tended to report more positively about their child's reading interest and engagement than teachers did (Baroody & Diamond, 2013; Bracken & Fischel, 2008), especially when they were asked to evaluate a global level of engagement rather than specific observable engagement behaviors (Seifer, 2005).

Finally, children's self-reports have been used to measure children's perception of their own reading engagement. For young children, an interview style was often used to make the self-report easier by asking forced-choice response questions with visuals (e.g., pictorial images of happy/sad face) or tangible props (e.g., a puppet or stuffed animal playing the role of the interviewer; Baker and Scher., 2002; Frijters et al., 2000; Sonnenschein & Munsterman, 2002). However, child-report literacy engagement measures showed no associations with the parent- or teacher-reports of literacy engagement (Baroody & Diamond, 2013).

Overall, existing measures often lack the evidence of validity and have methodological weaknesses. The literature suggests that young children's shared reading engagement could be reliably measured by including a range of observable engagement behaviors indicating components of reading engagement, and that teachers' reports can be an efficient approach to it. The current study attempted to focus on teacher rating of young children's engagement in shared book reading with items assessing the frequency of specific behavioral indicators to measure components of active and interactive shared reading engagement.

7. The current study

This study aimed to determine the construct and criterion-related validity of a measure of children's shared reading engagement in preschool years. We define reading engagement as a behavioral manifestation of various components of involvement in shared book reading. The tool purports to measure children's engagement levels by rating a frequency of a range of concrete, observable behaviors during classroom shared reading activities as reported by teachers. The target context is large-group or whole-class shared book reading to evaluate the shared reading engagement of each of the children in the classroom.

Given this framework, the current study's first goal was (1) to identify components of the shared reading engagement measure. We hypothesized that shared reading engagement may be represented as active and interactive engagement. Our second goal was (2) to compare the shared reading engagement measure with existing brief survey mea-

asures on children's overall literacy engagement level. We hypothesized that there would be significant correlations between shared reading engagement and other brief survey measures of literacy engagement. The correlations might be moderately high, leaving some variance in shared reading engagement unexplained by other brief survey measures. The unexplained variance might indicate that the shared reading engagement measure would provide unique information. Our third goal was (3) to test the associations between the shared reading engagement measure and early literacy skills. We hypothesized that higher levels of active as well as interactive engagement in shared reading would positively predict various literacy skills. Our final goal was (4) to evaluate group differences in shared reading engagement across gender and home language groups. We hypothesized that gender and home language differences would be less pronounced in shared reading engagement measure since the measure would be more likely to reflect behavioral differences in children rather than capture teacher's perceptions. We also hypothesized non-significant group differences in shared reading engagement's predictability of early literacy skills. We expected to find that shared reading engagement would benefit early literacy skills similarly for groups of children, including boys and girls as well as DLLs and English monolinguals.

1. Method

1.1. Participants

Participants in this study were 263 three- and four-year-old children (mean age = 49 months, $SD = 6.86$) enrolled in 21 preschool classrooms housed in three head start (HS) sites in urban settings in the Mountain West region. HS is a federally funded program that provides comprehensive services to promote school readiness of children ages birth to five years from low-income families. Current HS sites were under the same HS program administration, sharing the same educational standards and serving culturally diverse communities. The HS literacy program used repeated reading as a main literacy activity, incorporating story reading/understanding as well as print skills lessons during repeated reading. Two sites had established community-collaborative add-on literacy programs (i.e., public library's monthly storytime), whereas the third site had not utilized any auxiliary programs.

Participating children were ethnically diverse with 49.4% Hispanic, 5.2% African American, 12.6% Asian, and 14.0% other ethnicities. Many children spoke home languages other than English (DLLs; 40.7%) and their English competence as measured by receptive vocabulary was relatively low with the standard scores of 89.46 (compared to the population average of 100.00, SD of 15), although this is within normal range of scores for the age group. Gender was roughly split in half (50.2% of boys). Participating mothers' highest level of education ranged from some high school to graduate school with 22.1% of mothers reporting some high school; 33.5% reporting a high school diploma/GED; 20.2% reporting some college education but no degree; 6.5% reporting a two-year-college degree; and 13.7% reporting a four-year-college degree or higher. About 40% of mothers were employed out of the home; 25.9% of mothers reported that they worked full-time, and 14.1% of mothers worked part-time. Many families were economically disadvantaged based on their mean annual income of \$13,065 ($SD = 15,857$). Family income information was available for 54.4% of the participants.

Fourteen lead teachers taught participating children in 21 HS classrooms (i.e., some teachers taught two half-day classes). All of the HS teachers were female and used English as the language of instruction. Two of the teachers identified as Hispanic and bilingual in Spanish and English. The teachers' highest level of education ranged from an associate's degree to some graduate work: 14.29% reporting an associate's degree ($n = 2$), 71.43% reporting a Bachelor's degree ($n = 10$), and 14.29% reporting some graduate work or higher ($n = 2$). The teachers' years of teaching experience ranged from 1 to 20 years, with 13.38 years on average ($SD = 6.96$).

Table 1
Sample Characteristics and Descriptive Statistics of Study Variables (N = 263).

	Fall of Preschool				Spring of Preschool			
	N	M (%)	SD	Range	N	M (%)	SD	Range
Background								
Age (months)	262	49.00	6.86	34-59.79				
Boy	132	50.2%						
Home language, non-English	107	40.7%						
Race/Ethnicity^a								
Caucasian	43	18.6%						
Hispanic	114	49.4%						
African American	12	5.2%						
Asian	29	12.6%						
Other ethnicity	37	14.0%						
No response	28	10.6%						
SRERS								
Active reading engagement	253	3.62	.77	1.55 - 5	235	3.95	.75	1.18 - 5
Interactive reading engagement	253	2.88	.80	1.00 - 4.88	235	3.36	.86	1.13 - 5
Brief Survey on Literacy Engagement								
Teacher-reported literacy behavior	253	2.75	.70	1 - 5	235	3.25	.81	1 - 5
Teacher-reported literacy enjoyment	253	3.18	.63	1 - 4.67	235	3.67	.77	1 - 5
Parent-reported literacy behavior	198	3.65	.93	1.25 - 5	183	3.78	.88	1.50 - 5
Parent-reported literacy enjoyment	180	3.82	.83	1.67 - 5	177	3.94	.83	2 - 5
Child-reported literacy behavior	235	3.17	.85	1 - 4	208	2.98	.88	1 - 4
Child-reported literacy enjoyment	237	3.44	.57	1 - 4	209	3.35	.67	1 - 4
Early Literacy Skills								
WJ Letter-Word Identification	253	318.26	28.14	264 - 420	222	338.47	27.64	270 - 453
WJ Picture Vocabulary	253	444.08	26.66	374 - 498	222	452.73	20.90	374 - 494
WJ Sound Awareness	253	430.61	13.02	420 - 486	222	437.85	15.45	420 - 483
Print Awareness	251	88.90	19.28	46 - 145	222	99.44	17.91	46 - 145

Note: ^a Families were allowed to mark more than one race/ethnicity, thus a sum of percentages exceeds 100%.

1.2. Procedures

After the study proposal was approved by the University and HS administration, invitation letters to the study were sent to caregivers at the beginning of the school year. Researchers were available at each site for a week during drop-off and pick-up times to answer any questions caregivers might have and collect consent forms from caregivers for their child to participate in the study and pick up a demographic survey.

Consent forms were secured for 263 out of 313 children in the three HS sites (84% recruitment rate). In the fall, data were collected from 253 children. Teachers were asked to rate children's shared reading engagement reflecting on their experiences/observation of each of the study children's behaviors during the large group/whole-class shared book reading and also to complete a brief survey on their perceptions of children's overall interest in literacy activities. No specific instructions were provided to teachers other than that researchers were interested in children's learning experiences at school and home. Parents or legal guardians of participating children completed a brief survey reporting their perception of their child's interest in literacy activities. Children were interviewed about their own interest in literacy activities. Additionally, children were assessed individually on early literacy skills.

The same set of data was collected again in the spring of the school year for 235 children, including 10 additional children not included in the fall data collection and excluding 28 children who left the school. See Table 1 for a summary of the descriptive statistics of study variables.

2. Measures

2.1. Engagement in classroom shared reading

Children's engagement in large-group shared book reading in the classroom was measured by the Shared Reading Engagement Rating Scale (SRERS; Son & Baroody, 2017). SRERS was developed to assess a child's engagement in classroom shared book reading as reported by teachers. SRERS allows teachers to rate specific behaviors of individual

children during classroom shared reading that indicate children's interest and involvement in read-aloud and related discussion.

Teachers rated specific behavioral indicators of shared reading engagement on a 5-point Likert scale of behavioral frequency (1 = *hardly ever/never* to 5 = *almost always*). Previous literature on shared reading engagement informed the selection of engagement indicators (e.g., DeBruin-Parecki, 2006; Fleury & Hugh, 2018; Moschovaki et al., 2007; Son & Tineo, 2016; Sonnenschein & Munsterman, 2002). Indicator items were chosen based on the literature to exhibit various components of engagement (Chi, 2009; Lee & Smith, 1999), including socially participating interactive behaviors (e.g., The child asks for more information; The child answers questions that the reader asks about the story) and non-interactive but active behaviors (e.g., The child spontaneously joins in reading; The child visually attends to the book and the reader throughout reading). The indicators reflected various types of behaviors (Clarke et al., 2004), such as physical participation (Birch & Ladd, 1997; Finn, 1989), cognitive/verbal behaviors (Connell, & Wellborn, 1991; Fredricks, Blumenfeld, & Paris, 2004), and emotional reactions and enjoyment (Deckner et al., 2006; Moschovaki et al., 2007; Ortiz et al., 2001). The resulting SRERS includes a total of 21 items with 11 interactive and 10 non-interactive items, reflecting physical involvement ($n = 7$), cognitive behaviors ($n = 9$), and emotional behaviors ($n = 5$). A committee of early childhood educators and researchers reviewed the items before SRERS was administered to teachers. Internal consistency reliability for the current study sample was .96 for the fall measurement and .97 for the spring measurement.

2.2. Parent-reported literacy engagement

Parents or legal guardians of participating children were asked to complete a brief, seven-item survey questionnaire on their perceptions of their child's engagement in home literacy activities (i.e., reading, writing, and learning letters and words). The items were adapted from a parent-report of child interest questionnaire from Bracken and Fischel (2008). Four of these items measured children's literacy behaviors by assessing the frequency of participation in literacy activities (e.g.,

How often does your child look at books by him/herself?), and three items measured children's literacy enjoyment by assessing the child's level of enjoyment of literacy activities (e.g., How much does your child enjoy having a book read to him/her?). Items were rated on a 5-point Likert scale (1 = *not at all* to 5 = *a lot*). Item scores were averaged to create combined scores of *parent-reported literacy behavior* and *parent-reported literacy enjoyment*. The internal consistency reliability reached .79 and .87 for fall and spring parent-reported literacy behaviors, and .67 and .76 for fall and spring parent-reported literacy enjoyment.

2.3. Teacher-reported literacy engagement

Teachers were asked to report their perceptions of child engagement and interest in classroom literacy activities on a brief, seven-item survey questionnaire (i.e., reading, writing, and learning letters and words) for each participating child. The items were the same as those used in the parent-reported literacy engagement survey, with four items measuring literacy behavior and three items measuring literacy enjoyment on a 5-point Likert scale (1 = *not at all* to 5 = *a lot*). Item scores were averaged to create combined scores of *teacher-reported literacy behavior* and *teacher-reported literacy enjoyment*. The internal consistency reliability was .86 and .89 for fall and spring teacher-reported literacy behaviors and .77 and .81 for fall and spring teacher-reported literacy enjoyment.

2.4. Child-reported literacy engagement

Child-reported literacy engagement was assessed with the children's interest measure (Baroody & Diamond, 2013). The measure was a 6-item survey with pictures and was administered via a one-on-one interview with the child. Examiners read the questions as well as each response option to the child. The first eight items asked about literacy enjoyment, such as how much the child likes various literacy activities depicted in pictures, including reading, letters, and writing. Children were asked to respond verbally or by pointing among the four response options, accompanied by a smiling or frowning face. Four points were assigned for "Like a lot," 3 points for "Like a little," 2 points for "Don't like a little," and 1 point for "Don't like a lot."

The remaining eight items asked about literacy behavior, such as how often the child participates in a specific literacy activity. Children were shown a picture of an activity and a bar graph with the highest bar labeled "Every day" and the lowest bar labeled "No days." Children were asked to respond verbally or by pointing to the bar graph. Four points were assigned for "Every day," 3 points for "Lots of days," 2 points for "Few days," and 1 point for "No days." Item scores were averaged to create combined scores of *child-reported literacy behavior* and *child-reported literacy enjoyment*. The internal consistency reliability estimates for the current study sample reached .87 and .85 for fall and spring child-reported literacy behavior, and .77 and .77 for fall and spring of child-reported literacy enjoyment.

2.5. Early literacy skills

Children's core early literacy skills were assessed in letter-word identification, picture vocabulary, sound awareness, and print awareness. These skills reflect competencies in decoding, vocabulary, phonemic awareness, and print-concept knowledge. These skills are significant indicators of early reading experiences (Lonigan et al., 1999) and important predictors of later reading achievement (Dickinson et al., 2003; Storch & Whitehurst, 2002).

Letter-word identification, picture vocabulary, and sound awareness were assessed using a standardized measure of the Woodcock-Johnson Tests of Achievement III (WJ-III; Woodcock-Johnson et al., 2001). WJ-III is a widely used test of academic skills with a range of item difficulty and a high inter-item reliability coefficient for each subtest, ranging from .81 to .94 (Woodcock-Johnson et al., 2001). Item response theory (IRT)-based *W* scores were used in analyses.

Additionally, print-concept knowledge was assessed using the preschool word and print awareness (PWPA; Justice et al., 2006). The PWPA measures children's knowledge about the functions and organizational rules of print (e.g., left-to-right directionality, location and purpose of the title, print functions of narrative text, etc.). The PWPA has been validated using an item response model and reports high measurement validity (Justice et al., 2006). IRT-based estimate scores were used in analyses.

2.6. Covariates

This study considered several caregiver-reported child and family characteristics as covariates in the analysis for the concurrent validity. The covariates included child gender (boy or not), home language (DLL or not) and child age (in months at the start of the school year), based on their reported relationships with the dependent variables of early literacy skills (Huang & Invernizzi, 2012; Lee & Al Otaiba, 2015; Lonigan et al., 2013). Each analysis considered classroom nesting to counter classroom-level literacy skills differences (Maier et al., 2012). Additionally, the HS site was included as a covariate to control potential site differences and the existence of additional literacy enrichment programs. Regression analysis of spring literacy skills controlled for fall initial literacy skills.

2.7. Plan of analysis

Descriptive and correlation analyses were conducted in *SPSS*, and all other analyses were conducted in *Mplus 7* (Muthén & Muthén, 1998–2015). Other than descriptive statistics, all the analyses utilized full information maximum likelihood (FIML) estimation to handle missing data. FIML strengthens the power of analysis by simultaneously using all available data in model estimation and is known to produce parameter estimates that are less biased than other procedures for handling missing data (Baraldi & Enders, 2010). Using FIML enabled us to maintain the sample size of 263 children across analyses. Also, we accounted for the nested structure of the data in HS classrooms. Intraclass correlation analysis showed that SRERS has significant classroom-level variance (i.e., children within a classroom were rated more similarly to each other than children in other classrooms) of .11 and .22 for its fall and spring measurements. The nested structure of the data was considered in all *Mplus* analyses, by using the *Mplus* command TYPE=COMPLEX, which adjusts standard errors to reduce Type I error.

First, we examined the construct validity of the SRERS measure by running factor analysis. Factor analysis is a statistical technique to examine the relationships between scale items (i.e., behavioral indicators of reading engagement) and to identify components or constructs represented on the scale measure (i.e., components of engagement, such as active engagement and interactive engagement). To rigorously test the measurement structure of SRERS, we ran the factor analysis in two steps, first with the exploratory factor analysis (EFA) to identify the constructs within SRERS and then ran a confirmatory factor analysis (CFA) to verify constructs found from the EFA.

We randomly split the sample to perform EFA and CFA with each of the split samples. This is a robust method to confirm a factor structure by showing that the factorial structure found with the randomized half of the sample would fit the remaining half of the sample (Anderson & Gerbing, 1988). In the EFA, we used a Geomin (oblique) rotation, which allows the factors to be correlated. To determine the number of factors from the EFA, we used the Eigenvalues, their confidence intervals (CI), and factor loadings of items. We looked for Eigenvalues over 1.00 and calculated Eigenvalue CIs using the techniques described in Larsen and Warne (2010) to check if the upper and lower CI's contained 1.00: Eigenvalues above 1.00 with CIs that do not contain 1.00 suggest a factor. Furthermore, we looked at the factor loadings to determine which items were loaded onto which factors and if any items were cross-loaded. If

Table 2
Factor Loadings from Exploratory Factor Analysis of SRERS.

RERS Items	Fall of Preschool		Spring of Preschool	
	Active Reading Engagement	Interactive Reading Engagement	Active Reading Engagement	Interactive Reading Engagement
Spontaneously joins in reading by coming to the reading place or carpet	.917*	-.159*	.886*	.000
Wants/attempts to be close to the reader	.463*	.036	.727*	-.081
Sits still throughout the reading	.974*	-.192*	.924*	-.114
Takes turns in reading discussion and wait for his/her turns to talk and answer	.785*	.144	.482*	.475*
Takes turns in touching books or other related materials related to the reading	.834*	.023	.730*	.212
Follows directions or rules of the reader during reading without requiring repeated reminders	.999*	-.202*	.933*	-.073
Participates and follows through story-extension activities	.708*	.212	.573*	.395*
Visually attend to the book and/or the reader throughout the reading	.918*	-.007	.891*	.039
Concentrate on reading and book discussion	.796*	.175*	.665*	.323*
Pay attention and visually follow reader's finger pointing or tracking of the book text	.758*	.109	.675*	.261*
Answers questions that the reader asks him or her about the story	.099	.820*	.010	.865*
Asks for more information if he/she doesn't understand the question	-.085	.851*	-.106	.873*
Initiates questions and makes comments about the story	-.018	.912*	-.247*	.993*
Ready to respond to the cues that the reader provides in regard to pictures; Begins to pick them out on his/her own as the book progresses	.385*	.643*	.059	.899*
Answers the reader's questions about print concepts, including author, title, or letters	.272*	.719*	.028	.882*
Associates the content of the book relevant to his/her life experiences including something he/she knows, has done, or has been in another book or TV	.174	.748*	.003	.876*
Provides affirmation to other children's comments and responses verbally during reading discussion	-.008	.596*	-.057	.713*
Seems interested in listening to stories; displays curiosity	.632*	.216*	.628*	.232*
Enjoys the story by showing smiling and laughing or other emotional responses	.604*	.240*	.544*	.379*
Initiates or responds to dramatic book sharing, such as asking the adult to read in character voices or let him/her participate more in reading such as role play	.125	.683*	.011	.765*
Shows enthusiasm for story-extension activities	.527*	.373*	.499*	.381*

Note: Loadings from pattern matrix are reported. Items that load at .40 or above appear in boldface font. * $p < .05$.

an item loading was at .40 or above, we considered that it loaded onto a factor.

For the CFA, we examined model fit using a number of indicators: Chi-square, Comparative fit index (CFI), Tucker-lewis index (TLI), Root mean square error of approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Good fit was indicated by a non-significant Chi-square (although sample size affects the significance level, therefore, often times, the Chi-square test is significant). For CFI and TLI, values above .90 indicate a good fit, and above .95 indicate an excellent fit (Bentler, 1990; Hu & Bentler, 1999; Kline, 2005). For RMSEA and SRMR, an acceptable model fit is between .08–.10, with a good model fit being .06 or smaller (Hu & Bentler, 1999; Kline, 2005). We calculated inter-item reliability for each factor.

Next, we examined the criterion-related validity of the SRERS measure. We conducted correlation analyses between SRERS factors and other brief survey measures of child literacy engagement from different informants: parent-reported child literacy engagement, teacher-reported child literacy engagement, and child-reported literacy engagement. Additionally, we conducted regression analyses for SRERS factors predicting concurrent literacy outcomes in the fall and spring of the school year. Two models were tested for each regression: Model 1 contained SRERS factors as predictors of literacy outcomes and Model 2 contained SRERS factors and other brief survey measures of literacy engagement to determine if SRERS factors contributed to literacy outcomes in the presence of other survey measures of literacy engagement. All models accounted for the nested structure of the data and controlled for child gender, age, home language, and HS site. Spring models additionally controlled for fall literacy scores.

Finally, we tested if the SRERS measure worked equally well for boys and girls as well as for DLLs and English monolinguals. To examine gen-

der (in)variability, we first compared SRERS factor scores of girls and boys using dichotomous regressions considering covariates—age, home language, and HS site—and the nesting of data at the classroom level. The dichotomous predictor was child gender (0 = girl, 1 = boy). These analyses checked if one gender group had higher or lower scores in SRERS factors than the other group as a main effect. We also included interaction effects of child gender with SRERS factors in predicting literacy outcomes. The same analysis was repeated for home language groups by compared SRERS factor scores of DLLs and English monolinguals using dichotomous regressions considering covariates—age, gender and HS site—and the nesting of data at the classroom level, and by testing interaction effects of home language with SRERS factors. These analyses attempted to test if shared reading engagement levels were dependent on gender or home language groups and if the predictability of shared reading engagement for early literacy skills were dependent on these groups.

3. Results

3.1. Construct dimensions of SRERS

3.1.1. EFA

Together the fall and spring results of the EFA suggested a two-factor solution. In the initial EFA run, three factors were extracted but results showed some cross-loading. In the fall, all items loaded onto factors 1 or 2 except three items (Attempts to be close to the reader; Initiates or responds to dramatic book sharing; Shows enthusiasm for story-extension activities), which cross-loaded on either factor 1 or 2 and factor 3. In the spring, all items loaded onto factors 1 or 2, except of three items (Seems interested in listening to stories or displays curiosity; Initiates or re-

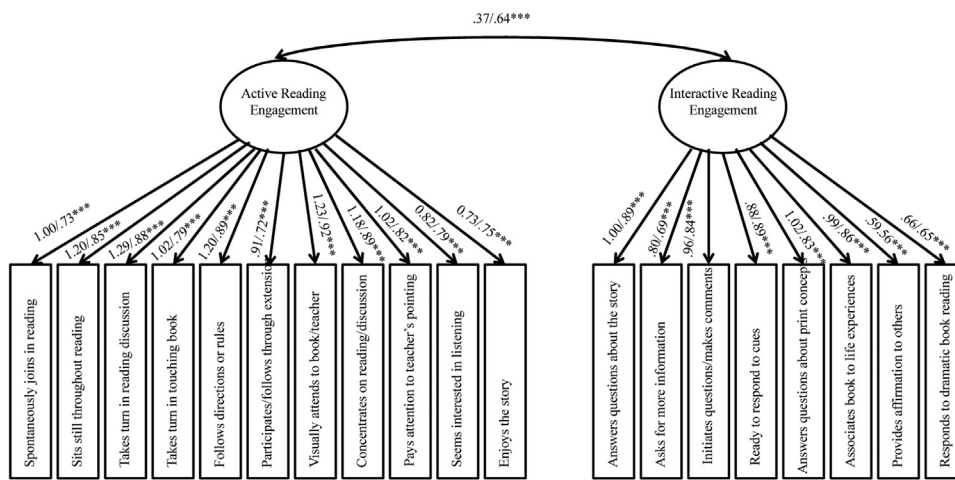


Figure 1. Confirmatory factor analysis model for fall measurement of SRERS items, $\chi^2 = 314.98^{***}$, CFI = .91, TLI = .90, RMSEA = .09, SRMR = .07. Unstandardized factor loadings are presented first followed by standardized factor loadings, *** $p < .001$.

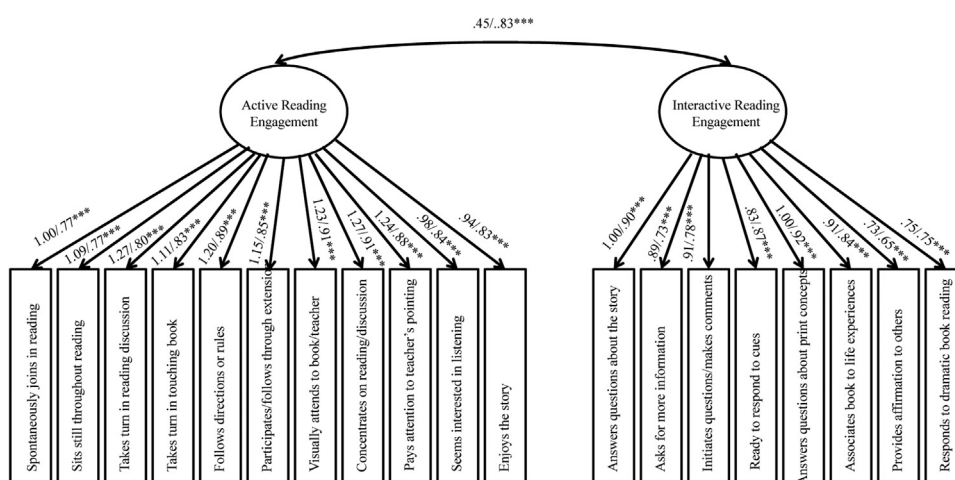


Figure 2. Confirmatory factor analysis model for spring measurement of SRERS items, $\chi^2 = 286.66^{***}$, CFI=.93, TLI=.92, RMSEA=.09, SRMR=.06. Unstandardized factor loadings are presented first followed by standardized factor loadings, *** $p < .001$.

sponds to dramatic book sharing; Shows enthusiasm for story-extension activities). These items cross-loaded onto either factors 1 or 2 and factor 3. In the spring, cross-loadings were weaker on factor 3 than on factors 1 and 2.

We re-ran the EFA with two factors to determine where the cross-loading items loaded on between factors 1 and 2. The factor loadings are reported in Table 2 (fall Eigenvalue: factor 1 = 12.13, CI = 9.58, 14.67; factor 2 = 2.77, CI = 2.19, 3.35; spring Eigenvalue: factor 1 = 12.97, CI = 8.16, 17.78; factor 2 = 2.57, CI = 2.02, 3.13). Items on factor 1 appear to indicate non-interactive, active engagement behaviors (e.g., attending to the story reading). Items on factor 2 appear to indicate interactive engagement behaviors (e.g., responding to questions).

3.1.2. CFA

Based on the EFA, we ran CFA using two SRERS factors of active and interactive reading engagement. In the initial run with all items, CFA indicated poor model fit. After examining items and modification indices, we decided to drop two items: Attempts to be close to the reader (due to large missing data with some teachers using assigned seating during storytime) and Shows enthusiasm for story-extension activities (due to modification indices and cross-loading both in the fall and the spring). We conducted the CFA with the remaining items while accounting for the nested structure of the data. Model fit was acceptable for both fall and spring measures, confirming the two-factor structure of SRERS (fall: $\chi^2 = 314.98$, $p < .001$, CFI = .91, TLI = .90, RMSEA = .09, SRMR=.07; spring: $\chi^2 = 286.66$, $p < .001$, CFI = .93, TLI = .92, RMSEA = .09, SRMR = .06; see Figures 1 and 2). Internal consistency reliability for active reading engagement reached .93 for fall and .94 for spring. Inter-

nal consistency reliability for interactive reading engagement reached .96 for fall and .97 for spring. Active and interactive reading engagement factors were moderately to strongly correlated with each other ($rs = .64$ for fall, .83 for spring).

3.2. Concurrent validity of SRERS

3.2.1. Associations with other brief survey measures of literacy engagement

We conducted correlational analysis between SRERS factors of active and interactive shared reading engagement on the one hand and other brief survey measures of literacy engagement on the other as measured in the fall and again in the spring (see Table 3). Correlations results were similar across fall and spring measurements. Overall, active and interactive shared reading engagement had moderate to strong correlations with brief teacher-reported survey measures of children’s literacy behavior and literacy enjoyment ($rs = .53 - .72$) and small but significant correlations with parent-reported measures of children’s literacy behavior and enjoyment ($rs = .20 - .34$). Active and interactive shared reading engagement had weak correlations with child-reported literacy behavior and enjoyment ($rs = -.00 - .26$).

3.2.2. Predicting early literacy skills

We conducted regression analyses of the fall and spring active and interactive shared reading engagement predicting concurrent early literacy skills. The analysis was conducted with two models; Model 1 included active and interactive engagement as predictors, and Model 2 included additional predictors of other brief survey measures of literacy engagement. In Model 1 of Table 4, fall interactive reading engage-

Table 3
Concurrent Correlations among Reading Engagement Measures and Early Literacy Skills.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Active reading engagement	–	.715***	.656***	.709***	.216**	.203**	.079	.147*	.430***	.205**	.378***	.346***
2. Interactive reading engagement	.613***	–	.72***	.655***	.177*	.263***	.147*	.254***	.553***	.326***	.545***	.529***
3. Teacher-reported literacy behavior	.528***	.707***	–	.840***	.202**	.239**	.018	.147*	.485***	.179**	.360***	.351***
4. Teacher-reported literacy enjoyment	.656***	.536***	.756***	–	.251**	.233**	.023	.150*	.487***	.172*	.316***	.301***
5. Parent-reported literacy behavior	.236**	.226**	.197**	.139	–	.671***	.000	.072	.272***	.248***	.142	.087
6. Parent-reported literacy enjoyment	.284***	.335***	.292***	.236**	.679***	–	.029	.094	.235**	.162*	.190*	.150
7. Child-reported literacy behavior	.046	-.003	-.068	-.050	.014	.034	–	.521***	.085	.156*	.048	.027
8. Child-reported literacy enjoyment	.075	.156*	.107	.053	-.060	.032	.440***	–	.270***	.267***	.195**	.194**
9. Letter-Word Identification	.319***	.452***	.351***	.284***	.175*	.206**	-.010	.092	–	.342***	.550***	.509***
10. Picture Vocabulary	.246***	.584***	.313***	.178**	.219**	.348***	.010	.192**	.411***	–	.346***	.287***
11. Sound Awareness	.314***	.548***	.377***	.274***	.083	.197**	.078	.234***	.493***	.553***	–	.553***
12. Print Awareness	.250***	.542***	.370***	.263***	.168*	.270***	.031	.169*	.444***	.549***	.529***	–

p* < .05, *p* < .01, ****p* < .001.

Note. Top half includes spring correlations and bottom half includes fall correlations.

Table 4
Results of Multiple Regression Analysis of Fall Shared Reading Engagement Predicting Fall Literacy Skills.

	Letter-Word Identification			Picture Vocabulary			Sound Awareness			Print Awareness		
	<i>B</i>	S.E.	β	<i>B</i>	S.E.	β	<i>B</i>	S.E.	β	<i>B</i>	S.E.	β
Model 1												
Active reading engagement	-.68	2.64	.02	-2.09	2.16	-.06	-.57	1.03	-.03	-4.41	1.65	-.17**
Interactive reading engagement	13.25	3.26	.38***	13.83	3.02	.42***	6.88	1.28	.43***	11.83	1.67	.49***
Model 2												
Active reading engagement	-.72	2.73	-.02	-1.39	2.21	-.04	-.40	1.41	-.02	-5.85	2.23	-.23**
Interactive reading engagement	11.21	3.44	.32**	15.10	3.35	.46***	6.49	1.59	.40***	10.51	2.03	.44***
Teacher-reported literacy behavior	3.08	3.77	.08	-3.46	2.23	-.09	.71	1.77	.04	1.29	2.42	.05
Teacher-reported literacy enjoyment	1.91	5.18	.04	-1.83	3.66	-.04	-.06	1.92	-.00	2.66	2.80	.09
Parent-reported literacy behavior	2.61	2.88	.09	1.12	2.17	.04	-.22	1.33	-.02	.92	1.52	.04
Parent-reported literacy enjoyment	-1.09	3.87	-.03	2.13	2.28	.07	-.69	1.46	-.04	.39	2.23	.02
Child-reported literacy behavior	-1.05	1.82	-.03	.48	2.12	.02	.66	.78	.04	.19	1.60	.01
Child-reported literacy enjoyment	1.54	3.07	.03	4.61	2.31	.10*	2.76	1.10	.12*	2.58	1.74	.08

p* < .05, *p* < .01, ****p* < .001.

Note: All models controlled for classroom nesting, HS site, child age, gender, and home language. Significant predictors are in bold type.

Table 5
Results of Multiple Regression Analysis of Spring Shared Reading Engagement Predicting Spring Literacy Skills.

	Letter-Word Identification			Picture Vocabulary			Sound Awareness			Print Awareness		
	<i>B</i>	S.E.	β	<i>B</i>	S.E.	β	<i>B</i>	S.E.	β	<i>B</i>	S.E.	β
Model 1												
Active reading engagement	1.34	2.77	.04	2.68	3.44	.06	-.73	1.83	-.04	.27	1.82	.01
Interactive reading engagement	9.54	2.82	.30**	1.25	3.70	.03	5.33	1.46	.30***	5.41	1.94	.26**
Model 2												
Active reading engagement	-1.96	3.44	-.05	2.85	3.83	.06	-.08	1.82	-.00	1.35	1.80	.06
Interactive reading engagement	7.88	3.86	.25*	.06	4.35	.00	6.56	2.17	.37**	5.40	2.23	.26*
Teacher-reported literacy behavior	-.24	4.07	-.01	-.56	2.42	-.01	-3.56	1.70	-.19*	-.24	1.85	-.01
Teacher-reported literacy enjoyment	5.90	2.83	.17*	.11	3.11	.00	.59	1.57	.03	-1.52	1.84	-.07
Parent-reported literacy behavior	5.27	2.89	.17~	7.02	5.51	.18	.16	1.24	.01	-1.03	2.02	-.05
Parent-reported literacy enjoyment	-1.08	2.98	-.03	-4.23	3.18	-.10	1.86	1.51	.10	1.61	2.15	.08
Child-reported literacy behavior	-1.37	2.00	-.04	3.43	2.90	.09	-.84	.73	-.05	-.57	1.22	-.03
Child-reported literacy enjoyment	5.92	3.12	.15~	6.63	4.19	.13	1.01	1.04	.05	1.66	2.05	.06

~*p* < .10, **p* < .05, ***p* < .01, ****p* < .001.

Note: All models controlled for classroom nesting, HS site, child age, gender, and home language as well as initial literacy skills in the fall. Significant predictors are in bold type.

ment significantly and positively predicted all the concurrent literacy outcome measures, of which predictability ranged from $\beta = .38$ to $.49$. Its significant predictability remained in Model 2 in the presence of other brief survey measures of literacy engagement. The predictability of interactive engagement ranged from $\beta = .32$ to $\beta = .46$. In Model 1 of Table 5, spring interactive reading engagement significantly and positively predicted three of the four concurrent literacy outcomes: letter-word identification ($\beta = .30$, $p < .01$), sound awareness ($\beta = .30$, $p < .001$), and print awareness ($\beta = .26$, $p < .01$). In Model 2, spring interactive engagement remained significant, predicting letter-word identification ($\beta = .25$, $p < .05$), sound awareness ($\beta = .37$, $p < .01$), and

print awareness ($\beta = .26$, $p < .05$). Spring interactive engagement did not significantly predict spring picture vocabulary. Overall, interactive shared reading engagement was a significant concurrent predictor of many early literacy skills.

In contrast, active shared reading engagement was not significantly related to concurrent literacy skills, except that it negatively predicted fall print awareness ($\beta = -.17$, $p < .01$; Model 1 of Table 4). This association remained in the presence of other brief survey measures of literacy engagement ($\beta = -.23$, $p < .01$; see Model 2 of Table 4). Again in spring, active reading engagement did not significantly predict any of the concurrent literacy outcomes, without and in the

Table 6
Comparing Shared Reading Engagement by Child Gender and Home Language.

Measures	Girl		Boy		DLL		English monolinguals	
	M	SD	M	SD	M	SD	M	SD
SRERS								
Fall Active Engagement	3.86	.70	3.38	.75	3.61	.72	3.61	.81
Fall Interactive Engagement	3.03	.83	2.74	.75	2.63	.75	3.06	.80
Spring Active Engagement	4.11	.68	3.78	.78	3.97	.75	3.93	.76
Spring Interactive Engagement	3.46	.84	3.26	.87	3.13	.88	3.53	.81
Brief Teacher-Reported Survey on Literacy Engagement								
Fall Literacy Behavior	3.00	.67	2.50	.63	2.64	.69	2.81	.70
Fall Literacy Enjoyment	3.44	.59	2.92	.56	3.15	.60	3.20	.66
Spring Literacy Behavior	3.49~	.78	3.00~	.76	3.19	.84	3.30	.80
Spring Literacy Enjoyment	3.85**	.74	3.48**	.77	3.70	.84	3.68	.74

~ $p < .10$, ** $p < .05$.

presence of other brief survey measures of literacy engagement (see Table 5).

Of note is that none of the brief survey measures were significantly related to literacy outcomes in the fall, except for child-reported literacy enjoyment. Fall child-reported literacy enjoyment concurrently and significantly predicted fall picture vocabulary ($\beta = .10, p < .05$) and sound awareness ($\beta = .12, p < .05$) (see Table 4). Spring child-reported literacy enjoyment was not significantly associated with concurrent literacy outcomes. However, spring teacher-reported literacy enjoyment was associated with spring letter-word identification ($\beta = .17, p < .05$) and spring teacher-reported literacy behavior was negatively associated with spring sound awareness ($\beta = -.19, p < .05$) (see Table 5).

3.3. Gender and home language (In)variability in SRERS

3.3.1. Gender difference in shared reading engagement

We examined the levels of active and interactive shared reading engagement by child gender (see Table 6 for descriptive statistics). SRERS active and interactive engagement scores were compared between boys and girls after controlling for classroom clustering and covariates of child age, home language, and HS site. Results showed that SRERS measures did not show gender differences. There were no significant differences between boys and girls for fall active engagement (difference estimate = .15, $p = .78$) and fall interactive engagement (estimate = -.38, $p = .53$). Likewise, there were no significant gender differences for spring active engagement (estimate = .07, $p = .91$) and spring interactive engagement (estimate = -.06, $p = .93$).

To check if the current findings of gender invariance were related to the characteristics of the current sample or the measurement instrument, we compared boys and girls on the other teacher-reported brief survey measure of literacy engagement. The results showed gender differences in some of the teacher-reported brief survey measures, especially literacy enjoyment. There were no gender differences in the fall measures of teacher-reported child literacy behavior (difference estimate = -.55, $p = .38$) and literacy enjoyment (estimate = -.09, $p = .84$) as well as the spring measure of teacher-reported literacy behavior (estimate = .64, $p = .12$). One gender difference was captured in the spring teacher-reported literacy enjoyment (estimate = .90, $p < .01$).

3.3.2. Gender by shared reading engagement interaction effects

We examined if the predictability of active and interactive shared reading engagement was dependent on gender for each literacy outcome. We created two interaction terms: gender by active engagement and gender by interactive engagement. We tested these two interaction effects in addition to the main effects of active and interactive engagement in predicting early literacy skills. Regression showed that none of the interaction effects were significant for any literacy outcome. The predictability of fall active and interactive engagement for fall literacy outcomes was not significantly different between boys and girls. Likewise, the predictability of spring active and interactive engagement for

spring literacy outcome was not significantly different between boys and girls. Due to the lack of significance, interaction effects were not tested for the model of considering other brief survey measures of literacy engagement.

3.3.3. Home language difference in shared reading engagement

Additionally, we examined systematic differences between DLLs and English monolinguals in the levels of active and interactive shared reading engagement (see Table 6 for descriptive statistics). SRERS active and interactive engagement scores were compared between DLLs and English monolinguals after controlling for classroom clustering and covariates of child age, gender, and HS site. Results showed that there were no significant differences between DLLs and English monolinguals for fall active engagement (difference estimate = -.11, $p = .90$) or fall interactive engagement (estimate = .12, $p = .89$). There were also no significant home language group differences for spring active engagement (estimate = .38, $p = .61$) and spring interactive engagement (estimate = .70, $p = .43$).

We further checked whether the home language group invariance could be found in the other teacher-reported brief survey measures of literacy engagement. Results showed that there were no home language group differences in the fall measures of teacher-reported child literacy behavior (difference estimate = .22, $p = .70$) and literacy enjoyment (estimate = .45, $p = .34$) as well as the spring measures of teacher-reported child literacy behavior (estimate = -.15, $p = .77$) and literacy enjoyment (estimate = .32, $p = .58$).

3.3.4. Home language by shared reading engagement interaction effects

Finally, we examined if the predictability of active and interactive shared reading engagement for each literacy outcome depended on home language. We created two interaction terms: home language by active engagement and home language by interactive engagement. We tested the interactions effects of these two terms in addition to the main effects of active and interactive engagement. For the fall literacy skills, none of the interaction effects were significant; the predictability of fall active and interactive engagement for fall literacy outcomes was not significantly different between DLLs and English monolinguals. Similarly, interaction effects were not significant for spring literacy outcome, except for the interaction of home language by active engagement predicting for spring print awareness skills ($\beta = .77, p < .05$).

4. Discussion

The current study examined the validity of SRERS, a teacher-rated measure of young children's engagement behaviors in large-group classroom shared reading. Whole-class shared book reading is a good context to measure reading engagement of young children. Our analysis identified two main constructs of shared reading engagement: active and interactive engagement. Children show active engagement in shared book

reading by physically joining, attending to, and enjoying shared book reading. Children show interactive engagement in shared book reading by asking and answering questions about the story and prints and sharing related experiences.

Our findings of the two-factor structure of active and interactive engagement with moderate to high correlations between them would mean that active and interactive engagement are related, both characterizing shared reading engagement. At the same time, the two components are discrete, not represented on the same continuum, with one component representing higher-level engagement and the other representing lower-level engagement (Appleton et al., 2008). The current findings imply that children may not necessarily show one type of engagement (e.g., interactive) over the other (e.g., active); rather, they may show varied engagement patterns across active and interactive shared reading engagement (e.g., high/low on active engagement and high/low on interactive engagement).

Children's active and interactive engagement scores from SRERS were shown to have moderate to high correlations with brief teacher surveys of child literacy behaviors and enjoyment. SRERS and brief teacher surveys shared similar information on child literacy engagement, possibly due to the use of the same informant. At the same time, SRERS seemed to report unique information about child reading engagement, different from the data collected by brief teacher surveys. Our findings indicate the good reliability and constructive validity of SRERS that uses specific behavioral indicators to measure multiple components of shared reading engagement. Our findings also suggest that child literacy engagement could be activity specific. Measuring behaviors specific to shared reading could provide distinct information from measuring general literacy-related engagement and interest. Children may display particular levels, forms, or functions of engagement across various literacy activities. Given the potential variability, global measures of engagement in general activities (e.g., overall time in classroom tasks during the day) or general literacy (e.g., overall engagement level for various literacy activities) may not accurately capture reading engagement.

The low to moderate correlations between SRERS and parent-reported survey measures might not be due to the measurement inaccuracy but contextual differences. For example, children may experience different kinds or frequencies of literacy activities at home than at school (Phillips & Lonigan, 2009). It is also possible that children experience different expectations about reading behaviors and language use during home shared reading as compared to classroom shared reading, such as using less interactive language or less participation (Caspé, 2009). Children may behave differently or show different levels of active and interactive engagement while reading at home than when at school.

The validity of SRERS was confirmed in the regression analysis. While teacher- or parent-reported survey measures were not significantly associated with children's literacy skills, SRERS was consistently related to early literacy skills. Specifically, interactive engagement, not active engagement, predicted multiple early literacy skills. Interactive engagement may support semantic processing of information and literacy learning during shared reading (Hargrave & Sénéchal, 2000; Sipe, 1998, 2002) by promoting children's dynamic participation and agency (Son et al., 2020) as well as deep cognitive processing (Kuhn, 2015).

It is interesting that interactive engagement was related to most of the literacy outcomes in the fall and spring, except spring picture vocabulary. We speculate that the nonsignificant predictability of interactive engagement for spring vocabulary may be due to the characteristics of the current standardized measure of vocabulary. Engaged children likely learn book-specific vocabulary words from the books shared, but their learning of specific words might not be likely shown in standardized assessment results. Second, teacher practice during read-aloud may explain the non-significant findings. The current HS program did not adopt any specific literacy approaches or curricula, but it encouraged teachers to use repeated read-aloud of a picture book over a week, with some days specifically focusing on concept of print and print skills

and other days focusing on meanings of the story. Explicitly addressing print during read-aloud might help children develop print-related skills. Finally, children's vocabulary is a skill that develops in many settings, in and out of shared reading activities, which is a contrast to other print-related literacy skills that may be more directly learned from literacy activities. Unless there is a separate instructional time explicitly teaching print skills, shared reading activities may have a crucial role for the development of print skills in early childhood classrooms (Justice & Ezell, 2002). In other words, engaged reading would lead changes in print-related skills relatively easily but improving general vocabulary competence may need much more rigorous, intensive, and curated learning and reading opportunities as well as children's engagement in those opportunities. This is in line with the findings from previous research showing the limited efficacy of shared reading on standardized vocabulary measures (Pollard-Durodola et al., 2011).

In contrast to interactive engagement, active engagement was not related to early literacy skills, except for fall print awareness. Children with low-level understanding of print concepts may be reluctant to actively attend to shared book reading. However, children with high scores in active engagement did not show high scores in literacy outcomes. The results suggest that active engagement, on its own, may not be enough to affect children's literacy skills. However, supporting active engagement by inviting reluctant readers to join and attend to shared reading may provide those readers opportunities to enjoy the activity and learn ideas about when and where to engage interactively. In other words, supporting active engagement would open a pathway for children to be interactively engaged in shared reading. In this way, active engagement may set a necessary condition for interactive engagement or provide a foundation for learning, and it would be important to encourage active engagement even if it is not directly associated with literacy skills.

Finally, the current results showed that boys demonstrated active and interactives shared reading engagement behaviors similar to girls. Further, DLLs showed similar levels of active and interactive shared reading engagement to English monolinguals. These findings markedly differ from previous studies' findings in which girls displayed overall higher levels of engagement in reading activities than boys as evaluated by teachers (Alexander et al., 2008; Baroody & Diamond, 2013) and English monolinguals had higher levels of classroom engagement than DLLs (Rojas et al., 2021). Our results also revealed that boys and girls as well as DLLs and English monolinguals equally showed the significant predictability of interactive reading engagement and the nonsignificant predictability of active reading engagement for early literacy outcomes. These results suggest that SRERS can work well for multiple groups of children, including boys and DLLs.

Current findings suggest that assessing specific reading engagement behaviors as in SRERS may allow better measurement of shared reading engagement that predict early literacy skills, compared to evaluating the global level of literacy engagement as in brief teacher survey measures. It is also possible that differentiating between active and interactive shared reading engagement captures children's engagement characteristics more accurately beyond gender-related or home-language-related differences. Finally, shared reading engagement, especially interactive shared reading engagement, could lead to literacy learning for young children, regardless of their gender or home language status.

4.1. Limitations

The current study attempted to compare a teacher rating measure of shared reading engagement behaviors with other brief survey measures of overall literacy engagement. While measures of multiple approaches were utilized, including teacher-reported, parent-reported, and child-reported surveys, no observation measures of children's reading engagement were collected due to our focus on comparing SRERS to brief survey measures. Future studies may compare SRERS with observation measures and add evidence to the measurement validity of SRERS.

The brief survey measures of literacy engagement consider engagement in various literacy activities, not just in shared book reading as SRERS does. Although shared book reading is one of the most prominent literacy activities, young children may show different levels of engagement for various types of literacy activities, such as reading versus writing (Zhang & Quinn, 2020). The different target activities in SRERS versus brief survey measures could have contributed to the current results of moderate correlations.

The current sample of HS children might influence the findings. Most participants were children from low-income families and from various socio-cultural backgrounds. Participants may have different cultural expectations and experiences related to shared reading (Phillips & Lonigan, 2009). For example, in some families, adults are more likely to control storytelling and less likely to encourage story-building and children's interactive participation (Casper, 2009). Since children tend to develop reading behaviors that align well with their parents' beliefs (Morgan, 2005), some children might have limited experience in interactive engagement behaviors. In that case, low levels of interactive engagement would likely occur, especially in the beginning of the school year, before children become familiar with classroom expectations. Low correlations between child-reported engagement survey and SRERS may imply potential differences in cultural expectations of reading behaviors, where children reporting high interest in literacy did not show much interactive engagement behaviors in classroom shared reading.

Finally, SRERS mainly focuses on children's engagement behaviors, but not on teachers' behaviors. The current study is based on the previous findings that child engagement is represented as more of stable behavioral characteristics of children rather than context-dependent behavioral features governed by the quality of a reader (i.e., teacher practices) or a reading context (i.e., classroom environments) (Kaderavek et al., 2014). Yet, teachers play an essential role in determining the quality of language and reading environments and instruction (Justice et al., 2008), which may affect the development of shared reading engagement (Finn & Zimmer, 2012). Teacher practices and classroom environments can be possible contributors to children's shared reading engagement. Children may be more engaged in shared reading where adults provide more scaffolding utterances to invite children's involvement (Son & Tineo, 2016). Teachers may provide practices to support individual children's shared reading engagement in addition to practices for the overall classroom group's engagement (Ramirez & Linbert, 2022).

However, few studies have examined teacher practices to control individual children's opportunities to actively or interactively engage in shared reading and tested the impact of teacher practices on children's engagement behaviors. Since our focus was not on the classroom-level predictors or teacher practices of shared reading engagement, the current study did not test classroom/teacher effects but tried to control the potential role of classroom/teacher in the analysis by utilizing multi-level modeling, with classroom as a level-2 cluster in the analysis. A focus on the dynamic transactions between teacher practices and individual children's shared reading engagement as well as within-class variance in teacher practices supporting individual children's shared reading engagement warrants further research, which would lead to a deeper understanding of the development of young children's shared reading engagement.

4.2. Implications and Future Directions

Current findings suggest that teachers' rating of specific shared reading engagement behaviors is a useful assessment. Targeting reading behaviors in a more or less standardized context of classroom shared book reading could help clarify the conceptual and methodological focus in assessing young children's shared reading engagement. The focus on specific behaviors could reduce reporting bias and improve reliability (Seifer, 2005). The assessment provides teachers with a tool to better understand children's reading interest and literacy learning.

The results on the two components of active and interactive shared reading engagement and their predictability suggest the importance of planning specific behavioral support to intervene early literacy development. Teachers may encourage reluctant readers to physically join in and attend to shared reading activities. Active behaviors can work as an important initial step to shared reading engagement; yet, they may not be enough to stimulate literacy learning. Literacy learning would be possible with interactive engagement (Hargrave & Sénéchal, 2000; Son & Tineo, 2016). Since interactive engagement behaviors are external behaviors, easily recognized and observed, they likely enable timely and effective intervention (Appleton et al., 2008). Teachers need to encourage interactive engagement behaviors by designing shared reading activities that invite, prompt, and scaffold children's verbal involvement. These practices for interactive engagement are likely to support literacy development of children, including girls and boys as well as DLLs and English monolinguals. Future studies need to examine interactive and active engagement to explore how one component of engagement could lead to another and how multiple components of engagement work together in affecting literacy outcomes.

Future research studies may further examine the nature of longitudinal associations between shared reading engagement and literacy skills by studying their growth in engagement and literacy skills. It is possible that the growth in children's shared reading engagement leads to literacy skills growth, and/or the growth in shared reading engagement is affected by literacy development.

It is also possible that child engagement and literacy skills have complex associations, where children's shared reading engagement may work together with varying qualities of teacher practices in affecting literacy learning. In other words, children's shared reading engagement levels may moderate the association between the quality of teachers' reading practices and children's literacy learning. By considering teachers' behaviors during shared reading, future studies may reveal the context of shared reading engagement as well as the impact of teacher practices on shared reading engagement.

Finally, future research may expand the current study by examining other child skills and background characteristics related to shared reading engagement. For example, studies can test the relationships between shared reading engagement and multiple learning-related competencies, including behavioral control, self-regulation, socio-emotional competence, attention, and executive functioning. Detailing these relationships will allow differentiating shared reading engagement from other learning-related characteristics and better understanding of predictors of shared reading engagement.

The current study attempted to demonstrate the constructs and the validity of preschool children's Shared Reading Engagement Rating Scale. An accurate measure of young children's reading engagement allows teachers, parents, and researchers to assess and support children's engagement, reading experiences, and literacy learning. Further, recognizing the importance of child engagement in shared reading helps conceptualize shared book reading as a co-constructing activity, where what children actively do and experience in learning is as important as what teachers do and provide to children. More studies on the nature and the role of child engagement in shared book reading will provide a full picture of shared reading processes and children's development of early literacy skills.

Data availability

The data that has been used is confidential.

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