

Validity of the children's orientation to book reading rating scale

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The present study investigates the validity of a 4-point rating scale used to measure the level of preschool children's orientation to literacy during shared book reading. Validity was explored by (a) comparing the children's level of literacy orientation as measured with the *Children's Orientation to Book Reading Rating Scale* (COB) with a teacher's rating of a child's level of attention and effortful control on the *Children's Behaviour Questionnaire* (CBQ), and (b) computing the predictive validity of a child's COB rating with overall levels of emergent literacy at the end of the preschool school year. This study involved 46 preschool children from low-income backgrounds; children's literacy orientation was rated during a group teacher-led book reading. Children's ratings of literacy orientation during shared book reading using the global 4-point COB scale were significantly correlated with teacher ratings of a child's attention and effortful control as measured on the CBQ. Hierarchical regression results indicated children's literacy orientation significantly predicted children's end-of-year alphabet knowledge and overall emergent reading skills above and beyond the variance contributed by children's language skills and family income. The validity of a global rating for indexing children's level of literacy orientation was supported. Educational implications and recommendations for the COB as a component of early literacy assessment are discussed.

There is relatively little research regarding young children's attitude towards literacy despite the fact that teachers indicate that 'helping children develop a love of reading' is a primary goal for beginning readers (Nolen, 2001). The challenge within this research domain is that literacy motivation is a complex multidimensional factor and it can be difficult to measure (Morgan & Fuchs, 2010; Wigfield, Eccles, Schiefele, Roeser & Davis-Kean,

2006). Children's attitude towards literacy is referred to as literacy motivation (Becker, McElvany & Kortenbruck, 2010), literacy engagement (Brozo, Shiel & Topping, 2007) or literacy orientation (High, Hopmann, LaGasse & Linn, 1998; Kaderavek & Pakulski, 2007). The authors use the term literacy orientation to describe a child's level of interest, persistence and attention during a literacy activity. The research on literacy orientation represents the recent emphasis on using an integrated approach to understand children's readiness by incorporating observation and assessments of different domains such as the child's social, cognitive and emotional aptitudes (Bierman, Torres, Domitrovich, Welsh & Gest, 2009; La Paro & Pianta, 2000; Lewit & Baker, 1995).

Often researchers explore the relationships between young children's aptitudes by having caregivers rate children's social and emotional behaviours and subsequently statistically exploring relationships between (a) different non-cognitive domains (i.e., motivation, attentional skills, social skills; e.g., Rothbart, Posner & Kieras, 2006; Trentacosta, Izard, Mostow & Fine, 2006), (b) adults' ratings of children's behaviours and independent observations of children's abilities (e.g., Eisenberg et al., 1993) and (c) non-cognitive skills and subsequent academic achievement (e.g., McClelland et al., 2007; Trentacosta & Izard, 2007). For example, Chang and Burns (2005) asked 73 mothers of preschoolers to rate their child's temperament using the *Children's Behaviour Questionnaire* (CBQ; Putnam & Rothbart, 2006); they were interested in the relationship between children's aptitudes in the domains of sustained attention, effortful control and motivation. Sustained attention allows children to intentionally focus on a particular target in the environment and to avoid distraction over time. In contrast, effortful control allows children to shift their attention away from threatening stimuli and to orient their attention towards soothing stimuli (Derryberry & Rothbart, 1997). While there is a strong overlap between the two constructs, they are not identical; effortful control is viewed as having a more regulatory function on a child's reactive emotions. Along with adult ratings via the CBQ, Chang and her colleagues documented attention and effortful control by measuring children's responses to computerised tasks and assessed motivation by documenting child responses to solvable and unsolvable puzzles. Analyses found parents' ratings on the CBQ significantly predicted children's performance on the observed tasks. Additionally, there were both individual and collective relationships between the attention, effortful control and preschool children's level of task motivation during the puzzle activity. In the current study, we provide a preliminary validation of a measure of child literacy orientation (i.e., literacy motivation) by comparing an observational rating of a preschooler's literacy orientation during shared storybook with adult ratings of children's overall level attention and effortful control on the CBQ.

Importance of measuring children's literacy orientation

It is important to measure children's literacy orientation because school-age children with high literacy motivation read more than their peers who have low literacy interest (Guthrie, Wigfield, Metsala & Cox, 1999; Wigfield & Guthrie, 1997), have improved reading comprehension (Guthrie et al., 2004; Taboada, Tonks, Wigfield & Guthrie, 2009) and receive higher grades in school (Sweet, Guthrie & Ng, 1998). In older school-age children, literacy motivation is described as a combination of interrelated variables that include intrinsic motivation, extrinsic motivation, self-efficacy and social motivation (Wigfield, 2000). Intrinsic motivation refers to a child's desire to do something 'for its own sake', while extrinsic motivation is prompted by a reward or perceived external benefit. Self-efficacy refers to the

child's perception of his or her competence at literacy activities. Social motivation reflects the child's desire to relate to others during literacy activities. While researchers tend to separate out the various components of motivation for older school-age children, in young preschool children motivation is perceived as a more generalised, global construct (Morgan & Fuchs, 2010).

This goal of this study is to assess the validity of a global rating scale assessing children's level of interest during preschool group book reading and to determine if literacy orientation predicts a child's early literacy skill level. We hypothesise that children's level of interest impacts 'what a child can learn' from literacy activities. Specifically, it is logical to presume that children with high literacy orientation demonstrate behaviours that contribute to improved literacy outcomes. For example, children with high literacy orientation may ask to be read to more frequently, actively engage in literacy opportunities, attend to environmental print and use literacy tools during imaginative play. In its emphasis on the child's contribution to the literacy learning process, this study is based within a social interaction theoretical perspective, a theory acknowledging the reciprocal interactive nature of early literacy learning (Wasik, 2004; Vygotsky, 1978). In other words, while specific adult behaviour within literacy activities can foster early literacy development, each child brings a unique orientation to literacy events that may directly impact his or her literacy outcomes.

The impact of literacy orientation

Research findings indicate that children with high literacy orientation participate more in shared book reading resulting in increased learning opportunities (Crain-Thoreson & Dale, 1992; Frijters, Barron & Brunello, 2000). In fact, some researchers have reported that factor analysis indicates that frequency of shared book reading and literacy interest variables load on the same factor (Briggs & Elkind, 1997; Mason, Stewart, Peterman & Dunning, 1992). However, more recent studies suggest that literacy interest and home literacy variables (i.e., frequency of book reading) are independent constructs (Frijters et al., 2000).

Correlational studies further demonstrate links between children's literacy interest and literacy outcomes. In a review of seven studies (Crain-Thoreson & Dale, 1992; Durkin, 1966; Manning & Manning, 1984; Morrow, 1983; Scarborough, Dobrich & Hager, 1991; Thomas, 1984; Wells, 1985), Scarborough and Dobrich (1994) reported a significant correlation between measures of interest in literacy and measures of literacy skills ($r = .37$). A recent study supports these findings. Specifically, in the Baltimore Early Literacy Project (Serpell, Baker & Sonnenschein, 2005), researchers followed 81 African-American and European-American families from low-income or middle-income backgrounds in a 5-year longitudinal project starting when the children were in preschool. The researchers documented child variables, the family culture of literacy beliefs and observed shared book reading. Researchers reported on the relationships between children's levels of reading motivation and children's reading performance in elementary grades. Although children's level of motivation in second grade was not significantly correlated with performance on the Woodcock-Johnson word recognition measures, total motivation score was associated with higher levels of storybook comprehension.

Another study used alternative analytic procedures to further explore the relationship between literacy interest and reading outcomes in young children. Frijters et al. (2000) documented the link between literacy interest and reading ability (i.e., letter-name and letter-sound knowledge) in a study of 95 kindergarteners using hierarchical regression analysis. The researchers measured children's interest in literacy and also documented

aspects of home literacy activities (i.e., frequency of joint book reading and print exposure). Children's feelings about engaging in literacy activities were significantly associated with children's letter-name and letter-sound knowledge, accounting for 6% of the unique variance ($p < .01$).

The studies in the preceding section documented the relationship between literacy orientation and literacy outcomes for children developing typically. Children with language impairment (LI) represent a critical subgroup in terms of literacy orientation since there are some data showing that children with LI more frequently demonstrate low literacy orientation as compared to children developing typically. For example, Skibbe, Justice, Moody and McGinty (2010) reported that children with LI were less compliant than children with typical language during mother-child dyadic book reading and demonstrated a trend to be less persistent during the interaction. In the Skibbe et al. study, children with LI participated at a high level during the book reading interaction only when mothers' behaviours were observed to be highly sensitive in nature. In an earlier work, Kaderavek and Sulzby (1998) reported that in a group of children with LI, 40% of the children demonstrated lower literacy orientation during mother-child book reading interactions ($N = 10$) as compared to children who were typically developing (TD). Studies with children with LI underscore the need to consider 'what children bring' to adult-child literacy activities, highlight the dynamic nature of adult-child literacy interactions and emphasise the importance of attending to children's literacy engagement. It should be noted, however, that the stimulus book used in the Kaderavek and Sulzby (1998) study was a higher-level children's narrative storybook. The authors hypothesised that the linguistic level of the book may have contributed to the lower orientation scores of the children with LI.

Another reason to observe a child's level of literacy orientation is that literacy orientation levels may influence the outcome of interventions targeting literacy development. As an example, 18 4-year-old Head Start preschoolers completed a 6-week explicit literacy intervention (Justice, Chow, Capellini, Flanigan & Colton, 2003). The sessions focused on name writing, alphabet knowledge and phonological awareness. The explicit literacy intervention resulted in a significant improvement in emergent literacy skill as compared to level of improvement as a result of a comparison intervention. Importantly, children's orientation to literacy contributed 11.2% of the variance predicting child literacy gain following the intervention protocol. The authors suggested that children with LI who concomitantly exhibit low literacy orientation might be particularly vulnerable to experiencing less-than-optimal gains during literacy intervention (Justice et al., 2003). Taken together, the research points to a potentially important link between literacy orientation and children's literacy outcomes.

Measuring children's level of literacy orientation

Several different methods have been used to evaluate children's level of literacy orientation. A predominant pattern is to ask caregivers to rate a child's level of literacy interest (Baker & Scher, 2002; Bracken & Fischel, 2008; DeBaryshe, 1995; Farver, Xu, Eppe & Lonigan, 2006; Lyytinen, Laakso & Poikkeus, 1998; Olofsson & Niedersoe, 1999; Roberts, Jurgens & Burchinal, 2005; Weigel, Martin & Bennett, 2006; Zhou & Salili, 2008). Typically, parents or teachers are asked to document the frequency of child initiated literacy activity as well the child's emotional response (i.e., enjoyment). A second technique, typically used for older school-age children, is to document literacy orientation via child report (Ecale, Magnan & Gibert, 2006; Frijters et al., 2000; LePage & Mills, 1990). A third

avenue of documenting literacy orientation is through the use of observational techniques (Crain-Thoreson & Dale, 1992; Moody, Justice & Cabell, 2010; Sonnenschein & Munsterman, 2002). Researchers typically complete observational ratings by videotaping and then analysing adult-child book reading interactions. Observational data are more time intensive than parent or child report measures as they require the researcher to establish a coding system, complete multiple passes through the data to code child engagement levels, and conduct inter-rater reliability checks.

In contrast to itemised coding of child literacy orientation behaviours, global ratings of child behaviour based on observational techniques sometimes are used to gauge child behaviour. Global rating scales for young children are clinically meaningful (De Kruif & McWilliam, 1999; Wagner et al., 2007) and have been reported to be sensitive to change following behavioural intervention programmes (Endicott, Spitzer, Fleiss & Cohen, 1976; Lehmann, 1984). Some argue that global ratings provide a more comprehensive view of child behaviour as compared to scores based on specific subtask analysis or scores based on the opinion of a single informant (Wagner et al., 2007). Research demonstrates that rating scales can have considerable levels of short- and long-term predictive validity throughout later school years and even into adulthood (Epstein, Schweinhart, DeBruin-Parecki & Robin, 2004). The current literacy orientation scale, the *Children's Orientation to Book Reading* (COB), is a 4-point global rating of child literacy orientation during adult-child book reading interactions. This scale was originally developed to compare the literacy orientation of young children – children with and without typical language development (Kaderavek & Sulzby, 2000). It also has been used in prior studies to evaluate the literacy orientation of children with hearing loss (Kaderavek & Pakulski, 2007) and to analyse the contribution of literacy orientation in gauging the effectiveness of a 6-week early literacy intervention programme in children with speech or LI (Justice et al., 2003). However, assessment of the validity of this tool has not been systematically assessed. To begin to explore this matter, the present study addressed two research questions:

1. To what extent is there a relationship between ratings of children's literacy orientation during a teacher-led group book reading based on the COB and adult report (teacher) of a child's levels of attention and effortful control?
2. To what extent does children's literacy orientation predict his/her level of literacy knowledge as indexed by alphabet knowledge, name-writing ability and emergent reading skills?

Method

Participants

The participants in this study were enrolled in a larger multi-state study of language and literacy intervention in preschool classrooms (see Justice, Kaderavek, Fan, Sofka & Hunt, 2009). In the larger study, classrooms were assigned to three conditions, two of which were experimental (teachers implemented an experimental reading programme) and one of which was a control condition (teachers read books across the year using their typical practices). Within each of the classrooms, all children were consented to participate by sending consent forms home to caregivers through 'backpack mail'; from those for whom consent was received, approximately four children were

randomly selected for ongoing assessments over the preschool year and subsequently through first grade. Most of the enrolled classrooms prioritised enrolment for children from low-income homes; thus, the children in the present study met eligibility requirements for participation based on household income.

For the purposes of this study, we included only children from control classrooms and for whom a complete data set of key variables was available. In total, 46 children within 17 classrooms participated. Children had a mean age of 4 years, 2 months ($SD = 4.5$ months), ranging in age from 3 years, 5 months to 4 years, 9 months. In terms of race and ethnicity, 15 children were Caucasian (33%); 21 African American (46%); 1 Latino (2%); and 9 multiracial, Asian, Native American or other (19%).

Measures

Children's family characteristics. Each child's family characteristics were collected via a caregiver questionnaire completed in the fall of the preschool year (e.g., family structure, parent employment status, parent educational level). In the current sample, 65% of children resided in households in which the annual income was less than \$25,000, whereas 20% lived in households with annual incomes between \$25,000 and \$50,000 (15% of children's households had annual incomes exceeding \$50,000). In the state of Ohio, the income threshold for determining poverty for a family of four is \$17,464 (Ohio Poverty Report, 2011).

With regard to mothers' educational level, the mothers' reported highest education levels indicated that 56% of children's mothers had a high-school diploma as their highest level of education. For the remainder of the children, 10% had an associate's or 2-year degree as their highest level of education. A total of 34% of mothers had attended some college or had a college degree.

Children's language skills. Children's language skills were assessed using three subtests of the standardised norm-referenced *Clinical Evaluation of Language ability Fundamentals – Preschool: 2* (CELF-P: 2; Wiig, Secord & Semel, 2004): Sentence Structure, Word Structure and Expressive Vocabulary. These subtests assessed children's expressive and receptive language ability in the area of vocabulary, syntax and morphology. Adequate reliability for these three subtests is reported in the examiner's manual (Wiig et al., 2004). For the purpose of the present study, the composite standard scores of Sentence Structure, Word Structure and Expressive Vocabulary were used in the analysis. Children's composite standard scores averaged 85.72 ($SD = 12.61$, see Table 1).

Children's rating of literacy orientation. Children's level of literacy orientation, as assessed during a teacher-led group book reading, was measured using the *COB Rating Scale* developed by Kaderavek and Hunt (2009). The COB is an observation tool designed to capture children's overall responses to literacy events by monitoring levels of engagement, nonverbal and verbal behaviours, persistence and their focus of attention during book reading. Scoring guidelines for the COB are presented in Table 2.

In the current study, teachers were asked to read a storybook as a large group activity involving all the children in the classroom. Thus, the study involved evaluation of a whole-class shared reading activity, implemented by teachers using their typical practices. The teachers self-selected the text; they were instructed to present an unfamiliar book (a book the children had not previously heard) representing a narrative format (i.e., contained characters, a story plot). Texts thus represented selections from teachers and varied substantially.

Table 1. Descriptive statistics for the measures.

Measure	<i>M</i>	<i>SD</i>	Range
Language skills (CELF)	85.72	12.61	57–116
Literacy orientation (COB)	3.46	0.89	1–4
Attention (CBQ)	5.29	0.77	3–7
Effortful control (CBQ)	5.18	0.61	3.75–6.33
Upper-case alphabet knowledge (PALS)	8.78	8.76	0–26
Name-writing ability (PALS)	4.09	2.06	0–7
Emergent reading skills (CELF–PLRS)	2.91	0.58	1.58–4

Notes: CELF, Clinical Evaluation of Language ability Fundamentals; COB, Children's Orientation to Book Reading Rating Scale; CBQ, Child Behaviour Questionnaire; PALS, Phonological Awareness Literacy Screening (preschool or prekindergarten); PLRS, Pre-Literacy Rating Scale.

While we cannot presume what guided teachers' text selections, we would expect that teachers selected books that they believed would engage the children in their classrooms. In this study, members of the research team videotaped the teacher-led book reading session in the classroom in the fall of the preschool academic year. The book-reading interactions were approximately 5–8 minutes in length.

To rate a child's literacy orientation using the COB, reliable and trained observers watch children's affective involvement over the entire reading session and then rate children's behaviour on a 4-point scale with scores of 1 and 2 indicating overall low orientation and scores of 3 and 4 indicating high orientation. The training methods and scoring protocol used for COB assessment are stringent. To become a reliable observer, each trainee must complete an online self-study training and achieve an 80% coding reliability with three 'gold standard' classroom videotaped examples. Per the COB protocol manual, up to three children can be coded after a single viewing of a group book reading session.

For the present study, videotapes of the classroom-based reading sessions were scored in a lab-based setting by trained coders; 20% of videos were randomly selected and were coded by two reliable coders to determine inter-rater reliability. Results showed that inter-rater reliability was high with interclass correlation coefficients of .86. Overall, COB scores ranged from 1 to 4 ($M = 3.46$, $SD = 0.89$, see Table 1), indicating that overall children demonstrated high literacy orientation. However, raw scores of COB were not normally distributed (skewness = -1.86 , kurtosis = 2.89). Because the acceptable range for skewness and kurtosis is from -1 to 1 , the raw scores of the COB were transformed into normal curve equivalent scores for analysis.

Teacher report on children's level of attention and effortful control. Teachers' ratings of children's attention and effortful control were obtained using the short form of the CBQ (see Putnam & Rothbart, 2006). To complete the CBQ, teachers rate each child's behaviours along a 7-point continuum (e.g., 1 = extremely untrue of your child; 3 = slightly untrue; 4 = neither true nor untrue; 5 = slightly true; 7 = extremely true). This scale also includes a *not applicable* (NA) rating. For the present study, any items with NA ratings were considered as missing data. Fifteen items in total were used in this study: the attention scale comprised three items (e.g., 'When drawing or colouring in a book, shows strong concentration') which together demonstrated adequate internal consistency ($\alpha = .69$),

Table 2. Rating guidelines for the COB scale.

Behaviours associated with child's level of literacy orientation	COB Rating		
	Rating of 1	Rating of 2	Rating of 3
Overall impression	The child is clearly not engaged during the book interaction	Overall impression is that the child is not very interested in book interaction	The child is generally engaged with occasional moments of lower engagement
Persistence	The child is engaged less than 30% of the book interaction	The child is engaged during 30–50% of the book interaction	The child is engaged during 50–70% of the book interaction
Posture	A lack of forward leaning posture (i.e., away from the book or reader); child may position himself/herself at the periphery of the group of children	Intermittent forward leaning posture; child may initially place himself/herself in good position to participate but moves towards the periphery of the group as the session continues	Intermittent forward leaning posture but demonstrates engaged posture for the majority of the book reading session
Facial expressions	Child's facial expression is likely to be nonrelated to the story	Intermittent/rare/brief affective facial responses tied to the story	Demonstrates positive facial affect tied to story sometimes/often during the book reading session
Eye gaze	Child may look blankly around the room, looking at other children or preoccupied visually with a toy or other object. Child does not look at the book	Intermittent attentive eye gaze. Child may be interested in discussion about the illustrations but look away or appear uninterested in discussions about text or print or book-related concepts	Eye gaze is focused on reader and text $\geq 70\%$ of the story. Child may be observed moving or adjusting posture to maintain eye gaze with book
Distractibility	Child is fidgeting, rocking or moving during the reading session; easily distracted by other events in the classroom	Intermittent distractibility during the book reading session; often fidgeting, rocking or moving throughout the story. Following distractions, child does not easily re-engage with the book reading	Occasional distractibility during the book reading session but child is engaged for the majority of the book reading. Following distractions, child may show low orientation but will re-engage with the book reading
			Child is interested in the book reading throughout the reading session with minimal/no display of low orientation
			The child is engaged $\geq 70\%$ of the book interaction
			A consistent forward leaning posture. Child is likely to place himself/herself in a good position to participate in the book reading and may move closer to the teacher so he/she can see the book more clearly
			Demonstrates frequent and positive facial affect tied to story
			Eye gaze is focused on reader and text $\geq 70\%$ of the story. Child may be observed moving or adjusting posture to maintain eye gaze with book
			If there are major distractions in the book reading the child is minimally distracted and easily transitions back to the story reading session

Table 2. Continued

Behaviours associated with child's level of literacy orientation	COB Rating		
	Rating of 1	Rating of 2	Rating of 3
Verbal communication	The child does not communicate verbally in response to storybook reading	The child minimally verbally responds. Note: <i>The lack of verbal responsiveness in and of itself is not to be seen as a deficit and should not (by itself) lower the child's engagement score</i>	The child may or may not respond verbally but is generally attentive to the verbal interactions of others
Response to adult support	Adults may provide support (e.g., the teaching assistant puts the child in his/her lap, the teacher moves the child closer and keeps a hand on his or her shoulder) but even with support, the child is minimally engaged throughout the book interaction	When the adult gives redirection (with moderate levels of support) the child is re-engaged. Engagement may be reduced when support is discontinued (e.g., when adult is not physically close)	The child may volunteer relevant information and thoughts during the book reading; he or she is attentive to the verbal interaction of others. Note: <i>A lack of verbal interaction in and of itself is not sufficient to lower a child's engagement rating</i> Minimal/no adult support is required

Notes: COB, Children's Orientation to Book Reading. Child is assigned one overall rating (1, 2, 3 or 4); specific behavioural descriptions (eye gaze, posture, etc.) are provided to guide rater in establishing the child's overall global literacy orientation rating. The rater should assign the rating that best captures the child's overall orientation during the entire book reading session.

whereas the effortful control scale comprised 12 items ('Child is good at following instructions') which also exhibited good internal consistency ($\alpha = .83$). Descriptive statistics for children's attention and effortful control scales are shown in Table 1.

Children's literacy skills. Both direct and indirect measures were used to assess children's literacy skills in the fall of the year. Members of the research team administered the Alphabet Knowledge and Name Writing subtests of the *Phonological Awareness and Literacy Screening-Pre-k* (PALS-Pre-k; Invernizzi, Sullivan, Meier & Swank, 2004) to each child in the study. The Alphabet Knowledge subtest is a measure of children's knowledge of the 26 upper-case letters of the alphabet. The child is required to name each individual letter within a randomly ordered array; Invernizzi et al. (2004) reported that the inter-rater reliability for this subtest is .99. The mean of children's alphabet knowledge was 8.78 ($SD = 8.76$, see Table 1). The Name Writing subtest is a measure of children's emergent writing skills; the child is required to draw a portrait of him/herself and then sign the portrait. The child's response is scored on a 7-point scale. Invernizzi et al. (2004) reported that the inter-rater reliability for the Name Writing subtest is .99. The mean of the children's Alphabet Knowledge subtest was 4.09 ($SD = 2.06$, see Table 1). Raw scores of these two subtests were used in the present study.

As a complement to these direct assessments, the research team collected an indirect measure of children's literacy skills. The research team asked teachers to rate each child's emergent literacy ability on the *Clinical Evaluation of Language Fundamentals Preschool – Second Edition, Pre-Literacy Rating Scale* (CELF Preschool–2, PLRS; Wiig et al., 2004); teachers responded to 12 items about a child's emergent reading skills (e.g., 'The child understands that a group of letters forms a word'). For each item, teachers rated how often the child demonstrates the skills on a 4-point scale (i.e., 1 – never; 2 – sometimes; 3 – often; 4 – always). In the present sample, the reliability of these 12 items was adequate ($\alpha = .87$). The PLRS scores were obtained by averaging the ratings across all 12 items. The mean of children's emergent reading skills was 2.91 ($SD = .58$, see Table 1) as rated by the classroom teacher.

Results

Before addressing the major research questions, we conducted some initial analyses of the data. In the current study, 46 children were nested within 17 teachers. Given the nested nature of the data, we computed the amount of variance explained by teacher-level variables using the intra-class correlation coefficient (ICC). We tested the unconditional model for each outcome (alphabet knowledge, name writing ability, emergent reading skills) using hierarchical linear modelling (HLM; Raudenbush & Bryk, 2002). The unconditional model predicting alphabet knowledge yielded an ICC of .13, indicating that most of the variability in alphabet knowledge was attributable to between-child effects. Similarly, the ICC (.08) obtained from the unconditional model predicting name-writing ability suggested that the majority of variance in name-writing ability lay between children. Finally, the unconditional model predicting emergent reading skills yielded an ICC (.13) indicating that most of the variability in emergent reading skills was at the child level. Given the small sample size and limited variance of each outcome explained by teacher-level variables, the present study focused on the child-level variables using a regression framework rather than HLM.

Table 3. Correlation between COB and teacher-report measure of attention and effortful control.

Variable	1	2	3
1. COB	—	.42**	.34*
2. Teacher-report attention		—	.69**
3. Teacher-report effortful control			—

Notes: COB = Children's Orientation to Book Reading Rating Scale; * $p < .05$; ** $p < .01$.

To address the first research question, which focused on assessing the relationship between ratings of children's COB literacy orientation during a teacher-led group book reading and teacher report of children's attention and effortful control, we calculated bivariate correlations between child's COB scores and the CBQ scales (see Table 3). As shown, children's ratings of literacy orientation during shared book reading were significantly correlated with teacher ratings of a child's attention ($r = .42, p < .01$) and effortful control ($r = .34, p < .05$). Of importance is recognising that the ratings of children's literacy orientation were conducted in a laboratory setting independent of the teacher's ratings. The moderate correlations between children's literacy orientation as observed and teachers' rating of the children's attention and effortful control support the relations between the constructs.

To answer the second research question, which concerned the predictive relations between children's literacy orientation and his/her literacy skills, a series of three hierarchically ordered regression models for each outcome (alphabet knowledge, name-writing ability and emergent reading skills, respectively) were created by sequentially adding (1) family income, (2) child's language skills (based on the CELF composite) and (3) child's ratings of literacy orientation during shared book reading. It is important to note that the hierarchical analytical approach employed in the current study provides a strict evaluation of children's literacy orientation effects on their early literacy skills, as each regression model built upon previous models, allowing for an iterative evaluation of the relations among predictors and children's early literacy skills. It is worth noting that we controlled for family characteristics using the measure of family income only. However, children's mother education was also an important indicator of child family characteristics that contributes to children's early literacy skills (e.g., Curenton, 2008). In the present sample, however, the maternal education variable had a limited range and was not significantly correlated with any of the children's literacy measures. Therefore, because we had a small sample size and a simpler and more parsimonious model with fewer estimated parameters might offer a better fit with the data, we did not include mother education in our regression models as a control variable and allowed household income to serve as a proxy for family characteristics. Table 4 reports hierarchical regression results.

For children's alphabet knowledge, the first regression model showed that family characteristics (income) had a trend of significantly predicting children's alphabet knowledge ($\beta = .30, t(39) = 1.92, p = .06$, see Table 4) and uniquely explained 9% of the variance in children's alphabet knowledge. The second model demonstrated that when children's language skills were added to the model, children's language skills had a trend of significantly predicting their alphabet knowledge ($\beta = .29, t(39) = 1.91, p = .06$, see Table 4) and uniquely explained about 8% of variance in children's alphabet knowledge ($R^2\Delta = .08, p < .05$). The results of the third model demonstrated that children's literacy orientation

Table 4. Summary of hierarchical regression model predicting children’s literacy knowledge.

Variable	Alphabet knowledge					
	Step 1		Step 2		Step 3	
	β	$t(1, 39)$	β	$t(1, 39)$	β	$t(1, 39)$
Family income	.30	1.92	.23	1.48	.24	1.67
Child language skills			.29	1.91	.27	1.89
Child literacy orientation					.38**	2.73

Variable	Name-writing ability					
	Step 1		Step 2		Step 3	
	β	$t(1, 36)$	β	$t(1, 36)$	β	$t(1, 36)$
Family income	.24	1.48	.14	.92	.14	.91
Child language skills			.42**	2.73	.41**	2.64
Child literacy orientation					.07	.46

Variable	Emergent reading skills					
	Step 1		Step 2		Step 3	
	β	$t(1, 32)$	β	$t(1, 32)$	β	$t(1, 32)$
Family income	-.05	-.29	-.06	-.34	-.05	-.29
Child language skills			.05	.26	.03	.19
Child literacy orientation					.35*	2.04

Notes: * $p < .05$; ** $p < .01$.

during teacher-led group book reading was a significant predictor of their alphabet knowledge ($\beta = .38, t(39) = 2.73, p = .01$, see Table 4) and uniquely explained 14% of the variance in children’s alphabet knowledge ($R^2\Delta = .14, p < .01$), above that accounted for by children’s family income and language skills.

For children’s name-writing ability, the first regression model demonstrated that family income was not significantly associated with children’s name-writing ability. The second regression model demonstrated that when children’s language skills was added to the model, children’s language skills were significantly associated with their name-writing ability ($\beta = .42, t(36) = 2.73, p = .01$, see Table 4) and uniquely explained about 17% of variance in children’s name-writing ability ($R^2\Delta = .17, p < .05$). The third model, regressing children’s literacy orientation on their name-writing ability, demonstrated that children’s literacy orientation during teacher-led group book reading was not a significant predictor of their name-writing ability ($\beta = .07, t(36) = .46, p = .65$, see Table 4), when controlling for children’s family income and language skills.

With respect to children’s emergent reading skills, the first and second models demonstrated that neither family income nor children’s language skills demonstrated a significant association with children’s emergent reading skills. By contrast, the third and final model examined the unique contribution of children’s literacy orientation in predicting children’s overall emergent reading skills, when family income and children’s language skills were both included in the model. Results showed that

children's literacy orientation during teacher-led group book reading significantly predicted children's emergent reading skills ($\beta = .35$, $t(32) = 2.04$, $p = .05$, see Table 4) and uniquely explained about 12% of variance in children's emergent reading skills ($R^2\Delta = .12$, $p = .05$).

Discussion

This study was conducted to provide a preliminary assessment of the validity of a global rating scale of children's literacy orientation, which was designed to assess children's engagement during and interest in shared book reading. In the present study, the rating scale was used to assess children's level of interest during large group book reading conducted in children's preschool classrooms. To inform the validity of the tool, independently conducted assessments of children's literacy orientation ratings were compared with teacher ratings of children's level of attention and effortful control. Additionally, we also examined whether children's literacy orientation would be predictive of their early literacy skills. Theoretically, we would surmise that higher levels of literacy orientation would be associated with higher levels of attention and effortful control: children who regularly attend to tasks and who can monitor their own behaviour would, we expect, show higher engagement during reading activities. Likewise, we would also surmise that higher levels of literacy orientation would be associated with higher levels of literacy skill. If these relations were demonstrated, we would provide initial evidence that the COB provides a valid representation of children's orientation to literacy.

Before addressing the major findings, we describe an overall picture of the COB scores of participating children in this study. The majority of children demonstrated a high level of literacy orientation measured by COB ($M = 3.46$, $SD = 0.89$) with a subsequent limited distribution of COB scores. To interpret these results, we compare our current data with children's literacy orientation ratings obtained in other studies. In the study of Justice et al. (2003), participating children exhibited LI or speech production impairment and resided in a poor community. This study found that the average COB score was 2.6 during adult-child shared storybook reading. In contrast, Kaderavek and Pakulski (2007) examined the literacy orientation of preschool children with hearing impairment (who had significant levels of communication impairment) during mother-child storybook interactions and found that the average COB scores were 3.6 when interacting with a manipulative book (a book with flaps or dials that the child could open) and 2.6 when interacting with a narrative book. Different from these two studies, our sample consisted of children who were TD but were considered as 'at risk' of academic difficulties due to low socioeconomic status (SES).

To further understand these data, we noted that overall language skill level of children in this study was below average (mean CELF language score = 85.72; within one standard deviation of the mean of 100), but the majority of children did not have LI given a score of ≤ 81 on the CELF is indicative of LI (Tomblin et al., 1997). Taken together, the high level of literacy orientation found in our sample suggests that preschool children who are TD (but at risk due to low SES) demonstrate a higher level of literacy orientation as compared with children with more significant disabilities. Future research is warranted to determine if these data reflect the literacy orientation of children with higher levels of language ability and higher SES.

The first major finding of this work was that a child's level of literacy orientation as measured on the COB was significantly correlated with teachers' ratings of children's attention

and effortful control. The CBQ was theoretically designed to assess a child's biologically driven temperament; specifically, the CBQ documents a child's reactive and regulatory mechanisms (Rothbart, Ahadi, Hershey & Fisher, 2001). The significant correlation between teacher CBQ ratings of a child's attention and effortful control aptitudes and a child's COB literacy orientation rating supports the concurrent validity of the COB. Particularly relevant to this significant correlation is the (a) simplicity and ease of administration of the COB rating scale (each child was rated after viewing his/her orientation during one group book reading session) and the fact that (b) the CBQ is a widely used tool in developmental research and the attention and effortful subscales have been associated previously with children's motivation levels (Chang & Burns, 2005). It is interesting to point out, from a theoretical perspective, the apparently close relationship between children's temperament and how they engage within literacy activities. Future research that explores the dimensionality of literacy orientation, and determines its uniqueness from and overlap with temperamentally based attributes, is a welcome next step in this area of research.

The second finding indicates that literacy orientation has a unique predictive relationship with some key areas of literacy development. In this study, children's COB rating uniquely explained 14% of children's alphabet knowledge and approximately 12% of the variance in children's emergent reading skills above and beyond the variance contributed by children's language skills and family income. Such findings may be helpful for understanding the role of shared book reading in children's literacy development. For instance, in a seminal work, Bus, Ijzendoorn and Pelligrini (1995) completed a meta-analysis considering the contribution of frequency of early parent-child book reading to children's language and literacy growth. Outcomes indicated home-based preschool book reading exposure explained approximately 8% of the variance in the child outcomes, which was interpreted by some as suggesting that shared reading interactions are not as influential to children's literacy development as has long been thought. However, it may be that to fully represent the impacts of shared reading sessions on children's literacy growth, one must consider children's engagement within such activities. It may be that children's literacy orientation is a critical moderator of the impacts of shared reading participation on their literacy development. This conjecture was supported by work by Justice et al. (2003), which showed that direct assessments of children's literacy orientation (measured on a prototype of the COB) contributed unique variability (11.2%) in predicting the benefits preschoolers experienced when participating in a 12-week emergent literacy intervention.

A third finding worth noting is that the children in this study generally showed overall high levels of literacy orientation, allowing us to conclude that most young preschool children maintain a high level of literacy orientation across book reading sessions, regardless of the specific tasks demands associated with a particular book. As noted in the Method section, teachers in this study were asked to select a book of their own choosing to read to their pupils; thus, children's literacy orientation was coded across a variety of different texts. It may be that teachers are quite skilled at selecting texts that children will orient highly too; in this vein, an important future direction for research would be assessing the stability of children's literacy orientation across different types of texts and children's orientation in response to easier versus more advanced storybooks. It may be that children's orientation to literacy would decrease in the context of certain types of texts, such as alphabet books or expository works. Future research should consider children's literacy orientation in response to different text genres and evaluate children's orientation across literacy contexts. The stability of literacy orientation among young children has not been explored in any depth in the early childhood literature.

The final finding of note concerns the observed position relations between children's level of literacy orientation and their literacy skills, namely with respect to alphabet knowledge and emerging reading skills. This finding is consistent with reports of other researchers who have studied relationships between children's level of attention and reading outcomes. For example, Dally (2006) asked teachers to rate children's level of attention in kindergarten and then evaluated children's reading skills in first and second grade. Level of attention had a significant direct influence on first-grade word reading and an indirect influence, through Grade 1 measures, on second-grade reading comprehension. The results of this study suggests that when children are active, engaged and attentive during shared book reading, they have an opportunity to maximally benefit from the language and literacy opportunities occurring during shared book reading. On the contrary, we might also interpret findings to suggest that children with low literacy orientation may be unlikely to benefit from the language and literacy exposure. The results of this study suggest that practitioners should consider a child's exposure to rich oral language, specific literacy-related skills (e.g., print and phonological awareness) and also monitor a child's level of literacy orientation.

We do need to point out, with interest, that children's literacy orientation during book reading was associated with alphabet knowledge and emergent reading skills, but not with name-writing ability. Because these dimensions of literacy skill are inter-correlated (e.g., Cabell, Justice, McGinty & Zucker, 2009), it is somewhat surprising to find that literacy orientation is predictive of skills in alphabet knowledge and emergent reading ability, but not so for emergent writing skills. Nonetheless, the results have intuitive appeal as alphabet knowledge and emergent reading concepts (e.g., directionality of print, concept of word) are skills that can be acquired within the context of shared reading sessions, whereas emergent writing skills are typically acquired within writing activities (see Aram & Biron, 2004). The extent to which children are actively engaged in book-reading activities may not have direct impact on their writing skills, whereas their active engagement in writing activities may. Research that examines if children's orientation to book reading is similar to their orientation in other literacy activities, such as writing, would be an interesting future foray in this area of work. It might be that children show preferences to some types of literacy activities, such as reading, over other types of activities, such as writing, and that orientation may be task-specific. To explore this topic, children could be observed during writing experiences, during literacy-rich dramatic play, and in one-on-one, small group, and large group book reading sessions to monitor variations in orientation level. We suspect that some children will vary in their response to different task demands and linguistic challenges (Kaderavek & Pakulski, 2007).

There are several limitations to this study. As discussed above, the sample size was relatively small and the children, on average, had relatively low language skills. A larger study including children with a range of language ability and SES is needed.

In framing the findings of this work, we must note that this study did not explore causative factors that impact children's literacy orientation levels. We hypothesise that some children have low literacy orientation because they are challenged by innate attentional or regulatory weaknesses, others may demonstrate lower literacy orientation due to their reduced language skill or background knowledge and yet some may have only limited experience with shared book reading and task unfamiliarity. Future research should be focused on identifying possible links between possible negative factors and evaluating the benefits of targeted book reading interventions for children with specific orientation profiles.

The use of an instrument such as the COB in such work is promising. The ease of administration of the COB makes it an easy-to-use and efficient means to assess children's literacy orientation. In the current study, teachers were allowed to self-select a narrative

book and orientation levels were rated during a group book. Because group book reading sessions should occur in all preschool classrooms and because three children can be assessed during a single book reading session, the protocol is clinically practical for educators and speech-language pathologists. The data from this study suggest that the COB is a valid instrument; future research can focus on how the COB can be used to identify and monitor children who are at risk for literacy learning.

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