5-2014

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Published in *Learning and Individual Differences* 34 (2014), pp. 57-62; doi: 10.1016/j.lindif.2014.05.008

Submitted October 29, 2013; revised April 25, 2014; accepted May 16, 2014; published online May 28, 2014.

Parent vs. teacher ratings of children's shyness as predictors of language and attention skills

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Abstract

Shyness in childhood has been linked to multiple adjustment outcomes, including poor peer relations, internalizing problems, and clinical anxiety. However, shyness does not consistently emerge as a negative predictor of children's success. This incongruity may stem, in part, from variations in the operationalization and measurement of shyness in different studies. Researchers often combine parent and teacher ratings of shyness, but correlations between parent and teacher reports are consistently small to medium. The purpose of this study is to examine parent and teacher ratings of shyness as they predict language and attention skills in preschool children, and explore discrepancies between parent and teacher ratings of shyness. Participants were 104 preschool children (48 males, 56 females), enrolled in 22 classrooms. Results from multi-level modeling revealed that teacher, but not parent, ratings of shyness using the shyness subscale of the Children's Behavior Questionnaire (CBQ) were significantly and negatively associated with children's early language and attention skills. Follow-up exploratory factor analyses with parent and teacher CBQ shyness subscale ratings revealed a similar two-factor structure reflecting shyness and low sociability. Results suggest that a) discrepancies between parents' and teachers' views of children's shy behaviors may stem from the different contexts and developmental time periods in which they observe children, and b) teachers' ratings of shyness are more closely associated with children's skills in an academic setting. Implications for research are discussed.

Keywords: Shyness, Parent and teacher ratings, Language skills, Attention, Children's Behavior Questionnaire, Early childhood

1. Introduction

Shyness in childhood has been linked to multiple adjustment outcomes, including poor peer relations, internalizing problems, and clinical anxiety (Rubin, Coplan, & Bowker, 2009). Shyness may be particularly impactful in early education settings (Arbeau et al., 2010; Coplan and Weeks, 2009; Evans, 2001) where children experience significant socio-emotional and academic development, both of which are critical for later school success. Indeed, more shy children tend to have less positive relationships with teachers (Rudasill, Rimm-Kaufman, Justice, & Pence, 2006) and peers (Gazelle et al., 2005), and demonstrate less complex language (Crozier & Badawood, 2009) and poorer expressive and receptive vocabulary compared with their non-shy counterparts (Crozier and Hostettler, 2003; Evans, 2010; Spere et al., 2004). There is also evidence that more shy children are less engaged in classroom activities, hindering both academic and socio-emotional growth (Hughes & Coplan, 2010).

Although shyness may be a risk factor for children's positive adjustment in early childhood, it does not consistently emerge as a predictor of children's negative outcomes. For example, evidence suggests that shy children are less likely to act out in the kindergarten classroom, particularly during large-group activities (Rimm-Kaufman & Kagan, 2005), more likely to receive teacher attention during free play in preschool (Coplan & Prakash, 2003), and less likely to have conflictual relationships with teachers in preschool and early elementary grades (Rudasill and Rimm-Kaufman, 2009; Valiente et al., 2012) compared to bolder peers. Thus, research on early childhood points to shyness as a protective and a risk factor. Although this seeming incongruity may be an artifact of the child outcome under investigation (such as compliance vs. expressive vocabulary), it may also stem, in part, from variations in the operationalization and measurement of shyness in different studies (Coplan & Rubin, 2010). A comprehensive review of links between shyness and academic performance revealed that most studies used parent or teacher assessments, or observations of children, to assess shyness (Evans, 2010). None, however, was an investigation of which mode of assessment was most closely connected to children's academic performance. Therefore, the purpose of this

study is to examine parent and teacher ratings of children's shyness and determine the extent to which their ratings differentially predict children's vocabulary and attention skills in preschool.

Shyness is defined as fear of unfamiliar social stimuli, and conceptualized as a motivating force in an individual's choice to withdraw from social interaction (Coplan & Rubin, 2010); shyness is theorized as rooted in behavioral inhibition, or the early-emerging tendency to withdraw from novel stimuli (Kagan, Reznick, Snidman, & Steven, 1988). Yet, like many constructs in social science, there are abundant similar, overlapping constructs and terms, and different approaches to measurement. In early childhood, parent report is often used to measure child shyness and other behavior. This tendency is based on the notion that parents see children a variety of contexts, including unfamiliar ones, so they are best able to observe their children's patterns of behavior across multiple situations (Crozier & Badawood, 2009).

However, parents also may have a bias when reporting their children's behavior. For example, parents may be motivated to depict their children's behavior positively (Gartstein, Bridgett, & Low, 2012). In contrast, teachers might not have such bias. Teachers have the advantage of observing the behavior of multiple children in a classroom and, therefore, may be able to judge a child's behavior in comparison to other children of the same age (Crozier & Badawood, 2009). Concerning shyness specifically, teachers have the opportunity to observe children's behavior at school where they are engaged in social interactions for much of the day; thus, teachers may have opportunities to see more shy behavior than parents. However, evidence suggests teachers may have a negative perception of shy children, viewing them as less competent and more dependent than less shy children (Coplan et al., 2011; Evans, 2001; Ladd and Burgess, 1999). Interestingly, Coplan et al. (2011) also found that *teacher* shyness moderated teacher appraisal of shy children's academic competence, such that teachers who were low in shyness were more likely to view more shy children as less academically competent than their non-shy peers, whereas teachers who were high in shyness did not view shy children as academically different from other children. Teachers also see children in far fewer contexts than parents, and, thus, have less information about a child's typical behavioral responses to different social situations (other than the classroom). Indeed, evidence suggests that parents and teachers may see and rate shy behavior differently. Wang and Kemple (1993) found that parents' ratings of shyness are often based on their children's behavior around strangers, whereas teachers' ratings of shyness are typically based on children's relationships with classroom peers. Eisenberg, Shepard, Fabes, Murphy, and Guthrie (1998) found that parental ratings of shyness reflect a more temperamentally based wariness, while teacher ratings of shyness are more reflective of social inhibition brought on by social evaluation.

It is also important to note that cross-cultural differences in teachers' and parents' perceptions of children's shy behavior have been reported. For example, in Western cultures, inhibited behaviors tend to be regarded as socially immature, incompetent, and maladaptive, while in Eastern cultures, shy and inhibited children are believed to be well behaved and understanding (Rubin et al., 2009).

To capture a more complete picture of children's behavior, researchers often combine parent and teacher ratings. However, this approach may not be ideal, as the correlations between parent and teacher reports of children's shyness and other behavior are consistently low to moderate (Eisenberg et al., 1998; Measelle et al., 1998). For example, in a study of temperament, classroom engagement, and student–teacher relationships in kindergartners, Valiente et al. (2012) found that parent and teacher ratings of shyness had a modest correlation (r = .33). Crooks and Peters (2005) found a similar correlation (r = .29) between parent and teacher ratings of emotional functioning, which was composed of items assessing shyness and anxiety in 3- to 5-year-old children.

With growing evidence of the importance of shyness in early childhood as it relates to academic outcomes (see Evans, 2010, for a review), the purpose of this study is to examine parent and teacher ratings of shyness as they are associated with language and attention skills in preschool children, and explore discrepancies between parent and teacher ratings of shyness. We expect that parent and teacher ratings of shyness will be negatively associated with children's language and attention skills and only moderately correlated with each other. It is likely that teacher ratings of children's shyness will be more strongly associated with children's performance on language and attention measures than parents' ratings; language and attention are academic skills, and teachers' perceptions of children's shyness are likely influenced by their knowledge of the demands of the school setting.

2. Method

2.1. Participants

Participants were 104 children, including 48 males (46%) and 56 (54%) females, from a mid-sized Mid-western city. Children attended nine preschools in which administrators and all preschool teachers had agreed to participate in the study. All preschool children were invited to participate in the study, and parental consent was given for approximately 50% of children. Due to resource constraints, a maximum of seven children from each class was included in the study. In classes where more than seven children had parental consent, seven children were randomly selected to participate. In classes where seven or fewer had parental consent, all children participated. This resulted in a sample of 105 children. One parent withdrew a male child from the study, resulting in a sample of 104 children with demographic, temperament, and fall language and attention skills data. No other data are available on children or families who did not participate. Participant race was based on parent reports; the sample consisted of white (n = 80; 76.9%), Latino (n = 5; 4.8%), Asian (n = 3; 2.9%), African American (n = 2; 1.9%), and mixed race (n = 13; 12.5%) children. Race was not reported for one child. The mean age for the sample at the start of the study was 4.22 (SD = 0.58) years. Children were dispersed across 22 preschool classrooms; 21 teachers were white, and 1 was African American; 21 were female, and 1 was male. Average annual family income was \$65,000–\$75,000 (range: <\$5,000 to >\$95,000). Annual family income in this sample was highly skewed, with 63% of the sample reporting family income above \$75,000, and very few (12%) reporting income below \$25,000.

2.2. Children's Behavior Questionnaire

Both teachers and parents rated children on the Shyness subscale of the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, Hershey, & Fisher, 2001). The CBQ has a 7-point Likert scale ranging from "extremely untrue of your child" to "extremely true of your child." The Shyness subscale includes 13 items such as "Is sometimes shy even around people s/he has known a long time" and "Joins other quickly, even when they are strangers (reversed)." Internal consistency for the subscale with the current sample was high for teacher (.94) and parent (.92) ratings.

2.3. Language and attention skills

Children's receptive vocabulary was measured using the Peabody Picture Vocabulary Test Fourth Edition (PPVT-IV; Dunn & Dunn, 2007). For each item, the examiner instructed the child to point to the picture depicting a word (e.g., "Show me 'necklace'"). Test–retest reliability estimates range from .70 to .90, and scores on the PPVT-IV are correlated (r = .81) with 2- to 4-year-old children's performance on the EVT-II (Dunn & Dunn, 2007).

Children's expressive vocabulary was measured with the Expressive Vocabulary Test (EVT; Williams, 1997), a standardized test of vocabulary knowledge and word retrieval. For the first 38 items,

the child was asked to label pictures. For the remaining 152 items, the child was required to verbalize synonyms of the pictures. Test–retest reliability estimates range from .77 to .90, and correlations with performance on the PPVT-III range from .66 to .82 in 3½- to 5-year-olds (Williams, 1997).

Children's attention was measured with the visual attention subtest of the NEPSY (Korkman, Kirk, & Kemp, 1998), a neuropsychological test for children requiring visual scanning and attention, and psychomotor speed (Spreen & Strauss, 1998). The child was asked to search for pictures of a target cat or rabbit among a random array of different pictures. There is adequate support for concurrent validity of the NEPSY based on other measures of children's performance on tests of intelligence (Korkman et al., 1998). Test–retest reliability estimates for the visual attention subtest range from .76 for 3-year-olds to .68 for 5-year-olds (Korkman et al., 1998).

2.4. Procedure

In October of the children's preschool year, parents and teachers completed the CBQ Shyness subscale and parents completed demographic information on each study child. In November, trained researchers administered the PPVT, EVT, and NEPSY visual attention assessments to study children individually during the preschool day. Training involved a) reviewing assessment manuals, b) administering and scoring assessments on practice children under supervision of senior researchers, and c) ongoing field supervision of assessment administration. To facilitate children's cooperation during assessment of language and attention skills, particularly by more reticent children, the PPVT or visual attention tests were administered first because these require no verbalization from the child. After one or the other of these tests was administered, the EVT and remaining test (PPVT or visual attention) were administered.

2.5. Analytical approach

Means, standard deviations, and correlations were calculated for all study variables. Parent and teacher Total Shyness scores were not significantly correlated (r = .18). Teacher-rated Total Shyness was significantly, negatively associated with students' PPVT scores (r = – .25); however, there were no other significant correlations between teacher- or parent-rated Total Shyness and students' PPVT, EVT, or NEPSY scores (see Table 1). We also investigated whether gender differences emerged in PPVT, EVT, and NEPSY scores, as well as in parents' and teachers' ratings of children's shyness. There were no statistically significant differences by gender, so gender was not included in any further analyses.

Next, students' language (PPVT and EVT) and attention (NEPSY) scores were regressed on their parents' and teachers' ratings on the CBQ's Shyness subscale (i.e., Total Shyness). Because children were nested in classrooms, intraclass correlation coefficients (ICCs) were estimated (using SPSS 20.0 Mixed Model analysis) to determine the extent to which variance in children's scores could be attributed to being in the same classroom (and rated on the CBQ by the same teacher). ICCs indicated that 23%, 14%, and 17% of the variance in students' PPVT, EVT, and NEPSY scores, respectively, was explained by classroom membership. Therefore, two-level models were estimated with children at level 1 and classrooms at level 2 to control for variance owing to the non-independence of teacher-report data (teachers reporting on multiple children in the same classroom). Next, we ran intercept as outcomes models (final fitted models) where children's Total Shyness ratings from parent and teacher report were entered as predictors of their PPVT, EVT, and NEPSY scores. All predictor variables were grand mean centered. Multi-level models were conducted with restricted maximum likelihood estimation to accommodate missing data.

3. Results

3.1. Hierarchical regression models regressing PPVT, EVT, and NEPSY scores on parent and teacher ratings of total shyness

Controlling for teacher ratings of Total Shyness, parent ratings of Total Shyness were non-significantly associated with children's PPVT, EVT, and NEPSY scores (see Table 2). However, controlling for parent ratings of Total Shyness, teacher ratings were significantly associated with children's PPVT, EVT, and NEPSY scores (see Table 2) such that higher ratings of Total Shyness were associated with lower scores on all three assessments of language and attention skills.

3.2. Post-hoc analyses

3.2.1. Exploratory factor analyses with CBQ Shyness subscale items

Given the discrepancy between parent- and teacher-rated Total Shyness as predictors of children's language and attention skills, we considered the possibility that teachers' and parents' conceptualizations of shyness, as measured by the CBQ Shyness subscale, are not the same. For example, it is possible that parents' perceptions of children's shyness are holistic, reflecting the corpus of responses children have to social stimuli; teachers' perceptions may be more atomistic, for example, separating children's responses to other children from their responses to adults. To explore this possibility, we conducted post-hoc exploratory factor analyses (EFA) of parent- and teacher-rated items on the CBQ Shyness subscale using principal axis factoring extraction (Varimax rotation). In both EFAs, two factors emerged using the Kaiser criterion of retaining factors with eigenvalues > 1 and examination of the Scree plot. The factor structures were nearly identical for the teacher-rated and parent-rated Shyness subscales, but the loadings were in reverse patterns (see Table 3). That is, Factor 1 for the teacher-rated items was aligned with Factor 2 for the parent-rated items, and vice versa. One item, "Talks easily to new people (reversed)," loaded almost equally on both factors in ratings by parents, but in ratings by teachers, the item clearly loaded on Factor 1 (see Table 3). The two factors accounted for 64.45% of the variance for parent-rated items, and 66.87% of the variance for teacher-rated items. The factors were renamed Shyness (to avoid confusion, we refer to scores from the full

Table 1. Correlations among all study variables.

	1	2	3	4	5	6	7	8
1. CBQ Total Shyness (T)								
2. CBQ Total Shyness (P)	0.18							
3. Shyness (T)	0.91**	0.17						
4. Shyness (P)	0.11	0.92**	0.13					
5. Low Sociability (T)	0.92**	0.15	0.68**	0.05				
6. Low Sociability (P)	0.23*	0.92**	0.19	0.70**	0.23*			
7. PPVT Standard Score	– 0.25*	0.06	– 0.26*	0.04	– 0.18	0.08		
8. EVT Standard Score	– 0.18	0.06	– 0.14	0.01	– 0.16	0.11	0.67**	
9. NEPSY Standard Score	– 0.15	0.03	– 0.06	0.03	– 0.20	0.03	0.26*	0.31**

T = teacher-rated; P = parent rated; *p < .05 ; **p < .01

Table 2. Results from multilevel models regressing PPVT, EVT, and NEPSY visual attention on parent and teacher ratings of children on the CBQ Shyness Scale.

	PPVT				EVT				NEPSY visual attention			
	Coefficient	Std. error	*t*	*df*	Coefficient	Std. error	*t*	*df*	Coefficient	Std. error	*t*	*df*
Model 1												
Intercept	103.74	1.81	57.31***	19.53	103.09	1.59	64.95***	19.36	15.34	1.19	12.88	15.66
TS Parent	1.37	1.34	1.02	77.56	1.59	1.30	1.22	81.59	.85	.86	.99	73.91
TS Teacher	− 3.92	1.44	− 2.73**	86.79	− 2.98	1.34	− 2.22*	88.98	− 1.91	.88	− 2.16*	85.19
Model 2												
Intercept	103.56	1.76	58.95***	18.22	102.88	1.59	64.77***	20.18	15.39	1.21	12.76***	15.22
S Parent	− .70	1.94	− .36	81.24	− 2.16	1.81	− 1.20	84.70	− .23	1.20	− .20	79.33
S Teacher	− 2.96	1.90	− 1.56	83.83	− .93	1.75	− .53	85.75	.78	1.18	.66	81.37
LS Parent	2.10	1.96	1.07	82.04	3.81	1.84	2.08*	85.02	1.08	1.22	.89	79.48
LS Teacher	− 1.01	2.05	− .49	83.36	− 2.39	1.79	− 1.33	84.38	− 2.85	1.19	− 2.40*	73.91

Model 1 = total shyness scores as predictors. Model 2 = shyness and low sociability scores as predictors.
TS = total shyness, S = shyness subscale score, LS = low sociability subscale score.
* $p < .05$; ** $p < .01$; *** $p < .001$

CBQ Shyness subscale as "Total Shyness") and Low Sociability (see Table 3). We also conducted confirmatory factor analyses with parent (N = 1062) and secondary caregiver (N = 812) ratings of children (at age 54 months) using the CBQ Shyness subscale from the NICHD Study of Early Child Care and Youth Development to test the tenability of the models. Results supported the factor structure resulting from EFAs with the current sample with good model-to-data fit (parent ratings: $\chi^2_{26} = 234.87$, $p < .001$, TLI = .88, CFI = .93, RMSEA = .09; secondary caregiver ratings: $\chi^2_{34} = 256.88$, $p < .001$; TLI = .88, CFI = .93, RMSEA = .09).

Scores for parent- and teacher-rated Shyness had high internal consistency (Cronbach's α = .88 and .93, respectively). Scores for parent- and teacher-rated Low Sociability also had high internal consistency (Cronbach's α = .90 and .88, respectively). However, teacher-rated Shyness scores had significantly higher internal consistency than parent-rated Shyness scores (Fisher–Bonnett $z = 2.104$, $p < .05$). Correlations between the Shyness, Low Sociability, and language and attention skills variables are shown in Table 1. The correlations between parent- and teacher-ratings on the Shyness and Low Sociability factors were very low and non-significant. However, correlations between teacher-rated Shyness and Low Sociability, and between parent-rated Shyness and Low Sociability, were positive and significant.

3.2.2. Hierarchical models regressing PPVT, EVT, and NEPSY scores on parent and teacher ratings of shyness and low sociability

Finally, we conducted another set of intercept as outcomes models (final fitted models), to test the extent to which Shyness and Low Sociability ratings from parent and teacher report predicted children's language and attention skills. Again, all predictor variables were grand mean centered. With both parent- and teacher-rated Shyness and Low Sociability in the models, parent-rated Low Sociability was positively associated with EVT scores, and teacher-rated Low Sociability was negatively associated with NEPSY scores. No other significant associations emerged. Results are reported in Table 2 (lower half).

4. Discussion

In this study, we examined teacher and parent ratings of children's shyness, using the shyness subscale of the CBQ, as predictors of children's language and attention skills. Three main findings emerged: a) teacher and parent ratings of children's shyness were not in agreement, b) teacher ratings of total shyness were more closely related to children's language and attention skills than parent ratings of total shyness, and c) in analyses with shyness and low sociability, parent and teacher ratings of low sociability, but not shyness, were associated with children's skills. Each finding will be discussed below.

The lack of agreement in teacher and parent ratings on the CBQ Shyness subscale is congruent with other work using teacher and parent ratings of children's behavior. For example, in a study by Spooner, Evans, and Santos (2005) of children who rated themselves as shy (> 1 SD above the sample mean), the correlation between teacher and parent ratings of the children's shyness (r = .17) was very close to what we found in the present study (r = .18). The low correlation between teacher and parent ratings of children's

Table 3. Means, standard deviations, and factor loadings for parent- and teacher-rated total shyness, shyness, and low sociability.

	Parent, mean (SD)	Teacher, mean (SD)	Parent Factor 1	Parent Factor 2	Teacher Factor 1	Teacher Factor 2
Total shyness	3.59 (1.23)	3.49 (1.15)				
Shyness factor items	4.12 (1.47)	3.90 (1.39)				
Gets embarrassed when strangers pay a lot of attention to her/him.			.214	**.636**	**.766**	.089
Is sometimes shy even around people s/he has known a long time.			.065	**.733**	**.545**	.491
Sometimes seems nervous when talking to adults s/he has just met.			.347	**.679**	**.826**	.285
Acts shy around new people.			.339	**.839**	**.883**	.300
Talks easily to new people. (rev)			.626	**.648**	**.786**	.378
Sometimes turns away shyly from new acquaintances.			.249	**.780**	**.837**	.285
Low sociability factor items	3.14 (1.22)	3.16 (1.12)				
Sometimes prefers to watch rather than join other children playing.			**.735**	.092	−.077	**.723**
Is comfortable in situations where s/he will be meeting others. (rev)			**.568**	.376	.367	**.433**
Seems to be at ease with almost any person. (rev)			**.730**	.391	.513	**.618**
Acts very friendly and outgoing with new children. (rev)			**.872**	.207	.401	**.779**
Joins other quickly, even when they are strangers. (rev)			**.756**	.384	.467	**.705**
Is comfortable asking other children to play. (rev)			**.751**	.141	.357	**.755**
Seems completely at ease with almost any group. (rev)			**.719**	.429	.345	**.779**

Factor loadings from EFA with principle axis factoring (Varimax rotation) of the Shyness subscale of the CBQ (N = 94). Loadings assigned to each factor are shown in **bold** font.

shyness may stem from the fact that teachers and parents witness a child's behavior and interactions with others in very different situations. While parents may see their child's behavior in interactions with peers only occasionally, teachers consistently see such interactions in both structured and unstructured activities with age-mates in the preschool classroom (Odom, Peterson, McConnell, & Ostrosky, 1990). On the other hand, parents are more likely to see children in settings with other adults (e.g., family friends, relatives) and a wider variety of contexts. These differential experiences may provide parents and teachers inconsonant frames of reference from which to draw when rating a child's behavior.

Our findings also indicate that teachers' ratings of children's shyness are more closely associated with children's language and attention skills than parents' ratings. This may be due to teachers' unique perspective on the behavioral manifestation of shyness in an academic environment. That is, teachers interact with and observe children in an academic environment, and may therefore view children's behavioral characteristics (such as shyness) from an academic-focused perspective. Indeed, results from previous research show shy behavior as partly dependent on environmental context (Buss, 1985). In addition, teachers' interactions with and observations of children are restricted to a specific point of development (3–5 years). This is congruent with the contention that children's shy behavior changes with developmental age. Specifically, Buss (1985) and Lewis (2001) identified two types of shyness. The first, emerging in infancy and toddlerhood, is fear of unfamiliar people. The second is shyness related to self-consciousness or embarrassment, and emerges in early childhood (3–5 years), the developmental period of the current study. There is also evidence that children's shyness and sociability begin to differentiate in kindergarten (Boer & Westenberg, 1994), adding further support to the notion that teachers' ratings of children's behavior are influenced by their restricted knowledge of children during a developmental shift in shyness. Taken together, this work lends support to our conjecture that teachers' ratings of preschool children's shy behaviors may be more strongly related to language and attention skills than parents' ratings because of the developmental period and academic context in which teachers interact with and observe children.

In the models regressing children's language and attention skills on the shyness and low sociability factors, only low sociability was associated with children's skills. Parent-rated low sociability was positively associated with children's expressive vocabulary, and teacher-rated low sociability was negatively related to children's visual attention. These results are somewhat consistent with those found in the models regressing total shyness on children's skills in that the directions of effects were the same. However, while parents' ratings of children's total shyness were not significantly linked to children's language or attention skills, their ratings of children's low sociability were significantly and positively related to children's expressive vocabulary. That is, children with lower sociability (based on *parent* report) were more likely to perform better on the EVT than children with higher sociability.

Interpreting these findings in the context of the items comprising low sociability may be helpful. The low sociability items primarily reflect a child's lack of enjoyment or comfort from interacting with others. So parents' ratings of children's low sociability may reflect the perception that children would prefer to spend time with their parents rather than with other children; more interactions with parents than peers could result in greater expressive vocabulary via more opportunities to engage in complex verbal interactions. Teachers' ratings of children's low sociability, on the other hand, may indicate that teachers perceive the children as spending time alone in the classroom. This withdrawal from peers may result in less engagement in classroom instruction and peer interaction and, by extension, less developed attention skills (Hughes & Coplan, 2010). However, our conclusions regarding parents' and teachers' ratings of children's low sociability are conjectures that warrant further investigation.

4.1. Limitations and future directions

The present study provides evidence of the differential nature of parent and teacher ratings of children's shyness as it relates to early language and attention skills. These findings lay the groundwork for future investigations into how parents and teachers interpret shy behaviors at home and in school, and how those interpretations may be associated with children's early language and attention skills. Despite this promising avenue for future research, some limitations of the present study must be acknowledged.

First, the CBQ was developed to capture a wide range of temperament traits (Rothbart et al., 2001), not just shyness. As such, it may be less sensitive to the different behavioral and affective nuances of shyness and other behaviors indicative of social withdrawal (e.g., behavioral inhibition, self-conscious shyness, sociability, anxious solitude; Coplan & Rubin, 2010). Others have noted that the shyness items from the CBQ measure shy *behavior*, rather than internal states of shyness, such as anxiety and fear (Spooner et al., 2005). Using multiple measures focused on the differing aspects of shyness may yield more complete pictures of children's shyness than using the CBQ shyness subscale alone. Alternatively, following up using a qualitative approach with interviews of teachers and parents to explore their reasoning behind ratings of children's behavior could illuminate findings based on objective scores alone.

Second, teachers were more likely than parents to indicate that various child behaviors were not observed, resulting in more missing information from teachers than parents. For example, teachers have few if any opportunities to observe children's behavior with unfamiliar adults, so they may not have scored children on items such as "gets embarrassed when strangers pay a lot of attention to her/him" and "sometimes seems nervous when talking to adults s/he has just met." Although this limitation was mitigated with the use of restricted maximum likelihood estimation in the multi-level analyses, the fact that teachers had more unanswered items than parents may have introduced bias to our estimates.

Third, our sample size was rather small, particularly with respect to the second level of analysis (classrooms), thus constraining generalizability and power to examine potential interactions, such as those between gender and shyness, as they are associated with children's language and attention performance. We should also note that we had a response rate of approximately 50% in preschool classrooms, which also limits the generalizability of our findings.

Fourth, our measures were limited to assessments of language and attention, and therefore may not adequately capture issues of underperformance due to competence as opposed to performance. In addition, our measure of attention is, arguably, also a measure of processing speed. It is not clear whether children's scores were indicators of attention, processing speed, or both. Addressing these shortcomings of the present study is a potential avenue for future research.

Finally, it is important to note that the factor structure that emerged from our EFA may have been an artifact of the way the CBQ Shyness subscale items are worded, rather than reflecting a true two-factor solution. That is, all but one of the items in the low sociability factor were reverse scored (e.g., "Seems to be at ease with almost any person"). On the other hand, only one of the items in the shyness factor was reverse scored. Even so, confirmatory factor analyses conducted to test the tenability of this factor structure with a much larger sample resulted in good model-to-data fit, providing further support for the two-factor solution found in the current study.

4.2. Implications and conclusions

The findings reported here have several important implications for research and practice.

First, the fact that teachers' and parents' ratings of children's shyness were both weakly correlated and differentially predictive of children's language and attention skills suggests that aggregating ratings by parents and teachers may suppress associations be-

tween children's shy behaviors and their academic and social outcomes. Future studies of shyness and other temperamental traits should include ratings from multiple sources, such as parents, teachers, external raters, and children, as well as examinations of rater discrepancies. As children age, it becomes more critical to include self-reports of shyness. Indeed, Spooner et al. (2005) found that teachers' and parents' ratings of 10–12-year-old children's shyness were often incongruent with children's self-ratings of shyness, resulting in mismatches about one-third of the time. Second, results reported herein suggest that teachers may provide more helpful ratings of children's behavior as it relates to outcomes in school. Although parent report of children's temperament is widely used in research (e.g., Coplan and Weeks, 2009; Rudasill, 2011; Sterry et al., 2010), findings from the present study point to the unique perspective teachers bring to understanding connections between child behavior and school success.

The findings presented here may be salient when we consider the stresses concomitant with the start of formal schooling (Rimm-Kaufman & Pianta, 2000); children who are extremely shy may be particularly at risk for negative outcomes at the transition to kindergarten (Coplan & Arbeau, 2008) potentially leading to clinical levels of social anxiety downstream (Coplan & Rubin, 2010). Thus, results from the current study highlight the importance of providing teachers with tools for working with shy children to promote positive outcomes. Recent findings from an experimental investigation of the effectiveness of a temperament-based intervention called *INSIGHTS into Children's Temperament* support this contention. A central goal of *INSIGHTS* is to give teachers the tools to recognize, empathize, and promote problem-solving skills in shy children. Shy children in kindergarten and first grade classrooms receiving the *INSIGHTS* intervention had better critical thinking and math skills than shy children in classrooms assigned to a control condition (O'Connor, Cappella, McCormick, & McClowry, in press). Results reported here, as well as results from studies of *INSIGHTS*, suggest that increasing both teachers' and parents' awareness of the needs of shy children in the classroom may interrupt a potential trajectory of academic difficulties as shy children begin formal school.

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