



Effective behavior management in preschool classrooms and children's task orientation: Enhancing emergent literacy and language development[☆]

Jennifer Dobbs-Oates^{a,*}, Joan N. Kaderavek^b, Ying Guo^c, Laura M. Justice^c

^a Department of Child Development and Family Studies, Purdue University, 1200 W. State St., West Lafayette, IN 47904-2055, USA

^b Department of Early Childhood, Physical & Special Education, University of Toledo, Gilham Hall 4500J, Mail Stop 954, Toledo, OH 43606-3390, USA

^c School of Teaching and Learning, The Ohio State University, 1945 N. High St., Columbus, OH 43210-1172, USA

ARTICLE INFO

Article history:

Received 30 April 2010

Received in revised form 17 February 2011

Accepted 24 February 2011

Keywords:

Preschool

Teachers

Behavior management

Task orientation

Emergent literacy

Language

ABSTRACT

This study investigated the relations among preschool teachers' behavior management, children's task orientation, and children's emergent literacy and language development, as well as the extent to which task orientation moderated the relation between teachers' behavior management and children's emergent literacy and language development. Participants included 398 children and 67 preschool teachers from preschool programs serving an at-risk population. Teachers' behavior management was observationally assessed and children's task orientation was measured via teacher-report. Children's language and emergent literacy skills were directly assessed in the fall and in the spring of the preschool year. Hierarchical linear models were used to predict children's residualized gain in emergent literacy and language (i.e., Spring scores with Fall scores as covariates) from their task orientation and their teachers' behavior management. Task orientation and behavior management each positively predicted children's emergent literacy development, but not language development. There was a significant interaction between teachers' behavior management and children's task orientation in predicting children's language development, such that high scores on both variables were associated with the most optimal language outcomes. Implications for research and early education are discussed.

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One of the key developmental tasks of the preschool years is developing skills and knowledge that promote communication and the eventual development of reading skills. Children's emergent literacy and language development in preschool is predictive of their early reading ability and later school success (Blatchford, Burke, Farquhar, Plewis, & Tizard, 1987; Kendeou, van den Broek, White, & Lynch, 2009; Levy, Gong, Hessels, Evans, & Jared, 2006; Storch & Whitehurst, 2002). Thus, it is important that the early childhood community understands what factors are associated with preschool literacy and language development proficiency. This study focused on two such factors: teachers' behavior management, a classroom-level characteristic describing one aspect of the

learning environment, and children's task orientation, an individual characteristic representative of a child's approach to learning opportunities. Specifically, this study investigated the relations among teachers' behavior management, children's task orientation, and children's emergent literacy and language development, as well as the extent to which task orientation moderated the relation between teachers' behavior management and children's development.

We hypothesize that teachers' behavior management skills and children's task orientations – both independently and in combination – play important roles in young children's development of emergent literacy and language abilities. By preventing misbehavior, and effectively dealing with it when it does occur, teachers' behavior management skills are thought to establish an environment conducive to literacy and language learning. A strong task orientation indicates that a child engages actively and persistently in learning activities. As a result, these children are presumed to have more opportunities to develop their language and literacy skills. Finally, we hypothesize that teachers' behavior management and children's task orientation may also work in combination to influence children's learning. Specifically, we theorize that teachers' behavior management skills may be most important for children who do not have strong task orientations themselves.

[☆] We are grateful to the many administrators, teachers, children, and families who contributed to this project. Members of our research team requiring special mention include Xitao Fan, Amy Sofka, Aileen Hunt, Elizabeth Cottone, Tricia Zucker, and Jill Pentimonti. The content of this publication does not necessarily reflect the views or policies of IES, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Department of Education.

* Corresponding author. Tel.: +1 765 494 2931; fax: +1 765 494 0503.

E-mail addresses: jendo@purdue.edu (J. Dobbs-Oates), joan.kaderavek@utoledo.edu (J.N. Kaderavek), yguo@ehe.osu.edu (Y. Guo), ljustice@ehe.osu.edu (L.M. Justice).

In order to learn most effectively, these children may need the external structure provided by a well-managed classroom. Thus, we expect behavior management and task orientation to interact in predicting children's literacy and language growth. Next, we consider each of these constructs in detail, beginning with the outcomes of interest to this study.

1. Emergent literacy and language development

Young children's emergent literacy skills are most commonly organized into two separate albeit interrelated domains: oral language skills and code-related skills (Storch & Whitehurst, 2002). Oral language skills include both vocabulary and grammar, whereas print concepts, letter knowledge, and phonological awareness are the predominant code-related skills. Children's skills in these two domains are generally stable and closely related in the preschool years (Storch & Whitehurst), though the correlation between the two domains diminishes over time, as children progress into middle childhood (Kendeou et al., 2009). For example, in those two studies, standardized beta weights describing the relation between the two domains in preschool ranged from .53 to .69. In kindergarten the beta weights ranged from .17 to .31, and Kendeou et al. report the 2nd grade relation to be .11.

In the present study, the aspect of oral language measured was receptive vocabulary. Receptive vocabulary is only one aspect of oral language, but it is an important one, as young children's receptive vocabulary is a precursor of later reading comprehension (Kendeou et al., 2009; Storch & Whitehurst, 2002), and in some cases, general reading achievement (Blatchford et al., 1987). One aspect of code-related skills, print awareness, was used in the present study. Print awareness was measured by a composite variable involving alphabet knowledge, print-concept knowledge, and name writing. Previous research has found that alphabet knowledge is one of the best preschool predictors of elementary school reading achievement (Blatchford et al., 1987; Lonigan, Burgess, & Anthony, 2000). Young children's print-concept knowledge is correlated with later reading skill (Levy et al., 2006), general school achievement, and likelihood of grade retention (Day & Day, 1984). Preschoolers' name writing ability has also been identified as a strong predictor of later decoding skills and, to a lesser extent, reading comprehension (NELP, 2008). Thus, the composite variable print awareness includes three key code-related predictors of later reading skills.

2. Teachers' behavior management

Preschool teachers' behavior management is a key teaching skill and an important determinant of the preschool classroom environment. Definitions of behavior management vary in the extant literature. In this article, the term *behavior management* refers to "the teacher's ability to provide clear behavioral expectations and use effective methods to prevent and redirect misbehavior" (Pianta, La Paro, & Hamre, 2008, p. 44). Teachers' behavior management has most often been studied for its relation to children's behavior. First, we will briefly summarize this literature, and then turn our attention to children's learning—the outcome of interest in this study.

Preschool teachers' behavior management strategies have been linked to children's behaviors, such that teachers using effective, positive behavior management strategies have students who demonstrated less severe misbehavior (Kim, Stormont, & Espinosa, 2009). Earlier research addressing causality suggests that discipline that is relatively less lax and behavior management that includes positive rationales for behavioral expectations increase appropriate behavior in young children (Arnold, McWilliams, & Arnold,

1998; Karoly & Briggs, 1978). Intervention research also indicates that teachers' behavior management strategies causally influence children's classroom behavior (Han, Catron, Weiss, & Marciel, 2005; Hiralall & Martens, 1998; Webster-Stratton, Reid, & Hammond, 2001; Webster-Stratton, Reid, & Stoolmiller, 2008).

Thus, substantial evidence exists to show that effective behavior management promotes children's appropriate behavior. Behavior management may also be related to children's learning. It is logical to hypothesize that when children's problem behaviors decrease, children have enhanced learning opportunities. Although this hypothesis is supported by theoretical understandings of young children's learning, research that directly addresses this question is surprisingly rare. In a 1979 chapter, Soar and Soar summarized a program of observational research in which they linked elementary school teachers' effective management of students' behavior to students' learning over the course of the year. Another relevant study found that teachers who were highly effective in raising fourth grade students' mathematics test scores also tended to display effective behavior management skills (Good & Grouws, 1977). Since the publication of those studies in the late 1970s, no research has directly investigated the relation between teachers' behavior management and children's learning outcomes.

3. Children's task orientation

Task orientation is one of a number of constructs (including self-regulation, persistence, frustration tolerance, and so forth) often grouped together as indicators of children's approaches to learning, sometimes called learning-related social skills (George & Greenfield, 2005; Scott-Little, Kagan, & Frelow, 2006). These variables have frequently been linked with young children's learning outcomes across a variety of domains (Fantuzzo et al., 2007; McClelland, Morrison, & Holmes, 2000; McWayne, Fantuzzo, & McDermott, 2004).

As early as 1954, task orientation appeared in the literature as an important behavioral variable connected to young children's learning and development. In this early work, Gruber (1954) defined task orientation as the display of perseverance and emotional control in both constructive and social activities. Task orientation is a characteristic that teachers of young children value in their students, and it is positively correlated with a variety of measures of children's school adjustment (Ballantine & Klein, 1990). Studies of preschoolers, kindergarteners, and first graders have found task orientation to be positively correlated with children's adaptive behaviors and negatively correlated with problem behaviors, both concurrently and prospectively (Mobley & Pullis, 1991; Pianta, Smith, & Reeve, 1991; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). Research addressing task orientation and academic learning in young children has also found positive relations between these variables. In a study of 5-year-old boys, teachers' ratings of children's task orientation were positively correlated with multiple indices of both general and specific cognitive performance; these relations persisted even after accounting for family background and ratings of other social-emotional behaviors (Kohn & Rosman, 1973). In a study of kindergarteners, teachers' ratings of children's persistence, activity, and distractibility were correlated with pre-reading achievement test scores in the expected directions (Schoen & Nagle, 1994). Importantly, the same measures of children's persistence, activity, and distractibility have been combined into a task orientation factor in a previous research ($\alpha = .94$; Mobley & Pullis, 1991). Finally, a study of Finnish children found that their task orientation in preschool was positively correlated with their word-reading skill when they were in the first grade one year later (Salonen, Lepola, & Niemi, 1998).

4. Relations among the constructs of interest

The present study sought to understand the relations among the three constructs summarized above: preschool children's emergent literacy and receptive language development, preschool teachers' behavior management, and children's task orientation. Our experiences studying learning in preschool settings have convinced us that teacher- and child-level behaviors each play important roles in children's learning. Specifically, we hypothesize that effective behavior management creates environments conducive to children's language and literacy learning, and that children's task orientation promotes children's ability to benefit from learning opportunities. Furthermore, we expect that effective behavior management acts as a protective factor for children with poor task orientations; the external structure of a well-managed classroom is expected to be especially important for these children, who do not easily attend to instruction. However, no known studies have addressed these questions directly, and very few related studies exist. A recent study of preschoolers' language development found that classmates' expressive vocabulary abilities were positively related to children's receptive language development over the course of the prekindergarten year (Mashburn, Justice, Downer, & Pianta, 2009). This relation was stronger in classrooms with better behavior management. The authors concluded that children had more opportunities for language-rich peer interactions, and thus, more peer-mediated language development, in classrooms where behavior was more effectively managed. This study supports the hypothesis that preschool teachers' behavior management may influence the language development opportunities in a classroom.

Additionally, a study focusing on parents', rather than teachers', discipline styles concluded that the relation between family literacy practices and children's oral language development was enhanced in families where parents reported frequent use of nondirective reasoning in discipline situations (Gest, Freeman, Domitrovich, & Welsh, 2004). The authors suggested that parental discipline strategies may enhance the parent–child relationship, setting the stage for more learning in parent–child interactions. Extending to the classroom environment, then, we hypothesize that teachers' discipline strategies may enhance (or impair) teacher–student relationships, which themselves are an important predictor of children's learning outcomes (e.g., Esposito, 1999). Gest et al. additionally hypothesized that the use of nondirective reasoning may indicate that a parent uses more language-rich interactions in general, including when reading with the child. This hypothesis, extended to the classroom setting, suggests that teachers' effective behavior management strategies might be a proxy for effective instructional strategies, through which learning is enhanced.

In sum, both teachers' behavioral management and children's task orientation have been identified as important factors in young children's development. However, very little research exists that documents these variables' relations to children's learning, and no research of which we are aware has considered these two variables simultaneously in conjunction with preschool children's language and literacy learning. Despite this, there is good reason to expect that both behavior management and task orientation matter for children's language and literacy learning. It is logical to hypothesize that children's learning opportunities are enhanced in classrooms where behavior is effectively managed. Aspects of children's approaches to learning, including task orientation, have commonly been positively associated with children's learning (DiPerna, Lei, & Reid, 2007; Kohn & Rosman, 1973). Finally, the transactional theory of child development suggests that adult and child characteristics often interact to produce child outcomes (Combs-Ronto, Olson, Lunkenheimer, & Sameroff, 2009). We expect teachers' behavior management and children's task orientation to be another example of this phenomenon.

The present study was guided by two research questions. First, what is the relation among teachers' behavior management skills, children's task orientation, and children's emergent literacy and receptive language development? We hypothesized that positive and significant associations would be apparent among these variables. Our predictions were based upon the limited research that links teachers' behavior management skills to elementary school children's learning (Good & Grouws, 1977; Soar & Soar, 1979), as well as work that links task orientation to young children's learning (Kohn & Rosman, 1973; Salonen et al., 1998; Schoen & Nagle, 1994).

Second, to what extent are the relations between teachers' behavior management and preschoolers' emergent literacy and receptive language gains over an academic year moderated by children's task orientation? Although there is little research to guide this hypothesis, we tentatively expect that children with weaker task orientation may benefit more from the structured environment imposed by a teacher with strong behavior management skills; whereas, the learning of a child with strong task orientation may be less dependent on the teachers' behavior management. Therefore, we predict that children's task orientation will significantly moderate the relation between teachers' behavior management and children's development of receptive language and emergent literacy abilities.

5. Method

5.1. Participants

The participants were 398 children (49% males; 51% females) and 67 preschool teachers. Children had a mean age of four years, four months ($SD=4.5$ months), ranging in age from three years, two months to five years, three months. Ethnic composition of the participating children was 164 (41%) Caucasian, 156 (39%) African American, 23 (6%) Latino, and 55 (14%) multiracial, Asian, Native American, or other. Children were recruited from participating classrooms; six to eight children were randomly selected from each classroom pool of consented children.

The teachers led classrooms for children from low socioeconomic backgrounds in Ohio and Virginia during the 2005/2006 and 2006/2007 school years. The classrooms were located in three different types of programs: 25 (37%) of the classrooms were Head Start programs, 32 classrooms (48%) were Title 1 or state-funded, and 10 (15%) were private programs. Despite these differences in program affiliation, all had targeted-enrollment admission policies that constrained participation to low-income children.

Teachers' reported ethnicity was as follows: 42 (63%) Caucasian, 21 (31%) African American, and 4 (7%) Latino, multiracial, Asian, or Native American. Three male and 64 female teachers participated. Teaching experience ranged from 0 to 38 years (mean = 10.65 years; $SD=8.5$ years). Teachers reported varying levels of training: 15 (22%) reported a Master's degree or training beyond the Master's degree, 14 (21%) at least one year beyond the Bachelor's degree, 13 (19%) a Bachelor's degree, 15 (22%) an Associate's degree, 6 (9%) some college but no degree beyond the high school diploma, and 4 (6%) reported only a high school diploma.

5.2. Procedures

Data were drawn from a classroom-based literacy intervention study focusing on training teachers to include print-referencing behaviors during in-class storybook reading (see Justice, Kaderavek, Fan, Sofka, and Hunt (2009) for a published description of the study). Teachers in the larger study were randomly assigned to intervention and control conditions. Conditions

differed in the way and frequency with which teachers read to children in their class. Given the main effect of condition variations (see Justice et al., 2009), we controlled for the effect of condition status on children's language and emergent literacy gains in the statistical analysis for the current study (see Section 6).

All teachers in the study completed a one-day professional development training session prior to the beginning of the school year. The training for all the conditions was similar except the intervention teachers ($N=59$) participated in a half-day session regarding implementation of the print-referencing technique while the control group teachers received a half-day session on a non-print related topic. Some control-group teachers at one site ($N=8$) participated in a half-day workshop focusing on behavior management techniques. The behavior management ratings for this group were compared to the remaining teachers to examine potential effects of the half-day behavior management workshop. Results showed that there was no significant difference in behavior management skills between the eight teachers who received behavior management training and the intervention group ($t=-2.577$, $p=.11$). Thus, the current study included all the teachers across different conditions.

5.3. Measures

Measures were administered to document teacher behaviors (i.e., behavior management skills), child behaviors (i.e., task orientation), and child outcomes (i.e., emergent literacy and receptive language development over the course of the academic year).

5.3.1. Teachers' behavior management

Researchers documented teachers' behavior management by observing each teacher in the classroom in the fall and spring of the academic year and rating the teacher's behavior management skill using the seven-point behavior management dimension within the *Classroom Assessment Scoring System-PreK* (CLASS; Pianta et al., 2008). The CLASS focuses on relational processes between teachers and children and was developed through extensive classroom observation work in the NICHD Study of Early Child Care (Pianta et al., 2008).

The CLASS teacher behavior management dimension is one of nine CLASS dimensions (positive climate, negative climate, teacher sensitivity, regard for student perspectives, behavior management, productivity, instructional learning formats, concept development, quality of feedback, and language modeling) used to document instructional quality. Teacher ratings on the behavior management dimension can range from low (1) to excellent (7). A high behavior management rating reflects a classroom where "rules and expectations are clearly stated," "there are few, if any, instances of student misbehavior," and where the teacher "is consistently proactive and . . . prevent[s] problems from developing" and "redirects misbehavior by focusing on positives and . . . using subtle cues" (Pianta et al., 2008, pp. 47–48). A mid-level rating on the behavior management domain reflects a classroom where "rules and expectations may be stated clearly but are inconsistently enforced," "the teacher uses a mix of proactive and reactive responses," and "there are periodic episodes of misbehavior in the classroom." In contrast, a low-level rating reflects a classroom where "rules and expectations are absent, unclear, or inconsistently enforced," "the teacher is reactive," "attempts to redirect misbehavior are ineffective," and "there are frequent instances of misbehavior in the classroom" (Pianta et al., 2008, p. 44).

The CLASS is a reliable observation tool; researchers have documented that preschool teacher–child interactions (as measured by the CLASS) are consistently associated with children's academic and language skills (Mashburn et al., 2009). Researchers also have

documented that the CLASS-PreK has acceptable content validity in that CLASS scores are significantly correlated with the Interactions Factor in the *Early Childhood Environmental Scale – Revised Edition* (ECERS-R). The ECERS-R Interactions factor describes the extent to which a classroom promotes teacher–child interactions. The ECERS-R Interactions factor correlates at a level of $r=.63$ with the CLASS domain of Emotional Support, at a level of $r=.55$ with the CLASS domain of Classroom Organization, and at a level of $r=.45$ with the CLASS domain of Instructional Support (Pianta et al., 2008).

The training methods and scoring protocol used for CLASS assessment are stringent. The following procedures were followed in this study to achieve CLASS teacher ratings: (a) research assistants attended a two-day training workshop conducted by a certified CLASS master coder and achieved 80% coding reliability with six "gold standard" classroom videotaped examples, (b) researchers videotaped teachers for two one-hour classroom observations (fall and spring), and (c) videotapes were scored in a lab-based setting by trained coders to the established reliability criterion (see Pianta et al., 2008). The CLASS scores for the domain of behavior management were averaged across the two observations. The mean spring score ($M=5.07$) and the mean fall score ($M=4.55$) were significantly different ($p=.03$), indicating that teachers' behavior management ratings increased over the academic year. Over the whole year, the scores ranged from 2 to 7 (mean=4.81; $SD=1.09$). This mean score reflects a middle-range behavior management skill level.

5.3.2. Children's task orientation

Children's task orientation was documented with the eight-item "Children's Task Orientation Dimension" from the *Teacher-Child Rating Scale* (T-CRS; Perkins & Hightower, 2002). The T-CRS is a five-point Likert-type teacher-rating scale assessing children's school behaviors and competencies. Along with assessing a child's task orientation, the T-CRS documents a child's behavior control, assertiveness, and peer social skills. Each dimension contains eight items—four items measure competency and four items measure problem behaviors. An example competency item for the task orientation measure is that the child "works well without adult support." An example problem behavior item is that the child is "poorly motivated to achieve" (Perkins & Hightower). Validity of the T-CRS was documented by comparing its scores to equivalent domain scores on the *Classroom Adjustment Rating Scale* (CARS) and the *Health Resources Inventory* (HRI). Correlations between the T-CRS Acting-Out, Shy-Anxious, and Learning Scales ranged from .72 to .89 when compared to equivalent CARS domain scales. The T-CRS correlations ranged from .56 to .82 when compared to equivalent HRI domain scales (Hightower et al., 1986). Reliability for the task orientation dimension is considered good; internal consistency (i.e., alpha reliability) is .94 and long-term stability for ratings completed seven months apart is .80 (Perkins & Hightower, 2002). In our sample, the internal consistency for the task orientation subscale was .87. Table 1 shows descriptive statistics for children's task orientation. Children's task orientation scores ranged from 8 to 40 (mean = 30.15; $SD=8.04$), meaning that the majority of the sample displayed a moderate level of task orientation. There was no significant difference in children's task orientation between children in the intervention group and those in the control group ($t=-0.079$, $p=.937$).

5.3.3. Receptive language and emergent literacy

Children's receptive language and emergent literacy skills were assessed in the fall (Time 1) and spring (Time 2) of the year. Children's receptive language skills were assessed using *The Peabody Picture Vocabulary Test III* (Dunn & Dunn, 1997); emergent literacy

Table 1
Descriptive statistics for child participants.

Variable	Time 1			Time 2		
	M	SD	Range	M	SD	Range
RW: Vocabulary (PPVT)	46.93	17.36	2–96	58.31	17.24	6–115
SS: Vocabulary (PPVT)	91.61	14.90	31–135	95.22	13.82	40–134
RW: Print Concepts (PWPA)	6.25	3.38	0–16	9.35	3.95	1–17
SS: Print Concepts (PWPA)	95.2	16.43	46–145	108.77	19.46	11–161
RW: Upper-case alphabet recognition (PALS)	9.49	9.42	0–26	17.66	8.96	0–26
RW: Name Writing (PALS)	3.97	2.12	0–7	5.75	1.58	0–7
Print Awareness Composite Score	.06	.89	–1.43–1.97	.04	.84	–2.76–1.30

Note. RW: Raw Score; SS: Standard Score; PPVT: Peabody Picture Vocabulary Test; PWPA: Preschool Word and Print Awareness; PALS: Phonological Awareness Literacy Screening (preschool or prekindergarten).

skills were assessed using the (a) *Preschool Word and Print Awareness* (PWPA, Justice & Ezell, 2001), (b) the Alphabet Knowledge subtest of the *Phonological Awareness and Literacy Screening-PreK* (PALS; Invernizzi, Meier, & Sullivan, 2004), and (c) the Name-Writing Subtest of the PALS. The children were tested one-on-one with a trained examiner in a quiet location in the student's school.

The *Peabody Picture Vocabulary Test III* (PPVT) is a measure of receptive vocabulary; the examiner asks the child to select one picture from four picture alternatives. Vocabulary items are presented in increasing difficulty. The PPVT has an internal consistency reliability of .95 and a test–retest reliability of .92 (Dunn & Dunn, 1997). Validity is documented with a .91 correlation with verbal ability on the Wechsler Intelligence Scale for Children (3rd ed.). In our sample, internal consistency for the PPVT was .99. Table 1 shows children's mean standard and raw scores; however, raw scores were used for analysis so that change over time could be modeled in a meaningful way.

The *Preschool Word and Print Awareness* (PWPA) assesses children's knowledge of 14 print concepts. During PWPA administration, the examiner asks questions about 14 print concepts (e.g., knowledge of letters, awareness of text) during an adult-child shared book reading. The inter-rater reliability of the PWPA is .94 (Justice, Bowles, & Skibbe, 2006). In the present study, the internal consistency of the PWPA was .70.

Two subtests of the *Phonological Awareness Literacy Screening PreK* (PALS PreK; Invernizzi et al., 2004) were also used to measure children's emergent literacy abilities. The PALS-PreK is an emergent literacy assessment that evaluates children's knowledge of letters and sounds. During the PALS-PreK Alphabet Knowledge subtest, the examiner presents a stimulus sheet containing random presentation of the 26 alphabet letters. The child receives one point for each named letter. The inter-rater reliability for the Alphabet Naming Subtest is .99. In the present sample, internal consistency was found to be .98. During the PALS-PreK Name Writing Subtest, the examiner asks the child to draw a picture of himself/herself and then write his/her name. The child's production is rated using a 7-point scoring system scale ranging from a score of 1 (1 = name indistinguishable from picture) to 7 (7 = legible and orthographically complete name). The inter-rater reliability for the Name Writing Subtest is .99. Both the Alphabet Knowledge Subtest and the Name Writing Subtest demonstrate good validity; the correlation between the PALS-PreK and the *Test of Early Reading Ability* (3rd ed.) is medium–high and significant ($r = .67$, $p < .01$; $n = 73$; Invernizzi et al., 2004).

In this study, the authors derived a composite score of print awareness from the PWPA and two PALS measures (see Table 1) following procedures in McGinty and Justice (2009). Z-Scores were first computed for each measure using means and standard deviations across time points. Z-Scores for the three observed measures were then summed within time points, resulting in Time 1 and Time 2 print awareness composite scores.

6. Results

6.1. Analytical strategy

For this study, we used hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) to account for the nested nature of the data. The two-level HLMs nested children within classrooms, and predicted their residualized gain (i.e., Time 2 scores with Time 1 scores as covariates) from the classroom-level measures of teacher behavior management. Models were built separately for each child outcome, namely print awareness and vocabulary. First, an unconditional model without any predictor variables was tested to compute the intraclass correlation coefficients (ICCs). ICC refers to the amount of variance in individual child outcomes that is explained by classroom-level variables. Then, we entered child variables at level 1 and teacher variables at level 2.

Given that there may be some child, teacher, and classroom predictors associated with children's language and literacy achievement, we first examined the independent association between potential child- and teacher-level covariates and children's Time-2 outcomes, after controlling for children's Time-1 print awareness and vocabulary scores, task orientation scores, study condition, and teacher behavior management. Specifically, the child-level covariates we investigated included child age, sex, race, and family SES (as measured by maternal educational attainment and family income); teacher and classroom covariates included teacher educational attainment, teaching experience, classroom literacy environment, and program affiliation. In these analyses, children's age and maternal educational attainment were significant predictors of children's Time-2 print awareness. Children's race was a significant predictor of children's Time-2 vocabulary. As Procock, Assmann, Enos, and Kasten (2002) suggested, whether a covariate is strongly related to outcomes should be also considered. Thus, we investigated the correlation of those variables with the child outcomes. As seen in Table 2, children's age and race were significantly correlated with children's Time-2 print awareness and vocabulary. By contrast, maternal education was not significant correlated with children's Time-2 print awareness or vocabulary. Thus, children's age and race were included in the final model as covariates.

In the final model, level-1 variables included age, race, Time-1 scores, and children's task orientation. Level-2 variables included teachers' behavior management and intervention condition. Time 2 scores served as the dependent variable. For all HLMs, level-1 (Eq. (1)) predicted the Time 2 score (Y) of child (i) in classroom (j) as a function of Time 1 scores (β_{1j}), task orientation level (β_{4j}), and age (β_{2j}), which are all centered at the grand mean, and race (β_{3j}). In this model, β_{0j} is the classroom mean of Time 2 scores and (r_{ij}) refers to the child-level error:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{T1 score}) + \beta_{2j}(\text{Age}) + \beta_{3j}(\text{Race}) + \beta_{4j}(\text{Task Orientation}) + r_{ij} \quad (1)$$

Table 2
Correlations among significant covariates and child outcomes.

	1	2	3	4	5	6	7	8	9	10
Mother Education	–	–.05	–.05	–.07	.05	.05	.09	.18	.16	.17
Child Race: Black versus White		–	–.20**	–.31**	.09	–.07	.08	.06	–.18**	–.19**
Child Race: Latino versus White			–	–.09	–.04	.04	–.12*	–.11*	–.21*	–.16*
Child Race: Other Race versus White				–	–.14*	.00	.03	–.05	–.06	–.11*
Child Age					–	.08	.41**	.39**	.35**	.35**
Task Orientation Score						–	.47**	.39**	.31**	.30**
Time-1 Print Awareness							–	.70**	.53**	.48**
Time-2 Print Awareness								–	.51**	.51**
Time-1 Vocabulary									–	.79**
Time-2 Vocabulary										–

* $p < .05$.

** $p < .01$.

Level-2 modeled changes in children's scores (Time 1–Time 2) as a function of the teacher behavior management variable which was centered at the grand mean. Intervention status was entered so that these analyses would test the effects of teacher behavior management above and beyond any effects attributable to the intervention condition to which classrooms were assigned. Intervention status was modeled to control its effect on child outcomes. As we anticipated, effects of teacher behavior management were seen above and beyond the intervention, and effects were similar, because we did not find any significant two-way interactions involving intervention conditions. Eq. (2) presents the level-2 model used to assess the direct effects of teacher behavior management. In this model, the mean classroom Time 2 scores (β_{0j}) are a function of the grand mean (γ_{00}) plus the effects of teacher behavior management (γ_{01}), treatment status (γ_{02} and γ_{03}), and classroom-level error (u_{0j}). Based on preliminary analyses showing Time 1 scores (β_{01}) as fixed effects, these were modeled simply as a function of the classroom mean (γ_{10}):

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Behavior Management}) + \gamma_{02}(\text{Condition}) + u_{0j} \quad (2)$$

$$\beta_{1j} = \gamma_{10}$$

Final models included the cross-level interactions between teachers' behavior management and children's task orientation, as in Eq. (3):

$$\begin{aligned} \beta_{0j} &= \gamma_{00} + \gamma_{01}(\text{Behavior Management}) + \gamma_{02}(\text{Condition}) + u_{0j} \\ \beta_{1j} &= \gamma_{10} \\ \beta_{2j} &= \gamma_{20} \\ \beta_{3j} &= \gamma_{30} \\ \beta_{4j} &= \gamma_{30} + \gamma_{31}(\text{Behavior Management}) \end{aligned} \quad (3)$$

In this model, the main direct effects of teacher behavior management (γ_{01}) and child task orientation (β_{3j}) are modified by the interaction between these variables (γ_{31}).

6.2. Relations among teachers' behavior management skills, children's task orientation, and children's emergent literacy and language gains

Prior to addressing the first and second research questions, the unconditional model for each child outcome (print awareness and vocabulary knowledge) was first tested using HLM as discussed previously. The unconditional model predicting print awareness yielded an ICC of .324, indicating that most of the variability in Time 2 print awareness scores was attributable to between-child effects. Similarly, the ICC (.152) obtained from the unconditional model predicting vocabulary knowledge suggested that majority of variance in Time 2 vocabulary knowledge scores lay between children. In the remaining analyses, the following variables were always entered as controls: age, race, intervention status, and children's initial skills.

The first research question addressed the relations among teachers' behavior management skill, children's task orientation, and children's literacy and language gains. Table 3 reports the findings from HLM models examining the relations among these variables. HLM results showed that for print awareness, teachers' behavior management significantly predicted the residualized change in children's print awareness scores ($\beta = .080$, $p = .003$). By contrast, there was no main effect of teachers' behavior management on the residualized changes in children's vocabulary scores ($\beta = .330$, $p = .604$).

Concerning the relation between children's task orientation and child outcomes, HLM results demonstrated that for the print awareness outcomes, the direct effects of children's task orientation were significant ($\beta = .016$, $p = .001$). However, children's task orientation did not significantly predict the residualized changes in children's vocabulary scores ($\beta = .136$, $p = .184$). Teachers' behavior management did not significantly predict children's task orientation ($\beta = .524$, $p = .309$).

In sum, these results showed that teachers' behavior management skills have a significant and positive main effect on children's gains in print awareness, but not vocabulary knowledge. Similarly, children's task orientation significantly and directly predicted children's gains in print awareness, but not vocabulary knowledge. Furthermore, there was no association between teachers' behavior management and children's task orientation. To examine the effects of the significant predictors (teachers' behavior management and children's task orientation) of spring print awareness, we also estimated their individual effect size by multiplying their coefficients with the standard deviation for predictors and then dividing by the standard deviation of spring outcomes (as in Duncan & NICHD ECCRN, 2003; Mashburn et al., 2009). For children's spring print awareness, the effect size for teachers' behavior management was .102 and children's task orientation was .153, after controlling for the covariates of child age, race, fall print awareness and intervention condition.

6.3. Interactions among teachers' behavior management skills, children's task orientation, and children's emergent literacy and language gains

The second question considered the extent to which the relations between teachers' behavior management and children's emergent literacy and language gains may be moderated by (or dependent upon) children's task orientation. Table 3 shows the findings from the HLM models investigating the interplay among these variables. For children's print awareness gains, the cross-level interaction between teachers' behavior management and children's task orientation did not significantly predict children's print awareness scores (i.e., residualized change: $\beta = -.004$, $p = .269$); however, the cross-level interaction between teachers' behavior management and children's task orientation significantly predicted

Table 3

HLM results: relations among teachers' behavior management, children's task orientation, and children's language and literacy gains.

	Print Awareness			Vocabulary		
	Coefficient	SE	p	Coefficient	SE	p
<i>Block 1</i>						
<i>Child-level Variables</i>						
Time 1 Scores	0.50	0.04	<.001	0.72	0.05	<.001
Age	0.02	0.01	.01	0.29	0.14	.04
Race: Black versus White	−0.02	0.06	.74	−4.52	1.38	.002
Race: Latino versus White	−0.12	0.15	.43	−2.98	2.64	.26
Race: Other Race versus White	−0.07	0.09	.46	−3.97	1.94	.04
Children's Task Orientation	0.02	0.01	.001	0.14	0.10	.18
<i>Teacher-level Variables</i>						
Teacher Behavior Management	0.08	0.02	.003	0.33	0.64	.60
Intervention Condition	0.18	0.07	.013	−0.62	1.30	.63
<i>Block 2: Interactions</i>						
Teacher Behavior × Children Task Orientation	−0.01	0.01	.27	0.19	0.09	.038

children's vocabulary gains (i.e., residualized change: $\beta = .188$, $p = .038$). Fig. 1 depicts this relation. As shown, teachers' behavior management skills were associated with a higher level of vocabulary gains for the children whose task orientation levels were above average. However, children with a low level of task orientation made less vocabulary gains, even when teachers had a high level of behavior management.

As Preacher, Curran, and Bauer (2006) recommended, probing the interaction further using Multiple Linear Regression (MLR) two-way interaction tools could provide additional information about the interaction effects. We conducted the analysis about the simple intercepts and slopes. Calculations of simple intercepts show fairly comparable spring vocabulary knowledge performance across low, average, and high level of children's task orientation (estimated raw-scores for spring vocabulary knowledge are 56.50, 57.72, and 58.97, respectively) when teachers provide a low (−1 SD) level of behavior management. In contrast, spring vocabulary knowledge abilities showed more diversity across low, average, and high levels of children's task orientation (estimated raw-scores for spring vocabulary knowledge are 56.87, 58.09, and 60.51, respectively) when teachers provide high (+1 SD) level of behavior management. Moreover, tests of the simple slopes showed that teachers' behavior management skills had a significant and positive association with child vocabulary outcomes when children's task orientation level was high ($\beta = .86$; $p = .02$), but not average ($\beta = .54$; $p = .39$) or low ($\beta = .87$, $p = .24$).

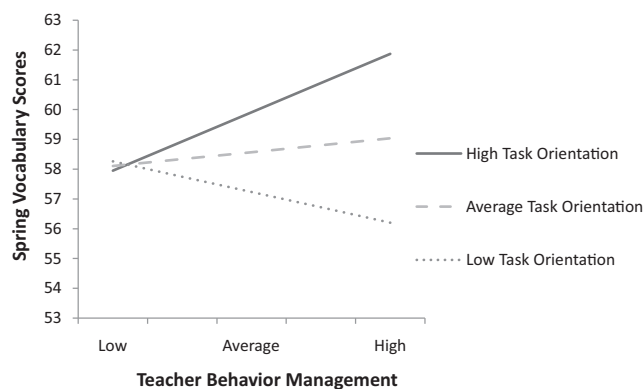


Fig. 1. Interaction between teachers' behavior management × children's task orientation on fitted spring vocabulary scores, adjusting for fall vocabulary score, gender and treatment status. Teachers' behavior management falls at the 25th (low), 50th (average), and 75th (high) percentiles.

7. Discussion

This study sheds light on the relations among preschool teachers' behavior management skills, children's task orientation, and children's language and emergent literacy development over the course of a school year. The first hypothesis of this study addressed main effect relations among these variables. As predicted, teachers' behavior management skills were positively related to children's print awareness development. Similarly, children's task orientation was positively related to their print awareness development. Therefore, children in well-managed classrooms, as well as children with a strong task orientation, experienced a benefit to their print awareness development.

In contrast to our predictions, however, similar relations were not found for the outcome of children's receptive vocabulary development. That is, neither teachers' behavior management nor children's task orientation was related to children's receptive language gains. The absence of these main effects must be interpreted in light of the findings for our second research question. There was a significant interaction between behavior management and task orientation in predicting children's vocabulary development. There is no main effect because the relation between behavior management and vocabulary depends upon children's task orientation. The presence of this interaction was consistent with our predictions; however, the direction of the interaction was counter to our predictions. Analyses revealed that at high levels (+1 SD) of teacher behavior management, there was a significant, positive relation between children's task orientation and their receptive language development. At average and low (−1 SD) levels of teacher behavior management, however, there was no significant association between task orientation and receptive language gains. Thus, in well-managed classrooms, children with strong task orientations are learning a lot in both the language and emergent literacy domains. But, in classrooms with average or below-average behavior management, children with strong task orientations experience a learning benefit *only* in the emergent literacy domain.

The most salient conclusion of this study is that preschool receptive language and emergent literacy development seem to operate in different ways when considered in the context of teachers' behavior management skills and children's task orientation. What is different about development in these two domains? The design of the present study does not allow for conclusions about the mechanisms at work in these two different patterns of outcomes. However, by revealing these patterns, this study provides guidance for future research in this area. Specifically, it will be important for future research to investigate whether teachers' behavior management skills differentially impact the opportunities children have to develop receptive language and print awareness. The findings of

the present study suggest that behavior management, *on its own*, is important for print awareness development, but that behavior management *in conjunction with task orientation* is important for receptive language development. This interaction can also be framed from another perspective. That is, task orientation, *on its own*, is important for print awareness development, but task orientation *in conjunction with behavior management* is important for receptive language development. Data from the current study can be compared to findings from several recent studies. First, Mashburn et al. (2009) reported that preschool teachers' behavior management moderated the relation between peer language and children's receptive language development. The independent variable is different from our study—Mashburn et al. were investigating the expressive language of peers in the classroom, while the present study is focused on children's task orientation. However, the study described in this paper and Mashburn et al. both found that children's receptive language growth was moderated by behavior management. In both cases, it appears that strong behavior management is necessary, but not sufficient, for children's receptive language growth.

The work of Fantuzzo, Perry, and McDermott (2004) and Fantuzzo et al. (2007) also clarifies our data interpretation. Specifically, Fantuzzo et al. (2004) forwarded a three-factor structure that explains preschool children's learning ability: competence motivation, attention/persistence, and attitude toward learning. Children's "attitude toward learning" is particularly relevant as it is "a child's general demeanor in learning activities, and the way in which he/she interacts with peers and adults in those learning activities" (p. 213). The work of Fantuzzo et al. indicates that children with lower-levels of "attitude towards learning" experience negative peer interactions and are at long-term academic risk (Fantuzzo et al., 2007).

Building from the work of Fantuzzo et al. (2004, 2007), we tentatively hypothesize that facilitating a child's receptive language ability requires peer interaction and participation in child-directed unstructured learning opportunities (i.e., dramatic play, center-time activities). We suspect that the children in our study with low task orientation – particularly in classrooms where unstructured learning might be less facilitative (i.e., chaotic or confusing due to lower levels of teachers' behavioral management) – participated less with peers and were less able to take advantage of unstructured language-learning opportunities.

As support for this position, we consider current research suggesting that children require at least some explicit exposure to print concepts for adequate learning to occur (Justice & Kaderavek, 2004; Kaderavek & Justice, 2004). In contrast, investigations into receptive language development often focus on more informal interactions, such as typical conversations in home and preschool settings, with both adults and peers (Goldstein & Gallagher, 1992; Goldstein & Kaczmarek, 1992; Hadley & Schuele, 1998). It may be that print awareness development occurs more often in intentional teacher-directed interactions, in which case, even children with low task orientations have the opportunity to benefit from effective teachers. In contrast, development opportunities for receptive language are more informal and less exclusively mediated by teachers; so, as we concluded in the previous section, effective behavior management, without strong task orientation, is insufficient to promote children's receptive language development. The hypothesis described here is simply one explanation consistent with these data and current literature. Well-designed studies are needed to investigate this hypothesis, and to rule out others.

7.1. Limitations and implications

The present study offers a description of the role of preschool teachers' behavior management and children's task orientation

in predicting children's receptive language and emergent literacy development. An important limitation of this study is that receptive vocabulary is the only measure of oral language included in the study. Future work should investigate other aspects of oral language, including expressive vocabulary, grammar, pragmatics, and semantics.

Although this study included a substantial sample of children, all the participating preschool programs served children at risk due to socioeconomic disadvantage or developmental delay. Thus, the findings of this study may not be applicable to more advantaged groups of preschoolers. Although the study used an appropriate nested analysis technique, an even more rich understanding of children's development would have been possible with the use of additional time points, allowing for the modeling of not just level of language/literacy, but also change over time. Finally, this study described relations, but cannot explain the mechanisms behind those relations. Now that these relations have been identified, future studies can be designed to uncover the processes at work.

The implications of this study are substantial for both early childhood research and practice. One key conclusion is the educational importance of effective behavior management in the preschool classroom. Substantial research has linked teachers' behavior management to children's classroom behavior (e.g., Arnold et al., 1998; Rimm-Kaufman et al., 2009), but few studies have examined children's learning in relation to teachers' behavior management. According to these analyses, preschool children's print awareness development is uniquely predicted by teachers' behavior management. Furthermore, preschool children's receptive language development is related to teachers' behavior management in conjunction with children's task orientation. For researchers, this opens up a new area of study, as there is much to learn about how teachers' behavior management promotes development in these domains, and potentially in other domains as well. For early childhood professionals, this finding is an endorsement of the important role their actions play in promoting children's learning. Teacher education and other professional training programs, in particular, could benefit from a focus on effective behavior management in order to promote children's positive development behaviorally, cognitively, and beyond.

This study also offers useful information to the research and practice communities about the role children's task orientation plays in emergent literacy and language development. Print awareness was identified as an area in which children's task orientation is associated with learning. This is consistent with existing research that suggests task orientation promotes learning in children of various ages (e.g., Johnston & Winograd, 1985; Kohn & Rosman, 1973; Salonen et al., 1998). The development of receptive language, though, required both task orientation *and* behavior management. This finding was not in line with our hypothesis, which predicted that effective behavior management would act as a protective factor for children with low task orientation. In fact, children with low task orientation showed relatively poor receptive language development regardless of the behavior management present in the classroom. This suggests that placing children in high-quality classrooms may not be a sufficient intervention, if the children struggle with task orientation. Researchers and teachers alike need to consider the possible need for interventions directly targeting children's task orientation.

Furthermore, the interaction between task orientation and behavior management also emphasizes the potential importance of "fit" between teacher and student. Research on transactional models of child development has concluded that child and adult behaviors have bidirectional and interactive contributions to children's development (Combs-Ronto et al., 2009). This perspective provides a meaningful lens to interpret the interaction between task orientation and behavior management; yet, much more

research is needed to understand how teachers' and students' characteristics interact to promote learning. For early childhood professionals, these findings emphasize the need to attend to children's task orientation. Children with low task orientations are at risk for limited learning progress. There is a need for educators to consider how task orientation and other learning-related skills are connected to young children's language and literacy development, as well as how practices in the classroom may promote those skills.

Role of the funding source

This study was supported in part by a grant from the U.S. Department of Education, Institute of Education Sciences (Grant #R305G050057). After selecting the proposal for funding, the funder played no role in the study design; collection, analysis, and interpretation of data; writing of the report; or in the decision to submit the paper for publication.

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