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Classroom Model and Peer Influence: The Relationship Between Preschoolers' Behavior and Academic Achievement in the Classroom

Rhonda Sue Jamison
University of North Florida

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CLASSROOM MODEL AND PEER INFLUENCE:
THE RELATIONSHIP BETWEEN PRESCHOOLERS'
BEHAVIOR AND ACADEMIC ACHIEVEMENT
IN THE CLASSROOM

by

Rhonda Sue Jamison

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The thesis of Rhonda Sue Jamison is approved:

Signature Deleted

_____   4/17/07
Susan Perez, Ph.D.   Date

Signature Deleted

_____   4/17/07
Rebecca Marcon, Ph.D., Committee Chairperson   Date

Accepted for the Department:

Signature Deleted
_____   4-18-07
Minor H. Chamblin, Ph.D., Chairperson   Date

Accepted for the College:
Signature Deleted

_____   25 April 2007
Dean of the College of Arts and Sciences   Date

Accepted for the University
Signature Deleted

_____   25 APRIL 2007
Dean of Graduate Studies   Date

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Abstract

Research indicates that classroom behaviors in students may be good predictors of academic success. The present study investigated the relationship between classroom peers, positive and negative classroom behaviors, early literacy and mathematics ability, and classroom model in 214 predominately low-income preschool children in 21 classes across a six-county area. It was hypothesized that peer classroom behavior would be a significant predictor of individual child ability and that peers would have differential influence across classroom models. Results indicated that peer classroom behavior was not a significant predictor of individual child ability. Individual child classroom behaviors, specifically positive behaviors, emerged as a significant predictor of child ability. Peer ability and peer positive classroom behaviors emerged as significant predictors of individual child ability in classrooms that were structured with an academically directed model, but not in classrooms that were more structured with a combination of academic and child-centered models.

Classroom Model and Peer Influence: The Relationship between Preschoolers'

Behavior and Academic Achievement in the Classroom

Children's classroom behavior and its relationship to their academic

achievement has been an area of interest for decades. Research has identified both

positive and negative relationships between student behavior and concurrent, as well

as future, academic achievement. Whereas child behaviors that can be considered

positive or constructive such as cooperation, attention, and completing tasks are

positively associated with academic achievement (Alexander, Entwisle, & Dauber,

1993; Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003; Malecki & Elliot,

2002), child behaviors considered to be negative or problematic, such as

hyperactivity, fighting, and withdrawal are negatively associated with academic

achievement (Alexander et al., 1993; DiLalla, Marcus, & Wright-Phillips, 2003).

Factors such as family income, child gender, teacher education, and the school

environment may help explain the relationship between child behavior in the

classroom and academic achievement. Less is known about the ways in which peers,

within the context of the classroom, may influence both child behavior and academic

achievement. Even less is known about these processes in children younger than 5

years of age. The current study examined preschoolers' behavior and academic

achievement to see how it is influenced by peer ability, peer behavior, and classroom

model.

Earlier research has focused mainly on children in educational programs at the

primary level and beyond. Fewer studies have assessed children at ages younger than

5 years. Early childhood education and intervention among low-income children is

an area of increasing interest as researchers and policy makers examine which components are most effective and cost-beneficial in preparing children for school (see Barnett, 1985; Schweinhart & Weikart, 1997; Schweinhart et al, 2005). The preschool years are a period of extensive development for children both academically and socially. Understanding the relationship between young children's classroom behavior, academic achievement, and peer influence on both behavior and achievement could have important implications for preschool teacher practices and classroom structure.

Previous research has examined how an individual student's behavior affects his or her own academic achievement. Early research showed that positive behavior (i.e., cooperation, self-confidence) in kindergartners was positively correlated with that child's academic achievement in the fifth grade (Attwell, Orpet, & Meyers, 1967). More recently, we have seen that positive self-regulating behaviors in kindergartners within the classroom (i.e., controlling impulsivity, self-starting, completing tasks) facilitate higher concurrent kindergarten literacy achievement scores (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003). Kindergartners who were better at self-regulation also showed greater development of early literacy skills. Fourth-graders who were classified as compliant (having few behavior problems) scored higher on all academic achievement tests than did students with classroom behavior problems (Finn, Pannozzo, & Voelkl, 1995). Whereas these studies address how positive behavior in the classroom is linked with concurrent academic achievement, other studies have found that positive behaviors (i.e., cooperation, empathy, enthusiasm, creativity) are also good predictors of future

academic achievement (e.g., Alexander, et al., 1993; Malecki & Elliot, 2002). Thus, previous research has demonstrated links between positive classroom behavior and both current and future academic achievement, thereby suggesting it would be beneficial for students to develop positive classroom behaviors at an early age.

Other researchers have examined the relationship between negative classroom behavior and academic performance and have consistently found that it is a good predictor of current academic achievement, but not children's future academic achievement. When preschoolers' behavior resulted in negative student-teacher relationships, poorer concurrent grades could be predicted. Future grades could not, however, be predicted from negative preschool behavior (DiLalla, Marcus, & Wright-Phillips, 2003). In first graders (Alexander et al., 1993), as well as in third graders (Malecki & Elliot, 2002), problem behavior such as acting out, hyperactivity, or fighting was negatively related to current academic achievement. The relationship with future achievement appears to be indirect. When problem behavior negatively affects current academic achievement it also may be indirectly affecting future academic achievement because children's learning is cumulative. Consequently, even if problem behavior in the classroom does not play a direct role, it could play some role in children's future academic success. The current study will examine how preschoolers' positive and negative classroom behavior influences academic achievement.

Although there are many studies on the relationship between an individual student's behavior and his or her academic achievement, less is known about peer influence on children's classroom behavior and children's academic achievement.

The few studies that have examined peer influence have determined it can be substantial. Summers and Wolfe (1977) found that elementary school students, who were randomly assigned to mixed-ability groups, were influenced by the groups in which they were placed. Their research showed that low achievers benefited academically from being in groups with higher achievers, but high achievers were not influenced either positively or negatively by being grouped with low achievers. Similarly, Zimmer and Toma (2000) found that low achievers were influenced more than high achievers when students in an elementary school or classroom were of mixed academic ability. They argued that as students' achievement increases, peer ability plays a less influential role in academic achievement. These findings suggest that peer influence may be an important factor to consider when examining academic achievement in children, especially for children who are at-risk for low academic achievement.

Recently, Henry and Rickman (2007) examined the influence of classroom peers on the development of preschoolers' school readiness skills. Using a sample of preschoolers who attended either Head Start, public pre-kindergarten, or private preschool, they found high peer ability had a positive effect on children's development in the domains of cognitive skills, pre-reading skills, and expressive language skills. Peer ability was measured by combining and averaging each child's standard scores on the developmental measures to get an overall score. A peer ability score was then created for each child by computing the average of overall scores in each classroom, each time leaving out the scores of the child for whom the score was being computed. Each child had a unique peer ability score. Developmental skills

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were measured using the Woodcock Johnson Applied Problems, the Peabody Picture Vocabulary Test, and the Woodcock Johnson Letter Word Recognition assessment (see Woodcock, McGrew, & Mayer, 2001), all of which are standardized measures of academic performance. Peers had a positive influence on preschoolers' literacy and language achievement.

One factor that may accentuate peer influence is the type of classroom model used by the teacher. In their discussion of findings, Henry and Rickman (2007) suggested that teachers' instructional practices can change the way that classmates influence each others' development. Marcon (1999) examined preschool teachers' beliefs and practices and found that children in classrooms where teachers used a child-initiated instructional approach had better communication, socialization, and motor skill development, as well as higher academic achievement in all areas. For the current study, preschool model and teachers' approach may be important factors to consider when examining peer influence on academic achievement. Classrooms where teachers use a child-initiated approach allow for more interaction among children because teachers who adopt this model also believe that children learn from peers. Peer ability in these classrooms may have a greater influence on achievement than in classrooms that are more teacher-directed. In academically-focused, teacher-directed classrooms children interact less with each other and engage in more whole-group instructional activities. In these teacher-directed classrooms, negative peer behavior, which interrupts the teacher and takes away from classroom instructional time, may have a greater negative influence on children's academic achievement.

Finally, gender differences have been examined by researchers in many aspects of education and young children's skill development. In kindergartners, girls have been found to have higher literacy achievement scores and fewer problem behaviors than boys (Ready, LoGerfo, Burkam, & Lee, 2005). Although differences in problem behaviors between boys and girls could not explain differences in literacy achievement scores, a large proportion of achievement differences were explained by girls' positive behaviors in the classroom (Ready, et al., 2005). In another kindergarten study, although boys more frequently displayed problem behavior they still scored higher than girls on mathematical assessments (Finn, et al. 1995). Overall, studies have shown differences in academic achievement and classroom behavior displayed by boys and girls. Previous findings were mixed regarding which types of behavior may influence achievement in boys and girls. For this reason, gender was included as a variable and controlled for in the current study.

The current study examined preschoolers to better understand (1) the relationship between behavior and academic achievement in a younger age group than had previously been studied, (2) the relationship between peer influence and preschoolers' behavior and achievement, and (3) the relationship between classroom model and peer influence on behavior and academic achievement in a preschool classroom. Five hypotheses were tested in this study.

1. It was hypothesized that individual child classroom behavior would be a significant predictor of child ability. Children who have more positive classroom behaviors would have higher ability scores, whereas children who have more negative classroom behaviors would have lower ability scores.

2. We sought to replicate and extend Henry and Rickman's (2007) earlier work. Using different standardized measures of academic achievement and behavior with another sample of at-risk preschoolers it was hypothesized that peer ability would be a significant predictor of individual child ability. Children whose peers had higher ability scores would have higher ability scores, whereas children whose peers had lower ability scores would have lower ability scores.

3. It was hypothesized that peer classroom behavior would be a significant predictor of individual child classroom behavior. Children whose peers had more positive classroom behaviors would have more positive classroom behaviors, whereas children whose peers had more negative classroom behaviors would have more negative classroom behaviors.

4. It was hypothesized that peer classroom behavior would be a significant predictor of child ability. Children whose peers had more positive classroom behaviors would have higher ability scores, whereas children whose peers had more negative classroom behaviors would have lower ability scores.

5. It was hypothesized that preschool model (as defined by teacher beliefs and practices) would make a significant difference in how peers' influenced one another within the classroom. In particular, the more academically-directed the classroom was, the more peer classroom behavior would predict child ability. The more child-initiated the classroom was, the more peer ability would predict child ability.

Method

Participants

Data for this study were drawn from an archival data set of a school readiness study. Use of this archival data set for the current study was approved by the Institutional Review Board (IRB #07-047). The sample of 214 predominately low-income preschoolers was enrolled in primarily publicly-funded school readiness programs which were located in a six-county metropolitan area of 1.3 million people (see Table 1). The majority of the sample resided in small town or rural communities. A small group of middle-income children included in the sample lived in an urban county and were enrolled in a corporate childcare center. Twenty-one classrooms, each with one teacher participating in the study, were assessed from a total of 11 centers.

Measures

Child literacy achievement. Each child was individually assessed using the third edition of the Test of Early Reading Ability (TERA-3; Reid, Hresko, & Hammill, 2001). Reliability for this assessment at age 4 is high, Cronbach's $\alpha = .97$, and for age 5, $\alpha = .95$. National norms were available for the TERA-3. The assessment is suitable for use with children ages 36 through 102 months. This measure takes approximately 15 minutes to administer to the age group involved in the current study (Reid et al., 2001). The TERA-3 is composed of three subtests. The alphabet subtest assesses knowledge and use of letters (i.e., recognizing letters, knowing the sounds associated with letters). The conventions subtest assesses knowledge and understanding of English in printed form (i.e., how to hold a book,

when to turn the page). The meaning subtest assesses knowledge of signs, logos, and whole words (i.e., street signs, popular food labels). There is a designated starting point, determined by the child's age, and testing continues until the child misses three consecutive questions. There are two forms of the TERA-3 that assess the same concepts using different questions. Children were randomly assigned to Form A or B for testing at the beginning of the school year. For testing at the end of the school year, they were administered the alternate form of the test. The two forms are highly correlated at age 4, $r = .95$, and age 5, $r = .90$. Raw scores were computed by totaling the number of correct items on each subtest. Raw scores (ranging from 1-20) were converted to standard scores based on child's age. A Reading Quotient standard score was computed from subtest standard scores and represented how the child performed on the assessment as a whole. To make comparisons with other measures, standard scores were converted to T-scores ($M = 50$, $SD = 10$) for data analysis in the current study.

Child mathematical achievement. Each child's mathematical ability was individually assessed using a pilot version of the Building Blocks-Number Assessment test (see Sarama & Clements, 2004). This test was developed for the National Science Foundation as part of the Building Blocks curriculum. Building Blocks is consistent with current national mathematics standards for young children and was chosen for this study because of its developmental appropriateness and comprehensiveness. The Building Blocks assessment is suitable for children ages 3-7 and is composed of five learning trajectories: (1) verbal counting, (i.e., forward, backward, starting at a given number) (2) recognition of small number and subitizing,

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(3) object counting and verbal counting strategies (i.e., producing groups, identifying mistakes made in counting), (4) comparing number and sequencing (i.e., quantity), and (5) composition of number and arithmetic (i.e., adding, subtracting). This measure takes approximately 30 minutes to administer to the age group involved in the current study. Based on a developmental progression of early mathematical ability, the questions are arranged in order of difficulty, starting with the easiest and moving to the most difficult within each trajectory. Children received separate scores for each of the five trajectories and continued in each trajectory until they missed three consecutive questions. Correct answers on all five trajectories were summed for a total raw math score. Raw scores were converted to z-scores for data analysis in the current study. This test was used with permission of the test author prior to publication. No national norms were available for the pilot version of this test. Because there were no alternate forms of this test, the same version was administered to each child at the beginning and end of the school year.

  Child classroom behavior. Classroom teachers completed the Devereux Early Childhood Assessment (DECA; Koralek, 1999; LeBuffe, 1998; Lebuffe & Naglieri, 1999) for each child at the beginning and end of the school year. The DECA's theoretical basis stems from Emmy Werner's work on resiliency (Werner, 1989). It assesses both protective factors and behavioral concerns. The DECA is a 37-item assessment that can be completed by either parents or teachers. Norms for the DECA were established and differed depending on rater (parent or teacher). The current study used teacher assessments because psychometric findings indicated teachers are more consistent raters than parents. The reliability for teacher-reported

behaviors is fairly high, Cronbach's $\alpha = .80$. The assessment can be used with children ages 2 through 5 years. The DECA includes four subscales: initiative, self-control, attachment, and behavioral concerns (see Table 2 for subscale descriptions and item examples). Initiative, self-control, and attachment are all considered protective factors. In completing the rating scale, teachers indicate how often individual children exhibited these attributes: never, rarely, occasionally, frequently, or very frequently. Teacher responses are scored as 0 to 4, respectively. All raw scores for all protective factors are summed to get a Total Protective Factor (TPF) raw score, ranging from 0 to 108. A high score indicates more protective factors. For data analysis in the current study raw scores were converted to T-scores ($M = 50$, $SD = 10$) so that comparisons could be made among measures.

Ten DECA items are devoted to the Behavioral Concerns subscale. This scale assesses a range of behaviors the child exhibits that are seen as problem behaviors in preschoolers. Teachers indicate how often individual children exhibited these behaviors: never, rarely, occasionally, frequently, or very frequently. Teacher responses are scored as 0 to 4, respectively. The 10-item scores are summed for a total Behavioral Concern (BC) raw score ranging from 0 to 40. A high score indicates more behavioral concerns. For data analysis in the current study raw scores were converted to T-scores ($M = 50$, $SD = 10$) so that comparisons could be made among measures.

Teacher beliefs and practices. At the beginning of the school year, teachers completed the Early Childhood Survey of Beliefs and Practices (ECSBP; see Marcon, 1999). Reliability for the ECSBP is high, Cronbach's $\alpha = .95$, as is the test-retest

reliability $r = .91$. This 14-item survey asks teachers to indicate on a 10 space continuum their "conceptions of early education…between opposing viewpoints" (Marcon, 1999, p. 360). Responses along the continuum are later scored from 1 to 10, with higher scores indicating a more child-initiated approach and lower scores reflecting a more teacher-directed approach. The ECSBP is theoretically based on work by Minuchin and Shapiro (1983) that differentiates early childhood education along five dimensions: (a) scope of developmental goals, (b) conception of how children learn, (c) amount of autonomy given to the child, (d) conception of teacher's role, and (e) provision of possibilities for learning from peers. On the ECSBP teachers were first asked to indicate their belief and then asked to indicate their actual classroom practice (see Appendix). Scale validity was confirmed by classroom observation and interviews with early childhood supervisors. In both cases, observers and supervisors were able to correctly identify classroom models that had been empirically determined by the ECSBP (Marcon, 1999). Additionally, Vartuli (1999) confirmed the validity of the self-report ECSBP by finding significant positive correlations between teacher-reported practices and actual observed practices in the classroom.

Procedure and Data Analysis

Data in the sample were drawn from an archival data set. No new data were collected for use in this analysis. In the archival data set from which a subsample was drawn, children had been individually assessed at their center by trained research assistants near the beginning and end of two consecutive preschool years. The archival data set included 2100 children. In the current study a subsample was

selected based on the following criteria: (1) each child must have been assessed in the initial school year of the archival study, (2) each child must be in a class where the teacher completed an ECSBP as well as have data for all measures at the beginning and end of the school year, including early literacy, mathematics, and behavior measures, and (3) each child must be in a classroom with five or more other children who were included in the study.

Identifying preschool model.   Marcon (1999) used a hierarchical cluster analysis of ECSBP responses to group teachers ranging from a child-initiated model to a more academically-focused, teacher-directed model. In the current study, cluster analysis was used to group 62 teachers in the original archival data set. The cluster analysis included a summed total belief and practices score and a discrepancy score that represented differences between beliefs and practices. In the current study, Ward's method of hierarchical cluster analysis provided a five cluster solution. From the five clusters that initially emerged, the current study selected three clusters for further examination (see Table 3). The two clusters that were eliminated included eight teachers. One cluster of four teachers was eliminated due to extreme discrepancy scores. Another eliminated cluster of four teachers had scores that fell between other clusters and did not fit well with either a child-initiated or a middle-of-the-road approach.

Of the 21 teachers in the subsample of the current study, 13 were given a classroom model designation based upon the cluster analysis. The three clusters used in the current study were classified as Child-Initiated (n = 1 class), Middle-of-the-Road (n = 8 classes), and Academically-Directed (n = 4 classes). Because the

subsample in the current study included only one child-initiated teacher, when analyzing the contribution of classroom model, only Middle-of-the-Road and Academically-Directed classrooms were included in the analysis. As described by Marcon (1999), Academically-Directed teachers are more likely to use direct instruction and teacher-directed learning experiences in the classroom. They tend to believe that the overall goal of preschool is academic preparation. Middle-of-the-Road teachers are more likely to use a combination of direct instruction and child-initiated learning. They tend to believe that the overall goal of preschool is a combination of academic preparation and socio-emotional growth.

Ability score calculation. For individual child ability, the standardized z-scores for each test of achievement, both early literacy and mathematics, were summed and averaged. This average was indicative of the child's overall ability. For peer ability, z-scores from both early literacy and mathematics measures of every participant in a particular classroom, (excluding the individual child for whom the score was being calculated) were summed. From this total, an average z-score was computed. This average z-score was used as the peer ability for each participant. Due to the nature of the calculation, each child's peer ability score was unique. In this study each child had an individual beginning-of-year and end-of-year ability score and a peer beginning-of-year and end-of-year ability score.

Behavior score calculation. Two separate scores of peer behavior were computed. A peer protective factors score was computed by summing and averaging the Total Protective Factor's (TPF) T-scores of every participant in a particular classroom (excluding the individual child for whom the score was being calculated).

A peer behavior score was computed by summing and averaging the Behavioral Concern's (BC) T-scores of every participant in a particular classroom (excluding the individual child for whom the score was being calculated). Due to the nature of the calculation, each child's beginning-of-year and end-of-year peer protective factors scores and peer behavioral concerns scores were unique.

Data analysis.   To test the first hypothesis that individual child classroom behavior would be a significant predictor of child ability, two hierarchical regressions were used. The first regression, after controlling for gender, was used to determine if TPF and BC at the beginning of the year would be significant predictors of beginning-of-the-year child ability. The second regression, after controlling for gender, was used to determine if TPF and BC at the beginning of the year would be significant predictors of end-of-the-year child ability.

To test the second hypothesis that peer ability would be a significant predictor of individual child end-of-year ability, hierarchical regression was used. After controlling for gender and individual child beginning-of-year ability, beginning-of-year and end-of-year peer ability were tested as potential predictors of end-of-year child ability.

To test the third hypothesis that peer classroom behavior would be a significant predictor of individual child classroom behavior, two hierarchical regressions were used. The first regression, after controlling for gender and beginning-of-year child TPF and BC, was used to determine if beginning-of-year and end-of-year peer TPF and BC would be significant predictors of end-of-year child TPF. The second regression, after controlling for gender and beginning-of-year child

TPF and BC, was used to determine if beginning-of-year and end-of-year peer TPF and BC would be significant predictors of end-of-year child BC.

To test the fourth hypothesis that peer classroom behavior would be a significant predictor of individual child ability, a hierarchical regression was used. After controlling for gender and beginning-of-year child ability, beginning-of-year and end-of-year peer TPF and BC were tested as potential predictors of end-of-year child ability.

To test the fifth hypothesis that classroom model would make a difference in how peers' influenced one another in the classroom, two hierarchical regressions were used. The first regression, after controlling for gender and beginning-of-year child ability, was used to determine if beginning-of-year and end-of-year peer ability, TPF, and BC would be significant predictors of end-of-year child ability in a Middle-of-the-Road classroom. The second regression, after controlling for gender and beginning-of-year child ability, was used to determine if beginning-of-year and end-of-year peer ability, TPF, and BC would be significant predictors of end-of-year child ability in an Academically-Directed classroom.

Results

Summary of Intercorrelations Among Variables of Interest

Zero-order correlations among all variables were conducted (see Table 4). A positive correlation was found between beginning-of-year child ability and end-of-year child ability, individual child TPF, and peer ability. A positive correlation was found between an individual child's beginning-of-year protective factors and beginning-of-year and end-of-year child ability. A negative correlation was found

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between individual child beginning-of-year behavioral concerns and beginning-of-year and end-of-year child ability. As hypothesized, findings indicate that children in this sample with more protective behaviors at the beginning of the school year tended to have higher beginning-of-year and end-of-year ability scores, while children who had more behavioral concerns at the beginning of the school year tended to have lower beginning-of-year and end-of-year ability scores.

Individual Child Behavior and Individual Child Ability

To test the hypothesis that individual child classroom behavior would predict individual child ability, hierarchical regression was used. The first analysis was used to predict beginning of the year individual child ability. Child gender was entered on step one and child protective factors and behavioral concerns at the beginning of the year were entered on step two (see Table 5). After controlling for gender, child classroom behavior at the beginning of the year significantly predicted child ability at the beginning of the year. Specifically, individual child positive classroom behaviors at the beginning of the year were a significant predictor of beginning-of-year child ability, whereas child negative classroom behaviors at the beginning of the year were not a significant predictor of beginning-of-year child ability.

A second hierarchical regression was used to determine if beginning-of-year child classroom behavior would predict end-of-year child ability. After controlling for gender, child classroom behavior at the beginning of the year was a good predictor of child ability at the end of the year. Specifically, individual child positive classroom behaviors at the beginning of the year were a significant predictor of end-of-year child ability, whereas child negative classroom behaviors at the beginning of

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the year were not a significant predictor of end-of-year child ability (see Table 6). The hypothesis was only partially supported by regression analysis. Children who initially had more positive classroom behavior tended to have higher end-of-year ability scores, however there were no significant findings relating to end-of-year child ability for children who initially had more negative classroom behavior.

Peer Ability and Individual Child Ability

To test the hypothesis that peer ability would predict individual child ability, hierarchical regression was used. After controlling for gender and beginning-of-year child ability, peer ability was a significant predictor of end-of-year child ability (see Table 7). Both beginning-of-year peer ability and end-of-year peer ability were significant predictors of end-of-year child ability. As hypothesized, children whose peers had higher end-of-year ability scores also had higher end-of-year ability scores, whereas children whose peers had lower end-of-year ability scores also had lower end-of-year ability scores. However, the negative relationship between beginning-of-year peer ability and end-of-year child ability was unexpected.

Peer Behavior and Individual Child Ability

To test the hypothesis that peer classroom behavior would predict individual child ability, hierarchical regression was used. After controlling for gender and beginning-of-year child ability, peer classroom behavior was not a significant predictor of end-of-year child ability (see Table 8). Contrary to the hypothesis, findings indicate that beginning-of-year child ability can predict end-of-year child ability, but beginning-of-year or end-of-year peer classroom behavior cannot predict end-of-year child ability.

Peer Behavior and Individual Child Behavior

To test the hypothesis that peer classroom behavior would predict individual child classroom behavior, hierarchical regression was used. After controlling for gender and individual child beginning-of-year TPF and BC, peer classroom behavior was a significant predictor of end-of-year child TPF scores (see Table 9). Only end-of-year peer TPF was a significant predictor of end-of-year child TPF scores, whereas beginning-of-year peer TPF, beginning-of-year peer BC, and end-of-year peer BC were not significant predictors. As hypothesized, children whose peers had more positive classroom behaviors also had more positive classroom behaviors. Specifically, children whose peers had higher TPF scores at the end of the year tended to have more positive classroom behaviors at the end of the year.

A second hierarchical regression was used to determine if peer behavior would predict individual child BC scores. After controlling for gender and individual child beginning-of-year TPF and BC, peer classroom behavior was a significant predictor of end-of-year child BC scores (see Table 10). Only end-of-year peer BC was a significant predictor of end-of-year child BC scores, whereas beginning-of-year peer TPF, end-of-year peer TPF, and beginning-of-year peer BC were not significant predictors. As hypothesized, children whose peers had more negative classroom behaviors also had more negative classroom behaviors. Again, children whose peers had higher BC scores at the end of the year tended to have more negative classroom behaviors at the end of the year.

To test the hypothesis that classroom model would make a difference in how peers influence one another in the classroom, hierarchical regression was used. In Middle-of-the-Road classrooms, after controlling for gender and beginning-of-year child ability, neither peer ability nor peer classroom behavior were significant predictors of end-of-year child ability (see Table 11). In Academically-Directed classrooms, after controlling for gender and beginning-of-year child ability, peer ability and beginning-of-year peer TPF were significant predictors of end-of-year child ability. Findings indicated that in Academically-Directed classrooms, but not Middle-of-the-Road classrooms, beginning-of-year peer TPF and peer ability throughout the year significantly predict end-of-year child ability, above and beyond gender and beginning-of-year child ability.

Discussion

The current study examined the relationship between academic achievement and behavior in the preschool classroom. Similar to previous research (Alexander et al., 1993; Finn et al., 1995; Howse et al., 2003), the current study indicates that individual child classroom behavior can predict individual child ability. Children's protective factors at the beginning of the year emerged as a significant predictor of end-of-year child ability, whereas behavioral concerns at the beginning of the year were not significant predictors of end-of-year child ability.

Peers also had an influence on children's ability and behaviors in the classroom. Findings indicated that in the overall sample, peer ability at both the beginning of the year and the end of the year emerged as significant predictors of

end-of-year child ability. Overall, children whose peers had higher ability scores tended to have higher ability scores. Findings also indicated that peer classroom behaviors were significant predictors of individual child classroom behaviors, but were not significant predictors of individual child ability. Individual children who were in classrooms with peers who by the end of the year had many protective factors also had higher protective factors at the end of the school year than children who were in classrooms with peers who had fewer protective factors. Similarly, children who were in classrooms with peers who by the end of the year had many behavioral concerns also had higher behavioral concerns at the end of the school year than children who were in classrooms with peers who had fewer behavioral concerns.

An exception to findings that peer behavior could not predict child ability was seen in Academically-Directed classrooms. In these classrooms where teachers used more whole group instruction and placed an emphasis on academic preparation, peers had a significant influence. In Academically-Directed classrooms, beginning-of-year and end-of-year peer ability, along with beginning-of-year peer TPF, emerged as significant predictors of end-of-year child ability. In contrast, neither peer ability nor peer behavior were significant predictors in the Middle-of-the-Road classrooms. It seems that peers played a more influential role in child ability within the Academically-Directed classrooms.

There were, of course, limitations involved in the current study. In the sample from the current study, there was not a lot of variability in extent of behavioral concerns between the preschoolers. In a sample with higher levels of behavior problems, we may find a stronger relationship between behavioral concerns and early

academic achievement. Another limitation is the lack of a child-initiated model in the current study. The nature of the child-initiated classroom allows for more small-group time and interaction among the children. It seems reasonable that, in a classroom with this format, there would be a peer influence on children's academic achievement. Future research should examine the effect of a strong child-initiated classroom model on peer behavior and peer ability and how these influence children's classroom behavior and academic achievement.

The relationship found between a child's initial protective behaviors and his or her academic achievement is another important connection for additional study. This relationship indicates that socio-emotional development is an important contributor to academic achievement in this age group. In the current study, protective behaviors such as being appropriately attached, showing initiative, and maintaining self-control all yielded higher academic achievement scores. McClelland, Acock, and Morrison (2006) found that self-regulatory behaviors were central to school readiness success.

The results of the current study could influence how a preschool teacher structures his or her classroom and lesson plans, in an effort to facilitate these appropriate behaviors at such a young age. Because previous research has shown a connection between positive classroom behaviors and academic success in a much older sample, the development of positive, protective classroom behaviors will surely be an asset to every child as they continue on the path to further education.

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Table 1

Sample Demographics

		Overall N = 214	Head Start n = 166	Childcare n = 48
Age (in months)	Range *M (SD)*	36-61 49.1 (6.9)	37-61 50.1 (6.7)	36-60 45.8 (6.8)
Gender	Boys Girls	54% 46%	50% 50%	67% 33%
# Centers		11	9	2
# Classes		21	17	4
Average class sample size		10.1	9.7	12

Table 2

Description of DECA Subscales and Examples

DECA Scale	Description	Item Example
Protective Factors	Behaviors that lead to resiliency in preschoolers	
Initiative	Uses independent thought, active learner	Child approaches and begins play with others.
Self-Control	Handles frustration appropriately	Openness to options that are not the child's first preference.
Attachment	Appropriately affectionate and trusting of familiar adults	Child is warm towards known adult figures.
Behavioral Concerns	Actions that are viewed as problem behaviors (both acting out and withdrawal) in preschoolers	Child has tantrums.

Child is easily distracted. |

Table 3

Preschool Teachers' Responses to Early Childhood Survey of Beliefs and Practices

Item	Beliefs				Practices			
	M	*SD*	*Mdn*	*Mode*	*M*	*SD*	*Mdn*	*Mode*
Goal								
Model CI	8.36	1.57	8	8	8.27	1.62	8	8, 10
Model M	6.54	1.72	6	6	6.10	1.67	6	8
Model AD	4.85	1.82	5	5	4.86	1.20	5	5
How children learn								
Model CI	9.54	0.69	10	10	9.46	0.82	10	10
Model M	8.22	1.31	8	8	7.78	1.51	8	8
Model AD	5.59	2.06	6	5	6.00	2.24	6	5
Who initiates								
Model CI	8.81	1.53	9	10	8.46	1.51	9	8
Model M	5.50	1.95	6	6	6.01	1.78	6	6
Model AD	4.46	2.47	5	5	4.62	1.94	5	5
Teacher role								
Model CI	9.72	0.65	10	10	9.00	1.55	10	10
Model M	6.99	1.87	7	6	6.95	1.71	6.5	6
Model AD	5.89	1.89	5	5	5.73	2.40	5	5
Learning Format								
Model CI	7.00	2.68	7	6, 10	5.73	2.69	6	6
Model M	5.43	1.93	6	6	5.01	1.75	5	6
Model AD	4.46	2.63	5	5	3.77	1.87	5	5
Peer learning								
Model CI	7.36	3.35	9	9, 10	8.00	2.61	9	8, 9, 10
Model M	7.08	1.37	7	6	7.22	1.38	7	6
Model AD	6.19	1.75	5	5	6.46	2.10	5.5	5
Resource control								
Model CI	9.36	1.03	10	10	9.32	1.01	10	10
Model M	7.43	1.44	7	6	7.41	1.57	7	6
Model AD	6.62	2.60	7	5	6.31	2.66	5	5

Note. Possible scores ranged from 1-10. CI = child-initiated classes (n = 11); M = middle-of-the-road classes (n = 38); AD = academically directed classes (n = 13).

Table 4

Intracorrelations and Intercorrelations Between Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. BY Child Ability	--	.71*	.29*	.23*	-.24*	-.26*	.39*	.30*	.07	-.04	.01	-.06
2. EY Child Ability		--	.26*	.22*	-.23*	-.31*	.27*	.30*	.08	-.05	-.03	-.12
3. BY Child TPF			--	.65*	-.57*	-.47*	.09	.11	.49*	.44*	-.18*	-.25*
4. EY Child TPF				--	-.40*	-.56*	.05	-.07	.47*	.54*	-.16*	-.19*
5. BY Child BC					--	.59*	.00	-.03	-.16*	-.11	.42*	.33*
6. EY Child BC						--	-.03	-.16*	-.25*	-.18*	.38*	.51*
7. BY Peer Ability							--	.77*	.22*	.01	-.05	-.14*
8. EY Peer Ability								--	.25*	-.03	-.11	-.33*
9. BY Peer TPF									--	.81*	-.43*	-.49*
10. EY Peer TPF										--	-.34*	-.41*
11. BY Peer BC											--	.73*
12. EY Peer BC												--

Note. BY = Beginning-of-Year; EY = End-of-Year; TPF = Total Protective Factors; BC = Behavioral Concerns; * $p < .05$.

Table 5

Summary of Hierarchical Regression Analysis Predicting Beginning-of-Year Child Ability from Beginning-of-Year Child Behavior Variables

Variable	B	$SE\ B$	β
Step 1			
Gender	.007	.104	.005
Step 2			
Gender	-.051	.100	-.033
B-Y Child TPF	.023	.008	.240*
B-Y Child BC	-.009	.006	-.109

Note. B-Y = Beginning-of-Year; TPF = Total Protective Factors; BC = Behavioral Concerns; $R^2 = .000$ for Step 1; $\Delta R^2 = .098$ for Step 2 ($p < .05$).
* $p < .05$.

Table 6

Summary of Hierarchical Regression Analysis Predicting End-of-Year Child Ability from Beginning-of-Year Child Behavior Variables

Variable	B	$SE\ B$	β
Step 1			
Gender	.053	.105	.035
Step 2			
Gender	.001	.102	.001
B-Y Child TPF	.019	.008	.197*
B-Y Child BC	-.009	.006	-.116

Note. B-Y = Beginning-of-Year; TPF = Total Protective Factors; BC = Behavioral Concerns; R^2 = .001 for Step 1; ΔR^2 = .077 for Step 2 ($p < .05$).
* $p < .05$.

Table 7

Summary of Hierarchical Regression Analysis for Peer Ability Variables Predicting End-of-Year Child Ability

Variable	B	$SE\ B$	β
Step 1			
Gender	.048	.074	.031
B-Y Child Ability	.712	.049	.705*
Step 2			
Gender	.055	.073	.036
B-Y Child Ability	.713	.052	.706*
B-Y Peer Ability	-.352	.149	-.184*
E-Y Peer Ability	.503	.161	.236*

Note. B-Y = Beginning-of-Year; E-Y = End-of-Year; R^2 = .498 for Step 1 ($p < .05$); ΔR^2 = .022 for Step 2 ($p < .05$).
* $p < .05$.

Table 8

Summary of Hierarchical Regression Analysis for Peer Behavior Variables Predicting End-of-Year Child Ability

Variable	B	$SE\ B$	β
Step 1			
Gender	.048	.074	.031
B-Y Child Ability	.712	.049	.705*
Step 2			
Gender	.070	.074	.046
B-Y Child Ability	.689	.050	.682*
B-Y Peer TPF	.019	.014	.124
E-Y Peer TPF	-.022	.011	-.164
B-Y Peer BC	.010	.010	.068
E-Y Peer BC	-.017	.009	-.143

Note. B-Y = Beginning-of-Year; E-Y = End-of-Year; TPF = Total Protective Factors; BC = Behavioral Concerns; R^2 = .498 for Step 1 ($p < .05$); ΔR^2 = .018 for Step 2 ($p = .106$).
* $p < .05$.

Table 9

Summary of Hierarchical Regression Analysis for Peer Behavior Variables Predicting End-of-Year Child Total Protective Factors

Variable	B	$SE\ B$	β
Step 1			
Gender	2.430	.886	.142*
B-Y Child TPF	.649	.067	.608*
B-Y Child BC	-.037	.056	-.042
Step 2			
Gender	2.537	.814	.148*
B-Y Child TPF	.415	.075	.388*
B-Y Child BC	-.154	.060	-.173*
B-Y Peer TPF	-.063	.155	-.036
E-Y Peer TPF	.662	.124	.431*
B-Y Peer BC	.108	.119	.069
E-Y Peer BC	.076	.095	.058

Note. B-Y = Beginning-of-Year; E-Y = End-of-Year; TPF = Total Protective Factors; BC = Behavioral Concerns; $R^2 = .441$ for Step 1 ($p < .05$); $\Delta R^2 = .107$ for Step 2 ($p < .05$).
* $p < .05$.

Table 10

Summary of Hierarchical Regression Analysis for Peer Behavior Variables
Predicting End-of-Year Child Behavioral Concerns

Variable	B	$SE\ B$	β
Step 1			
Gender	-3.052	1.117	-.146*
B-Y Child TPF	-.233	.084	-.178*
B-Y Child BC	.524	.070	.483*
Step 2			
Gender	-4.080	1.008	-.195*
B-Y Child TPF	-.204	.093	-.156*
B-Y Child BC	.431	.074	.398*
B-Y Peer TPF	-.040	.192	-.019
E-Y Peer TPF	.176	.154	.094
B-Y Peer BC	-.271	.147	-.141
E-Y Peer BC	.787	.118	.489*

Note. B-Y = Beginning-of-Year; E-Y = End-of-Year; TPF = Total Protective
Factors; BC = Behavioral Concerns; R^2 = .404 for Step 1 ($p < .05$); ΔR^2 = .131
for Step 2 ($p < .05$).
* $p < .05$.

Table 11

Summary of Hierarchical Regression Analysis by Model for Peer Variables Predicting End-of-Year Child Ability

	Middle-of-the-Road Classroom Model[a]			Academically-Directed Classroom Model[b]		
Step 1	B	SE	β	B	SE	β
Gender	.291	.140	.182*	-.206	.163	-.136
B-Y Child Ability	.730	.096	.668*	.767	.109	.762
Step 2						
Gender	.245	.139	.154	-.081	.117	-.053
B-Y Child Ability	.674	.101	.616*	.917	.103	.910*
B-Y Peer Ability	.023	.404	.009	4.973	.834	2.813*
E-Y Peer Ability	-.138	.476	-.065	-6.209	.965	-2.496*
B-Y Peer TPF	-.044	.047	-.147	.328	.089	1.273*
E-Y Peer TPF	-.020	.019	-.153	.020	.060	.090
B-Y Peer BC	.075	.044	.367	-.047	.062	-.181
E-Y Peer BC	-.037	.028	-.191	.036	.069	.108

Note. B-Y = Beginning-of-Year; E-Y = End-of-Year; TPF = Total Protective Factors; BC = Behavioral Concerns; [a]R^2 = .484 for Step 1 ($p < .05$); ΔR^2 = .080 for Step 2 ($p = .102$). [b]R^2 = .605 for Step 1 ($p < .05$); ΔR^2 = .261 for Step 2 ($p < .05$). *$p < .05$.

EARLY CHILDHOOD SURVEY OF BELIEFS AND PRACTICES

Instructions: Each statement on this survey represents a continuum of two different thoughts or ideas regarding Early Childhood Education. Mark an "X" <u>anywhere</u> on the line that best represents your conception of Early Childhood Education. Because situations often affect how we implement our actual beliefs, this survey asks first about your belief and then about your actual classroom situation.

* I BELIEVE THE MOST IMPORTANT DEVELOPMENTAL GOAL OF PRESCHOOL IS:

academic
preparation ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
social and emotional growth

My Preschool classroom is most effective in fostering:
academic
preparation ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
social and emotional growth

* I BELIEVE THAT PRESCHOOL CHILDREN LEARN BEST THROUGH:

direct
instruction ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
active experience

Children in my Preschool classroom are learning predominantly through:
direct
instruction ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
active experience

* I BELIEVE THAT ACTIVITIES IN A PRESCHOOL CLASSROOM SHOULD BE:

teacher
initiated ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
child initiated

The activities in my Preschool classroom are typically:
teacher
initiated ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
child initiated

* I BELIEVE THAT MY ROLE AS A TEACHER OF PRESCHOOL CHILDREN IS TO:

dispense
knowledge ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
facilitate learning

In my present Preschool classroom I am more likely to:
dispense
knowledge ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
facilitate learning

* I BELIEVE THAT PRESCHOOL PROGRAMS SHOULD USE A LEARNING FORMAT THAT IS:

group
oriented ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ individualized
one-to-one

* My Preschool classroom is typically:
group
oriented ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ *individualized*
one-to-one

* I BELIEVE THAT PRESCHOOL CHILDREN IN A GROUP LEARN EFFECTIVELY THROUGH INTERACTION WITH:

adults ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ peers

* Most learning in my Preschool classroom takes place through interactions with:
adults ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ *peers*

* I BELIEVE THAT CLASS MATERIALS AND RESOURCES FOR PRESCHOOL CHILDREN SHOULD BE:

teacher
distributed ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ child
accessible

* In my Preschool classroom materials and resources are:

teacher
distributed ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ *child*
accessible

BIRTH

Winchester, Virginia

EDUCATION
University of North Florida, 2001-2005
Bachelor of Science in Psychology
University of North Florida, 2005-2007
Master of Arts in General Psychology
University of Illinois-Urbana-Champaign, 2007-
Doctoral Candidate in Educational Psychology Program

EMPLOYMENT
University of North Florida Psychology Department, 2005-2007
Research Assistant
University of North Florida Psychology Department, 2006-2007
Research Methods Lab Instructor