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Impact of Teacher Demographic, Knowledge, and Instructional Variables on Children's Language Development

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Impact of Teacher Demographic, Knowledge, and Instructional Variables on Children’s Language Development

Donna Ellis

A dissertation submitted to the Doctoral Program Faculty in Educational Leadership in partial fulfillment of the requirements for the degree of

Doctor of Education

UNIVERSITY OF NORTH FLORIDA
COLLEGE OF EDUCATION AND HUMAN SERVICES
October 2011
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This doctoral dissertation is dedicated in memory of my uncle,

Robert Ellis
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Abstract

The purpose of the present study was to determine whether a set of teacher demographic, knowledge, and instructional variables is related to preschool children’s literacy development. Specifically, the study investigated how these teacher variables impact children’s language development scores on the four subscales of the Preschool Language Assessment Instrument, Second Edition (PLAI2) and the four subscales of the Test of Language Development – Primary, Fourth Edition (TOLD-P:4). There were two major research questions in the study: (a) Will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a teacher knowledge questionnaire (TKQ) correlate with the TOLD-P:4 language assessment subscales of relational vocabulary, syntactic understanding, sentence imitation, and morphological completion? (b) Will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a TKQ correlate with the PLAI2 language assessment subscales of matching, selective analysis, reordering, and reasoning?

Results indicated no noteworthy correlations between the predictor variable set and the subtests of the TOLD-P:4; hence, the
variable relationships posited in research question 1 were not supported by the data. Results for research question 2 indicated support for the variable relationships posited. Specifically, canonical correlation yielded two roots of noteworthy size ($R_c^2$ values = .19 and .09 for roots 1 and 2, respectively). Canonical structure coefficients indicated positive correlation between the teacher predictor variables of education, experience, knowledge, and the CLASS domain of emotional support with students’ scores on the PLAI2. At the same time, the amount of teaching experience that teachers had in the childcare industry was found to be negatively correlated to PLAI2 subscale scores. Findings are discussed relative to the literature on professional development.
CHAPTER I
INTRODUCTION

Over the past decade a great deal of attention has been given to increased performance and accountability measures of both teachers and students. The No Child Left Behind Act of 2001 has resulted in greater academic pressure for schools and for individual students at young ages (Silliman, Wilkinson, & Brea-Spahn, 2004). The pre-kindergarten year is becoming increasingly important in setting a good foundation for academic success. Children are now expected to arrive in kindergarten with some knowledge of early literacy basics. These new expectations have made the role of the pre-kindergarten teacher more important than ever before. Unfortunately, although public spending in early childhood education has substantially increased in recent years, this additional funding has mainly fueled expansion, not quality enhancement to help programs attract, compensate, and retain well-educated teachers and administrators (French, 2010).

In response to the increase in performance and accountability measures of pre-kindergarten students, researchers have been
investigating the effects of early literacy programs (e.g., Connor, Morrison, & Slowminski, 2006; Yeh, 2003). Numerous factors, including teacher preparedness and classroom quality, can influence children’s language development and their ability to learn early literacy skills. Likewise, classroom quality in early education programs and how it relates to student outcomes are becoming topics of increasing interest.

Conceptual Framework

Many studies now indicate that teachers’ effective implementation of instruction through interactions with children is the mechanism through which children learn best (Hamre & Pianta, 2005; Howes et al., 2008; National Council on Teacher Quality, 2004; National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network, 2000). In the past, several researchers have examined teachers’ education and classroom quality and have come up with inconsistent results (Early et al., 2007; Tout, Zaslow, & Berry, 2005). There are many other factors that come into play when examining quality in the classroom such as prior experience, teacher knowledge, teacher compensation, parent fees, motivation, supervision, working conditions, adult to child ratios, emotional support, classroom organization, and instructional support.
(Doherty, Forer, Lero, Goelman, & LaGrange, 2006; Pianta, LaParo, & Hamre, 2009; Torquati, Raikes, & Huddleston-Casas, 2007. Providing professional development to teachers, including mentoring and feedback, is also an important ingredient to increasing quality in the pre-kindergarten classroom (Landry, Anthony, Swank, & Monseque-Bailey, 2009).

Another key component to this study is pre-kindergarten children’s language development in relation to their early literacy skills. Vocabulary size and rate of growth are central to the development of early literacy skills, specifically reading and writing, and therefore the importance of developing children’s vocabulary in preschool cannot be overemphasized (Roskos et al., 2008).

Figure 1 presents a concept map that links pre-kindergarten teachers to student outcomes and professional development. The pre-kindergarten teachers may or may not have teaching experience, essential teaching skills (as described by Good & Brophy, 2008; Shuell, 1996), a general level of knowledge regarding early childhood education, or a degree in early childhood education. How do these characteristics impact student scores on a language development assessment, and what are the professional development implications? Desimone (2009) proposed a core conceptual framework for studying the effects of professional development on teachers and students. The
concept map in Figure 1 incorporates the Desimone core features, namely content focus, active learning, coherence, duration, and collective participation. When teachers experience effective professional development, teachers’ knowledge and skills increase and/or their attitudes and beliefs change. Teachers use their new knowledge, skills, attitudes, and beliefs to improve the content of their instruction. The instructional changes then foster increased student learning.

In summary, as noted in the top section of the conceptual framework diagram (Figure 1), it is posited that pre-kindergarten teachers’ characteristics (i.e., experience, knowledge, and teaching skills) will impact student language development assessment scores. This portion of the framework will be tested via the correlational analyses proposed in the present study. The lower section of the diagram, beginning with “professional development,” depicts how one might use the results of data analyses, such as those provided herein, to plan professional development activities for teachers based on their ability to impact student learning. As the conceptual framework diagram illustrates, the goal of professional development is to increase teachers’ knowledge and skills resulting in quality instruction and improved student learning. To that end, the framework poses the specific question: If it is possible to determine how children are
learning in relation to teacher characteristics, then what are the implications for teachers’ professional development? For example, if a group of teachers is lacking in knowledge and essential teaching skills and the children in their classrooms are scoring low on assessments, a series of professional development workshops could focus on early literacy basics, language development, teacher attitudes, the importance of questioning, and classroom organization.

Purpose

The purpose of the present study was to determine whether a set of teacher demographic, knowledge, and instructional variables is related to preschool children’s literacy development. Specifically, the study investigated how these teacher variables impact children’s language development scores on the four subscales of the Preschool Language Assessment Instrument, Second Edition (PLAI2; Blank, Rose, & Berlin, 2003) and the four subscales of the Test of Language Development – Primary, Fourth Edition (TOLD-P:4; Newcomer & Hammill, 2008). Data are interpreted in light of professional development implications for pre-kindergarten teachers.
Figure 1. Conceptual Framework

Pre-Kindergarten Teachers
- may or may not have

Experience
- how long they have been teaching

Essential Teaching Skills
(Good & Brophy, 2008; Sharma, 1996)
- attitudes
- feedback
- organization
- questioning
- focus
- review & closure

Knowledge
- general knowledge
- level of education

Student Assessment Scores on Language Development

Professional Development
- how does it relate to

Core Features of Professional Development
(Desimone, 2009)
- content focus
- duration
- active learning
- collective participation
- coherence

Increased Teacher Knowledge and Skills;
Change in Attitudes and Beliefs
- results in

Change in Instruction
- results in

Improved Student Learning
Research Questions

The following quantitative research questions were addressed in the present study:

1. Will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a teacher knowledge questionnaire (TKQ) correlate with the TOLD-P:4 language assessment subscales of relational vocabulary, syntactic understanding, sentence imitation, and morphological completion?

2. Will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a TKQ correlate with the PLAI2 language assessment subscales of matching, selective analysis, reordering, and reasoning?

Methodological Design

The participants for the present study were drawn from the population of teachers and pre-kindergarten students in Duval County (FL) Public Schools who participated in a joint study by the Early
Learning Coalition (ELC) and the Florida Institute of Education (FIE) during the 2010/2011 school year. The study participants were Duval County teachers \( n=19 \) and the pre-kindergarten children in their classrooms \( n=95 \) whose parents provided permission for their children to participate in the study. With permission from FIE, I used archived data (scores from CLASS, TOLD-P:4, PLAI2, and answers on a teacher knowledge questionnaire) collected during Spring 2011.

FIE provided intense training on the three instruments for the data collection team, of which I was a part. A full day of training was provided for both the PLAI2 and the TOLD-P:4. After training was complete, the assessors were tested to ensure training participants’ scoring was similar to that of the trainers. The CLASS training was 2 full days and then each assessor had to pass an online CLASS certification to become a certified CLASS observer. The certification requirements are challenging because the assessor must watch 5 videos, score them, and be within one point of the master coders 80% of the time.

I have past experience with the administration of assessments including the Test of Preschool Early Literacy (TOPEL), Get Ready to Read! (GRTR), Get it, Got it, Go (GGG), and the Assessment of Language and Literacy (ALL).
Data Analysis

The present study utilized descriptive correlational methods to investigate the relationship between teacher variables and preschool student outcomes. Multivariate data-analytic techniques were used to examine the relationships that exist between teacher variables and student outcomes on two different language development assessments. Canonical correlation analysis was used to determine the efficacy of a series of variables (CLASS scores, level of education, years teaching pre-kindergarten, and answers on a TKQ) in predicting students’ subscale scores on the language development assessments. Canonical correlation analysis is an appropriate technique as it honors the multivariate reality of the research design and allows for simultaneous consideration of multiple predictor and multiple dependent variables within the multivariate context in which they occur (Thompson, 2000).

Significance of the Study

The present study’s goal was to enhance the existing body of research on language development. An important implication of the study was that it provides additional understanding of student outcomes by examining the correlations among the teachers’ experience, education, knowledge, and scores on the CLASS
observational tool. The benefits of identifying specific predictor variables that contribute to enhanced student outcomes are immeasurable for the future of children and to the field of language development. Finally, the present study may be useful in informing educational leaders regarding standards for early childhood education programs, curriculum development, and practices for hiring pre-kindergarten teachers.

Definition of Terms

The following terms are defined as they were used in this study. Most definitions came from the examiner’s manuals of the Test of Language Development (TOLD; Newcomer & Hammill, 2008) and Preschool Language Assessment Instrument (PLAI; Blank et al., 2003).

**Discourse**
The back-and-forth exchange of language when engaging in conversation (Blank et al., 2003).

**Relational Vocabulary**
A child’s ability to understand and orally express the relationships between two spoken stimulus words (Newcomer & Hammill, 2008).

**Syntactic Understanding**
A child’s ability to comprehend the meaning of sentences (Newcomer & Hammill, 2008).

**Sentence Imitation**
A child’s ability to imitate English sentences (Newcomer & Hammill, 2008).
<table>
<thead>
<tr>
<th><strong>Morphological Completion</strong></th>
<th>A child’s ability to recognize, understand, and use common English morphological forms. It places particular emphasis on their knowledge of affixes (Newcomer &amp; Hammill, 2008).</th>
</tr>
</thead>
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<tr>
<td><strong>Matching</strong></td>
<td>A child’s ability to name objects and to point to common objects when named (Blank et al., 2003).</td>
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<tr>
<td><strong>Selective Analysis</strong></td>
<td>A child’s ability to respond to questions about specific attributes of objects and to integrate several elements into a unified idea (Blank et al., 2003).</td>
</tr>
<tr>
<td><strong>Reordering</strong></td>
<td>A child’s ability to respond to questions that require information beyond salient perceptual cues; for example, a child is shown two different objects and asked to describe how they are similar (Blank et al., 2003).</td>
</tr>
<tr>
<td><strong>Reasoning</strong></td>
<td>A child’s ability to reason about features of objects and what may, might, could, or would happen to materials under specified conditions (Blank et al., 2003).</td>
</tr>
<tr>
<td><strong>Canonical Correlation</strong></td>
<td>A multivariate correlational analytic technique that is employed to study relationships between two variable sets when each variable set consists of at least two variables (Thompson, 2000).</td>
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Organization of the Study

This dissertation is organized into five chapters. Chapter 1 introduced the study and included the background, conceptual framework, research questions, methodology, significance, and organization of the study. Chapter 2 contains a comprehensive review of the literature on early childhood programs, teacher preparedness, language development, classroom quality, and professional development. Chapter 3 outlines the research methodology of the study including the conceptual design, a description of the participants, the ethical considerations, the instruments, research procedures, data analysis, and the limitations of the study. Chapter 4 outlines the findings of the study including demographic data, descriptive statistics, bivariate correlations, reliability analysis, and canonical correlation analysis. Chapter 5 provides a summary, conclusions, and recommendations.
CHAPTER II
REVIEW OF THE LITERATURE

This chapter contains a comprehensive review of the literature on early childhood education, language development, classroom quality, and the education of early childcare workers. The literature review provides a foundation to address the following question: Will there be a statistically significant (p < .05) relationship between the predictor variable set of emotional support, classroom organization, instructional support, level of education, years experience teaching pre-kindergarten, and answers on a teacher knowledge questionnaire and the outcome variable set consisting of subscale scores on the PLAI2 and the TOLD-P:4 language development assessments?

The review is structured as follows: First, I present a review of early childhood education as it relates to early literacy and language development. Second, I present a comprehensive overview of the conceptual framework of classroom quality in the pre-kindergarten classroom. Next is a discussion of literature on the controversial issue
of level of education for pre-kindergarten teachers, followed by a discussion of the topic of professional development.

Overview of Early Childhood Education

The importance of early language development and the assessment of preschool classroom quality are topics of increasing interest across the nation. Increased performance and accountability measures through the No Child Left Behind (NCLB) Act of 2001 have resulted in greater academic pressure for schools and for individual students at young ages (Silliman et al., 2004). Early literacy programs at the pre-kindergarten level are increasingly being implemented to increase performance of children before they begin formal schooling in their kindergarten year, and many states (e.g., Florida) have developed permanent educational funding for pre-kindergarten.

Dickinson, McCabe, and Essex (2006) argued that the years between three and five are especially important for long-term development: “We substantiate this claim with developmental research from three broad areas: (1) early literacy, (2) social and emotional development, and (3) brain development” (p. 11). The National Association of School Psychologists (2005) argued that early identification of developmental and learning problems in infants and
young children (ages birth through five years) is essential because of young children's broad and rapid development. Intervention services for these children's psychological and developmental difficulties are essential, beneficial, and cost-effective (e.g., Barnett, 1993; Dawson & Osterling, 1997; Schweinhart, Barnes, Weikart, Barnett, & Epstein, 1993).

The No Child Left Behind (NCLB) Act of 2001, section 1221, provided support for local efforts to enhance the early language, literacy, and pre-reading development of preschool age children, particularly those from low-income families, through strategies and professional development that are grounded in scientifically based reading research.

Several researchers over the years have supported the idea that well-designed and well-implemented early education programs can benefit children, particularly those who are socially and economically disadvantaged and likely to enter kindergarten behind their advantaged peers in terms of their reading skills (Barnett, 1995; Heckman, Layne-Farrar, & Todd, 1996; Reynolds, Magnusson, & Ou, 2006). Takanishi and Bogard (2007) stated:

The benefits from such programs include increased academic achievement, greater success in school, less grade retention, fewer placements in special education, higher graduation rates,
higher employment rates and earnings, lower rates of crime, greater government revenues, and lowered governmental spending for criminal justice and public benefit systems. (p. 41)

Conversely, Clifford et al. (2005) stated that observational studies of state-funded pre-kindergarten programs indicate that most are of mediocre quality and that the benefits of economic success and community development show the “potential” of high quality programs and should not be considered typical for all early education programs (Takanishi & Bogard, 2007). Extended early intervention programs that span pre-kindergarten through elementary school is the key to sustaining gains that can have an impact on children’s academic success and make a difference in their adult years (Reynolds, 2003).

The public’s multi-billion-dollar investments in pre-K education are largely based on the presumption that the positive returns (e.g., increased educational attainment and income status for participants) outweigh the initial economic investment, with cost-benefit analyses lending support to this point (Lynch, 2004). As Meisels (2006) suggested, policymakers are pressing for greater evidence showing that children who attend pre-K programs are indeed learning and that public funds are being used wisely. The need for accurate information
is extremely important as budgets are being cut and funding of pre-K programs has been intensely scrutinized.

The National Association for the Education of Young Children (NAEYC) and the National Association of Early Childhood Specialists in State Departments of Education (NAECS/SDE) have maintained that early learning standards are a valuable part of a comprehensive, high-quality system of services for young children only if they

(1) Emphasize significant, developmentally appropriate content and outcomes;
(2) Are developed and reviewed through informed, inclusive processes;
(3) Are implemented and assessed in ways that support all young children's development; and
(4) Are accompanied by strong supports for early childhood programs, professionals, and families. (NAEYC & NAECS/SDE, 2009)

I agree that the early learning standards are a valuable part of a comprehensive, high quality system of services for young children and that early literacy and language development should be emphasized as the main building blocks of children’s academic development from birth to age 5.
Language Development

Language development in the early years plays an important role in early literacy and social skills. The social-interactionist theories of language acquisition view it as a psychobiological process to which "frequent, relatively well-tuned, affectively positive verbal interactions" are critical for supporting language growth in early childhood (Chapman, 2000, p. 43). Research confirms the importance of language interaction and its profound influences on vocabulary development and reading proficiency (Dickinson & Neuman, 2006).

When decoding an alphabetic language, children must identify the individual, meaningless squiggles as letters, learn the letters and their associated sounds, blend the individual sounds into words, and then access the meanings the words encode (Dickinson, Golinkoff & Hirsh-Pasek, 2010). Adams (1996) suggested that students must appreciate the alphabetic principle (that each letter has a corresponding sound) to become proficient readers. Meanwhile, Lonigan and Shanahan (2010) have found that some oral language measures are more closely related to reading than others with regard to comprehension and decoding.

An instructional focus on vocabulary alone in the pre-kindergarten years is an insufficient approach to promoting later literacy success (Lonigan, Schatschneider, & Westberg, 2008). A
longitudinal study conducted by MacDonald and Cornwell (1995) reported that partial correlations with decoding and reading comprehension show a stronger role for phonological awareness (.49) than for vocabulary (.21) measured in kindergarten for reading outcomes in high school. Senechal and LeFevre (2002) reported correlation coefficients between vocabulary (.14, .53), listening comprehension (.16, .38), phonological awareness (.50, .73), and alphabet knowledge (.44, .39) measured in kindergarten and reading outcomes in first and third grades respectively. “Although the results of Senechal and LeFevre’s study suggested a larger role for language skills at the later reading assessment, code-related skills continued to be as strongly or more strongly related to reading from the first- to third-grade assessments” (Lonigan & Shanahan, 2010, p. 342).

With regard to expressive language skills, Justice, Mashburn, Pence, and Wiggins (2008) found that children who receive relatively large amounts of a structured curriculum that emphasizes the processes and structures of quality language instruction may experience accelerated expressive language growth during pre-kindergarten. Expressive language becomes increasingly important with the emergence of children’s social skills. Tomasello (2000) argued that the ability to identify with the perspectives of others, combined with the ability to use language effectively, enables people
to communicate their mental states and intentions, thereby providing a very powerful means to transmit values and knowledge. Dickinson et al., (2006) corroborated these findings and noted that when language is viewed as a social skill, it becomes evident that, as children learn to use language, they acquire a tool that enables them to regulate their own emotions and behaviors, with important consequences for their social and academic functioning.

Roles of Parents and Caregivers

Language development occurs naturally for most infants and toddlers through everyday interactions with their parents and caregivers. Adults who verbally label objects in the environment and pay attention to children’s attempts at communication feed into children’s vocabulary learning (Harris, Golinkoff, & Hirsh-Pasek, 2011). When parents and caregivers build on children’s interests by offering information, they enhance language development and learning.

Researchers have found that during the preschool years, children from higher-SES families show a greater rate of vocabulary growth than their peers from lower-SES families and that SES accounted for more than one-third of variance in children’s vocabulary (Hart & Risley, 1995; Vasilyeva & Waterfall, 2011). Typically, children from
higher SES families have parents who have a higher level of education and use vocabularies that are more complex.

A meta-analysis of parent-child book readings revealed that shared dialogic reading is especially beneficial to the expressive language of young preschoolers (Mol, Bus, De Jong, & Smeets, 2008). Dialogic reading is defined as adults prompting children with questions, evaluating and expanding children’s verbalizations, and rewarding their efforts (Harris et al., 2011). Parents with a higher level of education tend to read more to their children.

Non-parental caregivers also play an important role in the language development of the child. This may include care by relatives, child-care homes, non-related babysitters, as well as childcare centers. Infants who hear more and richer language from their caregivers develop stronger processing skills, which in turn enable them to learn more language more quickly (Fernald & Weisleder, 2011). In addition, warmth and sensitive interactions by caregivers are especially beneficial when accompanied by rich lexical input (Harris et al., 2011). The frequency of warmth and sensitivity in adult-child conversations in preschool classrooms was found to be correlated with the same teachers’ tendency to engage in cognitively and linguistically enriching conversations with children (Densmore, Dickinson, & Smith, 1995).
Both parents and caregivers who interact with children have an opportunity to enhance children’s language development. Specifically, storybook reading or play that is adult-supported will lead to interactive conversations between adult and child and ultimately more learning. Language assessments are introduced in preschool to measure children’s learning and language development.

Language Assessments

A joint position statement of the NAEYC and NAECS/SDE (2003) suggested that educational administrators make ethical, appropriate, valid, and reliable assessment a central part of all early childhood programs:

To assess young children's strengths, progress, and needs, use assessment methods that are developmentally appropriate, culturally and linguistically responsive, tied to children's daily activities, supported by professional development, inclusive of families, and connected to specific, beneficial purposes:

(1) making sound decisions about teaching and learning,
(2) identifying significant concerns that may require focused intervention for individual children, and
(3) helping programs improve their educational and developmental interventions. (p. 1)
Several types of literacy and language assessments have been used in past research with pre-kindergarten children. Some popular assessments include the following: Test of Language Development – Primary, 4th edition (TOLD-P:4; Newcomer & Hammill, 2008), Preschool Language Assessment Instrument, 2nd edition (PLAI2; Blank et al., 2003), Bracken Basic Concept Scale (BBCS; Bracken, 1998), the Test of Preschool Early Literacy (TOPEL; Lonigan, Wagner, Torgeson, & Rashotte, 2002), and Get Ready to Read (GRTR; Whitehurst, 2001).

For the purpose of the literature review, I will only briefly mention two language development assessments that will be used in this study: (1) Test of Language Development – Primary: Fourth Edition (TOLD-P:4), and (2) Preschool Language Assessment Instrument: Second Edition (PLAI2). A more comprehensive discussion of the TOLD-P:4 and the PLAI2 will be presented in the methods section (Chapter 3) of this paper. The reason for choosing the TOLD-P:4 and the PLAI2 as the language development assessments for this study is that they focus more on spoken language abilities and children’s discourse than some of the other assessments.

The TOLD-P was created by Newcomer and Hammill in 1982, with the fourth edition published in 2008. The assessment was designed for children 4 years to 8 years, 11 months to measure spoken language abilities. The testing protocol requires some
concepts to be presented orally and some concepts to be presented visually. The assessments are conducted one-on-one, are untimed, and have a ceiling of five consecutive errors. There are six core subtests: picture vocabulary, relational vocabulary, oral vocabulary, syntactic understanding, sentence imitation, and morphological completion. All of the TOLD-P:4 subtests are direct measures of language.

The PLAI was created by Blank, Rose, and Berlin in 1978, with the second edition published in 2003. The assessment was designed for children 3 years to 5 years, 11 months to measure children’s discourse abilities. Discourse is the give and take of language in the classroom. Some concepts are presented orally and some concepts are presented visually. The assessments are conducted one-on-one, are untimed, and have no ceiling for errors. All 70 items are administered and measure four levels of language abstraction: matching, selective analysis, reordering, and reasoning. All four items measure either receptive or expressive language. An additional feature of this assessment is that it accounts for interfering behaviors. The assessor takes note if a child is non-responsive, has a delayed response, low volume, extra actions, excessive verbalizations, or a loud volume.
The PLAI2 has been used in past research to assist in intervention planning when it is evident that children have difficulty with the level of adult language in the preschool classroom (Hayward, Stewart, Phillips, Norris, & Lovell, 2008). A research study by Girolametto, Wiigs, Smyth, Weitzman and Pearce (2001) used both the PLAI and the TOLD-P:2 to examine a group of late-talking children compared to their typically developing peers. An examination of the individual scores revealed that the majority of the 21 late-talking children scored within normal limits on both assessments. The late-talking children did, however, receive lower scores than the children in the age-matched control group. One student with AD/HD scored below 1.25 SD of the mean on all subtests of the TOLD-P:2, and a second student with a developmental delay scored below 1.25 SD on the Oral Vocabulary subtest of the TOLD-P:2. In general, Girolametto et al. (2001) concluded that late-talking children in this study demonstrated significant weaknesses relative to a group of peers in general language skills as well as in more complex measures that examine classroom discourse, grammatical perspective-taking, and narrative ability.

The present study included data from the PLAI2 and the TOLD-P:4 in combination with a measure of classroom quality.
Classroom Quality

What makes one pre-kindergarten classroom a better learning environment than another? Is it level of education of the teacher (bachelor’s degree in early childhood education versus lesser preparation)? Is it years of experience working with pre-kindergarten children? Is it the curriculum? Is it the teacher/child ratio? Is it demographics (e.g., classrooms in indigent versus affluent neighborhoods)? Is it the interactions the children have throughout the day with their teacher? Or is it some combination of all of the above?

Many childcare experts agree that learning opportunities result from the interactions between the teacher and the children. Hamre and Pianta (2007) defined learning opportunities as a set of theoretically driven dimensions of interactions between adults and children with empirically supported links to children's social, emotional, and academic development. Howes et al. (2008) concluded from their pre-kindergarten study that children showed larger gains in academic outcomes when they experienced higher-quality instruction or closer teacher-child relationships. They also noted that gains were not related to characteristics of the child or program (e.g., ratio, teacher qualifications, and program location and length).
Bronfenbrenner and Morris (1998) stated that children are most directly influenced through “proximal processes,” their daily interactions with adults and peers. Pianta (2006) agreed with the proximal process theory, as applied to schooling, and suggested that classroom interactions between adults and children should be a primary focus of study when seeking to understand children's development in school contexts. Examples of proximal processes in classrooms include teachers' interactions with students around behavior management, questioning and feedback during instruction, and teachers' facilitation of peer interactions (Hamre & Pianta, 2007).

A key component of bio-ecological theory as discussed by Bronfenbrenner and Morris (1998) is the understanding that the ultimate results of processes, such as classroom learning opportunities, are dependent upon a complex interaction of those processes with characteristics of the people involved, the setting or context, and time. The pre-kindergarten classroom is an important year to observe and analyze because it is the year before children enter formal school. Children are expected to know certain things (e.g., the alphabet) before they enter kindergarten and will sometimes be retained in kindergarten if they cannot keep up. Parents who do not enroll their children in a quality preschool facility, with a focus on early literacy and language development, may be surprised to find out
that their kindergartener is behind their peers and may not have the skills to move to first grade.

Classroom quality, in the past, has often been defined as “structural” quality. Structural quality consisted of regulatable aspects of the program that were assumed to promote the likelihood that classrooms would be of high quality, e.g., safety, hygiene issues, and teacher qualifications (Phillips & Howes, 1987; Vandell & Wolfe, 2000). Observed classroom processes were nearly unrelated to structural features of program quality that were used in most state legislation to ensure that these programs supported children's learning (Early et al., 2006; Pianta et al., 2005). Today, there is more awareness that everyday classroom processes and teacher-child interactions are very important to children's learning in addition to structural concerns such as safety and hygiene.

Researchers today often measure the amount of learning opportunities in a classroom based on expert observation of teacher/child interactions. Results from several studies confirm that for young children, learning occurs via interactions, and high-quality emotional, and instructional interactions are the mechanisms through which pre-K programs transmit academic, language, and social competencies to children (Hamre & Pianta, 2007; Howes et al., 2008; Pianta, 2003). A study by Mashburn et al. (2008) found that teachers'
instructional interactions predicted academic and language skills and teachers' emotional interactions predicted teacher-reported social skills. From these findings, Mashburn et al. further suggested that policies, program development, and professional development efforts that improve teacher-child interactions can facilitate children's school readiness.

A cheerful, positive, pre-kindergarten teacher who understands the importance of concept development and knows how to engage children in conversation will have great influence on the social, emotional, and academic development of the children in the classroom. The Classroom Assessment Scoring System (CLASS) was created to measure the skills of teachers regarding emotional support, classroom organization, and instructional quality.

Classroom Assessment Scoring System

The Classroom Assessment Scoring System (CLASS; Pianta et al., 2009) is an observation instrument developed to assess classroom quality in preschool through third-grade classrooms. The theoretical framework for the CLASS posits that the interactions that take place among teachers and students on a daily basis are the primary mechanisms through which children learn, and the CLASS observation system assesses different dimensions of these interactions within
classrooms (Mashburn et al., 2008). The CLASS dimensions are based on developmental theory and research suggesting that interactions between students and adults are the primary mechanism of student development and learning (Hamre & Pianta, 2007; Morrison & Connor, 2002; Pianta, 2006; Rutter & Maughan, 2002).

The CLASS framework suggests that, within the school environment, students' academic and social development is most directly affected by interactions in the classroom described as emotional supports, classroom organization, and instructional supports (Hamre & Pianta, 2007). There are four dimensions of emotional support in the classroom: positive climate, negative climate, teacher sensitivity, and regard for student perspectives. Pianta et al. (2009) defined positive climate as the emotional connection between the teacher and students and among students and the warmth, respect, and enjoyment communicated by verbal and nonverbal interactions. Positive climate encompasses the degree to which students experience warm caring relationships with adults and peers and enjoy the time they spend in the classroom (Hamre & Pianta, 2007). A classroom with a positive climate sets the stage for learning to take place.

According to Pianta et al. (2009), a negative climate reflects the overall level of expressed negativity in the classroom; the frequency, quality, and intensity of teacher and peer negativity are key to this
scale. Negative climates are those in which students experience frequent yelling, humiliation, or irritation in interactions with teachers and peers (Hamre & Pianta, 2007). Teachers in these classrooms also often have more trouble with behavior management issues.

The dimension of teacher sensitivity encompasses the teacher’s awareness of and responsivity to students’ academic and emotional needs; high levels of sensitivity facilitate students’ ability to actively explore and learn because the teacher consistently provides comfort, reassurance, and encouragement (Pianta et al., 2009). Pre-kindergarten children require and demand individualized attention. Teachers must be attuned and responsive to the individual cues and needs of students in their classrooms, and highly sensitive teaching requires teachers to process and respond to information simultaneously (Hamre & Pianta, 2007). Theories of motivation suggest that students who experience sensitive, responsive, and positive interactions with teachers perceive them as more supportive and are more motivated within the academic contexts of schooling (Connell & Wellborn, 1991; Deci & Ryan, 1985; Eccles, 1993).

Regard for student perspectives is the final dimension of emotional support and is the degree to which classrooms and interactions are structured around the interests and motivations of the student, versus those of the teacher (Hamre & Pianta, 2007). It
captures the degree to which the teacher’s interactions with students and classroom activities place an emphasis on students’ interests, motivations, and points of view and encourage student responsibility and autonomy (Pianta et al., 2009).

The classroom organization domain includes a broad array of classroom processes related to the organization and management of students’ behavior, time, and attention in the classroom (Emmer & Stough, 2001). The classroom organization domain consists of three dimensions: behavior management, productivity, and instructional learning formats. Pianta et al. (2009) stated that behavior management encompasses the teacher’s ability to provide clear behavioral expectations and use effective methods to prevent and redirect misbehavior. Within the CLASS framework, behavior management is defined more narrowly as practices intended to promote positive behavior and prevent or terminate misbehavior in the classroom (Hamre & Pianta, 2007).

Productivity, according to Pianta et al. (2009), considers how well the teacher manages instructional time and routines and provides activities for students so that they have the opportunity to be involved in learning activities. In productive classrooms, teachers are not only effective managers of behavior, but are well-organized, spend a minimal amount of time on basic management activities such as taking
attendance or passing out and collecting homework, and are prepared for instructional activities so that little time is lost in transition (Hamre & Pianta, 2007). The productive classroom resembles a “well-oiled machine” where the children know what they are suppose to be doing.

The instructional learning formats dimension focuses on the ways in which the teacher maximizes students’ interest, engagement, and ability to learn from lessons and activities (Pianta et al., 2009). The instructional learning formats dimension measures the extent to which teachers provide interesting activities, instruction, centers, and materials, and the degree to which teachers facilitate activities so that students are actively engaged in instructional opportunities (Hamre & Pianta, 2007). Facilitation of the provided activities by the teacher is extremely important in the pre-kindergarten classroom to maximize learning objectives.

The final domain in the CLASS is called instructional support. Instructional support consists of concept development, quality of feedback, and language development. The National Research Council (1999) noted that there is a distinction between simply learning facts and gaining usable knowledge (learning how facts are interconnected, organized, and conditioned on one another) – noting that gaining usable knowledge is the more important of the two when it comes to cognitive development. Concept development, as defined by Pianta et
al. (2009), measures the teacher’s use of instructional discussions and activities to promote students’ higher-order thinking skills and cognition and the teacher’s focus on understanding rather than on rote instruction.

The second dimension of instructional support is quality of feedback. Quality of feedback assesses the degree to which the teacher provides feedback that expands learning and understanding and encourages continued participation (Hamre & Pianta, 2007). Teachers providing high quality feedback provide frequent feedback loops, or back and forth exchanges in which a teacher responds to an initial student comment by engaging with the student, or group of students, in a sustained effort to reach deeper understanding (Pianta et al., 2009).

The final dimension of instructional support is called language modeling. Language modeling describes the degree to which teachers engage students in conversations that promote the development of specific language skills such as vocabulary (Justice, 2002; Penno, Wilkinson, & Moore, 2002), social language pragmatics (Nino & Snow, 1999; Whitehurst et al., 1988), and narrative skills (Catts, Fey, Zhang, & Tomblin, 1999; Zevenbergen, Whitehurst, & Zevenbergen, 2003). Pianta et al. (2009) agreed and measured language modeling by capturing the quality and amount of the teacher’s use of language-
stimulation and language-facilitation techniques in classroom interactions.

The CLASS has been used extensively in past research and appears to be a useful tool in observing teacher-child interactions in the classroom. Results from studies are not dramatically affected by method of observation procedure. For example, The National Center for Early Development and Learning (NCEDL) Multi-State Study of Prekindergarten and State-Wide Early Education Programs Study (Early et al., 2005) examined 694 preschools in 11 states using the CLASS and had comparable results to the MyTeachingPartner Study (MTP; Pianta, Mashburn, Downer, Hamre, & Justice, 2008) that examined 164 preschools in Virginia that were coded by using videotaped observations. Mean scores from the two studies were recorded in the technical appendix (p. 93) of the CLASS manual (Pianta et al., 2009) as follows: positive climate ($M = 5.28$, $M = 5.21$), negative climate ($M = 1.55$, $M = 1.63$), teacher sensitivity ($M = 4.70$, $M = 4.34$), regard for student perspectives ($M = 4.36$, $M = 4.36$), behavior management ($M = 4.97$, $M = 4.94$), productivity ($M = 4.50$, $M = 5.41$), instructional learning formats ($M = 3.90$, $M = 4.57$), concept development ($M = 2.09$, $M = 2.69$), quality of feedback ($M = 2.04$, $M = 2.87$), and language modeling ($M = 2.85$, $M = 2.85$).
In all instances, CLASS observation means were listed first and MTP means were listed second.

An interesting component regarding the CLASS instrument is that the level of education of a teacher does not consistently impact their scores on the CLASS. Researchers have found small, if any, effects of teacher qualifications on observed classroom quality and, most importantly, there continues to be a high degree of variability in classroom quality even when observing in classrooms where teachers have the highest levels of education and experience and work with small numbers of high-income children (Mashburn et al., 2005; Pianta, et al., 2005). In other words, a teacher with a CDA may have higher scores on language development, as measured by the CLASS, than a teacher with a bachelor’s degree in early childhood education.

Education of Early Childcare Teacher

The purpose of this section of the literature review is to address the recently published empirical evidence regarding the level of education of the teacher and to help answer the following question: Does level of education affect program quality and pre-kindergarten children’s academic success?

This is an important area of research because so many children spend the majority of their day with early childcare workers. Cowles
(2006) wrote, “Almost all people become like the people they are around. If people want children to be kind, loving, and friendly, then the adults around them must be kind, loving, and friendly” (p. 37).

Today, almost half of infants are in out-of-home care for more than 30 hours each week, and as many as 80% of infants are in some form of childcare each week (Tran & Weinraub, 2006; Vandell & Wolfe, 2000). Knowledge of the age-specific needs of infants and toddlers and the critical importance to future learning and social/emotional development is imperative for anyone who is providing care to very young children (Zwahr, Davis, Aviles, Buss, & Stine, 2007). Most children should enter kindergarten with a strong foundation of skills and knowledge if they attended a good early childcare program. Policymakers and administrators have established program standards, such as teacher qualifications, that are intended to ensure high-quality experiences for participating children (Early et al., 2007).

In Florida, a voluntary pre-kindergarten (VPK) program for all four-year-old children began in fall 2005. As substantiated by the Florida Department of Education Office of Early Learning (2007), to be eligible to deliver the VPK program, the pre-kindergarten instructor must hold, at a minimum, one of the following credentials:

- A Child Development Associate credential (CDA) issued by the National Credentialing Program of the Council for Professional
Recognition and completion of an emergent literacy training course

- A credential approved by the Florida Department of Children and Family Services as being equivalent to or greater than the national CDA and completion of an emergent literacy training course

- A bachelor’s or higher degree in early childhood education, pre-kindergarten or primary education, preschool education, or family and consumer science

- A bachelor’s or higher degree in elementary education, if the instructor has been certified to teach children any age from birth through sixth grade, regardless of whether the certificate is current, and if the instructor is not ineligible to teach in a public school because his or her educator certificate is suspended or revoked

- An associate’s or higher degree in child development

- An associate’s or higher degree in an unrelated field, at least six credit hours in early childhood education or child development, and at least 480 hours of experience in teaching or providing child care services for children any age from birth through eight years of age, or
• an educational credential approved by DOE as being equivalent to or greater than an educational credential described above.

(p. 1)

The CDA is offered by some community colleges and agencies. An associate of science (AS) degree or an associate of arts (AA) degree in early childhood education would be the next step, followed by a bachelor degree or a graduate degree in early childhood or child development.

Measurement Considerations

The typical methods used when gathering information regarding teacher education, teacher knowledge, program quality, and the academic outcomes of children are questionnaires, observations, and assessments. Populations usually consist of early childcare workers in diverse centers and the boys and girls in their classrooms. Some centers are federally or state funded, some are private, and some are part of the public school system. Some of the centers are in urban communities and some are in rural communities.

Stratified random sampling has often been used to maximize the diversity of the children to be used in the studies. Justice, Chow, Capellini, Flanigan, and Colton (2003) examined the effects of a 12-week emergent literacy intervention with 18 preschoolers from a low-
income, urban preschool center. Researchers used questionnaires to obtain demographic information on the children.

Another common form of measurement used is the Early Childhood Environment Rating Scale – Revised Edition (ECERS-R). The ECERS-R is a highly recognized and widely used instrument, and, in most cases, observers who give the ECERS-R are trained and do practice observations obtaining the required inter-rater agreement level.

Some studies have used a variety of measurement instruments to obtain their results. For example, Early et al. (2006) used questionnaires, ECERS, and the Classroom Assessment Scoring System (CLASS). The CLASS instrument was used to measure the quality of emotional climate, instructional support, and classroom management provided by the teacher. In addition, Early et al. also used the Peabody Picture Vocabulary Test 3rd edition (PPVT-III), the Oral and Written Language Scale (OWLS), and the Woodcock-Johnson III tests of achievement to assess the students.

Results of Studies

The findings from previous research related to teachers’ education and classroom quality are inconsistent. Early et al. (2007) gathered results from seven studies of preschool programs. They
found two studies that demonstrated a strong correlation between teachers’ education and classroom quality: (a) Early Head Start Study (EHS, Administration for Children and Families, US Dept. of Health and Human Services, 2002) and (b) National Institute of Child Health and Human Development Study (NICHD, NICHD SECC, 1991). Early et al. (2007) stated, “...two studies (EHS and NICHD) found evidence that more educated teachers had higher quality classrooms and that quality was higher when teachers had a Bachelor's degree” (p.570).

By contrast, Early et al. (2007) reported that the Family and Child Experiences Survey (FACES, Zill & Resnick, 2005) found that teachers with a bachelor’s degree had lower quality classrooms compared with teachers without a bachelor’s. The remaining four studies found no conclusive evidence supporting an association between teacher education and classroom quality. Early et al. stated:

Whereas the existing literature generally indicates that more education may be beneficial, there is no conclusive evidence that a teacher with a bachelor’s degree or any other specific level of education will produce or ensure a high-quality classroom or children’s learning. (p. 560)

Tout et al. (2005) completed a review of the research examining links between early childhood teachers’ education and classroom
quality. They found that higher levels of teacher education, especially education that focuses on early childhood development, was generally linked to higher quality, but that there was insufficient research to conclude that an increase in teacher education would cause an increase in program quality. Fukkink and Lont (2007) completed a meta-analysis of caregiver training studies and found that caregivers with higher educational levels provided better personal care, were more sensitive, were more involved with children, and had more knowledge of developmentally appropriate practice than caregivers with lower educational levels. Vandell and Wolfe (2000) concluded that there is modest empirical support for attributing gains in child outcomes to teachers having a bachelor’s degree.

Generally speaking, quantitative studies examining teacher education and classroom quality have established that there is a positive correlation between education and quality; however, due to research design and limits of actual findings, studies have not always substantiated a causal relationship between these variables. Moreover, using a different methodology than typically used, Kennedy (2008) conducted a qualitative study to examine the influence of teachers’ qualifications on their teaching practice and found an inability to distinguish between teachers with different types of certificates or
different teacher education backgrounds. The inconsistencies in findings are typical.

There are factors other than teacher preparation that influence the quality of an early childcare program. Teachers’ prior experience in childcare, teacher compensation, parent fees, teacher motivation, supervision, working conditions, and adult:child ratios have also been found to affect quality in both child care homes and centers (Doherty et al., 2006; Torquati et al., 2007). For example, Kontos, Howes, Shinn, and Galinsky (1995) found that child care educators who have higher wages are more responsive to children and obtain higher scores on overall quality measures. Torquati et al. (2007) had similar findings stating that “compensation significantly predicted global observed quality (standardized path coefficient = .28)” (p. 269) and that “more highly qualified providers tend to choose programs that offer better compensation and that provide higher quality care, and provider and program characteristics work together to support quality” (p. 272).

The field of early childhood education lacks consistent standards and requirements for professional preparation, and, as a result, low levels of education and a minimum of specialized training in early childhood education are the norm (Zaslow, Tout, Halle, Whittaker, & Lavelle, 2010). The professional standards and requirements for early
childhood education staff vary according to funding streams or program type (NAEYC, 2008). Research done by NAEYC (2008) found the following:

- Most states have no legal requirements for a teacher to have training or education in child development prior to working in a child care center or family child care home.
- The recent reauthorization of the Head Start Act requires that by 2013 all Head Start teachers will have at least an associate’s degree and that 50 percent of those teachers will have earned a bachelor’s degree in early childhood.
- Many states require teachers in state-funded pre-kindergarten classrooms to have a bachelor’s degree.
- Many states require less early childhood preparation of child care administrators than is required of teachers.
- States typically do not require elementary school administrators to have early childhood education course work. (p. 8)

While child care licensing regulators/staff are often required to have a bachelor’s degree, the mandate may not include any specifications for early childhood education-related coursework or training.

The National Association for the Education of Young Children (NAEYC) and the National Association of Early Childhood Specialists in State Departments of Education (NAECSSDE) has published standards
for programs to prepare early childhood professionals. These standards describe what early childhood professionals are expected to know and do and define essential learning outcomes in professional preparation programs. The standards serve as guidelines of what is expected of early childhood professionals and include the following requirements:

(1) Promoting child development and learning (creating environments that are healthy, respectful, supportive, and challenging for each child).
(2) Building family and community relationships (creating respectful, reciprocal relationships that support and empower families and to involve all families in their children's development and learning).
(3) Observing, documenting, and assessing (They know about and understand the goals, benefits, and uses of assessment and observation).
(4) Using developmentally effective approaches to connect with children and families (developmentally appropriate instructional strategies and tools).
(5) Using content knowledge to build meaningful curriculum (using knowledge and other resources to design, implement, and evaluate meaningful, challenging curricula).
(6) Becoming a professional (they know and use ethical
guidelines). (NAEYC & NAECSSDE, 2009, p. 2)

The standards are important guidelines for teachers to aspire to; however, without research studies in the area of teacher knowledge and professional development, researchers and administrators are unclear about what works and what does not work.

Teacher Knowledge

Teacher knowledge is another important measure in the pre-kindergarten classroom. Verloop, Van Driel, and Meijer (2002) defined teacher knowledge as all profession-related insights which are related to a teacher’s activities. Verloop et al. argued that teacher knowledge is strongly related to individual experiences and that there are elements of teacher knowledge that should be shared by all teachers of pupils of a certain age level. The teacher knowledge questionnaire that was utilized in the present study was created specifically for early childcare educators and most questions focused on language and early literacy skills of pre-kindergarten students.

Cunningham, Zibulsky, and Callahan (2009) conducted a study that examined teachers’ scores on a teacher knowledge assessment survey (TKAS) in the fall and spring that assessed teachers’ actual knowledge of spoken and written language structures and their
perceived knowledge of these structures and relevant instructional practices. Concurrently, literacy assessments were administered to the children. They found that increases in teacher knowledge over the year had minimal effects on student gain and that many teachers’ scores did not differ significantly from fall to spring. Another interesting finding was that teachers overestimated their knowledge on crucial skills. The mean estimate of correct answers as predicted by teachers ($M = 51.94$, $SD = 16.9$) exceeded the actual mean score on the instrument ($M = 40.8$, $SD = 10.7$).

In summary, education of the early childcare teacher continues to be an important topic of research. Guidelines and standards have been put into place to measure teacher knowledge and quality. Research findings regarding level of education and resulting classroom quality remain inconsistent. However, it is generally accepted that ongoing professional development of early childcare teachers is beneficial to both teachers and children.

Professional Development

Professional development is another important factor that may influence quality. Though it may not be considered formal education, opportunities such as listening to experts, online learning, or study groups in the form of learning communities can be beneficial to many
childcare workers. Zwahr et al. (2007) noted that caregiver training in the form of professional development is a critical link in improving the quality of care.

Pianta et al. (2005) pointed out that the problems of inconsistent exposure to high quality classrooms are compounded by clear evidence of inequity - students from disadvantaged backgrounds are more likely to be exposed to poor quality classroom supports. With such inconsistencies across the nation, it is clear to see that policies regarding professional development are needed to level the playing field for the children who need the most support.

Another issue concerning professional development is the availability of professional development activities at times convenient to early childhood teachers. Less than one-third of the institutions of higher education offering two- and four-year degrees have programs in early childhood education, and those programs that exist must address the needs of non-traditional students who are likely to be juggling family and work responsibilities as well as dealing with logistical issues that make it difficult to attend class and complete course requirements (Early & Winton, 2001). As a result, professional development, though essential, is not always easy to attain unless it is scheduled into a teacher’s usual work day.
Neuman and Cunningham (2009) conducted a study to measure the effects of professional development and coaching on early language and literacy instructional practices across 291 childcare sites. Teachers were randomly assigned to 1 of 3 groups: Group 1, 3-credit course in early language and literacy; Group 2, course plus ongoing coaching; Group 3, control group. The researchers found that the combination of coursework and coaching was the most effective implementation strategy for professional development. Interestingly, coursework alone had negligible effects on improvements in quality practice. This finding has huge implications in the world of teacher professional development. Sending teachers to take a course on content was not the most effective way to increase quality.

Haymore-Sandholtz (2002) argued that professional development practices tend to be ineffective because the content is vague, irrelevant, or disconnected from classroom context, follow-up is limited, and methods involve passive learning techniques. Many professional development practices still focus on delivering content rather than enhancing learning (Webster-Wright, 2009). Teachers need follow-up, feedback, and coaching to truly improve their day-to-day teaching practice.

Landry et al. (2009) had similar results in their study involving 158 childcare sites. A 2 x 2 design was used to cross mentoring and
progress monitoring conditions among four professional development programs. Some teachers received both in-class mentoring and feedback concerning children’s progress in language and literacy; some received feedback only; some received in-class mentoring and limited feedback; and finally some teachers received no mentoring and only limited feedback. Landry et al. found the condition that included online coursework combined with mentoring and detailed, instructionally linked feedback yielded the greatest improvements in teaching behavior and children’s school readiness. Teachers who were exposed to content alone often did not implement what they learned. Having a mentor and on-going progress monitoring after training is complete helped to keep the teacher engaged in the process and provided needed support.

MyTeachingPartner (MTP; Pianta et al., 2008) is a web-based system of professional development resources that include video exemplars and web-mediated consultation on specific dimensions of interactions with children. MTP addresses the challenge of providing an enduring, classroom-focused, and scalable professional development experience that focuses on facilitating high-quality teacher-child interactions (Downer, Kraft-Sayre, & Pianta, 2009). MTP was designed to be used with the CLASS tool. Teachers videotape themselves implementing an MTP lesson once every 2 weeks. The
MTP consultant edits the classroom observation video and then posts the edited video and written prompts for review by the teacher on a secured website. The teacher views the edited video and responds to prompts, which are designed to promote reflective thought on the part of the teacher. After the teacher has viewed the video, the teacher and the consultant participate in a videoconference. They discuss the edited classroom video and issues related to classroom performance and determine goals for future cycles (MyTeachingPartner.net, 2006).

Pianta et al. (2009) conducted a study describing the effects of MTP for 113 teachers in a state-funded pre-kindergarten program that had significant results. Specifically, teachers assigned to receive on-line consultation and feedback targeted to their interactions showed significantly greater increases in independent ratings of the quality of interactions than did those teachers only receiving access to a website with video clips. Pianta et al. (2009) further explained that the positive effects of consultation were particularly evident in classrooms with higher proportions of children who experienced economic risks. This type of feedback is invaluable to teachers as it gives them another perspective as to what is going on in their classrooms. The pre-kindergarten classroom is so busy with activity that it is easy for teachers to lose sight of their instructional support objectives as they go through their daily routines. The videoconference consultation after
review of the edited video is an excellent source of feedback and professional development.

Chapter Conclusion

Language development is an important component of children’s early learning. Without it, children have difficulty communicating with others and learning to read. Research has shown that it is the social interactions between adults and children that have the most influence on their language development. All parents and early childcare workers should be made aware of this valuable information. Unfortunately, this is not always the case.

Educational requirements to teach pre-kindergarten vary by state, and researchers cannot always conclude that more education produces a higher-quality pre-kindergarten classroom. Observation tools such as the CLASS are available to measure teacher/child social interactions, and there are many different literacy and language development assessments available to measure the academic success of the children.

Professional development programs are sometimes successful in helping teachers address the needs of at-risk students. Programs that have proven to be successful often contain some combination of three important components: mentoring, progress monitoring, and
feedback. All too often, however, early childcare workers do not receive adequate professional development training in early literacy and language development. It is expensive, time-consuming, and often must be done during the work day which leaves the childcare site director short-staffed.

The present study’s goal was to enhance the existing body of research on teacher quality and language development. An important implication of the proposed research is that it provides additional understanding of student outcomes by examining the correlations among the teacher’s experience, education, knowledge, and scores on the CLASS observational tool. The benefits of identifying specific predictor variables that contribute to enhanced student outcomes are important for the future of children and to the field of language development. Chapter III will describe in detail the methodology that was employed in the present study.
CHAPTER III

METHODOLOGY

This chapter presents the research design and the procedures that were used to assess the correlation between teacher predictor variables and student outcomes on language development. The purpose of the present study was to enhance the existing body of research on teacher effects on preschool children’s language development.

Research Design

I used six predictor variables relative to teacher inputs: scores from the CLASS observation domains of (a) emotional support, (b) classroom organization, and (c) instructional support; (d) the level of education of the teacher, (e) the number of years of teaching pre-kindergarten, and (f) teacher responses to a knowledge questionnaire. The student outcome variables were the mid-year language development assessment scores of the pre-kindergartners on the Preschool Language Assessment Instrument, Second Edition (PLAI2).
consisting of (a) matching, (b) selective analysis, (c) reordering, and (d) reasoning; and the Test of Language Development, Primary, Fourth Edition (TOLD-P:4) consisting of (a) relational vocabulary, (b) syntactic understanding, (c) sentence imitation, and (d) morphological completion. This chapter describes the conceptual design, the research setting, selection of study participants, ethical considerations surrounding the study, instruments that were utilized, data collection procedures, analytical techniques that were used, and limitations of the research design.

Figure 2 presents the variables to be studied. The predictor variables in Figure 2 are on the left side of the conceptual map. They consist of CLASS Emotional Support, CLASS Classroom Organization, CLASS Instructional Support, level of education, years teaching pre-kindergarten, and answers on a teacher knowledge questionnaire. Two canonical correlation analysis were run using the same six predictor variables each time. The first analysis determined the relationships that existed between the six predictor variables and the TOLD-P:4 subset scores consisting of relational vocabulary (RV), syntactic understanding (SU), sentence imitation (SI), and morphological completion (MC). The second analysis determined the relationships that existed between the six predictor variables and the
PLAI2 subset scores of matching, selective analysis, reordering, and reasoning.

**Figure 2.** Conceptual Design of Predictor and Outcome Variables
The Research Setting

The Florida Institute of Education (FIE), in collaboration with the Early Learning Coalition (ELC) of Duval County (FL), conducted a two-part study (Strand One and Strand Two) called the Early Learning Coalition of Duval Guiding Stars Program Evaluation. The purpose of the Strand One study was to conduct an evaluation of services provided to participating centers as evidenced by child outcomes. Participating centers included those identified as serving School Readiness children and centers receiving the following services: Quality Connections (QC), Quality Rating and Improvement Systems (QRIS), and Ongoing Support (OGS). The purpose of the Strand Two study was to benchmark the strengths and weaknesses of language development of children served in the Guiding Stars of Duval centers so that interventions and professional learning services can focus on aspects of language development and teacher practice that would potentially benefit children. The present study, with permission from the Florida Institute of Education, used archived data collected during February through May 2011 from the Strand Two study. All assessments and observations were conducted at participating childcare sites in Duval County, Florida. I was a part of the assessment team that collected the data.
Description of Study Participants

The ELC of Duval recruited child care centers that receive ongoing support and are a part of the Quality Rating Improvement Systems (QRIS) to participate in the ELC Guiding Stars Program. FIE randomly selected centers from those who elected to participate and classrooms within those centers. From those classrooms, a random sample of children for whom parental permission had been obtained were given the language assessments.

Language assessment data were collected from 102 children in 27 pre-kindergarten classrooms, and 26 of those pre-kindergarten teachers were asked to participate in the CLASS observations. One center had only one child who completed the language assessments, so that teacher was not asked to participate in the CLASS observations. From the 26 teachers asked to participate in the CLASS observations, 22 agreed to participate, but only 20 observations were completed due to scheduling conflicts. This brought the number of eligible student assessments down to 95. Of the 20 observations that were completed, it was later determined that one teacher was replaced after the CLASS observation, and it was the new teacher that filled out the teacher knowledge questionnaire. This combination of CLASS observation and teacher knowledge questionnaire could not be used as part of the study because even though the students remained the
same, the teacher variables were inconsistent. This brought the number of teachers in the study to 19.

The teachers who participated in the CLASS observations received a teacher knowledge questionnaire in early May 2011 that they were asked to complete. The questionnaire consisted of 25 true and false questions on the topic of early childhood education. Also, the participants were asked to provide information regarding their level of education and years teaching experience at the pre-kindergarten level. The teachers’ level of education ranged from a CDA to a bachelor’s degree and their years teaching experienced ranged from 1 to 30 years.

Ethical Considerations

Prior to conducting the study, permission to use archived data was requested from the Florida Institute of Education at the University of North Florida. The permission document is included in Appendix A. The archived data includes parental consents, teacher consents, PLAI2 and TOLD-P:4 scores, CLASS scores, teachers’ highest level of education, their years of experience teaching pre-kindergarten, and their results on the teacher knowledge questionnaire.

Permission to use an adapted version of Susan Neuman’s teacher knowledge questionnaire was obtained by electronic
communication. A copy of the email correspondence is included in Appendix B.

The blank parent and teacher consent forms are included in Appendix C. The consent forms consist of the following: (a) parent consent for child to participate, (b) parent permission to use data, (c) teacher consent to participate and permission to use data, and (d) consent for teacher participation in the CLASS observations. The language on the consent forms was simplified to avoid misinterpretation, and confidentiality was assured. The data collected from the students included the student name, the parent name, the school name, the teacher name, and the scores on the PLAI2 and TOLD-P:4. Student, parent, school, and teacher names were removed by FIE prior to providing me with the data and after all data had been matched to ensure anonymity. Documentation of the review by the University of North Florida Internal Review Board is included in Appendix E.

Instruments

The following four instruments were utilized in the study:

(a) Preschool Language Assessment Instrument, Second Edition (PLAI2; Blank et al., 2003); (b) Test of Language Development, Primary: Fourth Edition (TOLD-P:4; Newcomer & Hammill, 2008); (c)
Classroom Assessment Scoring System (CLASS; Pianta et al., 2009); and (d) Teacher Knowledge Questionnaire (adapted from Susan Neuman’s “Project Great Start Professional Development Initiative Fall 2007 Caregiver Questionnaire”).

The PLAI2 was created by Blank, Rose, and Berlin in 1978, with the second edition published in 2003. The assessment was designed for children 3 years to 5 years, 11 months to measure children’s discourse abilities. Discourse is defined as the give and take of language in the classroom. Some concepts are presented orally, and some concepts are presented visually. The assessments are conducted one-on-one, are untimed, and have no basal or ceiling for errors. There are 70 questions that vary in level of language abstraction and are designed to reflect shifts in classroom conversation. All 70 items are administered and measure 4 levels of language abstraction: matching, selective analysis, reordering, and reasoning. The four items measure either receptive or expressive language and are scored with either a “1” for a correct answer or a “0” for an incorrect answer.

The internal consistency reliability estimates for scores of each subtest was computed by using Cronbach’s (1951) coefficient alpha method. Blank et al. (2003) reported score reliability coefficients of .73 for matching, .71 for selective analysis, .70 for reordering, and .72
for reasoning when measuring the scores of 4-year-olds. According to Nunnally (1978), .70 is an adequate coefficient alpha for scores on instruments used for research purposes. Nunnally further explained that depending on the purpose of the research, high coefficients alpha (i.e., > .90) are essential only when the scores are used for making decisions about individuals (e.g., selection and placement decisions). Blank et al. also calculated coefficients alpha for scores on receptive and expressive language subscales which were .81 and .83, respectively, meeting Guilford’s (1954) criteria for adequate reliability (.80). The overall discourse ability total score coefficient alpha was .94, exceeding Guilford’s desirable level of acceptance of .90 for a longer scale.

In addition to the four standardized measures, this assessment also contains two non-standardized measures: (a) adequacy of response and (b) interfering behaviors. The non-standardized measures provide information about the pragmatic characteristics of the child’s skills. For adequacy of response, the assessor must decide if the child’s expressive response was fully adequate, acceptable, ambiguous, or inadequate. Examples are given for each response, and the assessor must match the child’s response to one of the examples and then give a score. For interfering behaviors, the assessor takes note if a child has under-responsive interfering behaviors such as no
response, a delayed response, or low volume; or over-responsive interfering behaviors such as extra actions, excessive verbalizations, or a loud volume.

Typically the PLAI2 takes approximately 30 minutes to administer to a 4-year-old child. The picture book used has an easel format with colorful pictures. Children respond verbally and/or by pointing. The examiner (assessor) record booklet makes the task of scoring easier by shading areas for certain questions. For example, some questions require an answer that will either be right or wrong, leaving no room for interpretation and, therefore, no need to score the adequacy of response section. One booklet is used for each child to record their responses. Responses and behaviors are recorded in the record booklet as they occur.

*Test of Language Development – Primary: Fourth Edition.* The TOLD-P was created by Newcomer and Hammill in 1982, with the fourth edition published in 2008. The assessment was designed for children 4 years to 8 years, 11 months to measure spoken language abilities. Some concepts are presented orally and some concepts are presented visually. The assessments are conducted one-on-one, are untimed, no basal, and have a ceiling of five consecutive errors. There are six core subtests: picture vocabulary, relational vocabulary, oral vocabulary, syntactic understanding, sentence imitation, and
morphological completion. All of the TOLD-P:4 subtests are direct measures of language. For the purpose of the present study, only relational vocabulary (RV), syntactic understanding (SU), sentence imitation (SI), and morphological completion (MC) were administered. Coefficient alphas were .92 for RV scores, .90 for SU scores, .94 for SI scores, and .94 for MC scores. These alphas are noteworthy in that they all exceed or are equal to .90, indicating very good reliability (Newcomer & Hammil, 2008).

A picture book is used with the syntactic understanding subtest. It contains 30 items and measures a child’s ability to comprehend the meaning of spoken sentences. The child points to a picture that matches a sentence. The other three subtests are orally administered and are contained in the examiner’s record booklet. One booklet is used per child and contains directions, subtests, and space for scoring.

Relational vocabulary contains 34 items and measures a child’s ability to understand and orally express the relationships between two spoken words. For example, the assessor asks, “How are a fork and a spoon alike?” If a child’s response is vague, incorrect, or incomplete, the assessor then queries the child by saying, “Tell me more about how a fork and a spoon are alike.”
Sentence imitation contains 36 items and measures a child’s ability to imitate spoken sentences. The child listens to a sentence that is spoken by the assessor and then copies it.

The fourth subtest is morphological completion, contains 38 items, and measures a child’s ability to recognize, understand, and use common English morphological forms. For example the assessor says, “Jane is a girl and Amy is a girl. They are both_______(girls).” The child responds to the assessor by providing the missing word.

Typically the TOLD-P:4 takes approximately 30 minutes to administer to a 4-year-old child. Children respond verbally and/or by pointing. The test administrator records the child’s responses as they occur. Responses are scored with either a “1” for a correct answer or a “0” for an incorrect answer.

*Classroom Assessment Scoring System.* The Classroom Assessment Scoring System (CLASS; Pianta et al., 2009) is an observation instrument developed to assess classroom quality in preschool through third-grade classrooms. The CLASS measures three domains: emotional support, classroom organization, and instructional support. The emotional domain is comprised of four dimensions: positive climate, negative climate, teacher sensitivity, and regard for student perspectives. The classroom organization domain consists of behavior management, productivity, and instructional learning
formats. The final domain of instructional support has three dimensions: concept development, quality of feedback, and language modeling.

Each classroom observation consists of a 30-minute cycle. Twenty minutes are used for observing and taking notes, and then 10 minutes are used for scoring. A minimum of 4 cycles should be obtained for each classroom. Each dimension is scored using a Likert scale ranging from 1 to 7.

*Teacher Knowledge Questionnaire.* The Teacher Knowledge Questionnaire (Appendix D) consists of 25 true and false questions that were adapted from Susan Neuman’s “Project Great Start Professional Development Initiative.” Neuman’s original questionnaire was constructed to examine participants’ growth in knowledge of early language and literacy pre- and post a professional development intervention (Neuman & Cunningham, 2009). To ensure content validity, Neuman had several experts in the field review the assessment before giving it to 302 second-year early childhood students. Results from the pilot were analyzed, revisions were made, and the final form of the assessment indicated an excellent overall reliability (Cronbach’s alpha = .96).

In the present study, some questions were omitted and/or slightly modified from Neuman’s version with the intent to measure
early childcare educator’s knowledge in the area of early literacy and language development. Content validity analysis via an expert panel of early childhood professionals was used to determine appropriateness of the items on the knowledge questionnaire. The expert panel consisted of three experts in early childhood education assessment of reading. The panel reviewed the knowledge questionnaire items for clarity and also responded to all questions in an effort to determine if agreement could be reached on appropriate correct answers. Following completion of the surveys, panel members compared responses and provided guidance regarding wording prior to the questionnaires being given to the pre-kindergarten teachers in the study. Teachers’ responses were scored 1 point if correct and 0 points if incorrect; thus, scores could range from 0 to 25.

To assess the internal consistency reliability of scores on the teacher knowledge questionnaire, Cronbach’s coefficient alpha and item-to-total correlations were computed. This analysis is discussed further in Chapter 4.

The questionnaire also asked the teachers to divulge specific background information, including their name, current employer, highest level of education, the number of years working in the early childcare industry, and number of years working at their current job.
Teacher and employer names were removed by FIE prior to my receiving the data to ensure anonymity.

Data Collection and Analysis

The data analysis addressed the following null hypothesis:

1. There will be no statistically significant ($p = .05$) relationship between the predictor variable set of emotional support, classroom organization, instructional support, level of education, years teaching pre-kindergarten, and the teacher knowledge questionnaire with the TOLD-P:4 language assessment subscales of relational vocabulary, syntactic understanding, sentence imitation, and morphological completion.

2. There will be no statistically significant ($p = .05$) relationship between the predictor variable set of emotional support, classroom organization, instructional support, level of education, years teaching pre-kindergarten, and the teacher knowledge questionnaire with the PLAI2 language assessment subscales of matching, selective analysis, reordering, and reasoning.
Table 1
Variables Included in the Canonical Correlation Analyses

<table>
<thead>
<tr>
<th>Type of Variable</th>
<th>Data Collection Instrument</th>
<th>Research Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variables (unit of analysis)</td>
<td>PLAI2 (matching, selective analysis, reordering, reasoning) TOLD-P:4 (RV, SU, SI, MC)*</td>
<td>Children’s language development</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>CLASS</td>
<td>Classroom Quality</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>Teacher Knowledge Questionnaire</td>
<td>Teacher Knowledge</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>Survey</td>
<td>Teacher level of Education</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>Survey</td>
<td>Teacher Experience</td>
</tr>
</tbody>
</table>

* RV = Relational Vocabulary  
SU = Syntactic Understanding  
SI = Sentence Imitation  
MC = Morphological Completion

Descriptive statistics (means and standard deviations) of the students were examined prior to the canonical correlation analysis.

Canonical correlation analysis (Thompson, 2000) is a multivariate statistical model that facilitates the study of interrelationships among sets of multiple dependent variables and multiple independent
variables. The first step in a canonical correlation analysis involves the calculation of a square correlation matrix to determine simple relationships. These correlations assist the analyst in interpreting the more substantial relationships identified by the canonical correlation procedure. Eigenvalues are then computed to represent squared canonical correlation coefficients.

Two canonical correlation analysis procedures were computed via SPSS software to determine the results of this study. The six predictor variables were the same for each analysis but the outcome variables were different. The first set of outcome variables were the TOLD-P:4 subscales of relational vocabulary, syntactic understanding, sentence imitation, and morphological completion. The second set consisted of the PLAI2 subscales of matching, selective analysis, reordering, and reasoning. It was necessary to utilize two analytic procedures because the results would have been too unstable with the available number of participants if all eight dependent variables had been examined simultaneously.

Canonical results were interpreted using several useful coefficients that facilitate understanding of complex multivariate correlations. These include canonical roots, canonical structure coefficients, and canonical function coefficients. As noted by Thompson (2000), these various coefficients help the researcher
answer questions about overall explained variance between two variable sets, individual variable contributions to the analysis, and the relative weights assigned to variables in an analysis.

Limitations of the Study

One limitation of the study was the sample size of the teachers and the students. Ideally, a greater number of participants would have made the study more robust.

The second limitation of the study was the violation of the parametric independence assumption. The parametric assumption of independence of observations requires that all observations (i.e., cases) of a given variable within a data set are uniquely determined (Warner, 2008). In the present study, teacher variables (i.e., knowledge questionnaire scores, years experience teaching pre-kindergarten, level of education, CLASS subscale scores) were duplicated for each student included in a given teacher’s classroom. Because the student is the unit of analysis, the duplication of the teacher variables was unavoidable; hence observations of these variables were in violation of the independence assumption. Warner (2008) noted that violations of most parametric assumptions do not appreciably diminish the robustness of statistical results.
Yu (2002) stated that data collected in the social sciences usually violate parametric assumptions to some degree. Experts have suggested, however, that many parametric tests are not seriously affected (i.e., are robust) even with violation of assumptions (Glass, Peckman, & Sanders, 1972). This assumption violation was deemed essential in order to maintain student level data as the focus of the analyses. Conversely, student data could have been averaged across each teacher resulting in the classroom as the unit of analysis. This alternative was deemed unfeasible considering that it would have resulted in an $n$ of 19 (i.e., the number of teachers), greatly limiting data analytic options and focusing attention away from the individual student. Hence, the teacher variables were “repeated” for all students of a given teacher and were, therefore, not independently determined for each student.

Limited validity information regarding the scores on the teacher knowledge questionnaire was a third limitation of the study. Specifically, validity analysis was limited to content validity analysis by using an expert panel of early childhood professionals. Other methods for establishing validity of the data gathered in the study (e.g., construct validity, concurrent validity) were not feasible considering that archival data were used.
Chapter Conclusion

Canonical correlation analysis was used in the present study to determine what independent variables hold the most weight with regard to children’s language development assessments. The data gathered provided evidence necessary to test the present study’s research questions and served as a source of information for developing professional development opportunities for pre-kindergarten teachers.

As the conceptual framework diagram illustrates on page 6, the goal of professional development is to increase teachers’ knowledge and skills resulting in quality instruction and improved student learning. To that end, the framework poses the specific question: If it is possible to determine how children are learning in relation to teacher characteristics, then what are the implications for teachers’ professional development? Chapter 4 presents findings relative to the study’s substantive research questions.
CHAPTER IV
FINDINGS

As stated in Chapter 1, the present study investigated how different teacher variables are related to children’s language development scores. There were two major research questions in the study: (1) To what extent will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a teacher knowledge questionnaire (TKQ) be correlated with the TOLD-P:4 language assessment subscales of relational vocabulary, syntactic understanding, sentence imitation, and morphological completion? (2) To what extent will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a TKQ be correlated with the PLAI2 language assessment subscales of matching, selective analysis, reordering, and reasoning?

In order to answer the primary research questions and test the corresponding hypotheses, a multivariate data analysis was conducted.
The analysis included examining demographic data and descriptive statistics, calculating bivariate correlations for independent and dependent variables, conducting a reliability analysis, and performing a canonical correlation analysis to test the study’s research questions. All statistical analyses were performed using SPSS version 18.

Demographic Data

Demographic data were collected from the study participants in order to better understand the sample. These data are presented in Table 2. Among the 95 students in the sample, 62% were boys \( n = 59 \) and 38% were girls \( n = 36 \), 70% were 4-years-old \( n = 67 \) and 30% were 5-years-old \( n = 28 \). African American students constituted the largest ethnicity represented in the sample, with 46.3% \( n = 44 \) being African American, 35.8% White \( n = 34 \), and 11.6% \( n = 11 \) Hispanic. A total of 6.3% \( n = 6 \) of students were categorized with an ethnicity as “other.”
Table 2
Demographic Data of Student Sample

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>59</td>
</tr>
<tr>
<td>Girls</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>4-years-old</td>
<td>67</td>
</tr>
<tr>
<td>5-years-old</td>
<td>28</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>44</td>
</tr>
<tr>
<td>White</td>
<td>34</td>
</tr>
<tr>
<td>Hispanic</td>
<td>11</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
</tr>
</tbody>
</table>

Note.  n = 95.

Descriptive Statistics for Predictor Variables

Descriptive statistics for the scores on the teacher knowledge questionnaire, level of education, length of teaching experience, CLASS emotional support, CLASS classroom organization, and CLASS instructional support are presented in Table 3. The teacher knowledge questionnaire (TKQ) consisted of 25 questions (but only 8 were used due to the reliability analysis), and scores had a range of 6 with a minimum score of 2 and a maximum score of 8. The mean score was 5.95 with a standard deviation of 1.93. The teachers’ level of education had a similar mean, median, and mode (3) which indicates
that a CDA was the teachers’ highest level of education most often.
Level of education was coded as follows: 0 = some high school,
1 = high school diploma/GED, 2 = some post high school/GED
coursework, 3 = CDA/CDEA, 4 = Associate’s degree, 5 = other
Bachelor’s degree, 6 = Bachelor’s degree in early childhood education,
7 = other. The length of teaching experience that the 19 teachers had
in the childcare industry ranged from 1 year to 30 years. The mean
was 12.52 with a standard deviation of 8.1, the median was 12 and
the mode was 18.

The three domains of the CLASS predictor variables have a
possible range of 1 to 7. The CLASS emotional support subscale had a
minimum of 3.1 and a maximum of 6.6, the mean was 5 with a
standard deviation of .8, the median was 5 and the mode was 5.5.
The CLASS classroom organization subscale had a minimum of 2.6 and
a maximum of 6.3, the mean was 4.5 with a standard deviation of .9,
the median was 4.8 and the mode was 5.2. The CLASS instructional
support subscale had a minimum of 1.1 and a maximum of 3.7, the
mean was 2.2 with a standard deviation of .6, the median was 2.1 and
the mode was 2.5.
## Table 3
Descriptive Statistics for Predictor Variables

<table>
<thead>
<tr>
<th></th>
<th>Teacher Knowledge Questionnaire</th>
<th>*Level of Education</th>
<th>Years Experience in Childcare</th>
<th>CLASS Emotional Support</th>
<th>CLASS Classroom Organization</th>
<th>CLASS Instructional Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>5.95</td>
<td>3.08</td>
<td>12.52</td>
<td>5.04</td>
<td>4.59</td>
<td>2.21</td>
</tr>
<tr>
<td><strong>Std. Deviation</strong></td>
<td>1.93</td>
<td>.89</td>
<td>8.16</td>
<td>.89</td>
<td>.92</td>
<td>.66</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>6</td>
<td>4</td>
<td>29</td>
<td>3.50</td>
<td>3.70</td>
<td>2.58</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3.12</td>
<td>2.60</td>
<td>1.16</td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
<td>8</td>
<td>5</td>
<td>30</td>
<td>6.62</td>
<td>6.30</td>
<td>3.75</td>
</tr>
</tbody>
</table>

*Note.* *Level of education:* 0 = some high school, 1 = high school diploma/GED, 2 = some post high school/GED coursework, 3 = CDA/CDEA, 4 = Associates degree, 5 = other bachelor’s degree, 6 = bachelor’s degree in early childhood education, 7 = other.

This variable was treated as continuous for purposes of the correlational data analyses.
Descriptive Statistics for Dependent Variables

Descriptive statistics for the dependent variables are presented in Table 4. Four subtests of the Test of Language Development (TOLD) were used in this study. The relational vocabulary subtest has 34 questions and students scored between 0 and 15. The mean was 5.63 with a standard deviation of 4.4, the median was 5 and the mode was 0. The syntactic understanding subtest has 30 questions and students scored between 0 and 24. The mean was 14.12 with a standard deviation of 5.7, and the median was 15. Multiple modes exist for this subtest; the smallest value was 16. The sentence imitation subtest has 36 questions and students scored between 2 and 29. The mean was 10.08 with a standard deviation of 4.9, the median was 9, and the mode was 7. The morphological completion subtest has 38 questions, and students scored between 0 and 21. The mean was 8.32 with a standard deviation of 5.7, the median was 9, and the mode was 0. It should be noted that each subtest of the TOLD had a ceiling of 5 consecutive errors.

The Preschool Language Assessment Instrument (PLAI) consists of 70 questions and measures four levels of language abstraction. For matching, students scored between 7 and 17, had a mean of 15.25 with a standard deviation of 1.9, a median of 16, and a mode of 16. For selective analysis, students scored between 2 and 17, had a mean
of 11.60 with a standard deviation of 3.3, a median of 12, and a mode of 14. For reordering, students scored between 0 and 14, had a mean of 5.52 with a standard deviation of 3.4, a median of 5, and multiple modes with the lowest being 1. For reasoning, students scored between 1 and 18, had a mean of 7.44 with a standard deviation of 3.9, a median of 7, and a mode of 6.
Table 4
Descriptive Statistics for Dependent Variables

<table>
<thead>
<tr>
<th></th>
<th>TOLD RV</th>
<th>TOLD SU</th>
<th>TOLD SI</th>
<th>TOLD MC</th>
<th>PLAI Match</th>
<th>PLAI SA</th>
<th>PLAI Reorder</th>
<th>PLAI Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.63</td>
<td>14.12</td>
<td>10.08</td>
<td>8.32</td>
<td>15.25</td>
<td>11.60</td>
<td>5.52</td>
<td>7.44</td>
</tr>
<tr>
<td>Median</td>
<td>5.00</td>
<td>15.00</td>
<td>9.00</td>
<td>9.00</td>
<td>16.00</td>
<td>12.00</td>
<td>5.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Mode</td>
<td>0</td>
<td>16</td>
<td>7</td>
<td>0</td>
<td>16</td>
<td>14</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>4.49</td>
<td>5.76</td>
<td>4.99</td>
<td>5.75</td>
<td>1.99</td>
<td>3.31</td>
<td>3.47</td>
<td>3.95</td>
</tr>
<tr>
<td>Range</td>
<td>15</td>
<td>24</td>
<td>27</td>
<td>21</td>
<td>10</td>
<td>15</td>
<td>14</td>
<td>17</td>
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<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>7</td>
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<tr>
<td>Maximum</td>
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<td>24</td>
<td>29</td>
<td>21</td>
<td>17</td>
<td>17</td>
<td>14</td>
<td>18</td>
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</table>
Bivariate Correlations

Pairwise intercorrelations among all of the predictor variables are presented in Table 5. Examination of the bivariate correlations indicates that the CLASS domains of emotional support, classroom organization, and instructional support are highly intercorrelated. Pearson correlations were near .5 or above with values of .80, .54, and .48 for the three correlations among CLASS independent variables. There were no noteworthy correlations between the teachers’ level of education or the number of years teaching with the CLASS predictor variables. This would indicate that teachers’ CLASS scores are not appreciably related to their highest level of education or teaching experience.

There were moderate correlations (.30 and .29) between the teacher knowledge questionnaire and the level of education of the teacher and the CLASS emotional support subscales, respectively. This positive correlation indicates that teachers who had a higher level of education and who scored higher on the emotional support scale also scored higher on the TKQ. Interestingly, there was a moderate negative correlation (-.28) between the TKQ and teaching experience. This would indicate that the teachers with the most teaching experience in the childcare industry most often scored lower on the teacher knowledge questionnaire.
Table 5
Bivariate Correlations within Predictor Variable Set \((n = 95)\)

<table>
<thead>
<tr>
<th></th>
<th>TKQ TOTAL</th>
<th>LEVEL OF EDUCATION</th>
<th>YRS EXP CHILDCARE</th>
<th>CLASS Emotional Support</th>
<th>CLASS Classroom Organization</th>
<th>CLASS Instructional Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>TKQ TOTAL</td>
<td>1</td>
<td>.298</td>
<td>-.284</td>
<td>.288</td>
<td>.193</td>
<td>.052</td>
</tr>
<tr>
<td>LEVEL OF EDUCATION</td>
<td>.298</td>
<td>1</td>
<td>-.181</td>
<td>-.016</td>
<td>.020</td>
<td>-.199</td>
</tr>
<tr>
<td>YRS EXP CHILDCARE</td>
<td>-.284</td>
<td>-.181</td>
<td>1</td>
<td>.041</td>
<td>.027</td>
<td>.267</td>
</tr>
<tr>
<td>CLASS Emotional Support</td>
<td>.288</td>
<td>-.016</td>
<td>.041</td>
<td>1</td>
<td>.803</td>
<td>.538</td>
</tr>
<tr>
<td>CLASS Classroom Organization</td>
<td>.193</td>
<td>.020</td>
<td>.027</td>
<td>.803</td>
<td>1</td>
<td>.482</td>
</tr>
<tr>
<td>CLASS Instructional Support</td>
<td>.052</td>
<td>-.199</td>
<td>.267</td>
<td>.538</td>
<td>.482</td>
<td>1</td>
</tr>
</tbody>
</table>
Intercorrelations within the dependent variable sets are presented in Table 6. The four subscales of the TOLD are moderately to highly correlated with each other (.31, .40, .44, .49, .55, and .59), whereas the correlations among the PLAI values indicate a higher degree of correlation with Pearson values ranging from .55 to .76. These moderate to high positive correlations indicate that the subtests within each instrument are related to each other.

Bivariate correlations across the dependent variable sets are presented in Table 7. The PLAI and TOLD values are moderately to highly correlated as indicated by positive Pearson values ranging from .43 to .69. These values indicate that the two instruments are similar to each other in their measurement of children’s language development skills.
Table 6
Bivariate Correlations within Dependent Variable Set ($n = 95$)

<table>
<thead>
<tr>
<th></th>
<th>TOLD Relational Vocabulary</th>
<th>TOLD Syntactic Understanding</th>
<th>TOLD Sentence Imitation</th>
<th>TOLD Morphological Completion</th>
<th>PLAI Matching</th>
<th>PLAI Selective Analysis</th>
<th>PLAI Reordering</th>
<th>PLAI Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLD RV</td>
<td>1</td>
<td>.311</td>
<td>.494</td>
<td>.448</td>
<td>.472</td>
<td>.605</td>
<td>.499</td>
<td>.528</td>
</tr>
<tr>
<td>TOLD SU</td>
<td>.311</td>
<td>1</td>
<td>.403</td>
<td>.550</td>
<td>.443</td>
<td>.597</td>
<td>.498</td>
<td>.556</td>
</tr>
<tr>
<td>TOLD SI</td>
<td>.494</td>
<td>.403</td>
<td>1</td>
<td>.595</td>
<td>.439</td>
<td>.544</td>
<td>.596</td>
<td>.651</td>
</tr>
<tr>
<td>TOLD MC</td>
<td>.448</td>
<td>.550</td>
<td>.595</td>
<td>1</td>
<td>.518</td>
<td>.623</td>
<td>.623</td>
<td>.690</td>
</tr>
<tr>
<td>PLAI Matching</td>
<td>.472</td>
<td>.443</td>
<td>.439</td>
<td>.518</td>
<td>1</td>
<td>.764</td>
<td>.553</td>
<td>.562</td>
</tr>
<tr>
<td>PLAI SA</td>
<td>.605</td>
<td>.597</td>
<td>.544</td>
<td>.623</td>
<td>.764</td>
<td>1</td>
<td>.660</td>
<td>.706</td>
</tr>
<tr>
<td>PLAI Reordering</td>
<td>.499</td>
<td>.498</td>
<td>.596</td>
<td>.623</td>
<td>.553</td>
<td>.660</td>
<td>1</td>
<td>.766</td>
</tr>
<tr>
<td>PLAI Reasoning</td>
<td>.528</td>
<td>.556</td>
<td>.651</td>
<td>.690</td>
<td>.562</td>
<td>.706</td>
<td>.766</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 7
Bivariate Correlations across Variable Sets \( (n = 95) \)

<table>
<thead>
<tr>
<th></th>
<th>TKQ TOTAL</th>
<th>LEVEL OF EDUCATION</th>
<th>YRS EXP</th>
<th>CHILDCARE</th>
<th>CLASS Emo</th>
<th>CLASS Class</th>
<th>CLASS Instr</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLD RV</td>
<td>.072</td>
<td>.039</td>
<td>-.041</td>
<td>.130</td>
<td>.078</td>
<td>-.003</td>
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</tr>
<tr>
<td>TOLD SU</td>
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<td>.081</td>
<td>.098</td>
<td>.060</td>
<td>.021</td>
<td>-.072</td>
<td></td>
</tr>
<tr>
<td>TOLD SI</td>
<td>-.001</td>
<td>.148</td>
<td>-.024</td>
<td>.038</td>
<td>-.007</td>
<td>-.041</td>
<td></td>
</tr>
<tr>
<td>TOLD MC</td>
<td>.029</td>
<td>.079</td>
<td>.144</td>
<td>.109</td>
<td>.064</td>
<td>.032</td>
<td></td>
</tr>
<tr>
<td>PLAI Matching</td>
<td>-.066</td>
<td>.059</td>
<td>-.060</td>
<td>.104</td>
<td>-.005</td>
<td>-.074</td>
<td></td>
</tr>
<tr>
<td>PLAI SA</td>
<td>.047</td>
<td>.166</td>
<td>.049</td>
<td>.068</td>
<td>-.036</td>
<td>-.095</td>
<td></td>
</tr>
<tr>
<td>PLAI Reordering</td>
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<td>.232</td>
<td>.155</td>
<td>.154</td>
<td>.065</td>
<td>.038</td>
<td></td>
</tr>
<tr>
<td>PLAI Reasoning</td>
<td>.130</td>
<td>.215</td>
<td>.100</td>
<td>.209</td>
<td>.110</td>
<td>-.022</td>
<td></td>
</tr>
</tbody>
</table>

Reliability Analysis

To assess the internal consistency reliability of scores on the teacher knowledge questionnaire, Cronbach’s coefficient alpha and item-to-total correlations were computed. The initial Cronbach’s coefficient alpha estimate was extremely low (.07). In addition, several of the item-to-total correlations had values of zero or had a negative value. The zero correlations indicated a lack of variation in the item scores, and the negative correlations suggested that some items were measuring in the opposite direction of the total score (i.e., lower scorers tended to answer these items correctly and higher scorers tended to answer them incorrectly). Consequently, I eliminated the 17 items having negative or zero correlations, and
recomputed coefficient alpha for scores on the remaining 8 items (questions 5, 6, 7, 8, 10, 11, 12, and 15) which yielded a coefficient of .72. This value was deemed sufficient evidence to support the reliability of the scores on the teacher knowledge questionnaire; hence, the summative score for these eight items was used as the measure of teacher knowledge for the substantive analyses in the present study. The content of the original 25 questions consisted of early childcare knowledge, specifically language development and early literacy. There was no difference between the content of the questions that were discarded and those that were retained.

Canonical Correlation Analysis

To examine to what extent scores on the Preschool Language Assessment (PLAI) and the Test of Language Development (TOLD) could be explained by the predictor variable set of teacher knowledge, teacher experience, level of education, emotional support, classroom organization, and instructional support, two canonical correlation analyses were conducted. It was necessary to utilize two analytic procedures because the results would have been too unstable with the number of participants available had all the dependent variables been included in a single analysis.
Descriptive statistics for each of the variables included in the canonical analyses are presented in Tables 3 and 4. Canonical correlation was selected as the data analysis procedure because it allows for the complex interrelationships within and among two sets of variables to be considered simultaneously. The number of canonical roots, or functions, for a given analysis is equal to the number of variables in the smaller of the two sets. Because there were six predictor variables and only four dependent variables, four canonical roots or functions were yielded for each analysis (see Tables 8 and 13). In canonical correlation analysis, each root explains a smaller amount of variance than the previous root, and not all roots are necessarily worthy of interpretation (Thompson, 2000). To determine the number of canonical roots to interpret, both the magnitude of each root (i.e., the correlational effect size [ES]) and its statistical significance are typically considered (Fan, 2001). It was anticipated that it would be difficult to find statistically significant results for the canonical analyses due to the size of the sample (i.e., \( n = 95 \)) and the relatively large number of variables included in the canonical analyses. However, a growing number of researchers (e.g., Killeen, 2005; Levine, Weber, Hullet, Park, & Massi Lindsey, 2008; McClain, 1995) have recommended that statistical significance be downplayed or even eliminated and that researchers focus primarily on effect size. Hence,
following the logic suggested by Hojat and Xu (2004), it was predetermined that canonical correlations of a noteworthy size would be interpreted regardless of their statistical significance:

ES has two advantages over statistical significance testing: (a) it is independent of the size of the sample; (b) it is a scale-free index. Therefore ES can be interpreted in different studies regardless of the sample size and the original scale of the variables. (p. 241)

**Canonical Analysis of TOLD Variables**

For the purpose of conducting the first canonical correlation analysis, the six predictor variables (mentioned above) were correlated with the four dependent variables of the TOLD (i.e., relational vocabulary, syntactic understanding, sentence imitation, and morphological completion). The resultant canonical roots are reported in Table 8. Root 1 ($R_c^2 = .05$) indicated that using the best set of weights for variables across the two sets, the independent variables share approximately 5% of their variances with the dependent variables, which is not considered noteworthy as it is below the 10% threshold (Pedhazur, 1982), a commonly used criterion for determining the point at which explained variance is meaningful in social science research. Using the second best set of statistical
weights, root 2 ($R_c^2 = .04$) accounted for about 4% of the shared variance across the two sets. Similarly, root 3 ($R_c^2 = .02$) accounted for 2% of the variance, and root 4 ($R_c^2 = .01$) accounted for 1% of the variance. Because the four roots produced a result of less than 10% and are considered trivial, and because none of the roots were statistically significant, these roots were not interpreted. The canonical function and structure coefficients for the TOLD dependent variables are presented in Table 9 and Table 10, respectively, and the canonical function and structure coefficients for the predictor variables of the TOLD dependent variables are presented in Table 11 and Table 12, respectively.

Table 8
Canonical Correlations (TOLD Subtests as Dependent Variables)

<table>
<thead>
<tr>
<th>Root No.</th>
<th>Eigenvalue</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
<th>Canonical Correlation</th>
<th>Squared Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.06</td>
<td>42.82</td>
<td>42.82</td>
<td>.24</td>
<td>.05</td>
</tr>
<tr>
<td>2</td>
<td>.04</td>
<td>31.44</td>
<td>74.26</td>
<td>.21</td>
<td>.04</td>
</tr>
<tr>
<td>3</td>
<td>.02</td>
<td>17.36</td>
<td>91.63</td>
<td>.16</td>
<td>.02</td>
</tr>
<tr>
<td>4</td>
<td>.01</td>
<td>8.36</td>
<td>100.00</td>
<td>.11</td>
<td>.01</td>
</tr>
</tbody>
</table>

Table 9
Standardized Canonical Function Coefficients for TOLD Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLD RV</td>
<td>-.11</td>
<td>-.13</td>
<td>1.17</td>
<td>-.02</td>
</tr>
<tr>
<td>TOLD SU</td>
<td>.43</td>
<td>.55</td>
<td>.05</td>
<td>.98</td>
</tr>
<tr>
<td>TOLD SI</td>
<td>-.45</td>
<td>1.07</td>
<td>.34</td>
<td>-.52</td>
</tr>
<tr>
<td>TOLD MC</td>
<td>.94</td>
<td>-.72</td>
<td>-.26</td>
<td>-.69</td>
</tr>
</tbody>
</table>
### Table 10
**Canonical Structure Coefficients for TOLD Dependent Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOLD RV</td>
<td>.22</td>
<td>.25</td>
<td>.90</td>
<td>-.29</td>
</tr>
<tr>
<td>TOLD SU</td>
<td>.74</td>
<td>.54</td>
<td>.13</td>
<td>.38</td>
</tr>
<tr>
<td>TOLD SI</td>
<td>.23</td>
<td>.80</td>
<td>.10</td>
<td>-.55</td>
</tr>
<tr>
<td>TOLD MC</td>
<td>.86</td>
<td>.16</td>
<td>.09</td>
<td>-.48</td>
</tr>
</tbody>
</table>

### Table 11
**Standardized Canonical Function Coefficients for Predictor Variables of TOLD Dependent Variables**

<table>
<thead>
<tr>
<th>COVARIATE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUCATION</td>
<td>.29</td>
<td>.75</td>
<td>-.35</td>
<td>-.58</td>
</tr>
<tr>
<td>EXPERIENCE</td>
<td>.95</td>
<td>-.29</td>
<td>-.37</td>
<td>.13</td>
</tr>
<tr>
<td>CLASS ES</td>
<td>.66</td>
<td>.76</td>
<td>1.01</td>
<td>-.14</td>
</tr>
<tr>
<td>CLASS CM</td>
<td>-.09</td>
<td>-.56</td>
<td>-.11</td>
<td>.42</td>
</tr>
<tr>
<td>CLASS IS</td>
<td>-.45</td>
<td>-.38</td>
<td>-.48</td>
<td>-.92</td>
</tr>
<tr>
<td>TKQ</td>
<td>.08</td>
<td>-.63</td>
<td>.24</td>
<td>-.27</td>
</tr>
</tbody>
</table>

### Table 12
**Canonical Structure Coefficients for Predictor Variables of TOLD Dependent Variables**

<table>
<thead>
<tr>
<th>Covariate</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUCATION</td>
<td>.15</td>
<td>.67</td>
<td>-.14</td>
<td>-.49</td>
</tr>
<tr>
<td>EXPERIENCE</td>
<td>.79</td>
<td>-.33</td>
<td>-.46</td>
<td>.08</td>
</tr>
<tr>
<td>CLASS ES</td>
<td>.40</td>
<td>-.10</td>
<td>.72</td>
<td>-.36</td>
</tr>
<tr>
<td>CLASS CM</td>
<td>.27</td>
<td>-.25</td>
<td>.49</td>
<td>-.20</td>
</tr>
<tr>
<td>CLASS IS</td>
<td>.07</td>
<td>-.50</td>
<td>-.01</td>
<td>-.65</td>
</tr>
<tr>
<td>TKQ</td>
<td>.02</td>
<td>-.23</td>
<td>.48</td>
<td>-.49</td>
</tr>
</tbody>
</table>

### Table 13
**Canonical Correlations (PLAI Subtests as Dependent Variables)**

<table>
<thead>
<tr>
<th>Root No.</th>
<th>Eigenvalue</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
<th>Canonical Correlation</th>
<th>Squared Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.23</td>
<td>58.73</td>
<td>58.73</td>
<td>.43</td>
<td>.19</td>
</tr>
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<td>2</td>
<td>.10</td>
<td>26.57</td>
<td>85.29</td>
<td>.31</td>
<td>.09</td>
</tr>
<tr>
<td>3</td>
<td>.03</td>
<td>8.00</td>
<td>93.29</td>
<td>.17</td>
<td>.03</td>
</tr>
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<td>4</td>
<td>.03</td>
<td>6.71</td>
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<td>.16</td>
<td>.03</td>
</tr>
</tbody>
</table>
Canonical Analysis of the PLAI Variables

For the purpose of conducting the second canonical correlation analysis, the six predictor variables were correlated with the four dependent variables of the PLAI (i.e., matching, selective analysis, reordering, and reasoning). The resultant canonical roots are presented in Table 13. Root 1 ($R^2_c = .19$) indicated that using the best set of weights for variables across the two sets, the independent variables share approximately 19% of their variances with the dependent variables. Using the second best set of statistical weights, root 2 ($R^2_c = .09$) accounted for about 9% of the shared variance across the two sets. Root 3 ($R^2_c = .03$) accounted for 3% of the variance, and root 4 ($R^2_c = .03$) accounted for 3% of the variance. Because root 1 produced a result of greater than .10 ($R^2_c = .19$), it was interpreted. Root 2 produced a result slightly less than 10% ($R^2_c = .09$) but appeared worthy of interpretation as well. Roots 1 and 2 were not statistically significant ($p > .05$). Results of roots 3 and 4 were both 3%, indicating negligible effect sizes, not worthy of interpretation.

The canonical function and structure coefficients for the PLAI dependent variables across the four canonical roots are presented in Table 14 and Table 15, respectively, and the canonical function and
structure coefficients for the predictor variables of the PLAI dependent variables are presented in Table 16 and Table 17, respectively.

Table 14
Standardized Canonical Function Coefficients for PLAI Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAI MATCH</td>
<td>.90</td>
<td>1.07</td>
<td>-.21</td>
<td>.66</td>
</tr>
<tr>
<td>PLAI SA</td>
<td>-.36</td>
<td>-.48</td>
<td>1.51</td>
<td>-.85</td>
</tr>
<tr>
<td>PLAI REORDER</td>
<td>-.66</td>
<td>-.47</td>
<td>.17</td>
<td>1.39</td>
</tr>
<tr>
<td>PLAI REASON</td>
<td>-.47</td>
<td>.78</td>
<td>-1.10</td>
<td>-.94</td>
</tr>
</tbody>
</table>

Table 15
Canonical Structure Coefficients for PLAI Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
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<td>.42</td>
<td>.24</td>
</tr>
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<td>PLAI SA</td>
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<td>.57</td>
<td>.68</td>
<td>-.10</td>
</tr>
<tr>
<td>PLAI REORDER</td>
<td>-.76</td>
<td>.40</td>
<td>.21</td>
<td>.47</td>
</tr>
<tr>
<td>PLAI REASON</td>
<td>-.73</td>
<td>.68</td>
<td>-.02</td>
<td>-.11</td>
</tr>
</tbody>
</table>

Table 16
Standardized Canonical Function Coefficients for Predictor Variables of PLAI Dependent Variables

<table>
<thead>
<tr>
<th>COVARIATE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
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<td>.15</td>
<td>.30</td>
<td>.49</td>
</tr>
<tr>
<td>EXPERIENCE</td>
<td>-.76</td>
<td>-.27</td>
<td>.08</td>
<td>-.10</td>
</tr>
<tr>
<td>CLASS ES</td>
<td>-.31</td>
<td>1.54</td>
<td>.30</td>
<td>.19</td>
</tr>
<tr>
<td>CLASS CM</td>
<td>.11</td>
<td>-.61</td>
<td>-1.07</td>
<td>-.37</td>
</tr>
<tr>
<td>CLASS IS</td>
<td>.11</td>
<td>-.63</td>
<td>-.15</td>
<td>.90</td>
</tr>
<tr>
<td>TKQ</td>
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<td>-.52</td>
<td>-.19</td>
<td>-.73</td>
</tr>
</tbody>
</table>
Table 17

Canonical Structure Coefficients for Predictor Variables of PLAI Dependent Variables

<table>
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<tr>
<th>Covariate</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
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<td>-.60</td>
<td>.14</td>
<td>.24</td>
<td>.11</td>
</tr>
<tr>
<td>EXPERIENCE</td>
<td>-.51</td>
<td>-.27</td>
<td>.02</td>
<td>.25</td>
</tr>
<tr>
<td>CLASS ES</td>
<td>-.30</td>
<td>.55</td>
<td>-.70</td>
<td>.16</td>
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<tr>
<td>CLASS CM</td>
<td>-.20</td>
<td>.22</td>
<td>-.94</td>
<td>.09</td>
</tr>
<tr>
<td>CLASS IS</td>
<td>-.11</td>
<td>-.22</td>
<td>-.56</td>
<td>.66</td>
</tr>
<tr>
<td>TKQ</td>
<td>-.45</td>
<td>-.11</td>
<td>-.25</td>
<td>-.52</td>
</tr>
</tbody>
</table>

**Interpretation of Root 1** - The squared canonical correlation coefficient for root 1 ($R_c^2 = .19$) indicated that, as a set, the predictor variables accounted for approximately 19% of the variance in subscale scores on the PLAI. The canonical structure coefficients ($r_s$) were reflected for the first variant of both the predictor variable set and dependent variable set by multiplying by (-1) to obtain positive values (Comrey & Lee, 1992). In the predictor variable set, root 1 indicated that the teachers’ level of education ($r_s = .60$), experience ($r_s = .51$), knowledge ($r_s = .45$), and emotional support ($r_s = .30$) accounted for the highest proportion of variance of the function. Among the canonical structure coefficients for the PLAI dependent variable set, reordering ($r_s = .76$), reasoning ($r_s = .73$), and selective analysis ($r_s = .44$) were highly correlated with the predictor canonical variate for root 1.

These results indicated that the predictor variables of education, experience, knowledge, and emotional support were positively related to the students’ PLAI subscale scores for language development.
These findings would imply that the students of teachers who have a higher level of education, more teaching experience, scored high on the teacher knowledge questionnaire, and had high scores in the CLASS domain of emotional support score higher on the PLAI.

*Interpretation of Root 2* - The squared canonical correlation coefficient for root 2 ($R_c^2 = .09$) indicated that, as a set, the predictor variables accounted for approximately 9% of the variance in subscale scores on the PLAI. Analysis of the canonical structure coefficients across the predictor variable set for the second canonical function indicated that emotional support ($r_s = .55$) accounted for the highest positive proportion of variance of the function and teaching experience ($r_s = -.27$) accounted for the highest negative correlation. Among the canonical structure coefficients for the PLAI dependent variable set, matching ($r_s = .88$), reasoning ($r_s = .68$) and selective analysis ($r_s = .57$) were highly correlated with the dependent canonical variate for root 2.

These results indicated that teachers who scored high on CLASS emotional support had students who did well on the PLAI. Alternatively, the amount of teaching experience that teachers had in the childcare industry was found to be negatively correlated to PLAI subscale scores.
Consideration of the Primary Research Questions

There were two primary research questions that guided the present study: (1) To what extent will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a teacher knowledge questionnaire (TKQ) be correlated with the TOLD-P:4 language assessment subscales of relational vocabulary, syntactic understanding, sentence imitation, and morphological completion? (2) To what extent will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a TKQ be correlated with the PLAI2 language assessment subscales of matching, selective analysis, reordering, and reasoning?

The corresponding null hypothesis stated that there would be no statistically significant ($p = .05$) relationship between the predictor variables (CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a TKQ) and the dependent variables (TOLD-P:4 and the PLAI2 language assessments). Based on the analysis of the data, there is a lack of evidence for rejecting the null hypothesis for either the TOLD-P:4 or the PLAI2.
The results of the TOLD-P:4 analysis were not statistically significant at the p=.05 level. Additionally, effect sizes on the canonical correlation analysis were all well below 10%, which are not considered to be noteworthy; hence, there was no need for further interpretation.

The results of the PLAI2 analysis were not statistically significant at the p=.05 level; however, the first two roots yielded by the canonical correlation analysis were interpreted due to the strength (e.g., effect size) of the statistical results obtained (Hojat & Xu, 2004; Killeen, 2005). Root 1 had an effect size of .19, indicating that the independent variables shared approximately 19% of their variances with the dependent variables. Root 2 had an effect size of .09, indicating 9% of shared variance.

Summary

In this chapter, data were analyzed and used to examine the research questions and test the null hypothesis. Demographic data were provided about the study sample and descriptive statistics were presented for the independent and dependent variables. Results of the data analysis were presented, including bivariate correlations among the variables, a reliability analysis, and the canonical
correlation analysis. Findings indicated that there was a lack of evidence to reject the null hypothesis.

To examine to what extent scores on the Preschool Language Assessment (PLAI) and the Test of Language Development (TOLD) could be explained by the predictor variable set of teacher knowledge, teacher experience, level of education, emotional support, classroom organization, and instructional support, two canonical correlation analyses were conducted.

For the first canonical correlation analysis, the six predictor variables (mentioned above) were correlated with the four dependent variables of the TOLD. The four roots yielded by the canonical correlation analysis shared 5% or less of the variances with the dependent variables, which was not considered noteworthy. Because the four roots produced a result of less than 10%, these roots were not interpreted.

For the purpose of conducting the second canonical correlation analysis, the six predictor variables were correlated with the four dependent variables of the PLAI. Root 1 indicated that the independent variables shared approximately 19% of their variances with the dependent variables. Root 2 indicated 9% shared variance. The results of roots 3 and 4 were both 3%, which is considered trivial, and therefore only roots 1 and 2 were interpreted.
Root 1 interpretation indicated that the predictor variables of education, experience, knowledge, and emotional support were positively related to the PLAI subscale scores. These findings would imply that teachers who had the most education and experience, who scored well on the knowledge questionnaire, and who scored well on the CLASS domain of emotional support had students who scored higher on the PLAI.

Root 2 interpretation indicated that, as a set, the predictor variables accounted for approximately 9% of the variance in subscale scores on the PLAI. Emotional support accounted for the highest positive proportion of variance of the function. Alternatively, the amount of teaching experience that teachers had in the childcare industry was found to be negatively correlated to PLAI subscale scores.

The canonical correlation results of the TOLD-P:4 and PLAI2 analysis were not statistically significant at the $p=.05$ level. Based on the analysis of the data, there was a lack of evidence for rejecting the null hypothesis due, at least in part, to the relatively small sample size employed. However, the canonical correlation results for the PLAI2 variables were interpreted as they were of noteworthy statistical magnitude (Hojat & Xu, 2004; Killeen, 2005).
Chapter 5 presents a summary of the study and the methodology employed, findings are discussed, conclusions drawn, and recommendations are made for future research.
CHAPTER V  
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of the present study was to determine whether a set of teacher demographic, knowledge, and instructional variables would be related to preschool children’s literacy development. Specifically, the study investigated how these teacher variables impact children’s language development scores on the four subscales of the Preschool Language Assessment Instrument, Second Edition (PLAI2; Blank et al., 2003) and the four subscales of the Test of Language Development – Primary, Fourth Edition (TOLD-P:4; Newcomer & Hammill, 2008).

In this final chapter, the methodology employed is reviewed, findings are summarized and discussed, conclusions are drawn, and recommendations are made for future research.

Review of the Methodology

The present study, with permission from the Florida Institute of Education, used archived data collected during February through May
2011. All assessments and observations were conducted at participating childcare sites in Duval County, Florida.

The research instruments consisted of two language development assessments (PLAI2 & TOLD-P:4), one classroom observation instrument (CLASS), and a teacher knowledge questionnaire.

Six predictor variables were used relative to teacher inputs: scores from the CLASS observation domains of (a) emotional support, (b) classroom organization, and (c) instructional support; (d) the level of education of the teacher, (e) the number of years of teaching pre-kindergarten, and (f) teacher responses to a knowledge questionnaire.

The student outcome variables were the mid-year language development assessment scores of the pre-kindergartners on the Preschool Language Assessment Instrument, Second Edition (PLAI2 consisting of (a) matching, (b) selective analysis, (c) reordering, and (d) reasoning; and the Test of Language Development, Primary, Fourth Edition (TOLD-P:4) consisting of (a) relational vocabulary, (b) syntactic understanding, (c) sentence imitation, and (d) morphological completion.

Analysis of the data consisted of descriptive statistics (means and standard deviations) of the independent and dependent variables, examining bivariate correlations for dependent and independent
variables, conducting a reliability analysis, and using a canonical correlation analysis to test the present study’s research questions.

Institutional Review Board (IRB) clearance was obtained by FIE for the original collection of the data. For the present study, IRB review was waived because the study used archived data and therefore did not involve using human subjects directly in the research. IRB documentation can be found in Appendix E.

Summary of the Results

Examination of the bivariate correlations indicated that the CLASS domains of emotional support, classroom organization, and instructional support were highly correlated. There were no noteworthy correlations between the teachers’ level of education or the number of years teaching with the CLASS predictor variables. This would indicate that teachers’ CLASS scores are not appreciably related to their highest level of education or teaching experience.

There were moderate correlations (.30 and .29) between the teacher knowledge questionnaire and the level of education of the teacher and the CLASS emotional support subscales, respectively. This positive correlation indicates that teachers who had a higher level of education and who scored higher on the emotional support scale also scored higher on the TKQ. Interestingly, there was a moderate
negative correlation between the TKQ and teaching experience. This would indicate that the teachers with the most teaching experience in the childcare industry most often scored lower on the teacher knowledge questionnaire.

The four subscales of the TOLD were moderately to highly correlated with each other, while the PLAI values indicated a higher degree of correlation. These moderate to high positive correlations indicated that the subtests within each instrument were related to each other. The PLAI and TOLD values were moderately to highly correlated to each other. This indicated that the two instruments are similar in their measurement of children’s language development skills.

There were two primary research questions in the present study:

1. To what extent will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS instructional support, level of education, years teaching pre-kindergarten, and answers on a teacher knowledge questionnaire (TKQ) be correlated with the TOLD-P:4 language assessment subscales of relational vocabulary, syntactic understanding, sentence imitation, and morphological completion?

2. To what extent will the predictor set of CLASS emotional support, CLASS classroom organization, CLASS
instructional support, level of education, years teaching pre-kindergarten, and answers on a TKQ be correlated with the PLAI2 language assessment subscales of matching, selective analysis, reordering, and reasoning?

Results for Quantitative Research Question 1

For the first canonical correlation analysis, the six predictor variables (mentioned above) were correlated with the four dependent variables of the TOLD. The four roots yielded by the canonical correlation analysis shared 5% or less of the variances with the dependent variables, which was not considered noteworthy. Specifically, Root 1 = 5%, Root 2 = 4%, Root 3 = 2%, and Root 1 = 1%. Because the four roots produced a result of less than 10%, these roots were not interpreted.

Results for Quantitative Research Question 2

For the purpose of conducting the second canonical correlation analysis, the six predictor variables were correlated with the four dependent variables of the PLAI. Root 1 indicated that the independent variables shared approximately 19% of their variances with the dependent variables. Root 2 indicated 9% of shared variance.
The results of roots 3 and 4 were both 3%, which is considered trivial, and therefore only roots 1 and 2 were interpreted.

Root 1 interpretation indicated that the predictor variables of education, experience, knowledge, and emotional support were positively related to the PLAI subscale scores. These findings would imply that the students of teachers who had the most education and experience, who scored well on the knowledge questionnaire, and who scored well on the CLASS domain of emotional support, scored higher on the PLAI.

Root 2 interpretation indicated that, as a set, the predictor variables accounted for approximately 9% of the variance in subscale scores on the PLAI. Emotional support accounted for the highest positive proportion of variance of the function. Alternatively, the amount of teaching experience that teachers have in the childcare industry was found to be negatively correlated to PLAI subscale scores. It would be easy to speculate on this finding; however, because the predictor variables only accounted for 9% of the variance in subscale scores on the PLAI in root 2, it is recommended that further studies be conducted to see if there would be a replication of the negative correlation.
The results of the TOLD-P:4 and PLAI2 analysis were not statistically significant at the p=.05 level. Based on the analysis of the data, there was a lack of evidence for rejecting the null hypothesis.

Discussion of the Results

Many researchers in the past have studied the relationship between teachers’ level of education and classroom quality (e.g. Early et al., 2007; Fukkink & Lont, 2007; Mashburn, Hamre, Downer, & Pianta, 2005; Pianta et al., 2005; Tout et al., 2005; Vandell & Wolfe, 2000; and Zill & Resnick, 2005). The finding in the present study that there were no noteworthy correlations between the teachers’ level of education or the number of years teaching with the CLASS predictor variables is consistent with previous findings. Mashburn et al. (2005) and Pianta et al. (2005) noted small, if any, effects of teacher qualifications on observed classroom quality, and there continues to be a high degree of variability in classroom quality even when observing in classrooms where teachers have the highest levels of education and experience and work with small numbers of high-income children.

As previously noted, Early et al. (2007) gathered results from seven studies of preschool programs. They found two studies that demonstrated a strong correlation between teachers’ education and classroom quality: (a) Early Head Start Study (EHS, Administration for
Children and Families, US Dept. of Health and Human Services, 2002) and (b) National Institute of Child Health and Human Development Study (NICHD, NICHD SECC, 1991). Early et al. (2007) stated, “...two studies (EHS and NICHD) found evidence that more educated teachers had higher quality classrooms and that quality was higher when teachers had a Bachelor's degree” (p.570).

By contrast, Early et al. (2007) reported that the Family and Child Experiences Survey (FACES, Zill & Resnick, 2005) found that teachers with a bachelor’s degree had lower quality classrooms compared with teachers without a bachelor’s degree. The remaining four studies found no conclusive evidence supporting an association between teacher education and classroom quality, which is consistent with the findings of the present study.

Early et al. stated:

Whereas the existing literature generally indicates that more education may be beneficial, there is no conclusive evidence that a teacher with a bachelor’s degree or any other specific level of education will produce or ensure a high-quality classroom or children’s learning. (p. 560)

In a similar study, Tout et al. (2005) completed a review of the research examining links between early childhood teachers’ education
and classroom quality. They found that higher levels of teacher education, especially education that focuses on early childhood development, was generally linked to higher classroom quality, but that there was insufficient research to conclude that an increase in teacher education would cause an increase in program quality. Fukkink and Lont (2007) completed a meta-analysis of caregiver training studies and found that caregivers with higher educational levels provided better personal care, were more sensitive, were more involved with children, and had more knowledge of developmentally appropriate practice than caregivers with lower educational levels. Vandell and Wolfe (2000) concluded that there is modest empirical support for attributing gains in child outcomes to teachers having a bachelor's degree. Hence, the statistically nonsignificant, small Pearson correlations found between teacher background and CLASS variables are not atypical.

The finding in the present study that the teachers who had higher scores on the CLASS domain of emotional support had students who scored higher on the PLAI2 is consistent with the general findings of past research. Bronfenbrenner and Morris (1998) stated that children are most directly influenced through “proximal processes,” their daily interactions with adults and peers. Pianta (2006) agreed with the proximal process theory, as applied to schooling, and
suggested that classroom interactions between adults and children should be a primary focus of study when seeking to understand children's development in school contexts. Likewise, Howes et al. (2008) concluded from their pre-kindergarten study that children showed larger gains in academic outcomes when they experienced higher-quality instruction or closer teacher-child relationships. Densmore et al. (1995) noted from their study that the frequency of warmth and sensitivity in adult-child conversations in preschool classrooms was found to be correlated with the same teachers’ tendency to engage in cognitively and linguistically enriching conversations with children.

In the findings of the present study, the predictor variable of instructional support was weakly correlated to the students’ language assessment scores. This is inconsistent with Howes et al. (2008) who found that higher-quality instruction was related to gains in students’ academic outcomes.

The early childhood classroom is a complex learning environment with many issues arising on a daily basis. On the day of assessment, children may be absent, may not want to participate, or may not have slept well. There may have been a change in their classroom teacher or any of a host of other issues that may have happened before they arrived at school. Another issue is that children are easily distracted,
and from the assessment standpoint, having a quiet space to test children which is free of traffic and distractions might make a difference in children’s language assessment scores. The day of testing is a snapshot in the life of a child, which might look different if it had taken place on a different day. These factors may influence the assessors’ ability to measure variables effectively and draw conclusions from findings.

Limitations of the Research Instruments

As noted in Chapter 3, there were several limitations inherent to the present study (specifically small sample size and violation of the parametric independence assumption). In addition, research instruments were also a limitation. For example, several of the item-to-total correlations on the teacher knowledge questionnaire had values of zero or had a negative value. The zero correlations indicated a lack of variation in the item scores, and the negative correlations suggested that some items were measuring in the opposite direction of the total score (i.e., lower scorers tended to get these items correct and higher scorers tended to get them incorrect), suggesting guessing.

Limited validity data regarding the scores on the teacher knowledge questionnaire was also a limitation of the study. Specifically, validity analysis was limited to content validity analysis by
using an expert panel of early childhood professionals. Other methods for establishing validity of the data gathered in the study (e.g., construct validity, concurrent validity) were not feasible considering that archival data were used.

Conclusions and Recommendations

The findings of the present study lead to conclusions, implications for professional development, and recommendations for further research.

Conclusions

The results of the present study indicate that there is a positive correlation between the teacher predictor variables of education, experience, knowledge, and the CLASS domain of emotional support with students’ scores on the PLAI2. At the same time, the amount of teaching experience that teachers had in the childcare industry was found to be negatively correlated to PLAI2 subscale scores. Though the findings are inconsistent within the study, it is possible that the longer a teacher has been in the pre-kindergarten classroom, the more likely their students are to perform lower on language assessments. It was also found that the more teaching experience a pre-kindergarten
teacher had, the lower they scored on the teacher knowledge questionnaire.

In referring back to the conceptual model (page 6), I suggested that teaching experience, along with essential teaching skills and knowledge, may impact student assessment scores on language development. There were some confirmations and inconsistencies from the model; some elements were supported while others were not. For example, the current findings suggested that experience was not linked to student assessment scores. Even though the results of the present study did not match the conceptual framework exactly, it is inappropriate to accept or discard the model based on the findings of one study.

Finally, the CLASS observations were an invaluable data collection tool used to collect classroom environment information, including emotional support, classroom management, and instructional support, which are not easily measured by other classroom observation tools. Other measurement instruments, such as the ECERS, do not capture important teacher/child interactions such as positive climate, negative climate, and regard for student perspective. The CLASS method of data collection by the certified CLASS observer provides a new and improved way to view the pre-kindergarten
classroom as compared to previous measures commonly used in the past.

Implications for Professional Development

Teachers who have been out of formal education longer may require more professional development as indicated by the results of the present study. In order to stay current on the latest research and best teaching methods in early literacy and language development, and to assure continuing professional renewal, it is recommended that all pre-kindergarten teachers receive regular professional development.

Neuman and Cunningham (2009) found that the combination of coursework and coaching was the most effective implementation strategy for professional development. Interestingly, coursework alone had negligible effects on improvements in quality practice. Teachers need follow-up, feedback, and coaching to truly improve their day-to-day teaching practice.

One example of a professional development package that exemplifies the Neuman and Cunningham ideal strategy is MyTeachingPartner (MTP; Pianta et al., 2008). MTP is a web-based system of professional development resources that includes video exemplars and web-mediated consultation on specific dimensions of
interactions with children. Teachers videotape themselves implementing an MTP lesson once every 2 weeks. The MTP consultant edits the classroom observation video and then posts the edited video and written prompts for review by the teacher on a secured website. The teacher views the edited video and responds to prompts, which are designed to promote reflective thought on the part of the teacher. After the teacher has viewed the video, the teacher and the consultant participate in a videoconference. They discuss the edited classroom video and issues related to classroom performance and determine goals for future cycles (MyTeachingPartner.net, 2006). The videoconference consultation after review of the edited video is an excellent source of feedback and professional development.

Recommendations for Further Research

The sample size for the present study was small (students $n = 95$, teachers $n = 19$). A greater number of participants would have made the study more robust. Larger sample sizes (i.e., at least double the size of the sample in the present study) should be used in the future to account for unforeseen obstacles such as teacher consent, retention, and scheduling conflicts. Larger samples would also increase the likelihood of obtaining statistically significant results which were not found in the present study, despite the fact that the second
canonical correlation analysis yielded results with a moderate effect size. Replication of the present findings with larger samples would not only determine whether the relationships identified herein would be generalizable but also help determine whether such relationships would also be statistically significant given a larger sample.

Teacher knowledge should continue to be a focus in studies of this type, and it is important that validity studies be conducted to establish estimates of the psychometric integrity of scores on instruments measuring teacher knowledge. Based on the disappointing performance of the teacher knowledge measure used in the present study, it is recommended that a teacher knowledge questionnaire for early childhood educators be piloted on approximately 250 early childhood teachers or teacher education students to ensure construct and concurrent validity before using with the participants in additional applied studies. Piloting the teacher knowledge questionnaire may help to eliminate the problem of no variance in particular items, which in the case of the present study, suggested the possibility that many of the participants were guessing. This will help to ensure that the instrument is not too difficult or easy for early childcare educators, who typically hold a CDA, to complete.

Finally, as note in Chapter 3, the present study’s design was limited to the extent that the data violated the assumption of
independence of observations. Specifically, because the student was the unit of analysis, teacher variables were repeated for all students in a given classroom calling into question the fact that all observations were uniquely determined. To avoid this limitation and threat to research validity, future studies should include much larger numbers of students and classrooms. One possible design would involve using a large enough sample of teachers to allow for the averaging of student performance across all students in the classroom so that the teacher would then become the unit of analysis with mean values of all student achievement measures for each teacher serving to indicate each teacher’s collective ability to produce important learning outcomes. Alternately, extremely large data sets could be used, and a limited number (e.g., two to five) of student cases could be extracted from each classroom/teacher in the data base. This would limit the effects of violating the independence assumption while simultaneously keeping the student as the unit of analysis. Still another appropriate research design would feature the student as the unit of analysis across a large number of teachers/classrooms, with data analyzed within its hierarchical complexity through use of hierarchical linear modeling.
Contributions of the Study

The results of the study raise the awareness of the importance of professional development for early childcare educators. The findings indicated negative correlations between teaching experience with PLAI scores and TKQ scores. This raises awareness regarding professional development for teachers who have been teaching for several years but who may not have necessarily stayed current on the latest research regarding language development, literacy, and best teaching methods. This should be a red flag for educational leaders to review policy regarding ongoing professional development requirements.

Findings complement those of previous studies with regard to teacher level of education and classroom quality. Findings of the present study were consistent with the findings of Mashburn et al. (2005) and Pianta et al. (2005) who noted that there were small, if any, effects of teacher qualifications on observed classroom quality. These findings emphasize the need for further research to determine which teacher variables contribute to the most students’ learning.
Appendix A

University of North Florida
Office of Research and Sponsored Programs

CONTROL DOCUMENT — CONFIDENTIAL DATA/INFORMATION

The person indicated below as "recipient" has received the documents or data described below, which has been obtained during research involving human subjects. The recipient recognizes the principles of protection of human subjects and by signature below commits to ensuring the continued confidentiality of this information/data.

Material transmitted: Scores from the Preschool Language Assessment Instrument, 2nd Edition (PLAI2), the Test of Language Development, Primary: 4th Edition (TOLD-P:4), the Classroom Assessment Scoring System (CLASS), and the Teacher Knowledge Questionnaire.

PI or project administrator authorizing the transfer or use of the referenced data/information:

Name: Cheryl Fountain
Signature: Signature Deleted
Date: 05/26/11

Recipient:
Name: Donna Ellis
Signature: Signature Deleted
Date: 05/26/11

Recipient has returned data or completed work and no longer retains control of confidential information:

Signature of PI or project administrator: __________________________
Date: __________________________

Rev. March 2010
that's fine donna... thanks for your request... best, susan

Ellis, Donna wrote:

> Dr. Neuman,
> My name is Donna Ellis and I am a Doctoral candidate in the
> Educational Leadership program at the University of North Florida. I
> am working at the Florida Institute of Education while finishing my
> dissertation. Dr. Stephanie Wehry suggested that I contact you
> regarding your "Project Great Start Professional Development
> Initiative Fall 2007 Caregiver Questionnaire".
> With your permission, I would like to use part of your questionnaire
> in my dissertation work with early childhood teachers. I propose to
> use your 20 true/false questions and modify 5 of your multiple choice
> questions into true/false questions. I will state in my dissertation
> that the questionnaire is a modified version of your original
> questionnaire.
> I am not working with degreed teachers and felt that the true/false
> questions were the most suitable for the population that I am
> gathering data on. I have attached a copy of what I propose to use and
> ask for your permission to include it in my work.
> Thank you,
> Donna Ellis, MEd
> Doctoral Research Assistant
> Florida Institute of Education
> at the University of North Florida
> University Center
> 12000 Alumni Drive
> Jacksonville, FL 32224
Appendix C

Early Learning Coalition of Duval
Parent/Guardian Consent for Child to Participate 2010-2011

Child's Name ____________________________  Child's Birthday ____________________________

The Early Learning Coalition of Duval and the Florida Institute of Education (FIE) at the University of North Florida (UNF) seek to improve the quality of childcare services by providing programs designed to improve the number and quality of early learning experiences of young children at home and in childcare. As part of the program, we will examine children's language and literacy skills.

While all children and their families will be encouraged to participate in the program, only children who are at least 4 years old (born on or before September 1, 2006) will be eligible to participate in the assessment designed to measure program effectiveness. A sample will be randomly selected from the total pool of informed consents signed and returned to your child's teacher.

We will ask questions about colors, numbers/counting, shapes, letters and letter sounds, words, sentence, and stories. The assessment process, held in fall 2010 and spring 2011, will take one hour and 15 minutes. We will administer one part of the assessment on one day and the rest on the second day. We will also assess some children early in 2011. This mid-year assessment will take about one hour and will be administered over two days.

All assessments are administered in a one-on-one setting by trained assessors sensitive to the needs of young children. Your child does not have to respond to any questions he/she does not want to answer. The results will be used to assess the impact of the program and for program improvement.

All information from the assessments will be kept confidential. There is no foreseeable risk to your child from participation.

Once your child enters kindergarten, we may seek additional information from the school district or your child's school attendance, referral to exceptional education services, statewide standardized assessment results, and/or promotion/retention information. Results may be used in combination with other projects in order to better understand what helps children learn.

There are no direct benefits to participants for taking part in the program assessment. However, we would like for your child to participate. In fact, your child's participation will provide valuable information about how well preschool readiness activities work. It will help agencies, childcare centers, and researchers make informed decisions about how to best improve the quality of services provided to your child.

Participation is voluntary. No compensation for participation will be provided. Your child may withdraw from the assessment process at any time without penalty. If you have any questions about the assessment process, you may call Dr. Madelaine Cosgrove, Associate Director for School Readiness at FIE ( ). You may get more information about UNF policies, the conduct of this study, and your rights as a participant from Dr. Katherine Kasten, Chair UNF Institutional Review Board.

Please check one of the following responses:

--- Yes, I consent to have my child included in the assessment process.
--- No, I do not consent to have my child included in the assessment process.

Name of Parent (Legal Guardian) ______________________________________________________

Signature of Parent (Legal Guardian) __________________________________________________

Print Name: ____________________________________________  Date ________________________

Site ____________________________  Teacher ____________________________________________

Florida Institute of Education the University of North Florida/Early Learning Coalition of Duval Informed Consent 2010
Florida Institute of Education (FIE) at the University of North Florida  
Early Learning Coalition of Duval  
Permission to Use Data (Parent/Guardian)  
April 2011

Child’s Parent/Guardian:

This past year, in the fall of 2010 and winter of 2011 (and, again in spring 2011) your child, ____________________________, participated in a study of services provided by the Early Learning Coalition of Duval. The Florida Institute of Education (FIE) at the University of North Florida (UNF) conducted this study. We asked questions about colors, numbers/counting, shapes, letters and letter sounds, words, sentence, and stories.

The purpose of the evaluation was to gather information related to the quality of childcare services by providing programs and how best to develop programs designed to improve the number and quality of early learning experiences of young children at home and in childcare. We truly appreciate your willingness to allow your child to participate in this study.

We now believe the data we collected has important implications for improving the quality of care and education provided to all children. We would like to use the data for research and publication purposes. Allowing us to use the data will help childcare advocates to better understand what preschool classrooms are like and how best to enhance professional development initiatives focused on improving the learning of young children. Allowing us to use this data will not impact your child in any way.

We do not believe that there are any foreseeable risks to your child. All information obtained is kept confidential and maintained in a secure location. Individual data will not be shared or used for any purposes. Only aggregated data will be used for program improvement and/or research purposes. To further maintain confidentiality, observers signed a Confidentiality Pledge requiring them to maintain standards of confidentiality for all aspects of information, except in cases of abuse, neglect, or abandonment. Only FIE staff working on this study with the correct security permission will have access to the data.

Participation is voluntary, and you can choose not to allow your child’s data to be used for research purposes. Neither you nor your child will receive direct benefits for allowing your child’s data to be used for research purposes, and neither you nor your child will be compensated for participation. However, results from the analysis of the data may benefit future children and teachers in similar preschool programs.

If you have any questions about the use of the data, you may call Dr. Madelaine Cosgrove, Associate Director for School Readiness at FIE. You may get more information about UNF policies, the conduct of this study, and your rights as a participant from Dr. Katherine Kasten, Chair UNF Institutional Review Board.

Consent to Use the Data
I have read this form and received answers to my questions. I have indicated below whether I am willing to give permission to use the child assessment data collected during the 2010-2011 school year for research and publication purposes.

______ Yes  ______ No

Name of Parent (Legal Guardian) ____________________________

Signature of Parent (Legal Guardian) ____________________________ Please Print

Site ____________________________  Teacher ____________________________ Date

Florida Institute of Education the University of North Florida/Early Learning Coalition of Duval Informed Consent 2010
Florida Institute of Education (FIE) at the University of North Florida
Early Learning Coalition of Duval
Informed Consent to Participate and Permission to Use Data (Teacher)
April 2011

Dear [Insert teacher's name]:

In March 2011, FIE staff completed an observation in your class to gather information related to children's classroom experiences. We used the Classroom Assessment Scoring System (CLASS) instrument to collect data in three areas: emotional support, classroom organization, and instructional support. We truly appreciate your willingness to help us as we seek ways to better facilitate the teaching and learning process in preschool classrooms.

We now believe the data we collected has important implications for improving the quality of care and education provided to all children. We would like to use the data for research and publication purposes. Allowing us to use the data will help childcare advocates to better understand what preschool classrooms are like and to devise new strategies to enhance professional development initiatives focused on improving the learning of young children.

We would also like for you to complete the Teacher Knowledge Questionnaire. The questionnaire has several questions about children's language and literacy as well as demographic questions. It should take about 15 minutes to complete.

We do not believe that there are any foreseeable risks to you. All information obtained is kept confidential and maintained in a secure location. Individual data will not be shared or used for any purposes. Only aggregated data will be used for program improvement and/or research purposes. To further maintain confidentiality, observers signed a Confidentiality Pledge requiring them to maintain standards of confidentiality for all aspects of information, except in cases of abuse, neglect, or abandonment. Only FIE staff working on this study with the correct security permission will have access to the data. Results will not be tied to evaluate teacher performance.

You will not receive any direct benefits for participating in this research. However, results from analysis of the data may benefit future children and teachers in similar preschool programs. You will receive $15 in compensation for assisting with the collection of parental recollection documents and an additional $10 for submission of the Teacher Knowledge Questionnaire. If you accept this monetary compensation, we will also obtain your social security number and address to use in reporting this compensation to the UNF Bursar's Office for federal income tax records.

If you have any questions about the use of the survey and observation data, you may call Dr. Madeline Cosgrove, Associate Director for School Readiness at FIE. You may get more information about UNF policies, the conduct of this study, and your rights as a participant from Dr. Katherine Kasten, Chair UNF Institutional Review Board.
Consent to Use the Data
I have read this form and received answers to my questions. By checking responses to the questions below, I indicate my permission to for the Florida Institute of Education (FIE) to use the observation data collected in March for research and publication purposes and my willingness to complete the Teacher Knowledge Questionnaire.

Are you willing to have the observation data collected in your classroom used for research purposes?

_______ Yes   _______ No

Are you willing to respond to the Teacher Knowledge Questionnaire?

_______ Yes   _______ No

Name of Teacher (print) ________________________________________

Signature of Teacher ____________________________________________ Date

Site ___________________________________________________________

Address and Social Security Number for Income Reporting Only

Address:

_____________________________________________________________

_____________________________________________________________

_____________________________________________________________

Social Security Number: _________________________________________
Early Learning Coalition of Duval
Informed Consent for Teacher Participation

Dear Teacher:

The Early Learning Coalition of Duval and the Florida Institute of Education (FIE) at the University of North Florida (UNF) seek to improve the quality of childcare services by providing programs designed to improve the number and quality of early learning experiences of young children at home and in childcare. As part of this initiative, we would like to complete one classroom observation in your class to gather data related to children’s classrooms experiences. We will use the Classroom Assessment Scoring System (CLASS) to collect data in three areas: emotional support, classroom organization, and instructional support. These observations will take place in February/March 2011.

We will use the data, aggregated by grade level, to guide professional development initiatives for teachers of young children. Individual data will not be shared or used for evaluation purposes. All information obtained will be kept confidential and maintained in a secure location. The information we collect will help us in our efforts to enhance teacher training.

The one-time observation will take up to 2 hours. A trained CLASS observer will schedule a time convenient for you, will remain as inconspicuous as possible during the observation, and will keep all information related to the observation confidential.

Participation is voluntary. No compensation for participation will be provided. However, your participation will help us better understand classroom dynamics and their impact on instruction. In fact, the information we collect will help us in our efforts to enhance teacher training. There is no foreseeable risk to your participation. You may withdraw from participation at anytime.

If you have any questions or concerns about the conduct of this observation, please call Dr. Madelaine Cosgrove, Associate Director for School Readiness at the Florida Institute of Education (FIE) at the University of North Florida. The telephone number is

Agreement to Participate
I have read this form and received answers to my questions. By signing this form I willingly agree to take part in the Early Learning Coalition of Duval CLASS observation.

Name of Teacher (print) __________________________________________________________

Signature of Teacher ____________________________________________________________ Date

Site __________________________________________________________________________
Appendix D

Teacher Knowledge Questionnaire for Early Childcare Educators:

**Directions:** Read each question and circle the best response. This should take about 15 minutes to complete.

1. It is common for children to have letter name knowledge at the end of age 4. [T] [F]
2. Children who are non-English language speakers benefit most when they are required to speak in English in formal settings. [T] [F]
3. Children may understand the concept of numbers by the end of age 4. [T] [F]
4. Children’s vocabulary in the early years is a strong predictor of their later reading achievement. [T] [F]
5. It is more important to have small teacher-child ratios in the toddler years when children are beginning to talk, than in early infancy when children spend most of their time napping. [T] [F]
6. Children always advance from one identifiable stage to another. [T] [F]
7. Reading instruction should begin about when children are 6 ½ years old. [T] [F]
8. Children can generally understand more language than they can produce. [T] [F]
9. It is common for children to have some number name knowledge by age 4. [T] [F]
10. Children’s beginning writing attempts at the age of 4 are often difficult for adults to interpret. [T] [F]
11. Second language learners should be exposed on a regular basis to storybooks in English. [T] [F]
12. Standardized tests with validity and reliability are the best way to determine if a child is ready for kindergarten. T F

13. Children can use different activities to learn how to identify letters. T F

14. Children’s knowledge of nursery rhymes may be correlated to their letter knowledge. T F

15. Infants learn about their world by using their 5 senses. T F

16. When a child makes a statement like “I runned”, the teacher can model correct syntax by saying “You ran?” T F

17. Encouraging parents of second language learners to use the English language exclusively in the home enhances children’s English acquisition. T F

18. Fathers can affect their children’s attitudes and engagement with books. T F

19. Parents should sometimes point to words in picture books as they read to their child. T F

20. Block areas can generate back-and-forth conversations among children. T F

21. The ability to point to the print as what carries the message instead of the picture on a page indicates a child’s understanding that the print is what is read. T F

22. Watching television is an activity that best promotes vocabulary development. T F

23. Identifying letter sounds and patterns in language defines phonemic awareness. T F

24. The alphabetic principle is best described as the understanding that there are many different alphabets in the world. T F
25. Singing the alphabet song is an appropriate activity for promoting letter knowledge.  

T  F

Personal Information:

What is your highest education level? (choose one)

- Some high school
- High school diploma or GED
- Some post H.S./GED coursework
- CDA
- Associates degree
- Bachelors degree in Early Childhood Education
- Other Bachelor’s degree _________________________________
- Other: _____________________________________________

How many years have you worked in childcare? ________________________________

How many years have you worked at your current job? ___________________________

Please provide your information:

Name _______________________________________________________

Current Employer _____________________________________________

Thank you for your participation.
MEMORANDUM

DATE:       June 30, 2011

TO:         Ms. Donna Ellis
            FIE

FROM:       Dr. Katherine Kasten, Chairperson
            On behalf of the UNF Institutional Review Board

RE:         Review by the UNF Institutional Review Board:
            “Impact of Teacher Demographic, Knowledge, and Instructional Variables on Children’s
            Language Development: Implications for Approaches to Professional Development”

This is to advise you that your project, “Impact of Teacher Demographic, Knowledge, and Instructional Variables on Children’s Language Development: Implications for Approaches to Professional Development,” was reviewed on behalf of the UNF Institutional Review Board. You are receiving this waiver because this project was declared “not research involving human subjects” based on the federal definition of “research” as stated in the U.S. Department of Health and Human Services Code of Federal Regulations 46.102. Therefore, it is not necessary for this project to be reviewed and approved by the UNF IRB.

This waiver should be kept for your records and applies to your project in the form and content as submitted to the IRB for review. Any variations or modifications to this waived project as related to dealing with human subjects must be cleared with the IRB prior to implementing such changes.

Thank you for submitting your work for IRB review. We appreciate that you understand the value of IRB review of research and projects conducted at UNF. Any unanticipated problems involving risk and any occurrence of serious harm to subjects and others shall be reported promptly to the IRB.

Should you have any questions or if we can be of further service, please contact Kayla Champaigne at
References


National Council on Teacher Quality (2004). *Increasing the odds: How good policies can yield better teachers*. Washington, DC.


Pianta, R. C. (2003). *Standardized observations from pre-K to 3rd grade: A mechanism for improving access to high quality classroom experiences and practices during the P-3 years*. Working paper, Foundation for Child Development.


Donna M. Ellis

Education

**University of North Florida**, Jacksonville, Florida  
*Doctorate in Educational Leadership*, 2011

**Dalhousie University**, Halifax, Nova Scotia  
*Master of Information Technology Education*, 1999

**University of New Brunswick**, Fredericton, New Brunswick  
*Bachelor of Education*, 1994

Employment

**Florida Institute of Education at the University of North Florida**, Jacksonville, Fl  
*Coordinator, Research Programs & Services*, November 2010 - present

**Nemours BrightStart! Dyslexia Initiative**, Jacksonville, Florida  
*Early Intervention Teacher and Educational Research Assistant*, 2005-2010

Professional Presentations


Ellis, D.M. (2010, October). Fidelity of Implementation. Roundtable discussion at the 55th Annual Florida Association for the Education of Young Children Conference, Orlando, FL.

Ellis, D.M. (2010, July). Implementation Fidelity of an Early Literacy Tier Two Intervention Program. Presentation to the One Goal Summer Conference, Tampa, FL.


**Training**

- Classroom Assessment Scoring System (CLASS) certified observer 2011
- Test of Language Development (TOLD) assessment instrument 2011
- Preschool Language Assessment Instrument (PLAI) 2011
- Test of Preschool Early Literacy (TOPEL) 2011
- Bracken Basic Concept Scale (BBCS) 2011
- Assessment of Language and Literacy (ALL) 2007
- Get Ready to Read (GRTR) assessment instrument 2005
- Microsoft Certified Professional (MCP) 1999