

THE INFLUENCE OF TEACHER CHARACTERISTICS,
BELIEFS, AND PROGRAM QUALITY ON
CHILDREN'S CREATIVITY

by

ERIN NICOLE FARELLA

A THESIS

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ABSTRACT

Creativity is important because it influences self-esteem, social development, behavior, and problem-solving abilities (Barron & Harrington, 1981). With this in mind, finding ways to promote creativity becomes necessary. Since teacher characteristics, beliefs, and program quality have all been found to influence children's cognitive and social development (Chang, 2003; Pianta et al., 2005; Fontaine et al., 2006), it seems possible that they could also influence creativity. To address this question, 10 early childhood education classrooms were assessed for program quality using the Early Childhood Environment Rating Scale-Revised (ECERS-R; Harms, Clifford, & Cryer, 2005) and the Classroom Assessment Scoring System (CLASS; Pianta, LaParo, & Hamre, 2006) measurements. Teachers of these classrooms were asked to complete a questionnaire that assessed their educational background, professional development, and beliefs regarding their profession, developmentally appropriate practices, and creativity. In addition, 82 children ages 3 to 5 completed an art collage, which was then assessed for creativity using the Consensual Assessment Technique (Amabile, 1982). Interestingly, negative correlations were found between program quality and creativity. This suggests that while high quality of care and education leads to higher academic skills in children (Burchinal et al., 2000), it does not lead to higher creativity. Further studies are recommended to validate these findings.

DEDICATION

This thesis is dedicated to my exceptionally supportive family and friends. Each have encouraged me, prayed with me, and been my driving force through this challenging feat.

LIST OF ABBREVIATIONS AND SYMBOLS

<i>a</i>	Cronbach's index of internal consistency
<i>df</i>	Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data
<i>M</i>	Mean: the sum of a set of measurements divided by the number of measurements in the set
<i>r</i>	Pearson product-moment correlation
<i>t</i>	Computed value of t test
<	Less than
=	Equal to

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Chapter 1: Introduction

As we search for innovative ways to solve today's problems, it becomes necessary to determine how this can be done. When problem solving comes to mind, so does creativity. Since creativity can be defined as producing novel ideas or concepts (Guilford, 1950; Mindham, 2005), divergent thinking (Butcher & Niec, 2005), being innovative (Butcher & Niec, 2005), and seeing things in fresh ways (Mindham, 2005), it becomes obvious that creativity is the key.

Since being creative can lend to effective, innovative problem solving, as well as autonomy, self-confidence, and independence of judgment (Barron & Harrington, 1981), it becomes important to determine where it comes from and how it can be fostered. Previous studies have found influences between teacher characteristics (Pianta et al., 2005; Saracho & Spodek, 2007; Mashburn et al., 2008), beliefs (Cassidy et al., 1995; Chang, 2003), and early childhood program quality (Burchinal et al., 2000; Bryant et al., 1994; Pianta et al., 2005; Howard-Jones, Taylor, & Sutton, 2002; Peisner-Burchinal et al., 2001) on children's social, emotional, and cognitive development, but not much research has been done regarding the influence on children's creativity. Also, research conducted regarding creativity has been geared more towards school-age children and adults, not towards young children. The purpose of this research is to examine the influences of teacher characteristics, beliefs, and program quality on preschool children's creativity. By noting the importance of educational attainment, behaviors, and classroom quality, teachers and administrators could transform how we teach our young children. The earlier creativity is fostered, the more prepared children may be to face life's challenges.

Creativity

Creativity is an abstract concept and can encompass many characteristics, which makes it difficult to define. Guilford (1950) described creativity as including factors such as: sensitivity to problems, fluency, flexibility of the mind, analyzing abilities, reorganization, complexity, and evaluation. According to Guilford (1950), fluency refers to the ability to produce a great number of ideas in a short period of time. Flexibility is the ability to produce a variety of approaches to solve a problem. Reorganization includes the ability to transform an existing object for the purpose of another function. Complexity refers to the ability to consider multiple variables while solving a problem. Similarly, Torrance (in Shaughnessy, 1998) defined creativity as the ability to find gaps in knowledge, search for solutions, and formulate and test hypotheses. Sternberg and Lubart (1996) defined creativity as being the ability to produce novel work that is useful or meets task restraints. They also suggested that it must be relevant and important. The relevancy of creativity can include individual creativity (e.g., solving daily problems) and societal creativity (e.g., new movements in art or introducing new scientific findings). To be important, creativity must promote coping with daily challenges and must provide unique ways to manage difficulties. Mindham (2005) suggested that creativity is “variable and person-related rather than absolute (p. 82).” Creativity can be described as the ability to see things in fresh ways, the ability to learn from the past and relate it to the present and future, thinking outside the box (original ideas), using non-traditional approaches to solve problems, going beyond the information that is provided (seeking more information), and creating something unique and original (Mindham, 2005).

Butcher and Niec (2005) suggested that creativity is considered to be a way of thinking, involving three different cognitive processes. The first cognitive process is divergent thinking,

which is the ability to develop multiple solutions to problems. The second is transformation, which is the ability to display flexibility in thinking and to use novel ways to solve problems. The third is evaluative thinking. Evaluative thinking is the ability to evaluate potential solutions, during and after solving a problem (Butcher & Niec, 2005). According to Mrevlje (2004), there are multiple levels of creativity: expressive, productive, inventive, and innovative. Mrevlje (2004) suggested that expressive creativity relates to freedom of expression. This is the ability to express feelings and ideas, but does not need skill or originality (e.g., child's artwork). Productive creativity relates to using skills and techniques to create new products. Inventive creativity does not lead to new ideas, but to new applications of old ideas. Innovative creativity includes seeking out and understanding principles and modifying them. These individuals have the ability to reach higher levels of understanding (Mrevlje, 2004).

Each of these definitions carry commonalities including: producing novel ideas or concepts, divergent thinking, using imagination, seeing things in fresh ways, seeking new information, and being open to experiences, which, simply put, defines the basis for creativity. In this study, creativity will be defined as the ability to produce a novel piece of art that includes many details. With all of these definitions of creativity, one question remains. Why is creativity important in children's development?

Children's Creativity and Development

Creativity is important because it has been found to influence children's self-esteem, social development, behavior, and problem-solving abilities (Butcher & Niec, 2005; Barron & Harrington, 1981; Dellas & Gaier, 1970; Kemple, David, & Wang, 1996; Uszynska-Jarmoc, 2005; Dess & Picken, 2000). Barron and Harrington (1981), for instance, found that high levels of autonomy, independence of judgment, self-confidence, self-regulation, and a lack of inhibition

were influenced by high levels of creativity in children. In addition, Dellas and Gaier (1970) suggested that individuals regarded as creative are more self-accepting and not concerned with the opinions of others. Kemple, David, and Wang (1996) found a positive relationship between self-esteem and creativity suggesting that individuals with high levels of creativity also possess higher self-esteem. Creativity also encourages perspective taking, which promotes social development and allows individuals to pay attention to more things at once (Butcher & Niec, 2005; Grabner, Fink, & Neubauer, 2007). Further, Butcher and Niec (2005) found that school-age children with higher levels of disruptive behaviors had lower levels of creativity. In their study, these disruptive children demonstrated deficits in their ability to generate multiple solutions on problem solving tasks due to poor divergent thinking skills. Evidently then, children's creativity is related to their social and emotional development, which has shown to be important factors in determining school-readiness (Bierman, Domitrovich, & Darling, 2009).

Creativity also facilitates adjustment to new situations and promotes the discovery of novel ways to solve problems. Finding novel ways to solve problems assists in one's coping ability (Carson et al., 1994). If an individual can think of interesting ways to solve problems then life crises may not seem as daunting. Carson et al. (1994) found a positive relationship between children's figural divergent thinking, known to be a creative characteristic, and teachers' ratings of children's coping. Not only does creativity relate to coping, brain activity is higher in children who display creative responses versus those who produce less creative responses (Grabner, Fink, & Neubauer, 2007). Uszynska-Jarmoc (2005) suggested that creative thinkers are better at solving tasks that require the application of new concepts in new ways of discovering, imagining, designing, or creating new and original things. Creative thinking and problem-solving is vital for adaptive functioning. Adaptive functioning is one's willingness to

practice new skills and pursue opportunities for improvement. Butcher and Niec (2005) suggested that creativity is an adaptive resource that encourages the increase of multiple solutions for problems, which is an important factor in solving interpersonal problems. This creative problem-solving ability is essential across the lifespan as companies and organizations face an increase in competition that requires hasty technological advances. Dess and Picken (2000), noted that this competition will require employees to find more novel ways to market and solve problems.

Creativity has shown to influence many aspects of children's development, including social and emotional development. It becomes necessary then to understand how creativity can be enhanced in young children within the early childhood education setting. With these important developmental attributes promoted by creativity, one question remains. What factors play a role in the development of children's creative outcomes?

Teacher Characteristics, Beliefs, and Children's Outcomes

Research suggests that teacher characteristics and behaviors play an important role in promoting the social and cognitive development of young children. Teacher characteristics, such as educational attainment and professional development influence their behaviors in the early childhood classroom (Saracho & Spodek, 2007; Brown, Molfese, & Molfese, 2008; Mashburn et al., 2008; Pianta et al., 2005). Teacher behaviors, such as teacher-child interactions (Mashburn et al., 2008; Peisner-Feinberg et al., 2001), emotional climate (Mashburn et al., 2008), and activity preparation (Howard-Jones, Taylor, & Sutton, 2002) can then influence a child's social and cognitive development. These characteristics and behaviors may also influence children's creative development.

Educational attainment and professional development can lead to more positive interactions between teachers and the children in their classrooms. These positive interactions can influence the overall emotional climate of the classroom, thus encouraging children to become more active explorers in their environment. Emotional climate refers to the positive or negative emotions or tone expressed by the teacher in the classroom environment (Pianta, La Paro, & Hamre, 2006). Positive emotional climate is established in consistent and caring relationships between the teachers, children, and their families (Copple & Bredekamp, 2009). Pianta et al. (2005) found that teachers with higher education were more responsive, stimulating, and provided a more overall positive emotional climate. Professional development has also been found to improve the emotional and instructional interactions between teachers and children by providing a positive climate and more teacher sensitivity (Mashburn et al., 2008). Saracho and Spodek (2007) noted that higher educated teachers motivated children more often. These higher-educated teachers were also more sensitive, responsive, and constructive in their relationships with their students. Positive teacher-child interactions can influence a child's cognitive and social development (Peisner-Feinberg et al., 2001) and promote school-readiness (Mashburn et al., 2008).

Developmentally appropriate practice means ensuring that children's developmental goals and objectives are met, based on theories of child development, while being attuned to unique social and cultural contexts (Copple & Bredekamp, 2009). Saracho and Spodek (2007) noted that teachers with higher education had better teaching practices, and their classrooms were more developmentally appropriate overall. These teachers also displayed a stronger knowledge of child development. Children are better stimulated and challenged in

developmentally appropriate classrooms (Copple & Bredekamp, 2009), which may then promote their creativity.

Also, Pianta et al. (2005) found that teachers with higher education provided the children in their classrooms with more activities. Higher educated teachers also use easier-to-follow directions, provide activities that promote language and literacy development, and use more novel, non-repetitive activities (Saracho & Spodek, 2007). Since language and literacy development are perceived as more important to teachers with higher education (Saracho & Spodek, 2007), children tend to perform better on letter identification tasks (Brown, Molfese, & Molfese, 2008). Children in classrooms with highly educated teachers also perform better on enumeration and numeral recognition tasks (Brown, Molfese, & Molfese, 2008).

Further, Howard-Jones, Taylor, and Sutton (2002) found that participation in a preceding, unstructured play activity, such as free-play with salt dough, as opposed to a structured activity, such as a handwriting exercise, influenced the creativity of young children in a subsequent activity. Children who participated in the unstructured activity provided art collages using a wider range of colors and materials, thus suggesting more creative value. While it appears evident that teacher characteristics and behaviors play important roles in children's social and cognitive development, they may also influence children's creative outcomes.

Program Quality

Research suggests that early childhood program quality influences the cognitive and socioemotional development of young children (Burchinal et al., 2000; Bryant et al., 1994; Peisner-Feinberg et al., 2001; Mashburn et al., 2008; Fontaine et al., 2006); however, not much research has been done in the way of the influences on creative development. Program quality has been found to have significant longitudinal effects on development (Peisner-Feinberg et al.,

2001), which could be a result of high quality program teachers providing more interesting activities (Bryant et al., 1994; Fontaine et al., 2006).

According to Burchinal et al. (2000), children who experienced higher quality care in center-based programs had higher verbal/language skills, reading scores, and math scores. Bryant et al. (1994) found that children in higher quality classrooms performed better regarding information processing, verbal cognition, and preacademic skills, even after controlling for the quality of the home environment. Peisner-Feinberg et al. (2001) suggested that higher quality classrooms lead to an increase in language skills, math skills, and fewer behavioral problems among preschool children. Program quality has also been linked to children's development of expressive language skills (Mashburn, et al., 2008). According to Peisner-Feinberg et al. (2001), program quality has a long-term impact on children's cognitive and socioemotional development, including receptive language ability, math ability, cognitive ability, attention skills, and sociability at least through kindergarten, and in some cases, through second grade.

One reason behind this increase in developmental outcomes could be that teachers in higher quality classrooms provide more interesting, unstructured activities that lead to children being more involved (Bryant et al., 1994). A study of the Enhancement Grant Project found that when teachers were assisted in evaluating their programs and in planning and implementing enhancement activities, the children displayed an increase in language and reasoning (Fontaine et al., 2006). The participating teachers who increased their classroom quality also encouraged children to communicate through books, pictures, and informal use of language (Fontaine et al., 2006). Language and reasoning are important aspects of determining school-readiness (Fontaine et al., 2006).

Program quality has been found to have a great influence on the socio-emotional and cognitive development of young children. It seems possible then that program quality could also influence and foster children's creativity. While several researchers have studied the impact of program quality on children's social, emotional, and cognitive development, not much has been done in the way of determining the impact on creativity. With this knowledge, teachers and program administrators can determine the best programs to provide to promote all aspects of development in children, including creativity.

The aim of this study is to determine how teacher characteristics, beliefs, and program quality influence creative development in young children. Previous studies have researched creative development in school-age children, but not in preschool children. The hypotheses of the current study are the following:

1. There are positive relations between teacher characteristics (e.g., experiences and professional development) and children's creative outcomes.
2. There are positive relations between teacher's beliefs and children's creative outcomes.
3. There are positive relations between program quality and children's creative outcomes.
4. There are positive relations between program quality and children's creativity after controlling for family income, child age, and classroom variability.

Chapter 2: Methods

Participants

This study consists of ten teachers of three- to five-year-old children from four early childhood programs in a southeastern, medium-sized, university town. Teachers were recruited through visitation and discussion of research goals and procedures. This research study also consists of 82 children ranging in age from three to five ($M = 4.1$ years). Of the children participants, 39 (47.6%) were male and 37 (45.1%) were female. In regards to gender, data was missing from six of the children's parent questionnaires. Approximately 73% of the children were European-American, 9% were African-American, 2% were bi-racial, and 5% were of other ethnicities. In regards to ethnicity, data was missing from nine of the children's parent questionnaires. The characteristics of the children, teachers, and classrooms in this study are presented in Table 1.

Procedures

Teachers were asked to complete a questionnaire regarding their educational attainment and beliefs. Upon completion of the questionnaire, the each classroom was observed using the ECERS-R and the CLASS measurements to capture classroom quality. The teacher was then asked to have children create art collages using the materials provided. The materials for the collage included: a box of 24-count crayons, 25 sheets of tissue paper (five sheets of five colors), five glue sticks, three pairs of scissors, and a white piece of paper for each child. The collage materials were arranged, by the teacher, on the table so that all pieces were seen. The children were encouraged to participate, but not required. The pieces of art were then collected and analyzed based on the number of details and the consensual assessment technique.

Measures

Classroom Quality

The Early Childhood Environment Rating Scale-Revised (ECERS-R; Harms, Clifford, & Cryer, 2005) is a measurement tool used to determine the quality of the classroom environment. The ECERS-R is designed for use in classrooms serving children ages two-and-a-half to five. It is a 7-point scale ranging from one (*inadequate*), three (*minimal*), five (*good*), and seven (*excellent*) and takes approximately three to four hours of observation to complete. This measurement consists of 43 items broken into seven subscales including space and furnishings, personal care routines, language and reasoning, activities, interaction, program structure, and parents and staff.

This measurement has been found to be reliable and established predictive validity (Harms et al., 2005). Internal consistencies of subscales were found to range between .71 and .88 with a total consistency of .92 (Harms et al., 2005). These findings were consistent with the research conducted by Peisner-Feinberg et al. (2001), which used the ECERS-R to predict the relationship between program quality and children's cognitive and social development.

The Classroom Assessment Scoring System (CLASS; Pianta, LaParo, & Hamre, 2006), another program quality measure, was then used to capture teacher's interactions with children in their classroom. The CLASS captures emotional support, classroom management, and instructional support provided by the teacher. The CLASS consists of three subscales consisting of eleven items including positive climate, negative climate, teacher sensitivity, regard for student perspectives, behavior management, productivity, instructional learning formats, concept development, quality of feedback, language modeling, and student engagement. The CLASS is a 7-point scale ranging from one (*low*) to seven (*high*). For example, if there are few indications

that the teacher enjoys warm, supportive relationships with the students then he/she would receive a score of one or two, indicating a low level of positive climate. If the teacher displayed some indications of enjoying warm, supportive relationships with the students then they would receive a score of three, four, or five, and would fall in the mid range. If there are many indications that the teacher enjoys warm, supportive relationships with the students, then he/she would receive a score of six or seven, indicating a high positive climate (Pianta et al., 2007). The CLASS scores on 30-minute cycles of observation and is repeated up to six times over the course of three hours. An acceptable consistency ($\alpha = .87$) was found across four cycles of CLASS (Pianta, et al., 2007). This study scored on 30-minute cycles of observation that was repeated four times over the course of two hours.

Table 1
Descriptive Statistics for Demographic Characteristics of Participants

Variable	N	%	M	SD	Range
Child Characteristics (N=82)					
Male	39	47.6			
Female	37	45.1			
Age (years)	76	92.7	4.05	0.61	2.92-5.02
Ethnicity					
European-American	60	73.2			
African-American	7	8.5			
Bi-racial	2	2.4			
Other	4	4.9			
Family Characteristics					
Income (yearly combined)					
\$0-\$20,000	3	3.7			
\$21,000-\$40,000	13	15.9			
\$41,000-\$60,000	11	13.4			
\$61,000-\$80,000	19	23.2			
\$81,000-\$100,000	6	7.3			
\$100,000 and up	23	28.0			
Teacher Characteristics (N=10)					
Female	10	100			
Age (years)	9	90	30.11	4.60	25-36
Ethnicity					
White/Caucasian	8	80			
Black/African-American	1	10			
Bi-racial/Multi-racial	1	10			
Education					
Some college	1	10			
BA/BS or higher	9	90			
College Majors					
ECE	5	50			
Child/Human Dev.	6	60			
Special Ed.	1	10			
Psychology	1	10			
Education	4	40			
Child Life	2	20			
Other	1	10			
Years of ECE Experience	10	100	9.90	3.40	6-16
CDA Training	1	10			
Salary (yearly)	10	100	\$22,413	\$7,833	\$14,208-\$34,000

Note: Total Ns of variables differ from N=82 (child variables) and N=10 (teacher variables) due to missing data

Teacher Beliefs

Profession

Information regarding the teachers' perceptions and beliefs of their profession was gathered using the teacher questionnaire. Questions related to teachers' perceptions and beliefs were adapted from the Early Childhood Teaching Inventory (ECTI: VandeWiele, 2001). The ECTI was designed to assess teacher perceptions of their professional knowledge, classroom management, abilities, and practices. This study included 19 of the original 38 items. Response options ranged from one (*Cannot do this*) to five (*I'm sure I can do this*). In order to get the composite profession score, the profession items were summed and the summative score was calculated. The higher the summative score indicates the more positive beliefs the teacher had regarding their profession.

Developmentally Appropriate Practices

The teacher questionnaire was used to assess the teachers' beliefs regarding developmentally appropriate practices (DAP). Questions regarding DAP were adapted from the Teacher's Belief Scale (TBS: Charlesworth et al., 1991). The TBS was designed to measure teachers' beliefs regarding developmentally appropriate practices. This study included 14 of the original 30 items. Response options ranged from one (*strongly disagree*) to five (*strongly agree*). The DAP items were summed and the summative score was calculated to get the composite DAP score. The higher the summative score indicates the more positive beliefs the teacher had regarding DAP.

Creativity

Teachers' beliefs regarding descriptions of creativity and the ways creativity can be fostered were assessed using the teacher questionnaire. Questions regarding teachers' beliefs

about creativity were based on a questionnaire used by Cheung, Tse, and Tsang (2003). This study consisted of 13 questions from the original 90. The response options ranged from one (*very little*) to five (*very much*). To get the composite creativity belief score, the creativity items were summed and the summative score was calculated. The higher the summative score indicates the more positive beliefs the teacher had regarding creativity.

Teacher and Family Characteristics

Teacher characteristics, such as years of teaching experience, professional development, years of education, and demographic information were obtained using the teacher questionnaire. The professional development portion of the questionnaire consisted of five types of training content (*yes/no*), including: child development; child care professional and family; language development; health, safety, and precautions; and quality child care and licensing. In order to get the composite training score, the training items were summed and the summative score was calculated. The higher summative score indicates the more training contents that the teachers received through a variety of training.

Family characteristics, such as family size, ethnicity, combined yearly income, child age, child gender, attendance in early childhood program, and special needs were obtained using the parent questionnaire.

Creativity

The children were asked to complete an art collage during their morning free play time. Based on the children's art collages, creativity was measured by counting the number of pieces, colors, and techniques used and by using the consensual assessment technique (Amabile, 1982), which involves a consensual group rating of the level of creativity.

The children's art collages were coded using several criteria, including: the number of tissue paper pieces used, the number of tissue paper colors used, the number of crayon colors used, whether or not the tissue paper was torn by hand (*yes/no*), and whether or not the tissue paper pieces were wadded (*yes/no*). The total number of pieces, colors, and techniques used were calculated separately for each child. Then the total number of each criterion was standardized. These three standardized scores and two dichotomous variables were added into a composite score (collage composite score).

The consensual assessment technique (CAT) was used to give each collage an overall score on a scale of one to ten. Scores of one to three indicated low levels of creativity, scores of four to six indicated medium levels of creativity, and scores of seven to ten indicated high levels of creativity. A group of four graduate students gathered to assess each collage individually. Raters were blind to knowledge regarding the program origin of each collage. It was expressed to the raters that all details had been counted prior to this assessment and they were instructed to look at the overall collage in terms of creativity. The raters came to an agreement on the assessment of each collage.

Data Analysis Plan

Descriptive statistics for the study variables were examined first, followed by correlation analyses. Children's creativity scores were compared by the status of specific training content received by teachers. Bivariate correlations were examined among teacher characteristics, classroom quality, and creative outcomes. Intraclass correlations were examined noting whether children's creativity variances were accounted for by the classroom traits because children's data were nested within the classroom. Hierarchical linear modeling analyses were employed to predict children's creativity based on intraclass correlation results. Since the ECERS-R and the

CLASS scores were positively correlated, and the ECERS-R score was a better predictor for creativity, the CLASS score was excluded in the hierarchical linear model.

Chapter 3: Results

Preliminary Analyses

Descriptive statistics of the study variables are found in Table 2. In regards to teacher education, 90% of the teachers had a bachelor's degree or higher. On average, the teachers received training in four different content areas. The overall ECERS-R scores rated on the higher end of the spectrum, indicating good quality. Similarly, the overall CLASS scores rated on the higher end. The children that used more pieces of tissue paper in their collages used more tissue paper colors but less crayon colors (see Table 3). Also, the children that used more tissue paper pieces had higher consensual assessment scores. Children that used more tissue paper colors used less crayon colors but had higher consensual assessment scores. Also, tearing and wadding the tissue paper were both positively correlated with higher consensual assessment scores.

Table 2
Descriptive Statistics for the Study Variables

Variable	N	%	M	SD	Range
Teacher Variables (N=10)					
Education					
Some college	1	10			
BA/BS or higher	9	90			
Training Contents	10	100	4.14	1.51	2.00-6.00
Beliefs					
Profession	10	100	4.20	0.38	2.00-6.00
DAP	10	100	4.04	0.46	2.93-4.57
Creativity	10	100	3.94	0.21	3.62-4.23
Observation Variables (N=10)					
ECERS-R					
Materials	10	100	5.37	1.15	3.00-6.39
Tone	10	100	5.90	1.50	2.24-6.88
Overall Score	10	100	5.65	1.31	2.58-6.52
CLASS					
Emotional Support	10	100	6.13	1.27	3.19-7.00
Classroom Organization	10	100	6.06	1.31	2.58-7.00
Instructional Support	10	100	5.61	1.68	2.08-7.00
Overall Score	10	100	5.93	1.39	2.62-6.90
Child Variables (N=82)					
Art Collage					
# of tissue paper pieces	82	100	10.78	11.21	0-63
# of tissue paper colors	82	100	3.05	1.78	0-5
# of crayon colors	82	100	1.67	2.42	0-12
Torn tissue paper					
No	44	53.7			
Yes	38	46.3			
Wadded tissue paper					
No	71	86.6			
Yes	11	13.4			
Consensual Assessment	82	100	5.45	2.54	1-10
Score					

Note. Developmentally Appropriate Practices (DAP)

Table 3
Correlations Among Creativity Measures and Constructed Variables

	2	3	4	5	6	7
1. Collage pieces	.60***	-.31**	-.13	-.02	.55***	.41***
2. Collage colors (tissue paper)		-.23*	.09	.09	.68***	.55***
3. Collage colors (crayons)			-.03	.02	.21	.16
4. Torn tissue paper				.42***	.31**	.27*
5. Tissue paper wadded					.39***	.38***
6. Collage composite						.95***
7. CAT						

Note. * $p < .05$, ** $p < .01$, *** $p < .001$; Consensual Assessment Technique score (CAT)

Relationships between Teacher Characteristics and Creativity

Children of teachers who received training in child development content had higher CAT scores on their collages (see Table 4). Children of teachers who received training in child care professional and family content and health, safety, and precautions content had higher CAT scores and overall collage composite scores. Training content was correlated with the CAT scores on the children's collages, $r = .31$, $p = .006$. Similarly, content training that teachers received was correlated with the overall collage composite scores, $r = .26$, $p = .024$.

Table 4
Mean Differences of CAT and Collage Composite by the Training by the Training Contents the Teacher's Received

Training Content	CAT			Collage Composite		
	Yes <i>M(SD)</i>	No <i>M(SD)</i>	<i>t(df)</i>	Yes <i>M(SD)</i>	No <i>M(SD)</i>	<i>t(df)</i>
Child Development	5.66 (2.65)	4.29 (1.11)	-2.60* (14.62)	1.05 (0.72)	0.99 (0.36)	-0.40 (11.77)
Child Care Professional & Family	6.20 (2.40)	3.58 (2.06)	-4.25*** (73.00)	1.22 (0.64)	0.54 (0.60)	-4.04*** (73.00)
Language Development	5.35 (1.81)	5.71 (3.16)	0.61 (59.28)	0.98 (0.47)	1.11 (0.86)	0.78 (58.03)
Health, Safety, & Precautions	5.96 (2.38)	2.00 (0.76)	-10.01*** (29.12)	1.16 (0.64)	0.13 (0.38)	-4.43*** (73.00)
Quality Child Care & Licensing	6.00 (2.00)	5.30 (2.81)	-1.24 (61.13)	1.14 (0.54)	1.00 (0.76)	-0.95 (64.07)

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Relationships between Teacher Beliefs and Creativity

A negative correlation was found between teachers' beliefs regarding their profession and developmentally appropriate practices (see Table 5). However, there was a positive correlation between teachers' beliefs regarding their profession and consensual assessment scores. Negative correlations were found between teachers' beliefs of developmentally appropriate practices and consensual assessment scores and overall collage composite scores. Not surprisingly, positive correlations were found between teachers' beliefs of creativity and consensual assessment scores, as well as with overall collage composite scores. In addition, consensual assessment scores were positively correlated with overall collage composite scores.

Table 5
Correlation Between Teacher's Beliefs and Children's Creativity

	2	3	4	5	6	7	8	9
1. Beliefs: Profession	-.33**	.05	-.39***	-.36***	-.39***	-.25*	.22*	.21
2. Beliefs: DAP		.08	.65***	.57***	.63***	.38**	-.47***	-.52***
3. Beliefs: Creativity			-.48***	-.46***	-.47***	-.19	.46***	.39***
4. ECERS-R				.98***	.97***	.75***	-.62***	-.65***
5. Tone Subscale					.90***	.86***	-.60***	-.62***
6. Material Subscale						.59***	-.60***	-.63***
7. CLASS							-.34**	-.38***
8. CAT								.95***
9. Collage Composite								

Note. * $p < .05$, ** $p < .01$, *** $p < .001$; Developmentally Appropriate Practice (DAP); Consensual Assessment Technique score (CAT)

Relationships between Program Quality and Creativity

Interestingly, a negative correlation was found between the ECERS-R scores and consensual assessment scores, as well as overall collage composite scores. Children enrolled in classrooms with lower ECERS-R scores had higher consensual assessment scores and overall collage composite scores on their art collages.

The interactional and instructional tone and classroom material provisions factors of the ECERS-R were both negatively correlated with both the consensual assessment scores and the overall collage composite scores (see Table 5). The total CLASS scores were negatively correlated with both consensual assessment scores and overall collage composite scores. Children in classrooms where teachers displayed more negative climates produced more creative collages.

Children's Creativity Predicted by Program Quality

In order to predict children's creativity, empty models were examined to determine whether children's creativities were accounted for by the classrooms (see Table 6). The Wald-Z statistics were 1.92 and 1.91 for CAT and collage composite scores respectively, indicating the classroom effects were marginal. In addition, intraclass correlations were calculated based on the suggestion from Singer (1998) and Albright and Marinova (2010). The intraclass correlation coefficients for the CAT and collage composite scores were .52 and .50, indicating that 52% and 50% of variances were attributable to classroom characteristics. These intraclass correlation coefficients showed a fair amount of variation across classrooms, grand mean-centered total ECERS-R score was added in Model 1. In the final model, other covariates (child age and gender, family income, and the teachers' years of experience) were added. In the final model, none of the covariates were significant predictors of children's creativity except the ECERS-R

scores. Based on results of the final model, a one unit increase in average ECERS-R score decreased the expected CAT (1.37) and collage composite (0.35) after controlling for the covariates.

Table 6

Estimates of CAT and Collage Composite by Classroom Quality, Child Characteristics, and Teacher Characteristics Using Hierarchical Linear Modeling

Fixed Effects	CAT			Collage Composite		
	Model 0	Model 1	Model 2	Model 0	Model 1	Model 2
Intercept	5.39*** (0.61)	5.40*** (0.40)	9.31** (2.48)	1.02 *** (0.16)	1.02*** (0.10)	1.52* (0.65)
Family income			-0.24 (0.14)			-0.03 (0.04)
Child's age			-0.76 (0.49)			-0.11 (0.14)
Child's gender			0.37 (0.42)			0.08 (0.12)
ECERS-R		-1.15** (0.320)	-1.37* (0.41)		-0.32** (0.08)	-0.35* (0.10)
Teacher's years of ECE			-0.38 (0.15)			-0.00 (0.04)
Random Effects						
Intercept	3.36 (1.75)	1.23 (0.82)	1.46 (1.01)	0.23 (0.12)	0.06 (0.05)	0.07 (0.05)
Residual	3.04*** (0.51)	3.04*** (0.51)	2.95*** (0.53)	0.23*** (0.04)	0.23*** (0.04)	0.25*** (0.05)
Model Fit Statistics						
Deviance	344.73	336.73	298.58	134.83	127.76	130.29
AIC	348.73	340.73	302.58	138.83	131.76	134.29
BIC	353.52	345.49	306.99	143.62	136.53	138.69

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Chapter 4: Discussion

The current study examined the factors that influence creativity in preschool children. This study used the Consensual Assessment Technique (Amabile, 1982), which notes the details used in artwork to assess the level of creativity. Major findings of this study were that classroom characteristics and program quality were related to creativity. Interestingly, children's creativity was related to program quality, but negatively. Children in lower program quality classrooms had higher levels of creativity. Also, teachers that displayed less sensitivity and more punitive control had children that expressed higher levels of creativity.

Teacher Characteristics

While there was no variability regarding teachers' educational attainment, there was variability regarding teachers' professional development. Teachers who received training in child care professional and family material had children that displayed higher levels of creativity. Similarly, teachers with training in health, safety, and precautions material had children that produced higher levels of creativity. This could be a result of teachers being more comfortable using new and unique materials due to having more knowledge regarding safety. Teachers who received training in child development content had children that produced moderately higher levels of creativity. Previous research suggested that teachers with training have higher quality classroom processes (Phillips et al., 2000). Previous research also suggested that teachers with training have better teaching practices and display a stronger knowledge of child development (Saracho and Spodek, 2007). Perhaps this could explain why these particular training topics related to higher creativity in children.

Teacher Beliefs

Teachers with more positive beliefs regarding their profession had children that expressed more creativity within their classrooms. Teachers with more positive attitudes regarding their profession would most likely create a better environment within their classrooms.

Unexpectedly, teachers' beliefs regarding their profession negatively related to developmentally appropriate practice, which was then negatively correlated with creativity. The current study findings indicate that teachers who had stronger beliefs regarding developmentally appropriate practices do not produce high creativity in young children. Previous research suggested that teacher beliefs regarding developmentally appropriate practices do not necessarily reflect their actual classroom behaviors and practices (Hegde et al., 2009). This could explain why teachers had higher beliefs regarding developmentally appropriate practices, but had less creativity within their classrooms. Teachers may believe in the importance of being developmentally appropriate, but may not actually display those characteristics.

Not surprisingly, children in classrooms with teachers who had more positive beliefs regarding creativity produced more creative collages. It could be possible that teachers who value creativity also promote it within their own classrooms.

Program Quality

Children's creativity was related to program quality, but negatively. Surprisingly, the most creative collages came from the classrooms with the lowest ECERS-R and CLASS scores. This suggests that high overall classroom quality produces less creativity within children. Previous research has linked program quality to children's expressive language development (Mashburn et al., 2008). This study did find a link between program quality and creativity; however, it was not in the direction expected. Similarly, the classrooms with the most positive

climates produced the least creativity. While positive teacher-child interactions (Peisner-Feinberg et al., 2001; Mashburn et al., 2008) and emotional climate (Mashburn et al., 2008) can positively influence social and cognitive development, it does not positively influence creativity.

Interestingly though this research does suggest that developmentally appropriate materials within the classroom negatively correlates with creativity. This means that children with a variety of materials accessible on a regular basis are less creative and children without many materials to work with are more creative. Previous research suggested that children show a preference for novel activities over familiar ones (Eson et al., 1977). Children may find more interest in the materials provided if the materials are rotated more often or if unfamiliar materials are presented. By promoting interest, the teachers would then promote creativity. Bryant et al. (1994) also suggested that by providing more interesting activities, teachers can promote children's involvement which could also encourage creativity.

Limitations

There are five major limitations regarding this research, the lack of variance in educational background, the small number of teacher participants, the developmentally appropriate measure, the creativity measure, and the collage activity presentation. This study only contained ten early childhood educators, which definitely limits the outcome. This small number of participants may not fully display the relationships between teachers and creativity. A follow-up study with more participating classrooms, with variance in teacher educational backgrounds, would provide information regarding the relationship between formal education and creativity. Also a more elaborate developmentally appropriate practices measure would be beneficial. The questionnaire used in this study may not have provided an accurate account of the teachers' beliefs and practices in this particular area due to the limited number of questions.

Due to the difficulty in measuring creativity, the creativity measure used in this study may not have provided an accurate account of the children's creativity. Creativity can be expressed in many ways including artwork, problem-solving abilities, and storytelling. This particular measure only noted children's artwork, or expressive creativity (Mrevlje, 2004), and that may not have provided a full perspective on creativity. In this study, the teachers presented the collage activity to the children. There could be much variability in the art activity delivery method among these teachers which is a lack of standardization. Some teachers might provide more directions or props to children during the activity than others which may be related to teachers' characteristics.

Implications

This research suggests that the number of materials provided on a regular basis within the classroom is important in terms of creativity. Previous research (Guilford, 1950; Butcher & Niec, 2005) suggested that one aspect of creativity is the ability to display flexible thinking or using novel ways to solve problems. Too many available items at any one time or the lack of frequent rotation may stifle creativity by not leaving much room for flexible thinking. Early childhood educators should rotate materials frequently to ensure novelty and could present the materials in unique ways. For example, a teacher who wants to add buttons to the art center could introduce the item by showing the buttons on her shirt. She could then ask the children what other ways buttons could be used and could display a variety of buttons for the children to manipulate to promote interest.

Chapter 5: Conclusion

The results of this study explored what does and does not influence creativity, especially in young children. Classroom materials have shown to be relational in terms of children's creative outcomes. While previous research findings indicate that higher program quality yields higher academic outcomes (Burchinal et al., 2000), it does not yield higher levels of creativity. Other studies found positive relationships between teacher-child interactions and cognitive and social development (Peisner-Feinberg et al., 2001). However, this study found negative influences between positive interactions and creative development. While positive interactions may be beneficial for some aspects of children's development, it is not for others. Further studies would be beneficial to confirm the relationships found in this study.

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APPENDIX

Observation Variables

Variable	N	%	<i>M</i>	<i>SD</i>	Range
ECERS-R					
Space/Furnishings	10	100	5.88	1.22	3.38-7.00
Personal Care	10	100	5.78	1.91	1.67-7.00
Language Reasoning	10	100	5.73	1.28	3.00-7.00
Activities	10	100	4.77	1.32	2.20-6.20
Interaction	10	100	6.17	1.44	2.17-7.00
Program Structure	10	100	6.40	1.90	1.00-7.00
Parents/Staff	10	100	5.50	1.69	2.25-7.00
CLASS					
Positive Climate	10	100	6.18	1.24	3.75-7.00
Negative Climate	10	100	1.65	1.16	1.00-4.25
Teacher Sensitivity	10	100	6.10	1.16	3.25-7.00
Regard for Student Perspectives	10	100	5.85	1.61	2.00-7.00
Behavior Management	10	100	6.20	1.36	2.50-7.00
Productivity	10	100	6.13	1.30	2.75-7.00
Instructional Learning Format	10	100	5.85	1.51	2.50-7.00
Concept Development	10	100	5.70	1.39	2.75-7.00
Quality of Feedback	10	100	5.50	1.93	1.75-7.00
Language Modeling	10	100	5.63	1.76	1.75-7.00