

THE EFFECTS OF PLAY ON COGNITION IN ELEMENTARY CLASSROOMS

by

Nora Jarvis

A Project Submitted to the Faculty of
The Evergreen State College
In Partial Fulfillment of the Requirements
for the degree
Master in Teaching
2013

This Project for the Master in Teaching Degree

by

Nora Jarvis

has been approved for

The Evergreen State College

by

Terry Ford, Ph.D., Member of the Faculty

June 2013

ACKNOWLEDGEMENTS

I wish to thank Terry Ford for editing my paper and providing helpful feedback.

ABSTRACT

Although play used to be commonplace in elementary school classrooms, recent decades have brought a push for academic testing and a focus on math and reading that frequently results in very little play in the classrooms. This history prompted the question: What are the effects of play on cognition in elementary children? This review of literature summarizes and critiques research on the role of play and shows that play has a positive effect on language and verbal skills, mathematical skills, and social skills. Since the findings suggest that play can be beneficial to learning, this review contends that teachers should work to incorporate play meaningfully into the curriculum. It is necessary that future research examine diverse populations, since this review features much research that focuses on white, middle-class children.

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CHAPTER 1: INTRODUCTION

Introduction

The role of play in the classroom has been debated through the history of formal schooling. Some educators and policy makers have insisted that educators and schooling should focus on traditionally academic curriculum, teaching math and reading skills through direct instruction, lecture, and worksheets. Achievement is measured to assess knowledge in math, reading, and other content areas. This measurement is done through testing as well as the recording of concrete skills like ability to write and recognize letters (Bodrova and Leong 2003).

Barbarin, Burchinal, Bryant, Clifford, Chien, Howes, Pianta and Ritchie (2010) found that children who engaged in free play in the classroom showed no significant improvement in math and reading skills over children who participated in direct instruction. Another research study found that fourth grade students showed an increase in math skills after one year of being in a classroom that focused strongly on academic skills as a result of No Child Left Behind legislation (Cook, Steiner and Wong (2010).

Other educators believe that play does have a role in the classroom. The cognitive skills developed through play are often more difficult to observe. These skills are frequently more abstract and center mostly on the student's development of conceptual skills (Bodrova and Leong 2003). These skills entail social cognitive aspects like communication with peers and language

development.

Theorists like Vygotsky (1933) have determined that play has a strong role in cognitive and social development. These claims are supported by research that has found a significant correlation between children's engagement in play and the development of cognitive abilities (Bodrova and Leong 2003).

In order to determine whether play can be a useful tool in classrooms, it is necessary to determine what the effects of play on cognition are in elementary education. A review of the literature will show how play may or may not affect cognition. The answer to this question will help determine what role, if any, play should have in the classroom. Play might be used much more than it currently is, or it may be used in conjunction with academic lessons, or simply discarded from the elementary education classroom.

Rationale

The effects of play on cognition is an important question for elementary school teachers and students. It is important to recognize the drastic developmental changes that children undergo in these formative years. If teachers are to provide the greatest impact on their students' knowledge and development, it is imperative that they understand the most affective way to incorporate curriculum into the classroom. By examining research on the effectiveness of teachers using play in the classroom, it should become apparent whether play can have a significant role in the cognition of elementary school students.

Additionally, the focus on academic learning in elementary schools has been particularly instrumental in changing classrooms in financially poor school districts (Hemphill, 2006). The goal has been to close the achievement gap between students in wealthy schools and poor schools. If research finds that play is a necessary aspect of effective cognition, then these efforts to close the achievement gap are failing students. Educational policy and teacher behavior should be formulated around how students learn and the most effective ways that students interact with curriculum. Examining the research on issues of play in the classroom will provide a framework for which policy makers and educators can structure curriculum choices and classroom environments.

In addition to the importance that research on play in the classroom has on the educational community, the answer to this question will help determine whether the author should utilize play in her own future classroom. As a future educator, the author should know how play has been used in the classroom historically, how it is used today, and its effectiveness on cognition in elementary-aged children. This knowledge will influence the way the author does or does not incorporate play into her classroom.

Historically, play in the classroom was commonplace and expected. With the incorporation of No Child Left Behind guidelines (Bornstein, 2011) and an increasing cultural emphasis on academic learning, play has become a marginalized aspect of the classroom (Hemphill, 2006). Teachers throughout elementary classrooms have felt the pressure to incorporate academic lessons like arithmetic and spelling, which shifts focus away from child free-play

(Hemphill, 2006). In more recent years, there has been an educational movement to reincorporate play into elementary classrooms (Rochman, 2011).

Opponents to play in the classroom suggest that students produce higher test scores through structured academic lessons that focus on facts and can directly be tied to acquisition of math and reading knowledge. Those who support play in elementary classrooms cite the development of important social skills and research that supports claims of higher achievement of children in play-based classrooms. Almon (2004) explained, “While allegedly, these approaches are providing 'quality education,' they trivialize and undermine children’s natural capacities for meaningful and focused life lessons through creative play and this leaves many children profoundly alienated from their school experiences” (p. 18).

Historical Background

Kindergarten, as designed by Friedrich Frobel in the nineteenth century, was originally a time for children to play (Bettelheim, 1987). It has existed in this form for much of its lifetime. The older grades in elementary schools have included play in an informal way, usually through recess (Almon, 2004).

Although older elementary students have included play in recess, it is much more rare to see play in the classroom. With the advancement of the pressures of testing and accountability, this play has become even more rare. Older elementary-aged students are viewed as budding adults who should focus on academic studies in order to succeed on tests (Jones and Reynolds, 2011).

In the beginning of the twentieth century, elementary classrooms,

particularly kindergarten, were centered on play. Kindergarten classrooms were filled with toys, and much of class time was devoted to free play or structured play with the teacher. This was based on the belief that childhood was a time for exploration and imagination (Jones and Reynolds, 2011).

Education during the Industrial Revolution was highly utilitarian, focusing on the acquisition of hard facts and usable skills. This emphasis in schools resulted in rational and quantitative curriculum (Bornstein, 2011). Although this basis for education subsisted for many generations, education of the past century has allowed for play in the classroom (Bornstein, 2011).

In the 1960s, as technology evolved and the number of working mothers rose, schools began to view kindergarteners as more mature than their counterparts from earlier generations. Parents, educators, and policy makers believed that these new kindergarteners deserved more serious schooling, and thus schooling turned toward structured academic lessons.

This emphasis on academic lessons in elementary schools gained momentum in the 1980s. The Nation at Risk report stated that schools were not focusing on mathematical and written language skills, causing the United States to fall behind their competitors in the global market. The report encouraged increased class time on developing math and written language skills, deemphasizing other subjects in school. This marked the educational policy shift to focus increasingly on standards-based achievement and national testing. With this focus, district officials and principals emphasized to their teachers the need for more academic time in the classrooms. Frequently, this resulted in less

recess and free-play in the classrooms (Cole and Kirn, 2001).

In the more recent years, educational policy has continued to move play out of the classroom, particularly in the primary grades. This is largely due to increasing focus on test scores and pressure to increase visible time in math and reading (Bornstein, 2011). School districts responded to No Child Left Behind, which bases its funding and ranking on math and reading test scores, by increasing the amount of time teachers spend teaching math and reading. School time has moved away from art, music, social studies and recess (Bornstein, 2011).

Research has indicated the positive effects of physical activity in the schools, finding improvements in cognitive skills, concentration and behavior, and brain physiology. In addition, some research has found that play has a positive affect on social development (Bornstein, 2011).

No Child Left Behind is supported by research that indicated the importance of classroom instruction on test scores (Bornstein, 2011). A study completed by the Institute for Policy Research has found that No Child Left Behind and its implied emphasis on classroom instruction has had a positive effect on fourth grader's math scores (Cook, Steiner and Wong, 2010).

Currently, educational policy and some research has supported the notion that child-play does not belong in elementary classrooms. However, this is in conflict with some developmental research and a history of play in American classrooms. The diminishing of play has been associated with a rise in accountability in schools, but that rise does not necessarily equal a superior

effectiveness of purely academic school lessons.

Definitions

Play is defined in a myriad of ways throughout the literature surrounding affects of play on cognition. Smilansky (as cited in Almon, 2004) defined dramatic play and sociodramatic play in her research. In dramatic play, the child undertakes a make-believe role, the child then uses make-believe to transform objects into things necessary for the play; verbal descriptions or exclamations are used at times in place of actions or situations; and the play scenarios last at least ten minutes Smilansky defined sociodramatic play as dramatic play with at least two others and there is verbal communication between the players (as cited in Almon, 2004).

Another definition of play was developed by Freud, who suggested that play was used by children to explore social norms and to understand their own negative feelings. In this context, Freud defines play as mental and physical activity that was in opposition to reality, although children frequently based their play on their understandings of adult reality (Bettelheim, 1987).

Vygotsky (1933) explained the differences between play and symbolism. Adults can use symbols to translate meaning from one object to another. However, the associations of children are not symbolic. In play, children utilize objects by maintaining the physical objects of properties but the meaning of the object is changed. Children use play to internalize speech, logical memory, and abstract thought. They accomplish this by attaching meaning to objects and

incorporating those objects into imagined situations (Vygotsky, 1933).

Several studies utilize the definition developed by Vygotsky, but most rely on a simpler definition. Bodrova and Leong (2001), File and Gullo (2002) and Elicker, Mao, McMullen, and Wang (2005) define play according to developmental stages. The play of elementary-aged children is defined as mental and physical activity that uses imaginary situations and assigned roles.

For the purposes of this paper, most definitions of play will use the above definitions. The research studies that use different definitions will be noted.

Limitations

The limitations of this study are that much research focuses on early childhood development, examining preschool and kindergarten. In order to determine whether or not play has a positive effect on cognition in elementary-aged students, it is important that the research literature truly examine all elementary-aged students as opposed to only kindergarten.

An additional limitation is the extensive inclusion of social development associated with play. Although social skills are indeed important to the development of children, this review of the literature focuses on cognition, rather than social skills.

Statement of Purpose

It is important for teachers to understand how their students learn best. Understanding how students learn can help teachers develop curriculum to suit the variety of students in a classroom. It is important to ensure that teachers are

able to utilize educational research to better develop curriculum that will support all students.

It is also necessary that educational policy respond to reputable research. If research indicates something that will benefit students, it's important that policy supports that and enable teachers to enact new research.

This leads to the topic of this review of literature. Historically, play has been in and out of elementary classrooms according to the political climate of the time. Curriculum should not be based on this, but rather on well-developed research. This leads to the question of this review. In order to determine what role play should have in the classroom, it is first necessary to understand the research surrounding the topic. What are the effects of play on cognition in elementary students? Answering this question will help determine how and if teachers should incorporate play into their classroom.

Summary

In the history of American education, the inclusion and perceived importance of play has fluctuated. Through the Industrial Revolution, development of kindergarten, and advance of No Child Left Behind, play has moved from the periphery of the classroom to the center and back. Educators, policy makers, and parents have had changing views on how prevalent play should be in elementary classrooms.

What role, if any, play should have in the classroom should be dependent upon the research that examines play and cognitive development. Research has

indicated both that play has an important impact on social and cognitive development, which others have found that play shows no significant advantages in the development of cognitive abilities. What follows is an examination of this research, which will attempt to determine the significant findings.

This review of literature will use definitions of play developed by Freud and Vygotsky, as well as definitions utilized by researchers in the field currently. The broad definition that all researchers seem to embrace is that play is the mental and physical activity in imaginary, possibly reality-based, situations.

Chapter 2 includes a review of the literature attempting to answer the question of what effects play has on cognition in elementary students. First, the review will examine the perceptions of teachers and parents on the value of play. Then, it will determine how children exhibit play behavior in a learning context and include teacher's views on children's behavior. Next, play will be examined as a pedagogical tool. Finally, the effects of play on will be discussed on language and verbal skills, mathematical skills, and social skills.

Chapter 3 summarizes the review of literature and discusses major findings, as well as a critique of the studies. It also includes implications for the classroom and suggestions for future research.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

Chapter 1 examined the history of play in the elementary classroom and found that with the advent of No Child Left Behind legislation, play-based activities and free play diminished. In its place, instruction was focused on math and reading skills.

Chapter 2 reviews a selection of research that has addressed the affects of play on the development of academic and social skills in elementary classrooms. First, Chapter 2 critiques research that has studied the perceptions among teachers and parents on the value of play in an academic as well as non-academic setting. Next, Chapter 2 examines the ways in which students exhibit play-behavior in a learning context, specifically the purposes for which children use play. Chapter 2 also examines how teachers use play in their curriculum and as a tool to teach children. Next, this chapter reviews the effects of play on language and verbal skills in children. Then, it reviews the effects of play on mathematical skills in children. Finally, this chapter concludes with a review of the effects of play on the social development of children.

Perceptions among teachers and parents on the value of play

There are varying results on the perceptions of teachers regarding the importance of play in the cognitive and social development of children. Hyvonen

(2011) found that Finnish teachers believed play allowed children to engage deeply with the material by utilizing their creativity. Golinkoff, Gryfe, Hirsch-Pasek, and Fisher (2008) found that mothers and child development professions differed in their belief of the importance of play; the professions believed unstructured play had more potential benefits than mothers did. Izumi-Taylor, Samuella and Rogers (2010) found that American teachers viewed play as having an academic benefit, while Japanese teachers viewed play as a natural part of childhood. Blatchford, Creaser & Mooney, (1990) found that children valued outdoor play as a way for them to socialize, get exercise, and get fresh air. Rao and Wu (2011) found that German and Chinese teachers had different definitions of free play and had differing beliefs of the benefits of free play. Clements (2004) found that mothers believe their children spend less time playing outside than in previous years.

Hyvonen (2011) conducted a qualitative study interviewing preschool teachers in Finnish schools using a grounded theory approach on their experiences of play in the classroom and found that teachers viewed play as a useful pedagogical tool if they interjected in children's organic play to provide academic insights. In this study, researchers conducted in-depth interviews with teachers who self-identified as using play in their classrooms. The teachers were Finnish kindergarten through fourth grade teachers whose ages ranged from 25 to 53 (N=14, 4 male and 10 female). To select teachers, Hyvonen (2011) contacted schools and asked for volunteers. Researchers used a "Straussian" method of grounded theory, in which they encouraged teachers to reflect on their

teaching practices and the effects on students. When conducting interview, researchers used the method of constant comparison to identify differences and similarities in the data. After the data was collected, researchers used selective coding to analyze the data. Hyvonen (2011) found that teachers often used educational play, in which they were the leaders and guided students through educational experiences using play. Teachers believed that play draws on students' creativity and allows for deeper learning. Finally, the teachers believed that the teaching environment interferes with natural play, and believe that creating space for students to play uninhibited will deepen educational experiences for children.

Hyvonen (2011) has strong credibility, using a grounded theory approach to conduct interviews is a reasonable way to collect data. However, the teachers selected were volunteers, so the sample was not selected randomly or semi-randomly. The transferability for this study is not strong; it interviews teachers who volunteered in Finland and has a small sample size (N=14). This small sample size and narrow selection of teachers makes it difficult to determine if the findings would be similar in another setting. The dependability of this study is unknown, since there are limited studies examining similar participants. However, the confirmability of this study is strong. The researchers provide extensive details for the interview process and the probing questions, as well as the selective coding process used to analyze the findings.

Golinkoff, Gryfe, Hirsch-Pasek, and Fisher (2008), in a quantitative study, examined the differing views of play among 1,130 mothers and 99 child development specialists in interviews and found that the mothers experts attributed significantly less academic learning value to structured play than mothers, $t(1227) = 12.10, p < .01$ and mothers and experts did not differ in beliefs about the academic learning value of unstructured play, $t(1227) = .584$.

Golinkoff, et al. (2008) recruited 1,130 mothers on the internet to answer a survey on their beliefs about the role of play on learning. The mothers ranged in geographical location, 86% Anglo American, 5% African American, 3% Hispanic, 4% multiple ethnicities, and 2% unidentified background/ethnicity, ages ranged from 18-52. Mothers reported higher than average educational level (15% high school graduate, 37% some college, 48% bachelor's degree or higher). Participants were typically married (86%) or unmarried and cohabitating (6%). Mothers were housewives (51%) or employed full- or part-time. They reported average national household income (22% less than \$35,000; 51% \$35,000–75,000; 26% greater than \$75,000; 1% no response).

The professionals were recruited via email with a formal letter asking them to participate. They completed two surveys—the first asked the same questions that the mothers were asked. The second required them to rate all of the activities according to whether the activities were a foundation to academic learning. The subjects were 99 (n males=26) U.S. professionals in the field of child development. Age ranged from 27 to 75, with an average age of 54.78 (SD = 10.43) years. The majority of the sample reported 16 years experience in their

given profession (14% b 5 years, 20% 6–10 years, 20% 11–15 years, 46% N 16 years) and had 2 or more children (26% no children, 19% one child, 34% 2 children, 17% three children, 4% N four children). After collecting the data, the researchers used zero order correlations and principal components analyses to determine perceptions of play on learning among mothers and child development professionals. Golinkoff, et al. (2008) used Bonferroni's corrections to reduce the likelihood of Type I error. Researchers found that the perceptions about play differed among mothers and the experts. They found that experts attributed significantly less academic learning value to structured play than mothers, $t(1227) = 12.10, p < .01$. The researchers also found that the beliefs of mothers and experts did not differ about the academic learning value of unstructured play, $t(1227) = .584, ns$. The researchers also found that experts believed there was more academic learning possible in unstructured activities, $t(98) = 8.71, p < .01$ than mothers did.

This study lacks some internal validity. The mothers in the study are 86% Anglo-American, which suggests that the perceptions of play might be most accurately described as the perceptions of play among Anglo-American mothers. Additionally, the sample sizes of mothers (N=1130) and experts (N=99) are very different, which may affect the findings. The external validity of this study is also weak. The subjects were not diverse in terms of race, so it is difficult to say whether the results can be generalized to all include all mothers. The study has reliability; the researchers were using the same survey questions for the mothers and experts, so the method is repeatable and consistent. The study is also

objective; the methods and analysis of data are clear and could be followed by other investigators.

Izumi-Taylor, Samuellsen, and Rogers (2010) examined the teacher perspectives on play in the United States, Sweden and Japan and found that perceptions of play were related to the cultural dialogue on play. Izumi-Taylor et al. (2010) aimed to identify the similarities and differences among the perceptions of play in Japan, the United States, and Sweden. The researchers conducted interviews and surveys among teachers in the various countries. The researchers interviewed 28 Japanese teachers, 22 teachers in the United States, and 11 Swedish teachers. The researchers have conducted separate research on the perspectives on play in the various countries, and are now examining the interrelated results of the previous research. Izumi-Taylor, Samuellsen, and Rogers (2010) found that the perceptions among American and Japanese teachers reflected the larger cultural discussion on play. This suggested that Japanese teachers offered play in the classroom that considered the needs of the group, with the American teachers did not. Japanese teachers tended to think of play as a natural part of childhood, while American teachers viewed it as having potential to aid learning and development.

The Swedish and Japanese teachers explained their view of the aspects of play called 'sources of possibilities' that emphasized the concept that while engaged in play, children can explore possibilities that would be unrealistic in real life. This research is a compilation and discussion of earlier research, and does

not describe in detail the methods used in that research, which does not lend itself to a discussion on the merits of the research.

Blatchford, Creeser, and Mooney (1990) conducted a qualitative study and examined the views of 175 London children on the importance of playtime and found that 48% of the students preferred quietly playing indoors compared to high-impact play activity outdoors. The subjects of this study were 175 London children 33 different schools with a multi-racial make-up. The sample was made up of 51 white boys, 46 white girls, 38 black boys, and 41 black girls. The students were seven-years-old during their first interview and 11-years-old during their second interview. The children were interviewed and asked questions about four areas: playtime and playgrounds, teaching and fighting, attitudes to work and school, and out-of-school activities. The interviews were 45-minutes each and had a mixture of open-ended and close-ended questions. The researchers found that 33% of the students liked being able to play games, 32% liked talking to friends, 25% liked getting into the fresh air, 16% liked football, 15% liked exercise. The most frequent dislike mentioned by the students was bad weather. 21% were worried about disruptive behavior, 15% did not like playtime because they had no one to play with, 12% said there were specific frustrations from playing certain games.

This study has strong credibility. The children were all asked the same questions, which ensures that there is consistency in the data-gathering procedures. The study also has strong transferability. The sample size is an

adequate size, and the gender and racial identities are close to equal. The study also has strong confirmability. The questions and answers from the students are clearly presented in the data, and the researchers provide rationalizations for the coding of student responses.

Rao and Wu (2011) conducted a qualitative study supported by quantitative data to determine the differing perceptions among 22 Chinese and 15 German female teachers by having the teachers answer survey questions and discuss video clips of 48 kindergarteners, and found that the Chinese and German teachers defined free play differently and saw different merits of play. The kindergarteners were considered representative of the larger culture according to enrollment in non-profit kindergartens, tuition fees, and mainstream programs available at the school. The researchers videotaped the groups of Chinese kindergarteners and German kindergarteners in five-minute segments over five consecutive days. The teachers then watched the videos and expressed their views and observations about what the children were doing. The researchers found that German teachers defined play as children's play without teacher instruction, while Chinese teachers defined play as associated with formal games and did not believe in 'free play' because they believe that academic activities can be incorporated into play. Rao and Wu (2011) further found that German teachers identified free play with learning, they believed that children could gain learning experiences during free play, like social skills and decision making. Chinese teachers believed that children learn cognitive and

pre-academic learning such as concepts of shapes, weight, quantity, measures, and mathematics.

This study has weak internal validity because the German teachers completed the survey at 54%, while the Chinese teachers completed the survey at 100%. Additionally, there were scheduling conflicts so not all the teachers who completed the surveys also viewed the video clips. The study does not have strong external validity, either. The sample size of the teachers and students is too small to know if the results can be generalized. The study does have strong reliability because the process of gathering data in the surveys and video clips are consistent and repeatable, even if not all of the subjects participated in each segment of the study. The study also has strong objectivity, the data gathering and conclusions are clearly discussed.

Clements (2004) conducted a qualitative study using an opinion survey with 830 mothers from various cities and towns in the United States with children aged three to 12 and found that 85% of the mothers agreed that children spend less time engaged in outdoor play than children did just a few years before. The subjects involved in this study were 830 mothers with children between the ages of three and 12, living in various cities, suburbs, small towns, and rural areas throughout the United States. The children were 50% boys and 50% girls. Eighty-seven percent of the mothers were between 25 and 44, half of them were employed, and 81% were married. The researchers had the mothers answer a multi-tiered opinion survey based on the behaviors of their children. The survey

found that 85% of the mothers believed that children played outside less frequently than children did 10 years before. Seventy-eight percent of the mothers also reported that they played make-believe games frequently as children, while only 57% of their children played make-believe.

The credibility of this study is strong. The researchers used the same survey with all the mothers, which allows them to collect reasonable findings. The transferability of this study is weak. The mothers they surveyed were diverse in their location, but 81% were married and 87% were between the ages of 25-44. The dependability of this study is strong. Other data suggests that students engage in far less active, unstructured play than was typical a generation earlier. The study also has strong confirmability. The survey, as well as the results are presented in the study, making their findings clear to outside parties.

It is clear that the perceptions about the importance of play vary among teachers. Hyvonen (2011) found that Finnish teachers believed play allowed children to engage deeply with the material by utilizing their creativity. Golinkoff, et al. (2008) found that mothers and child development professions differed in their belief of the importance of play; the professions believed unstructured play had more potential benefits than mothers did. Izumi-Taylor, et al. (2010) found that American teachers viewed play as having an academic benefit, while Japanese teachers viewed play as a natural part of childhood. Blatchford, et al. (1990) found that children valued outdoor play as a way for them to socialize, get

exercise, and get fresh air. Clements (2004) found that mother believe their children spend less time playing outside as compared to previous years.

How children exhibit play behavior in a learning-context

Studies have examined the behavior that children exhibit in play and have made different findings. Escobedo (1996) found that children incorporated what they learned from playing into their artwork, suggesting that children can learn through play and apply that learning to future work. Similarly, Kim (1999) found that children showed long-term retention of knowledge when they had the opportunity to act out what they'd learned. When examining children playing, Meckley (1996) found that children used metacommunicative skills to interact with other children. Genishi (1982) also studied communication between children during play, and found that high-status students initiated more games in play and had higher compliance rates among their peers.

Escobedo (1996) conducted a quantitative study in which the researchers made observations and collected artwork of four children ages 4-5 who were allowed to create art in a student-centered environment without explicit directions and found that 87.6% of the drawings incorporated imaginative play. The subjects of this study were four middle-class children, two boys and two girls, aged four to five years old. The children participated in eight 90-minute sessions in which they were given art supplies and no formal direction. Students played together and created art projects. Data was gathered from observation, field notes, videotapes, and 120 pieces of art that children created. Escobedo (1996)

found that 21.7% of the drawings were expository, 10.8% in manipulation, 87.6% meaningful play. Escobedo (1996) concluded that the children incorporated what they learned from the other children they played with into their art projects.

The credibility of this study is not strong. The art sessions do not incorporate any way to track what the children are learning in their play. This makes it difficult to claim that children are incorporating or reflecting that knowledge into their art. The study also does not have strong transferability. The authors do not indicated what the relationship is that the students have with each other, or how they came to be involved in the study. It cannot be determined how these findings might be applied to other setting since it is unclear what the studied setting actually entails. Although this study does not have strong credibility or transferability, it does have relatively strong dependability. Other studies also indicate that children incorporate new knowledge into their play and creative behaviors. This study does not have strong confirmability. It is unclear how the authors analyzed the art collected from the students as well as the play that the children engaged in during the sessions.

Kim (1999) examined, in a quantitative study, the long-term retention of academic knowledge in 23 children of middle and upper-class backgrounds through a storytelling and reenactment activity and found that the children who had been able to act out the story they'd heard through play with dolls had a stronger retention rate with a chi-square of 16.574 and a p value of .001. The

subjects of this study were 32 children, 13 girls and 19 boys, who were attending preschool and kindergarten. Their ages ranged from 4.0 to 5.6 years and the majority of the students came from middle-class and upper-middle-class homes. 87.6% of the students were European American, 3.1% were Asian American, and 9.3% were African American. Kim (1999) organized the study to have three different phases. In the first phase, children were divided into four groups. Each group heard the story; the first two groups were shown pictures that related to the story and the second two groups were given dolls and asked to pretend play the story. Each group was immediately checked for retention by answering eight knowledge questions about the content of the story. The children were checked for retention again one week later, being presented with the pictures and dolls again. They were checked a third time three days later, this time without the pictures and dolls. They were asked the same questions each time. The researchers were able to reject the null hypothesis that play did not result in increased retention. Their findings resulted in a chi-square of 16.574 with a significant level of .001. They concluded that there was a significant positive correlation of memory retention with the students who had used play after hearing the story that was not present among the student who had viewed pictures.

This study has strong internal validity. Each treatment was given to two groups, which limited the possible variations of outcomes. Additionally, the same questions were asked of each group at every stage of the study, again decreasing the possibility of variations in outcomes. The study's external validity

is somewhat weak. The sample of students were largely homogenous, most of them being from middle and upper-middle class backgrounds and 86.7% white. This makes it hard to determine if the results can be generalized to another setting with different subjects. The findings of this study are consistent, since each group that was given the same treatment had similar outcomes. The study is also repeatable and predictable, which gives this study strong reliability. The study also has strong objectivity, the process is clear and can be observed by other researchers.

Meckley (1996) conducted a quantitative study in which researched the meaning in children's play among 12 four- and five-year-olds in eastern Pennsylvania and found that the children used metacommunicative skills to interact with other children. The subjects of this study were 12 four and five-year-old children, six boys and six girls, and 83% were white. The children all attended the same preschool in a suburban area in eastern Pennsylvania. The study was conducted over a five-month period in which the author observed children on 34 occasions and documented children's actions and language. Over the five-month period, two primary games emerged from the children's play, Disappearing pegs in road and Tower for pegs. The researcher found that the two games were based on shared knowledge among the students. Additionally, children used metacommunicative skills to interact with each other. These skills became subtler as children became more familiar with the game. Some of these metacommunicative skills were: signaling others to join, the children with the peg is the leader, a change in voice by the leader means a change in the game

structures. Meckley (1996) concluded that children used the play sessions to develop their communication and social skills.

This study has strong credibility. The data collection was based off observation of children in their normal environment, engaging in free play. This observation suggests that data will not be disturbed by its collection process. The study does not have strong transferability. The setting and subjects are specific to this preschool, so it is difficult to determine if the results are applicable to other preschools which may exhibit a different demographic of subjects and setting. The study does have strong confirmability. Meckley (1996) provides examples of actions and language that were coded in specific ways. This allows for agreement among investigators.

Genishi (1982) conducted a qualitative study and videotaped and conducted interviews among Mexican-American students that used both Spanish and English in their play and found that high-status children initiated more games and had a higher compliance rate than low-status children. The subjects were students from an elementary school in Brownsville, Texas. Six children from the class were chosen to be focused on, as suggested by the teacher. Three of the children had single mothers, and 3 had a mother-father situation. All six children incorporated both Spanish and English into their play. Genishi (1982) observed the students for two months. The first month was spent immersing herself into the classroom, and getting to know the students and teacher. The second month involved videotaping the free play time and conducting interviews with the

children and teacher. Genishi (1982) found no clear evidence of temporal sequencing. However, there were 95 instances of negotiation and initiation during the play. Additionally, high-status children initiated more and had a larger degree of compliance among other children when they guided the games.

This study has strong credibility. The observations and interviews with students in their natural environment provide findings that are convincing. The study has weak transferability. The setting in this study is very specific. The students' relationships to each other and their environment are particular to this study, which would make it difficult to transfer to another setting. The study has strong confirmability. Genishi (1982) provides scripts and interview responses to support her findings.

Escobedo's (1996) findings that children incorporate what they've learned into their artwork and Kim's (1999) findings that children show strong long-term retention rates of knowledge when they've acted out lessons both support the conclusion that play has an effect on memory and children's internalization of knowledge. Meckley (1996) found that children used metacommunicative skills to interact with other children when playing. These findings support Genishi's (1982) findings that high-status students initiated more games and had higher compliance rates, which may suggest that high-status students have a stronger command of the metacommunicative skills that children use when playing.

Play as a pedagogical tool

A few studies have examined how play has been used by teachers as part of their pedagogy. deVries, Thomas, and Warren (2010) found that teachers in Australia believed that the most productive teaching method was a combination of direct instruction and guided play, which resulted in students incorporating new math concepts into their play. Schuler and Wolfberg (1993) found that when teachers taught a social skills lesson and then let children have free play, both teachers and parents believed that the children began incorporating the skills from the lesson.

deVries, Thomas, and Warren (2010) conducted a qualitative study in which they conducted reflective interviews and videotaped two female teachers in a classroom with 28 indigenous children in Australia and found that the teachers viewed the most effective teaching method as a combination of direct instruction and guided play. The subjects were two female teachers and 28 indigenous students in a Brisbane, Australia kindergarten classroom. The researchers conducted in-depth interviews with teachers on how they viewed play in their classroom. The researchers then took video recordings of the classroom, recording instances of play within the classroom and identifying the teacher role in that play. The teachers then watched the recordings and were interviewed again about the video. Researchers asked about teacher motivation, where teachers saw evidence of student learning, and reflecting on the different types of play that occurred in the classroom. Finally, the researchers analyzed

interviews and video to determine which types of play had a lasting effect on student learning. Researchers found that children showed the most significant evidence of learning in a combination of direct instruction and guided play. Researchers found that that the children's act of incorporating math into play was more sustainable if children had autonomy in the play, with teachers only stepping in to incorporate math concepts and then letting children resume playing by themselves.

This study has strong credibility. The multi-tiered approach of initial interviews, videotapes, and reflective interviews ensures that teachers are accurately reflecting on their practices when responding to videos of behavior in their classroom. The transferability of this study is not strong. The students in the classroom were a very homogenous group, all being indigenous Australians. The confirmability of this study is strong. deVries, et al. (2010) provided examples of teacher responses and transcripts of the videotaped play sessions to support their findings.

Schuler and Wolfberg (1993) conducted a qualitative study in which they observed children with autism and compared their gains in social and cognitive learning with the gains of nondisabled students in play groups and found that all students showed gains in functional object use and and functional/symbolic object play. The subjects of this study, who were part of the study for seven months, were 15 children from a public elementary school whose ages ranged from 6.11 years to 8.5 years; the authors did not provide information on the

ethnic or socioeconomic makeup of the sample. Six of the children had Autism, and the remaining nine children did not. Schuler and Wolfberg (1993) organized the children into three play groups with five children each. The special education teacher from the elementary school led each play group in a social skills lesson. After the lesson, the students played with each other without adult interference. These play sessions were videotaped and coded for evidence of children exhibiting the skills from the lesson into their play. The researchers followed up with semistructured interviews with parents of the children and the regular classroom teachers. These interviews aimed to determine if the children were continuing their new behaviors in play scenarios at home and in class. Schuler, et al. (1993) found that all students in the play groups exhibited an increase in appropriate social behaviors over the seven months of the study. Teachers and parents confirmed in their interviews that they were noticing that children increased their appropriate social behaviors more readily as the study increased in duration.

The credibility of this study is not convincing. The interviews with parents and teachers were not constant, which does not allow for reliable results. The sample of students were not picked in a pre-planned manner, and it is unclear what the relationship is between students. A group may have students that know each other very well, which would affect their play together. Additionally, the study spanned seven months, and it is unclear whether the gains the students made were due to the treatment in the study or simply natural maturation. The transferability of this study is weak. The authors do not provide much information

about their sample of the environment of the study, which makes it difficult to determine how these findings might affect other students. The dependability of this study is also weak. Their findings produce no differences between children with Autism and those without, which suggests a need for further research since this finding is questionable. This study also does not have strong confirmability. The researchers do not provide information on how the videotaped behaviors are coded or the structure of the interviews, which does not allow for this study to be reproduced elsewhere or for outsiders to examine their findings.

These two studies discuss ways in which teachers have incorporated play into their pedagogy. deVries, Thomas, and Warren (2010) showed that teachers believe children show the most evidence of learning with a combination of direct instruction and guided play. Schuler and Wolfberg (1993) found that children with autism showed an increase in social behaviors after regularly engaging in play groups.

Play has a positive effect on language and verbal skills

Several studies show that incorporating play into the learning process has a positive effect on the development of language and verbal skills. Contrary to these other studies, Barbarin, Burchinal, Bryant, Clifford, Chien, Howes, Pianta, and Ritchie (2010) found that children in free play showed less gains in literacy skills. However, several other studies show different findings. Daiute (1990) found that writing scores increased for children who worked collaboratively and playfully with a partner. Howe, Rinaldi, Jennings, and Petrakos (2002) found that

children in play groups were more likely to solve conflict quickly and engage in verbal negotiation. Pellegrini and Galda (1982) found that children in play groups scored higher on story comprehension than students who did not engage in play. Boykin and Cunningham (2001) found that children performed higher on comprehension post-tests when encouraged to clap and dance while listening to a story. Pellegrini (1980) found that dramatic play had the strongest effects on isolated work writing as compared with functional play, constructive play, and games with rules. Allen and Butler (1996) found that African American children showed a better understanding of analogical skills when their lesson included music and movement, while white students performed better without music and movement.

Barbarin, Burchinal, Bryant, Clifford, Chien, Howes, Pianta, and Ritchie (2010) conducted a quantitative study in which they examined the language and mathematical gains in 2,751 students who were in free play, individual instruction, group instruction, and scaffolded learning groups and found that the students in free play had a correlation coefficient of .45 with mathematical and language gains. The subjects were 2,751 in a public pre-kindergarten school with a mean age of 4.62 years. The preschool was part of the Multi-State Study of Pre-Kindergarten and the State-Wide Early Education Programs Study in California, Illinois, Georgia, Kentucky, New York, Ohio, Massachusetts, New Jersey, Texas, and Washington. One classroom from each state was randomly selected. Students were diverse in regard to urbanicity. 58% of students were from families living below the federal poverty line, 49% boys, 51% girls, 41%

European American, 18% African American, 27% Latino, 4% Asian American, 1% Native American, 10% other ethnicities. Before classroom observations, children's language, preliteracy, and mathematics skills were conducted by a different data collector. Researchers observed over two days in the fall and spring. Each child was observed in 20-second snapshots and children were coded with one of six activity settings: basics, free choice, individual time, meals, small group, and whole group. Each child was coded with one or more preacademic engagements: esthetics, fine motor skills, gross motor skills, letter and sound, mathematics, oral language development, prereading, read to, science, social studies, and writing. Each child was then coded with one or more teacher-child interactions: routine, minimal, simple, elaborated, scaffolding, and didactic. Researchers used the Early Childhood Education Rating System-Revised and the Classroom Assessment Scoring System to assess teacher interaction. In the spring, children were re-assessed on language, preliteracy, and mathematics skills. Researchers then examined children's gains compared to where most of their classroom time was spent: free play, individual instruction, group instruction, scaffolded learning. They found that using ANCOVA, children in free play showed less gains in naming letters, WJ letter-word identification, language and literacy skills, number counting, and writing their names (n=1398).

This study does not have strong internal validity. The initial findings were taken in the fall, and the second round of data was gathered in the spring. This time difference means that the findings could be attributed to natural maturation, rather than practices by the teacher. The external validity of this study is strong.

The schools are varied geographically, socio-economically, and the students vary in race and gender. This ensures that the study could be generalized to other settings. The study also has strong reliability. The procedure is repeatable, the pre- and post-tests are pre-made, so they can be applied to another sample. The observations are also repeatable because it involves observing and coding behavior. The study does not have strong objectivity. The researchers do not provide all of their data in their findings, so it is difficult to check their conclusions.

Daiute (1990) conducted a qualitative study investigating the role of play in writing development among 48 fourth and fifth grade students in Boston suburbs by examining writing samples written before and after playing with a partner and found that when students played at a higher rate, their writing scores increased. Forty-eight 4th and 5th grade students from a middle to upper-middle class suburb of Boston. The students scored between 4.2 and 9.0 on their reading comprehension part of the California Achievement Test. There were 48 students observed, but only the data from 16 were ultimately included in the study. The student's writing samples were judged holistically using the ETS model in which two teachers read and rated the students' writing and they determined the mean of the scores. The teachers then designed writing tasks based on material the students had already learned. The children worked in self-selected pairs, which resulted in same-sex pairings, to write a story together. The work sessions were videotaped and recorded. The writing tasks were playful in nature, and researchers were looking for how children would enact play in their collaborative writing process. The types of play that were examined were play with reality,

making play, and play with composing. After the collaborative writing task, students then wrote individual writing samples that were again judged using the ETS system. Daiute (1990) then determined how much time the children spent in play behaviors while working collaboratively and compared that with their pre-test and post-test writing scores. Daiute (1990) found that two of the pairs whose use of play was very high (62.7 and 54.5) included one partner whose writing score increased dramatically (3 to 6 and 3 to 7), indicating that extensive playing was not detrimental to the composing process.

This study has weak credibility; the students' changes in writing samples could be due to working collaboratively, rather than engaging in play behavior. Daiute (1990) does not account for this possibility in the research. However, this study does have strong transferability. The students in the sample had varied writing scores in the California Achievement Tests, which suggests that the findings could be applied to a variety of students. The study does have strong dependability as other studies have also shown that play has a positive effect on writing and language abilities. However, the study does not have strong confirmability. The teachers in this study organize a writing activity around a previous lesson, and this information is not provided.

Howe, Rinaldi, Jennings, and Petrakos (2002) conducted a quantitative study in which they observed 40 sibling dyads of white, middle class, English-speaking children and examined conflict and pretend enactment and negotiation in play periods and found that there was a wide range of conflicts with $M=3.9$ and

a SD=2.1. The subjects of this study were 40 sibling dyads, chosen from an original sample size of 72. Each dyad had one sibling aged 5, and the other sibling was eight older or younger. The children are from white, middle-class, English-speaking families. They are all bilingual, speaking French and English, and were recruited through daycare centers and word-of-mouth. The pairs of siblings were broken into two groups, based on their levels of play. One group was labeled low pretend play, and the other was labeled frequent pretend play. The play sequences were videotaped for 15-minute segments. The videotapes were analyzed for verbal and physical indications conflict, pretend enactment and negotiation, and internal state discourse using a Likert scale. When examining the data, the researchers controlled for gender and age by using partial correlations. Howe, et al. (2002) found that children in the frequent play group were more likely to solve conflict quickly and engage in negotiation, $r_s=.41$ to $.50$, $p=.05$.

The internal validity of this study is weak. The variation in age and gender was accounted for in the analysis of the data, but was not addressed when selecting dyads. The external validity is also weak. The sample demographics are all white, middle-class students. Additionally, their inclusion in the study varied so that some joined the study after hearing about it from someone else. The gathering of subjects made no attempts at randomizing. The reliability of this study is strong. Children played in their natural manner, and their behaviors were coded. The coding procedures are clear and could be followed by another

study. The objectivity of this study is also strong. The original data was included in the study, as well as their mathematical analysis of the data.

Pellegrini and Galda (1982) conducted a qualitative study in which they researched 108 kindergarten-second grade children in rural Georgia and assigned them to groups that participated in thematic-fantasy, teacher-led discussion, or drawing and found that children in the thematic-fantasy group scored the highest on post tests. The subjects consisted of 108 kindergarten through second grade children in rural Georgia. The children were randomly assigned to one of three groups. The first group was thematic-fantasy, the second was teacher-led discussion, and the third was drawing. The study included three different sessions in which a book was read to all the students, and after students participated in activities in their assigned groups. The thematic-fantasy group acted out the story; the discussion group had a discussion about the book, and the drawing group drew pictures of the story. The researchers then gave the students a test to determine their comprehension of the story. Pellegrini and Galda (1982) found that the children in the play group scored higher on all three occasions, while the drawing group was consistently the lowest-scoring group.

This study has strong credibility. The three different groups allows for a sufficient amount of comparison. The sample size of 108 is also sufficient. The transferability of this study is not as strong. The students were all living in rural Georgia, and no other demographics were provided. This makes it difficult to

determine if these findings are relevant for a diverse group of students. The study has strong credibility. The process of assigning kids to groups is clear, as is the procedure while the children are in their groups. The outcome is based on results of the post-test, which is also made clear.

Boykin and Cunningham (2001) examined 64 African-American children's understandings of story concepts after listening to the story with either low-activity words or high-activity words and listening to the story with either a rhythmic beat accompanying or absent and found that a significant interaction between story content and learning context with $F(1,60) = 15.64; p < .0001$. Boykin and Cunningham (2001), researched the understandings of story concepts in children aged seven to eight. The sample consisted of 64 African-American children all Chapter 1 classified, indicating low-income backgrounds in a mid-Atlantic urban elementary classroom. The children were randomly assigned to two different groups. The groups each heard a story on tape, although the story was presented in two different ways. The first story had low-activity words (LME), like 'sat,' 'walked,' or 'stood' and did not have any music or activity instructions. The other group had a story with high-activity words (HME) like 'ran' and 'skipped.' The story was also played with a rhythmic beat, and children were encouraged to clap or dance along. After the stories, children were asked encoding and inferring questions about the story. The results revealed that children in the HME ($M = 10.06; SD = 1.06$) context performed significantly higher than children in the LME ($M = 7.16; SD = 1.32$) context. A significant two-way interaction emerged between story content and learning context, $F(1,60) =$

15.64; $p < .0001$. This p value shows that the researchers were able to strongly reject the null hypothesis, as there is a .0001 possibility of their results being random.

The strength of this study lies in the guiding and inferring questions, which strengthens internal validity in that the repetition of questions ensured the most accurate responses from students, rather than allowing for the possibility that students answered questions randomly or did not understand the questions.

Pellegrini (1980) conducted a quantitative study in which he researched the effects of play on language development among 65 kindergarten students through observations and Robinson's Test of Writing Fluency and found that dramatic play and the strongest effects on isolated word writing. The subjects were 65 kindergarteners, 37 males and 28 female, in a rural school. Pellegrini (1980) first conducted Robinson's Test of Writing Fluency on the children as a pre-test. The researchers then observed the children during free play for four weeks. They recorded descriptions of play episodes according to a hierarchy of play considered to involve different levels of cognitive functioning. These were functional play (exercising muscles), constructive play (creating something), dramatic play (pretend roles), and games with rules. They rated drama and games with rules as more cognitively demanding because they involve using language for shared symbols. They then used ANOVA to determine if there was a relationship between the play that children engaged in and their levels of

writing fluency. Pellegrini (1980) found that dramatic play had the strongest effects on isolated word writing.

This study had weak internal validity. The different styles of play were analyzed separately, but all children participated in all types of play. The researchers examined which types children spent the most time in, but did not have any children that only spent time in one play style. Each child was observed for 100 minutes, and through those 100 minutes, they were categorized as functional, constructive, or dramatic. Children that played somewhat equally between two or three different styles were still placed in only one category. All of these elements may have caused changes in the dependent variables. The external validity of this study is also weak. There was no demographic information provided for the students, which does not allow a conclusion on how these findings would relate to other environments. However, the sample size of 65 students is an acceptable sample size. The reliability of this study is also weak. The categorizations of behavior are based on the free play behaviors exhibited by the students. In a different group of students, they may not exhibit the same play categories, which would affect the repeatability of this study. The objectivity of this study is strong. Pellegrini (1980) provided classifications of behaviors and how he coded them, along with the results of the Robinson's Test of Writing Fluency.

Allen and Butler (1996) conducted a quantitative study in which they examined the analogical reasoning skills of African-American and white children

in third grade and found that music and movement while hearing a story greatly improved the skills of African American students ($M=.509$, $SD=.899$), while the white children ($M=.620$, $SD=.698$) performed better in the scenario without music and movement. The subjects of this study were 28 children, 15 African American and 13 white, between the ages of eight and nine years old, all in the third grade. There were 12 females and 16 males. All students attended the same public elementary school in a moderately-sized Northeastern city. School records indicated that all African American students were coming from low-income families while all the white students came from middle-income families. The researches established two learning contexts, and each student participated in both contexts. In the first learning context, the children were instructed to sit or stand while they listened to the story. This situation was labeled Low-Movement Expressive context. The other learning context involved a story being read to a rhythmic beat and children were encouraged to move, dance, and clap to the rhythm. This was labeled the High-Movement Expressive context. After each learning context, children were given a multiple choice question-and-answer test that measured cognitive processing, specifically encoding, inferring, and mapping. The researchers used ANOVA on the test results and found no significant relationship across gender, but did find that African American children's performance was significantly better under the HME than the LME learning context. ($M=.509$, and $M=.207$). White children's performances was significantly better under the LME context ($M=.620$) than the HME context ($M=.199$).

This study has strong internal validity. All children experienced the same treatment at the same time, which ensures that the tests are measuring the same experiences. The study also has strong external validity. The sample has children of two racial groups and two socio-economic groups, as well as males and females. This shows that the findings can be generalized to more settings related to the demographics of the sample. The study also has strong reliability. The learning contexts can be replicated, as can the multiple-choice test. The study also has strong objectivity. The researchers present their results and process of ANOVA, which allows for the results to be assessed by other investigators. Researchers acknowledged that many students got all of the questions correct, and the test may have been structured in a way that allowed students to guess the correct answers. They suggest it may have been more helpful to have free-recall questions.

Although Barbarin, et al. (2010) found that children in free play showed less gains in literacy skills, the other studies examined in this section has opposing findings. Dauite (1990) found that after children worked with a partner and engaged in high levels of play, their writing scores increased. Howe, Rinaldi, Jennings, and Petrakos (2002) found that children in play groups were more likely to solve conflict quickly and more frequently engaged in negotiation. Pellegrini and Galda (1982) found that children in play groups scored higher on story comprehension post-tests. Boykin and Cunningham (2001) found that children performed higher on comprehension post-tests when they danced and clapped while listening to stories. Pellegrini (1980) found that dramatic play had

positive effects on isolated word writing. Allen and Butler (1996) found that African American children performed better in analogical skills when using music and movement, while white children performed better without music and movement.

Play has a positive effect on mathematical skills

Several studies have examined how play effects mathematical development in children. Emfinger (2009) found that children incorporated new mathematical knowledge into sociodramatic play. Golomb and Friedman (1982) found that children using pretense-play when learning conservation of quantity showed higher acquisition. However, Phinney (1972) found that there was no significant correlation between children who played with complex and simple blocks and their sorting skills. Nichol and Crespo (2005) found that children who had an imaginative math lesson generated more theoretical questions, as compared with a direct instruction lesson in which the students generated factual questions. Dunn and Herwig (1992) found no significant correlation between intelligence and cognitive play behavior. Duatepe-Paksu and Ubuz (2009) found that children in dramatic-play instruction had higher rates of understanding of geometrical concepts than students who had participated in a direct instruction lesson.

Emfinger (2009) conducted a qualitative study on the numerical conceptions of students by videotaping and analyzing the behavior of 23 white middle-class children ages three to ten in a rural area who participated in a two-

week summer program and found that the children's developing mathematical ideas were reflected in their use of sociodramatic play to communicate logicomathematical ideas. The 23 children, 18 females and five males, were selected by convenience sample. The two classroom teachers were students in an undergraduate teacher preparation program, and the supervising teacher had ten years of experience and held a Master's degree. The children involved in the study participated in a two-week summer program which consisted of thematic studies with two "free play" times and two "free choice" center times during the day. Emfinger (2009) videotaped the children over the course of the program for an hour and a half every day during center times. During these times, there is no adult intervention and children were allowed to travel between centers as they liked. The videotapes were then analyzed for evidence of numerical behaviors. The different behaviors were coded and recorded. Emfinger (2009) categorized numerical behaviors into oral, gestural, and written form. After examining the twelve hours of videotape, the researchers found that students exhibited 144 logicomathematical behaviors in their sociodramatic play. Emfinger (2009) concluded that children utilize their growing mathematical concepts in play, as a process to internalize the knowledge.

The credibility of this study is strong; researchers did not interfere with students' behavior with a treatment. Instead, they recorded and coded behaviors that students were already exhibiting in their natural setting. The transferability of this study is somewhat weak. The sample included students who were all white and living in a rural environment. This makes it difficult to know if the same

results would be found among another segment of students. The dependability of this study is strong, as it is consistent with other studies that conclude that dramatic play helps children remember new information. The confirmability for the study is somewhat weak. Emfinger (2009) provided substantial information to allow other researchers to reproduce the process. However, the conclusion that Emfinger (2009) reached is not necessarily clear from the data. It is clear that children used logicomathematical behaviors in their sociodramatic play, but there is nothing in the study that suggests doing this helped them internalize that information.

Golomb and Friedman (1982) conducted a quantitative study found that 75 middle-class children from three to five years old who experienced pretense-play training with the concepts of conservation of quantity showed a higher rate of acquisition than students who experienced the concepts from several other methods with $p < .025$. The researchers conducted pretests on children aged 3.10 to 5.00 years in seven nursery schools surrounding the Boston metro area. The pretests determined whether children understood conservation of quantity or not. From the pretests, the researchers selected 75 children, 39 boys and 36 girls, who were nonconserving, and randomly assigned them to five groups. The groups were pretense-play training, conservation training, combo of pretense and conservation, repeated exposure of conservation tasks without instruction, control group of only pre and post tests. Each group was monitored by a teacher who led them through various conserving activities based on their assigned group. After the activities, student took the post-test in which the researchers

poured water into different containers, and children had to identify which containers had more, equal, or less water. The results were then analyzed using ANOVA. Golomb and Freidman (1982) found that the highest scores were in the group that used pretense-play training. The researchers conducted two post tests with the students. They found that on the first post test, the pretense-play training group showed the highest scores: conservation-only (U=61), pretense (U=58.5), control (U=49.5), all $p < .025$. None of the remaining comparisons achieved statistical significance. On the second post test, only the combined treatment was significantly better than the control group (U=56, $p < .025$).

The internal validity of this study is strong. The researchers attempted to correct for any variations among students or their lessons by having a control group and testing the children twice after they received the treatment. The external validity of this study is questionable. Their sample size is sufficient, as is their means for choosing students to be part of the study. However, they do not include demographic data so it is difficult to determine whether these results could be relevant for other students. The reliability of this study is also slightly questionable. Their significance value of .025 is reasonable, but their two post tests yielded slightly different results. The first test showed significant scores in all groups, but the second showed that only the play group had significantly different scores than the control group. This suggests that more post tests should be done to determine the significance of the results. The study does have strong objectivity. The process of choosing the sample and the procedures in the tests and lessons are clear, as is their results of their tests.

Phinney (1972) conducted research with children aged three-six in different developmental stages in which children were tested on their ability to sort objects and then given two different sets of blocks, complex or simple, and took the test again after playing; Phinney (1972) found that there was no significant difference, $p < 0.056$, between children who had played with complex or simple blocks. Phinney (1972) sought to determine if playing with materials that were matched to children's developmental needs would have an effect on cognition. The subjects were three- to six-year-old children from a Los Angeles daycare center in varying developmental stages. The children took a pretest to help researchers determine which developmental stages children were in currently regarding their classification abilities. Children were then matched in pairs, each pair was the same gender and developmental level. Teacher input was used to identify pairs that would play well together. Children were given sets of either simple or complex blocks with which to play. The play, interactions, conversations, actions were observed and recorded. The children were then given a post-test to determine if their classification abilities had improved. The findings indicated a small correlation between abilities and block usage, but those findings had a p value of .056, so the researchers were unable to reject the null hypothesis.

This study does not have strong internal validity. Some groupings were based on teacher input, but it was not explained how heavily this was considered or how often it was used. Additionally, the groups did not take age into consideration, which would affect the developmental expectations of the

students. The study also does not have strong external validity. The demographics of the students are not given, so it is unclear whether the results could apply to other students. Additionally, any increases in classification ability could be due simply to playing and learning from another child, regardless of the type of block the child used. The study also has weak reliability. The authors explain that their findings do not have an acceptable p value, which indicates that the correlation between block type and classification ability is not significant. The pre-test and post-test that involved students' classification abilities were not transparent, so this test also does not have strong objectivity.

Nichol and Crespo (2005) conducted a qualitative study in which they designed two mathematics lessons, one which was direct instruction and the other an imaginative lesson, and examined 36 elementary teachers teaching the lessons; they found that children in the imaginative lesson generated questions about the theory behind the lesson, rather than factual questions, and were more emotionally engaged in the lesson. The subjects of this study are 36 prospective elementary school teachers and the classes they were teaching. The classes were made up of six and seven year old children. The teachers gave two different math lessons to their students. The first was an imaginative math lesson, which focused on a puzzle. The second was a direct instruction lesson which focused on math as an academic subject. Each class received both lessons. Researchers gathered field notes, pictures of student work, and video tapes of the class sessions. Nichol and Crespo (2005) concluded that students performed at higher levels in the math puzzle lesson. They found that when

students encountered these problems, they asked questions that surrounded mathematical theory, rather than procedures. They also asked more questions of each other, rather than the teacher. Teachers also reported that students were more engaged in the puzzle lesson.

The credibility of this study is strong. Although this study has no control group, each class received both lessons. This makes the findings credible since the performance of each class can be compared against its own performance in the other lesson. The transferability of this study is also strong. It was conducted in 36 different classrooms, and each classroom had the same results. Although the authors did not include demographic information on the classes included in the study, the fact that each classroom showed the same results suggests that this lesson would produce similar results in other classrooms. The confirmability of this study is also strong. The findings are based on the calculations of types of interactions among students, and the numbers and types of comments and questions made by the students. Although there is no post-test, tabulating the amount of certain instances from video taped footage is reasonable.

Dunn and Herwig (1992) conducted a quantitative study in which they observed play behaviors and administered intelligence tests among 34 middle class children aged three to five in central Iowa and found no significant correlation between intelligence and cognitive play behavior. The subjects were 34 children, 20 boys and 14 girls who were three-five years old, who were

enrolled in two daycare centers in rural Iowa. Both daycares had mixed-age classrooms and play-oriented curriculum. The children in the study attended the daycare five days a week for at least six hours a day. The researchers aimed to determine the effects of play on convergent and divergent thinking. The children's convergent and divergent thinking skills were assessed in two individual testing sessions. The children were then observed during their free play time. The researchers employed a nested form of Parten/Smilansky social-cognitive play scales when observing. They observed the students for the entire fall semester. The researchers found that intelligence, using the Stanford-Binet, had an inverse relationship with solitary play, $r = -.45$, $p < .01$. However, they found that there was no connection between intelligence and cognitive play behaviors.

The internal validity of this study is strong. The study was an observation of play patterns exhibited by students in their normal day, so the researchers did not have independent variables for which to account. The external validity of this study is not strong. The children are geographically homogenous, but their demographics were not included in the study which makes it difficult to determine how these results might affect other settings. The study does not have strong reliability. Since the children were observed in their natural setting, it is difficult to relate those different settings between studies. The objectivity of this study is strong. The researchers provided adequate information of their process and findings.

Duatepe-Paksu and Ubuz (2009) examined 102 seventh grade students in Turkey who were placed in either direct instruction classrooms or instruction involving dramatic activities and found that the students receiving dramatic-play instruction showed a higher rate of understanding in geometrical concepts than did those that received direct instruction. This quasi-experimental study examined 102 seventh grade students, aged 12-13, in a public elementary school. The school was in a middle-class area in Ankara, Turkey. The researchers first tested the students on angles, polygons, circles, and cylinders. They also used the Mathematics Attitude Scale to determine the students' attitudes on math. The students were divided into two groups. The first group received direct instruction on geometry concepts. The second group received lessons involving drama activities. The researchers tested the students again on their skills and attitudes four months after the treatment. The researchers found that the mean scores of students in the experimental group increased from 6.15 to 7.41. The mean scores of the students in the control group decreased from 7.40 to 6.16.

This study has strong internal validity. The study includes an adequate sample size and a control group, which confirms the gains in the experimental group. The study does not have strong external validity. The subjects were extremely homogenous, so it is difficult to determine if these findings could be applied to another setting. The study has strong reliability. The Mathematics Attitude Scale and the pre-test on geometry can be replicated, as well as the

lessons used for both the groups. The study also has strong objectivity. The results are presented, as are the analyses that were used on the data.

These preceding studies examined how play affects children's development of mathematical skills and found varying results. Emfinger (2009) found that children used mathematical ideas in their sociodramatic play. Golomb and Freidman (1982) found that children who used pretense-play in their lessons on conservation of quantity showed higher rates of acquisition. Phinney (1982) found no significant difference in sorting skills between children who played with simple blocks and complex blocks. Nichol and Crespos (2005) found that children who partook in an imaginative math lesson showed an engagement with mathematical theory rather than students in a direct instruction lesson. Dunn and Herwig (1992) found no significant correlation between intelligence and cognitive play behavior in children. Duatepe-Paksu and Ubuz (2009) found that children who participated in dramatic-play instruction rather than direct instruction showed higher rates of understanding geometrical concepts.

Play has a positive effect on social skills

In addition to studies conducted on language and mathematical skills, there have also been studies that examined the relationship between play and the development of social skills. O'Connor and Stagnitti (2010) found that children with an intellectual disability became more socially active when participating in a play-based classroom. Abeles, Burton and Horowitz (2000) found that children in arts-rich schools had higher levels of academic self-

concept and risk-taking than students in arts-poor schools. Holmes, Pelligrini and Schmidt (2005) found that students exhibited higher levels of attention in a teacher-led didactic-story presentation post-recess. Arens, Cress and Zajicek (2007) found that children with developmental delays showed higher rates of attention when engaging in structured play. Blizzard (2004) found that children experienced feelings of loss when a wooded area, which acted as a playground, at their school was removed.

O'Connor and Stagnitti (2010) examined 35 children with an intellectual disability in a traditional classroom and play-based classroom and their gains over a six-month period and found that children in the play-based classroom showed less deficits and they became more socially active with their peers. The subjects of this study were 35 children, 19 boys and 16 girls, who were had an intellectual disability and were between the ages of five and eight. The majority of the students were diagnosed with more than one disability. The children were randomly assigned to two different groups, a play-intervention group and a comparison group. Before treatment, the students were coded using CHIPPA, Play Deficit scores, PIPPS, Social Interaction, Disruption and Disconnection, and GAS Literacy, Numeracy and Personal Development. These tests determined the behavior, language, and social skills of the students. The researchers taught play-intervention methods to the teachers and therapists who worked with the play-intervention group. The teachers taught their groups for six months using these methods while the comparison group maintained their normal lessons. The researchers then re-assessed the children after six months of the lessons.

The researchers found that children in the comparison group showed higher auditory comprehension ($M = 38.75$) when compared to the play intervention group ($M = 26.74$) with $p < .048$.

The internal validity of this study is not strong. Although they taught play-intervention methods to the teachers, they did not check up on the teachers to determine if their teaching maintained fidelity to the training. Over the six months, teachers may have varied in their implementation of the methods. At the end of the six months, teachers were not reviewed or interviewed about their implementation. This study also does not have strong external validity. The researchers do not include demographics of the students, other than their intellectual disabilities and age. This exclusion does not account for cultural differences that might affect the findings. This study also does not have strong reliability. Since the teachers were teaching their interpretation of new methods, rather than set lessons designed by the researchers, there is a significant amount of variation that might occur in the six months of the program. This study also does not have strong objectivity. Although the pre-test and post-test use consistent methods of assessment, the teaching sessions are so disparate that the results are not observable to outside investigators.

Abeles, Burton, and Horowitz (2000) conducted a quantitative study in which they used teacher-observation and tests to research 2,206 students in 18 public schools that were classified as either arts-rich or arts-poor and found that students in arts-rich schools had higher academic self-concept and levels of risk-

taking. The subjects of this study were 2,406 students total in 18 public schools. The students were in fourth through eighth grade. The schools they attended either had arts integrated into the curriculum or arts taught as separate subjects. Students were given tests to assess the levels of creativity. Teachers were given questionnaires to rate children and schools. They were not given a treatment. The researchers used regression analysis to determine the relationship between arts in the classroom to student creativity and academic achievement. Abeles, Burton and Horowitz (2000) found that high arts children scored higher in creativity, teacher ratings on expression, risk-taking, creativity-imagination, and cooperative learning. The regression analysis showed a significant relation between the amount of arts instruction and teachers' efforts at integrating art and teacher's perceptions of students' risk-taking. High arts children also scored higher in academic self-concept.

The internal validity of this study is not strong. It is not clear that arts is what caused the differences in results. The arts-rich schools are also interdisciplinary, which may have caused the differences in test scores. The external validity of this study is strong. The sample size of students is large, as is the number of schools involved in the study. This suggests that the differences between arts-rich and arts-poor schools is consistent across a multitude of situations. The reliability of this study is also strong. The format for the interviews as well as the tests can be given to readily to other subjects. The objectivity of this study is weak. The researchers did not report any statistics for

their findings, which makes it impossible to confirm that their data yields the results they reported.

Holmes, Pellegrini, and Schmidt (2005) conducted a quantitative study in which they observed 27 European-American preschool-aged children during and after recess and in a teacher-led didactic-story presentation to examine the attention of children and found that all children had the highest levels of attention post-recess. The subjects of this study were 27 European-American students, 18 girls and nine boys with a mean age of 54 months, enrolled in a private preschool in the Northeastern United States. The school was located in a middle-income neighborhood made up of primarily European-American families; the sample children reflected the same demographics of their neighborhood. Researchers aimed to determine the effects of recess timing on children's attention in class. They observed children during and after outdoor recess for three days a week, for six weeks. Children were divided into three groups, which participated in varying recess length. The first group had ten-minute recess, the second had 20-minute recess, and the third had 30-minute recess. When the children came back to class, they were involved in a teacher-led didactic story. Researchers observed each child at 30-second intervals and recorded their behavior. These results were then analyzed using ANOVA to determine the relationship between recess length and post-recess attention. Their findings using ANOVA showed significant relationship between recess and post-recess attention ($F(2,24) = 13.08, p < 0.001$), showing that for all groups, recess had a

positive effect on attention. The researchers found that children exhibited the most attentive behaviors after 20-minute recess.

This study has strong internal validity. The researchers attempted to eliminate changes in the independent variables by observing children consistently, at 30-second intervals, and over a reasonable period of time. This study has weak external validity. The sample is overwhelmingly female, so the results might not be representative of boys as well. Additionally, the group of students is homogenous in socioeconomic class and race, which may prevent the findings from being generalized to other settings. The study has strong reliability. The p value of .001 indicates that researchers can be 99.9% confident in rejecting the null hypothesis, suggesting that the findings are significant. The results of this study also have strong objectivity. The process and procedures that the researchers used are clear.

Arens, Cress, and Zajicek (2007) conducted a quantitative study with 25 children under three-years-old with developmental delays in which they videotaped children and coded their behavior and determined that children who engaged in structured play showed higher rates of attention with a z value of 3.435. The subjects were 25 children under three years old with developmental disabilities who are at risk for being non-speaking. Nine of the 25 were female, 36% were from racial minority groups, 40% of parents had high school degree or less, 60% completed some college courses, and 20% had college degrees. All children and their parents took part in a total of six sessions in the families'

homes lasting approximately two hours, every three months for eighteen months. The researcher interviewed the child's parents and assessed the child's communicative and cognitive skills. Researchers videotaped each session, and after instances of naturally occurring structured play and coded the children's responses. The frequency of children's various engagement behaviors were scored and the rate of each engagement behavior per minute was calculated. Children produced significantly less unengaged behavior during structured play than free play. No significant differences were found between free and structured play for the engagement behavior categories of objects, persons, and passive joint. The p value for unengaged behavior was 0.171.

This study does not have strong internal validity. The study is focused on play sessions, but does not account for the behavior of the parents, who were often included in structured play sessions. The study does have strong external validity. The subjects are diverse in terms of race and parents' education, which indicates that the results could be generalized to other settings. The study does not have strong reliability. The interviews and observations are difficult to repeat since the observations occurred in each subject's home and was based on the natural behavior of children and their parents. The objectivity of this study is also not strong. The researchers do not provide details on how they coded behavior or what interview questions they asked the parents.

Blizard (2004) conducted a qualitative study and examined the experiences of elementary school children in a school in upstate New York which

lost a wooded area that children played in during recess and found that the children expressed feelings of loss and associated play with the wooded area which resulted in the perception that there was nowhere for the students to play. Blizard (2004) completed the study with a K-12 Montessori school in upstate New York that had 160 students with a 1.5 acre play area that included a wooded area and a non-natural playing area that had a jungle gym and basketball court. The children were first observed using naturalistic inquiry methods. Then the researchers led classroom focus-group discussions. The last stage of the study included interviews with teachers that were video recorded. Blizard (2004) found that after the removal of the wooded area, children expressed feelings of loss that they related to losing a home. They also expressed feelings of being unable to connect to nature, and feelings of boredom. Many students complained that there was nothing for them to do anymore.

The study has strong credibility. Blizard (2004) used the three different stages of the study to include observation, discussion, and interviews. These different approaches make the findings more accurate since they are gathered from multiple avenues. The transferability of this study is very weak. The removal of the wooded area and the relationship that the students had with the area is specific to this school, making it difficult to transfer the findings to another situation. The confirmability of this study is weak. The process of gathering data is clear, but the findings that Blizard (2004) presents are based on the author's overall understandings of the study, rather than a systematic organization of data.

These studies examine how play has an effect on the development of social skills among children. O'Connor and Stagnitti (2010) found that children with an intellectual disability became more socially active in a play-based classroom. Abeles, Burton and Horowitz (2000) found that when children attended arts-rich schools, they exhibited higher levels of academic self-concept and risk-taking. Holmes, Pellegrini and Schmidt (2005) showed higher levels attention while listening to a story after recess than before recess. Arens, Cress and Zajicek (2007) found that when involved in structured play, children with developmental delays showed higher rates of attention. Blizzard (2004) found that when children at a Montessori school were unable to play in a wooded area that acted as a playground, expressed feelings of loss.

Summary

Chapter 2 examined research studies that aimed to determine the effects of play on elementary-aged children in the classroom. Each study included a summary of the research design and findings, as well as a critique of the methods used in the studies.

Chapter 2 began by exploring the perceptions of play and its usefulness among teachers and parents. The research found that teachers view play as a valuable part of the elementary classroom, and believed that play should be incorporated into curriculum. Next, Chapter 2 examined the ways in which children exhibit play-behavior in the classroom. This research found that children use play as a way to communicate and incorporate new information into their worldviews. Chapter 2 then examined how teachers use play as a tool in their

teaching. Then, Chapter 2 outlined the positive effects that play has been shown to have on the development of verbal and language skills in elementary-aged children. The literature found that when children learned new information in a play-context, they showed higher rates of retention. Chapter 2 then detailed the positive effects on mathematical skills found from incorporating play into the classroom. Studies found that children integrated new mathematical concepts into their play when guided by a teacher. Finally, Chapter 2 examined the effects of play on the social skills of children. The studies included in this review found that children adapted new social skills when taught the skills and given an opportunity to use them in a playgroup. Chapter 3 reviews the rationale for this paper, provides a summary of the findings and classroom implications, and final conclusions.

CHAPTER 3: CONCLUSION

Introduction

Chapter 1 explained how play has historically been viewed as an essential part of early-childhood education. With the advancement of the Nation at Risk report and No Child Left Behind, play began to be pushed from the classroom as an emphasis on testing and accountability came to the forefront. It is necessary to examine the effects of play on development in order to determine whether or not play has a place in the classroom.

Chapter 2 presented the findings from the literature. The literature showed that teachers view play as valuable to the students' learning and development, and believed that play could be incorporated into learning activities. The literature also examined how play has a positive effect on students' language and verbal skills. Students' retention of information and comprehension of reading increased when students were engaged in drama or play within the lesson. The studies also examined how play can have a positive effect on mathematical skills. Students were shown to incorporate mathematical concepts into their play when guided by a teacher. Students also showed higher rates of acquisition when the lesson included play. The literature demonstrated that play can have a positive effect on social skills among children, and that children incorporated more social skills when given a lesson was followed by a

play group. Children with autism and intellectual disabilities showed more engagement and positive social behavior when lessons included play.

Chapter 3 concludes with a summary of the findings from this review of literature. The findings show how play has positive effects on students' literacy and math skills, as well as social behavior. It also includes the implications for classroom practice. Since the research supports the understanding that play is beneficial to literacy, math, and social skills, classrooms should aim to incorporate play into lessons. Research also shows that children have higher rates of attention when given the opportunity to play and have recess. Schools should aim to include recess, outdoor play, and free play. There will also be suggestions for future research. The current body of research focuses on subjects that are predominantly white and middle-class children. These studies also rely heavily on interviews, resulting in fewer studies conducted using different techniques. These studies are also frequently conducted in a single environment with its own unique culture, making it difficult to draw universal conclusions. It is necessary to gain research in a diverse body of subjects so as to have a fuller picture of the effects of play on cognition. There should also be future research that studies students in older grades. Many of the studies focus on students in preschool through second grade, and there are far fewer studies that examine upper elementary and middle school students. It is necessary to know how play effects older students, as well.

Summary of Findings

Chapter 2 provided a review of the literature that attempts to answer the question: What are the effects of play on cognition in elementary children? This summary of findings will examine the major findings of the literature and their relative merits. This summary will begin by discussing the findings the differing perceptions of play among teachers and parents. It will then examine the findings about how children exhibit play-behaviors in the classroom. This summary will then review the findings of the ways teachers use play in the classroom. Finally, this review will summarize the findings among the effects of play on language and verbal skills, mathematical skills, and social skills.

Perception among teachers and parents on the value of play

There are varying results on the perceptions of teachers regarding the importance of play in the cognitive and social development of children. Hyvonen (2011) found that Finnish teachers believed play allowed children to engage deeply with the material by utilizing their creativity. Golinkoff, et al. (2008) found that mothers and child development professions differed in their belief of the importance of play; the professions believed unstructured play had more potential benefits than mothers did. Izumi-Taylor, Samuelsen and Rogers (2010) found that American teachers viewed play as having an academic benefit, while Japanese teachers viewed play as a natural part of childhood. Blatchford, Creaser and Mooney (1990) found that children valued outdoor play as a way for them to socialize, get exercise, and get fresh air. Rao and Wu (2011) found that

German and American teachers defined free play differently and had differing views as to the purposes of including play in their curriculum. Clements (2004) found that mothers believed that children spend less time playing outdoors than children did in years past.

Although Hyvonen (2011) has strong credibility due to the grounded theory approach, this study does not have strong transferability or dependability. The sample size is inadequate, as well as the means for recruiting subjects. Golinkoff, et al. (2008) lacks internal validity because the sample sizes of the two subjects are drastically different, and also lacks external validity because the subjects are 86% Anglo-American. However, Golinkoff, et al. (2008) does have strong reliability because all of the subjects were responding to the same survey questions and also has strong objectivity because the data and analysis is clearly presented. Izumi-Taylor, Samuelson and Rogers (2010) lacks internal validity and external validity because they do not include how their subjects were recruited, nor do they include the interview questions they asked the participants. Blatchford, Creaser and Mooney (1990) has strong credibility because all of the students were asked the same questions. The study also has strong transferability because there is an adequate sample size and diversity amongst the students. The study also has strong confirmability since the students' answers to questions were included in the study. Rao and Wu (2011) has weak internal validity due to an extreme difference in participation among the two subject groups. Clements (2004) is a strong study because the credibility, dependability, and confirmability are all strong.

How children exhibit play behavior in a learning-context

When children play within a learning context, their actions reflect new knowledge from lessons, as well as developing social skills. The research showed that play has an effect on children's retention of information. The strongest findings in this section come from Kim's (1999) research that concluded that children have higher levels of retention when they've acted out a new lesson. This research is supported by strong internal validity, in which the same treatment is given to each subject group, and the same questions are asked of each group. The process for gathering data is clearly explicated and is reproducible in another study.

The research also found that children use play as a way to utilize communication and social skills with other children. Genishi (1982) found that high-status students initiate more games and have higher compliance rates. This suggests that high-status students have a stronger understanding of how to communicate with peers. Although this study has strong credibility due to the extensive interviews and observations, the study does not have strong transferability because the subjects and location are a specific group of students and it is difficult to know that similar findings would be made in a different setting with a different demographic of subjects.

Meckley (1996) also found that children use play as a way to practice communication skills with other children. This study has strong credibility and confirmability due to the data being collected in a natural environment and

presents that data and methods to sufficiently allow other researchers to duplicate the study. The setting for this study is specific to this particular preschool in Pennsylvania, which makes the transferability weak since this preschool has factors that are not easily reproducible.

The weakest finding in this section is Escobedo's (1996) findings that children incorporate new knowledge into their artwork. The literature does not include information on how the subjects were chosen or what relationship the children have to each other. The study also does not explain how researchers monitored what children are learning, since there is no lesson that accompanies the art sessions. These findings are not compelling due to the lack of information from Escobedo (1996).

Play as a pedagogical tool

This section examined how play has been used in the classroom and the results on mathematical and social behaviors. deVries, Thomas and Warren (2010) found that the children's act of incorporating math into play was more sustainable if children had autonomy in the play, with teachers only stepping in to incorporate math concepts and then letting children resume playing by themselves. These findings are convincing due to the multi-tiered approach that the researchers took when gathering information from the teachers. The researchers also provided transcripts from the teachers that reflected the same findings they articulated.

Schuler and Wolfberg (1993) found that all students in the play groups exhibited an increase in appropriate social behaviors over the seven months of the study. Schuler and Wolfberg (1993) are not consistent in their data gathering, which makes these findings weak. The study does not include information on how the subjects were chosen or whether the subjects had a relationship prior to the beginning of the study. This lack of information and inconsistency both result in weak research.

Play has a positive effect on language and verbal skills

This section examined how play affects language and verbal skills, including communication with peers. Barbarin, et al. (2010) is the only study reviewed in this section that showed negative effects on language and verbal skills. The researchers found that children who engaged frequently in free play showed less gains in literacy skills than children who participated more in instruction. However, these findings are suspect because the pre-test was taken in the fall, and the post-test was taken in the spring. Any results could be due to natural maturation rather than any practices by the teacher. Despite this weakness, the study does have strong external validity due to the geographical, racial, and socioeconomic-class variety among the subjects. This strengthens the applicability of the study to a larger body of students.

Another major finding of this section is that students show higher rates of comprehension when able to dance or move around while listening to a story. Boykin and Cunningham (2001) found that children performed higher on

comprehension tests of a story when able to dance or clap. The findings of this study were strong because the researchers asked students comprehension questions in different ways, which resulted in more accurate data.

Similarly to Boykin and Cunningham (2001), Pellegrini and Galda (1982) also found that children who participated in play groups after listening to a story showed higher rates of comprehension. This study has strong findings because researchers used three different groups, which allows for sufficient data comparison. Researchers also clearly outlined their data collection process and how decisions were made, which strengthens the findings further.

Howe, et al. (2002) found that sibling pairs who were in a playgroup were more likely to develop their language skills in negotiating conflict than children who did not engage in frequent play. The internal validity and external validity of this study are not strong due to the manner in which subjects were selected for this study. Although the objectivity and reliability are strong, the findings of this study cannot be used to support the claim that play positively affects language and verbal skills because the erratic methods that Howe, et al. (2002) used to select participants for the study may have altered the findings of this study.

The studies in this section also found that students showed an increase in writing skills when play was incorporated into their lessons. Daiute (1990) found that writing skills in fourth and fifth grade students increased after the students engaged in play with a partner. Although these results seem to align with other researchers who found that play increased language skills, this study does not

have strong credibility because it is unclear whether the increase in writing skills is due to engaging in play or working collaboratively with a partner, in which case the gains that Daiute (1990) found might be a result of more ideas from two students and a natural peer-editing that could take place while two students are working together.

Similarly to Daiute (1990), Pellegrini (1980) also found that students' writing skills increased when taught in conjunction with dramatic play. This study has weak internal validity, external validity, and reliability due to a lack of transparency in the procedures and collection of data. Although Daiute (1990) and Pellegrini (1980) both found that play has a positive effect on the development of writing skills, their studies do not inspire confidence in their findings.

Interestingly, Allen and Butler (1996) found that African American students developed their analogical reasoning skills most effectively when they were able to listen to music and move to a story, while the white students performed better without the music and movement. This study had strong internal and external validity because the subjects are diverse, which ensures that the results can apply to other settings.

Play has a positive effect on mathematical skills

This section examined the research on the effects of play on mathematical development. A major finding is that children show higher rates of acquisition

when their math lesson involves play. Golomb and Friedman (1982) found that when children were engaged in pretense-play, they showed higher rates of acquisition of the conservation of quantity. These findings are strong because the researchers had an adequate sample size and utilized a control group to compare data.

Similarly to Golomb and Friedman (1982), Duatepe-Paksu and Ubuz (2009) found that when children were engaged in dramatic-play during their lesson, they showed a better understanding of geometrical concepts. These findings are strong because the sample size is adequate and the data collection is thoroughly presented and explained. Emfinger (2009) found that students incorporated their newly developing mathematical ideas into play, which suggests that students show a greater understanding of mathematical concepts when those concepts are included in play. The credibility and dependability of this study are strong since researchers coded behavior and the results are consistent with other similar studies.

Golomb and Friedman (1982), Duatepe-Paksu and Ubuz (2009), and Emfinger (2009) all found that children showed a deeper understanding of mathematical concepts through play. This finding is shown to an even greater degree in Nichol and Crespo's (2005) research which found that students engaged in an imaginative mathematical lesson asked more theoretical questions, suggesting a deeper engagement with the subject matter. These findings are strong due to the credibility and transferability of this study.

Phinney (1972) did not find any significant relationship between playing and mathematical sorting abilities. These findings are weak since researchers did not use consistent methods in grouping students nor did they include enough information on their procedures so that the study might be reproducible. Since these findings are not consistent with other findings, and the research methods are not reputable.

Dunn and Herwig (1999) found no relationship between imaginative play and intelligence among elementary-aged children. Although this study has strong internal validity due to the study being based on observing students in their normal day, it does not have strong external validity or reliability because researchers did not include information about the subjects' demographics and it is difficult to reproduce the exact settings of this study. These weaknesses suggest that the findings are suspect.

Dunn and Herwig (1999) and Phinney (1972) found no significant relationship between play and mathematical skills. However, these findings are weak and should not be used to make decisions regarding the use of play in the classroom. The other studies included in this section clearly demonstrated that children show an increased understanding of mathematical concepts when engaged in play or imaginative lessons.

Play has a positive effect on social skills

This section examines the research on play's effects on children's social skills. A major finding of this research is that children show improved social skills when participating in play groups or when their classrooms included play. O'Connor and Stagnitti (2010) found that children with an intellectual disability became more socially active when their classrooms incorporated play into the lessons. However, researchers conducted this study over six months and did not check in on teachers or students until the end of the study, so it is unclear whether the play-based lessons lasted the duration of the study.

Abeles, Burton, and Horowitz (2000) also found that schools which included art and dramatic play in their curriculum had students who showed higher rates of risk-taking, cooperative learning, and creativity. This study included a large sample size of students and can be duplicated in other schools, which suggests these are strong findings.

Arens, Cress and Zajicek (2007) found that when children with developmental delays participated in structured play groups, they showed more engaged behavior during lessons. This study is not strong because the study only accounts for the play sessions, but does not have any training or account for parents' behavior. Holmes, Pellegrini, and Schmidt (2005) also found that students showed higher rates of attention after engaging in play. However, the subjects are a homogeneous group and might not be indicative of other demographics.

Blizard (2004) found that students showed feelings of emotional loss after losing their playground, suggesting that students have an emotional relationship with their play space. This study was conducted at a single school and could not be replicated, which makes the results of this study weak.

These findings suggest that students' social skills may be affected by play, but because both the studies lack information and accountability, future research is necessary to determine the effects of play on social skills. Although these results need more research, it is clear that Arens, Cress and Zajicek (2007) and Holmes, Pellegrini, and Schmidt (2005) found that students showed higher rates of attention after participating in play.

Classroom Implications

The majority of the studies examined show that play has positive effects on cognition and social development. Although Dunn and Herwig (1992) found no significant correlation between intelligence and cognitive play behavior, this study is in the minority and can therefore the findings can be overruled. The rest of the studies in this review of literature consistently found that play has an impact on students. These results show that it would be beneficial to students to have play included in the classroom.

Play that is included in the classroom in the form of drama and art has been shown to have an effect on cognition and retention of information (Abeles, Burton, and Horowitz, 2000; Duatepe-Paksu and Ubuz, 2009; Escobedo, 1996; Kim, 1999; Pellegrini, 1980). Considering these findings, teachers should work

to incorporate dramatic play and art into their curriculum. This might include having children act out a story to aid in their comprehension or using a game to practice new mathematical skills. Using drama and art in this way can help students develop a deeper understanding of the concepts being taught as well as improve their retention. It is clear that drama and art can be important to helping students learn. Teachers should use drama and art in their classrooms to help students with retention of information, geometrical concepts, and writing. Incorporating drama and art can also help students' risk-taking and self-concept.

Play can also be used to help students in their development of math skills. According to research done by deVries, Thomas and Warren (2010), Emfinger (2009), Golomb and Friedman (1982), Nichol and Crespo (2005), and Duatepe-Paksu and Ubuz (2009), play can have a positive effect on students' understanding and retention of mathematical concepts. These findings indicate that teachers should aim to incorporate play into their math curriculum. Teachers can use this information in their classrooms by incorporating imaginative math lessons into their curriculum, where students are navigating a complex scenario rather than equations without a context. Teachers can also use pretense-play and dramatic play when teaching math concepts. Teachers could also monitor the students when engaging in free play and support students when they incorporate math concepts into their play by highlighting the students' thinking and furthering the concepts students are exploring.

Play also has shown to have a benefit on the development of language and literacy skills in children (Allen and Butler, 1996; Boykin and Cunningham,

2001; Meckley, 1996; Pellegrini and Galda, 1982; Pellegrini, 1980). These findings show that play has a positive effect on language and literacy skills. When developing literacy curriculum, teachers would benefit their students by including play in the lessons. Teachers can do this by allowing children to clap and dance along to a rhythmic story, making and playing with puppets of the characters in a story, or playing in small groups to develop a story.

Another implication of these findings is how play is viewed within schools. As explained in Chapter 1, the Nation at Risk report and No Child Left Behind resulted in less outdoor play, free play, and recess in schools in favor of more academic time. Despite the research that shows the benefits to outdoor play, free play, and recess, this trend still continues. This is apparent in the study by Clements (2004), who found that mothers believe their children spend less time outside than in previous years. Blatchford, Creeser and Mooney (1990) found that children themselves recognize the benefits of recess, believing recess was a chance for them to socialize, exercise, and get fresh air.

The opportunity for students to have recess and outdoor play can contribute to the social development of students. Several studies have shown that play provides children with opportunity to interact and hone their social skills as well as increases attention in the classroom (Arens, Cress and Zajicek, 2007; Genishi, 1982; Holmes, et al., 2005; Howe, et al., 2002; O'Connor and Stagnitti, 2010; Schuler and Wolfberg, 1993). Educational legislature should shift to ensure that all schools have adequate recess and play space in the classroom. Teachers in schools that do not have adequate recess should ensure that their

own students have daily time to play in the classroom. This would increase student attention during academic time as well as provide students with the necessary time to practice and hone their social skills.

Suggestions for Further Research

The research about the effects of play on cognition frequently focuses on subjects of a homogenous background. The subjects are frequently white, middle-class subjects. For instance, the subjects of Golinkoff, et al. (2008) research were mothers who were 86% Anglo-American. Howe's (2002) subjects were 80 white, middle class, English-speaking children. Additionally, Emfinger (2009) had 23 white, middle-class children who were aged three to ten and living in a rural area.

The research also tends to focus on subjects from a middle-class background. Escobedo (1996) observed four middle-class children. The participants of Kim's (1999) research were 23 children of middle-upperclass background. Golomb and Friedman (1982) conducted research in which the subjects were 75 middle-class children. Similarly, Dunn and Herwig (1992) included 34 middle-class children, aged three-five in central Iowa.

These studies focused on subjects that were white and middle-class, and thus limit an understanding of the body of research on this topic. Without diversity of subjects, it is unclear whether the findings can be generalized across

a variety of settings. It is also unclear what the classroom implications are when the subjects of the study are only one representative of a portion of students.

In addition to having greater diversity in race and socioeconomic class, there should also be further research studying older students. Currently, much of the research is focused on students at the preschool and primary grades.

Barbarin, et al. (2010), Boykin and Cunningham (2001), Dunn and Herwig (1992), Holmes, et al. (2005), Nichols and Crespo (2005), O'Connor and Stagnitti (2010), Pellegrini and Galda (1982), Pellegrini (1980), Phinney (1972), and Schuler and Wolfberg (1993) all focused on preschool and primary grades.

Since so much of the research is focused on younger grades, it is difficult to know if the gains through play seen in these grades would apply to older students as well. It might be possible that older students do not respond to play-based curriculum in the same way that younger children do, and therefore would should not be used as heavily in the classroom. However, it might also be found that older students do experience positive effects of play and teachers and lawmakers should aim to include play in the upper-elementary classrooms as well.

A common method of gathering data was to interview subjects. Sometimes, these interviews were supplemented with videotapes or questionnaires. Abeles, Burton and Horowitz (2000), Blatchford, Creaser and Mooney (1990), Blizard (2004), Clements (2004), deVries, Thomas and Warren (2010), Genishi (1982), Golinkoff, et al. (2008), Hyvonen (2012), Izumi-Taylor,

Rao and Wu (2011), Samuelson and Rogers (2010), Schuler and Wolfberg(1993) all based their studies off interviews done with subjects. These interviews were then examined for patterns and researchers made conclusions based on these interviews. Interviews can be part of a reputable research study, but when a substantial body of research all include interviews, it is necessary to find other methods of gathering data to provide a fuller picture of the subject.

Furthermore, interviews can be problematic since the subjects are reporting their beliefs or wishful thinking, which might be different from their actions. It is necessary to gather data in varying ways to ensure a more complex understanding of the data. Relying only on subjects' perceptions of their teaching or learning cannot provide a complete understanding of a classroom. Further research should aim to include other methods of gathering data, like observation or post-tests to ensure the most complete data set.

Another theme throughout this review of literature is that many researchers conducted their studies in a single classroom or school. They often followed one group of students in a singular environment. Allen and Butler (1996), Blizard (2004), Boykin and Cunningham (2001), Daiute (1990), Dunn and Herwig (1992), Emfinger (2009), Genishi (1982), Holmes, Pellegrini and Schmidt (2005), Howe, Rinaldi, Jennings, and Petrakos (2002), Kim (1999), Meckley (1996), O'Connor and Stagnitti (2010), Pellegrini and Galda (1982), Pellegrini (1980), and Phinney (1972) all conducted their studies in single playgroups, classrooms, and schools. This results in these studies having weak transferability and external validity. The studies were conducted in a specific

environment that exists outside of the study's parameters. Researchers cannot control for variables within a single classroom that might not exist in other settings. The studies also cannot be reproduced easily because researchers would not be able to find a setting that had the same exact environment as the original classroom.

Further research should aim to collect data from multiple classrooms or students that are in a variety of classrooms or schools. This would help to ensure that the data collected can be generalized to other settings, rather than being specific to a certain classroom. Findings of these studies would hold more weight in classroom implications. Studies that can be applied to multiple environments can ensure to a greater degree that the results will have similar impacts.

The studies in this review of literature are lacking in diversity of subjects' demographics. The studies also focus on preschool and primary grades, which does not necessarily imply the same results for older elementary students. These studies also rely heavily on interviews to collect data, which can be problematic as the only source of information. Finally, these studies are frequently conducted in a single environment that cannot be reproduced, thereby weakening the results of the study.

Conclusion

Chapter 1 explained how play has historically been viewed as an essential part of early-childhood education. With the advancement of the Nation at Risk report and No Child Left Behind, play began to be pushed from the classroom as

an emphasis on testing and accountability came to the forefront. It is necessary to examine the effects of play on development in order to determine whether or not play has a place in the classroom.

Chapter 2 presented the findings from the literature. The research showed that there were varying perceptions among teachers and parents on the value of play. It also showed that children incorporate new academic knowledge into their play, suggesting that play helps children internalize new information. Researchers found that children's incorporation of math into their play is more sustainable when the children have autonomy in their play. The studies also found that children show a higher rate of comprehension of stories when they're able to dance or clap along while listening to the story. When engaged in dramatic-play during a lesson, the research showed that students gain a better understanding of mathematical concepts. Finally, the research demonstrated that children improve their social skills when engaged in play groups or a play-based classroom.

Chapter 3 concluded with a summary of the findings from this review of literature. This summary included the overall findings of the literature. It also suggested classroom implications that teachers should include play in their lessons and that educational policy makers should ensure that children get recess and have access to play during the day. This section also suggested areas for future research, which include studying diverse bodies of students and also focusing on older elementary students.

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