Relationships between Pretend Play and Cognitive Development in Early Childhood Education

by

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Abstract

There has been a lack of awareness on the importance of play among parents and teachers, especially on the importance of pretend play. Pretend play has its unique roles and benefits in one's cognitive development. The relationship between pretend play and three cognitive abilities, problem-solving, self-regulation and creativity, are explored in this paper. Using the knowledge found in this research, some suggestions are provided to improve the teaching practice and curriculum of Chinese parents and teachers.

Keywords: pretend play, Vygotsky, cognitive ability, problem-solving, self-regulation, creativity.

Introduction

In this paper I review the empirical literature on the effect of pretend play on three cognitive abilities: problem-solving, self-regulation, and creativity. My special interest in this topic is raised from my early childhood experience in China. According to my parents, playing is a hindrance to learning through occupying precious time. As such, my childhood was occupied with extracurricular activities ranging from piano lessons to extra academic classes. Such is still the case in China where Chinese parents believe that play is just used to improve the physical health of the students according to my experience. Some Chinese parents do not provide children with sufficient toys or fill the child's schedule with academic tasks due to the lack of awareness and knowledge of the different benefits and types of play (Huang, 2013; Liao, 2007; Yang, 2011; Wu, 2009). The benefits of play in early childhood education are critical in shaping one's life. It is such assumptions that led me to review one of the most important benefits influenced by play, the cognitive benefit, to increase educators' awareness in the value of play in early childhood education. The three cognitive abilities were especially chosen to see if they could be effectively influenced by pretend play. In order to determine their relationship, it is important to narrow down the definition and the role of play. Understanding how play is defined in the psychological field is important for us to examine the role of play in the development of each cognitive ability.

Background

A good early childhood education is imperative for one's whole life. Play has been regarded as one of the best ways to help children exploring as well as learning and finally become mature. Children engaging in play cannot be compared to other kinds of activities since play has unique roles and benefits. Several research studies have shown that playing could be extremely beneficial to learning by increasing one's cognitive abilities (Bergen, 2002; Berk, Mann, & Ogan, 2006; Bodrova, 2008; Fein, 1981; Lillard, Pinkham, & Smith, 2011; Nicolopoulou, 1993; Pepler & Ross, 1981). The cognitive processes that are involved in play would in turn promote thinking such as the understanding of concepts, the ability to process information and the application of skills that children might need. Other benefits of play often discussed by researchers include those of physical, emotional, social, cognitive and intellectual nature (Ashiabi, 2007; Bergen, 2002; Bodrova & Leong, 2003; Ginsburg, 2007; Hu, Li, De Macro, & Chen, 2015). Cognition and intelligence are often merged together due to their strong correlation where mental processing is concerned. However, they differ from one another by definition: cognition is the method of processing information whereas intelligence is the capacity to capture information and put it into practice. Although each benefit is important, this paper will focus solely on the cognitive benefit and their corresponding cognitive abilities derived from play in early childhood education.

There are three main cognitive abilities that are widely acknowledged when play in early childhood is concerned: problem-solving, self-regulation, and creativity. These

three abilities are typically grouped into cognitive benefit due to the constant utilization of several processes, which may include recognition, classification, planning, monitoring and representation (Butler & Winne, 1995; Davidson & Sternberg, 2003; Forgas, Scholar, Baumeister, & Tice, 2011; Hayes, 1989; Mayer, 2013; Runco & Chand, 1995). The development of these three abilities can be enhanced through pretend play specifically because pretend play utilizes the cognitive processes.

Several researchers have since discussed the abilities mentioned above, but the empirical research available that test each cognitive ability is quite limited. Therefore, this paper reviews each type of cognitive ability in the empirical research. Methods and recommendations for implementing play into early childhood education will be explored with the optimization of cognitive development. North American and Chinese regions are of special interest as they are the primary targets for this paper.

The Definition of Play

The definition of "play" is deeply embedded in human beings that can stem from our animalistic roots long time ago (Crain, 2010). Defining what constitutes as "play" in children is always a highly debated topic among scholars. Several scholars define the term differently depending on their research topic, with some not even bothering to fully define play at all. This section discusses the definition of play as well as the cognitive abilities that are influenced by play.

Different types of play were introduced in research. Various types of play indicate different kinds of learning styles and processes, which connect with their psychological and emotional levels. Several researchers categorized play into physical play, social play, constructive play, fantasy play and games with rules (Wardle, 2006; Edwards, 2010; Anderson & Bailey, 2010). There is no definite categorization of play available as each classification of play incorporates one another to some degree. Among all types of play, pretend play, is generally agreed to be the most influential to the development of cognitive abilities. As such, pretend play will be used as the main focus of discussion throughout this paper. More detailed classification of pretend play will be discussed as well, such as object dependent, sociodramatic and thematic pretend play. Many different terms were used as synonyms for pretend play, such as "symbolic play, imaginative play, make-believe play, fantasy play, dramatic play" (Fein, 1981, p. 1096). Play and games in Vygotsky's work could have similar meaning, as "Russian uses a single word, *igra,* where English uses either play or game" (Vygotsky, 1966, p. 6).

Vygotsky and Piaget shaped the foundation of defining pretend play from different psychological points of view. Defining play based on the fact that it provides pleasure is not complete, as competition and other activities that do not include pretend play could also provide pleasure in the end (Vygotsky, 1966). Therefore, Vygotsky (1966) suggests that it is necessary to consider "child's needs, his incentives to act, and his affective aspirations" when defining play (p. 6).

There are several characteristics of pretend play in Vygotsky's theory, which includes the use of imagination, its rule based nature and positive affect. Pretend play emerges at the preschool age, which is around three years old (Vygotsky, 1966). At the age of three, children begin to have desires that could not be fulfilled immediately, and pretend play is a way for children to realize their desire and impulses. Children are then able to control their immediate wishes by using imagination, which separates objects and meanings. Children under three years of age tend to relate words to actual objects and meanings, so that they are not prepared for imagination and pretend play. This imagination process improves with practice and does not require physical objects or actions once proficiency has been achieved.

The second characteristic is the rule-based nature of pretend play. The rules created by the child originate from a state of confusion, which are internalized differently by the child. The newly formed rules then lead their corresponding actions during the play. According to Vygotsky (1966), the role of rules demands that the child control their immediate impulses as the game contains rules and restrictions.

Lastly, there should be a positive affect, which drives children to play. In the case of pretend play, this positive affect comes in the form of wish fulfilment. That is not to say that children would immediately resort to pretend play once their desire could not be fulfilled, as children have the ability to generalize the affective relationship and implement them in pretend play later on. As Vygotsky stated: "child not only has

individual affective reactions to separate phenomena, but generalized, unpredesignated, affective tendencies" (Vygotsky, 1966, p. 8). In conclusion, Vygotsky used several criteria to define pretend play. The creation of imaginary situations, age, its rule-based nature, and positive affect are all important characteristics that need to be considered when defining pretend play.

Piaget's definition of pretend play, and theory about cognitive development are different from Vygotsky. In Piaget's theory, pretend play is referred as symbolic play. According to Fein (1981), rise and fall of symbolic play in Piaget's theory is similar to a bell curve, in which it starts from age of two, peaks in frequency at the age of three and four, and declines afterwards. The origin of symbolic play, however, is not sudden and starts earlier in life. The "sensorimotor stage" (from birth to two years old) and "preoperational stage" (from two to seven years old) occurs during early childhood, where children begin to learn things through their senses, and their logical and abstract thinking are simplistic (Spodek & Saracho, 2014, p. 277).

During the sensorimotor stage, children begin to explore the things around them through physical interactions (Piaget, 1952). Their mental images become more complicated as they grow older, gain more experience, and understand new things through assimilation and accommodation. Symbolic play starts to appear during this stage when children could use symbols such as words or objects to represent something. Piaget and Inhelder (1969) suggest that the reason for this emergence is also influenced by the

child's desire to fulfil their affective and cognitive interests. The mental process required for a series of actions to be considered symbolic play is the dominance of assimilation over accommodation and the usage of symbols. “Play, which transforms reality by assimilation to the needs of the self, whereas imitation (when it constitutes an end in itself) is accommodation to external models” (p. 68). Accommodation in Piaget's texts refers to the revision of current knowledge according new surroundings whereas assimilation is the use of previous knowledge to deal with new situations.

In symbolic play, children use symbols to show whatever they could not assimilate in daily life (Piaget & Inhelder, 1969). This process begins with the imitation and repetition of a symbolic action until proficiency has been achieved. Their newfound actions are then applied through symbolic play. The final step includes the internalized imitation using their mental image as well as a verbal representation of the action. Piaget’s definition of symbolic play therefore requires two main aspects: the mental process of assimilation over accommodation and the use of symbolic meanings.

There are some similarities in Vygotsky and Piaget’s theory, such as the requirement for considering children’s needs and affective, as well as the rule-based nature of pretend play. Both Vygotsky and Piaget stated the importance of internal needs and incentives that children could fulfill during pretend play, and they all stated that cognitive and affective are two inseparable factors in the psychological process of pretend play. Vygotsky and Piaget suggested that there are two moralities in children’s mind that

contain rules, and Vygotsky stated in his paper that he has read Piaget's work and agreed with his idea about the rule-based nature of pretend play (Vygotsky, 1966). These rules are created from two sources; the physical rules set by others and an internal one, which comes from the cooperation of both other people and the children themselves (Vygotsky, 1966). In pretend play, the second type of rule is adopted, which contains self-regulation.

There are also some differences, such as the duration of pretend play, the sequence of development happened, the complexity of children's cognitive thinking, and the influence from culture aspect. Piaget stated the distinct stages whereas Vygotsky did not set any stages for one's mental development. According to Piaget, pretend play and cognitive development mainly occur during the preoperational stage (Piaget & Inhelder, 1969), whereas Vygotsky (1966) notes that one could develop cognitively through their whole life (Davison, 2006). Piaget states that children gain experience by exploring and repeating at the sensorimotor stage, then practicing them in pretend play during the preoperational stage and development later on (Piaget & Inhelder, 1969), whereas Vygotsky (1966) held the opinion that children developed some abilities before they actually start pretend play. Piaget and Inhelder (1969) suggested that children's pretend play is quite simple, because of egocentrism, while Vygotsky stated that "internal speech, logical memory, and abstract thought" could be observed through play (Vygotsky, 1966, p. 13). Moreover, Piaget's definition of play lacks the cultural factors, whereas Vygotsky stated that children were influenced by the environment or input from others (Davison,

2006; Gelman, 2009). In Piaget's pebble-counting example, children learn math by continuously counting and exploring by themselves (Piaget & Duckworth, 1970). According to Gelman (2009), Piaget's example contains cultural and language background that allowed children to count and continue the test. Therefore, keeping culture influence into account is important as we are surrounded by culture.

Researchers have since further classified pretend play into three types: object dependent, sociodramatic and thematic pretend play (Saltz, Dixon, & Johnson, 1977; Wyver & Spence, 1999). As the name suggests, object dependent play uses objects as the main focus of the pretend play (Saltz, Dixon, & Johnson, 1977; Wyver & Spence, 1999). Sociodramatic play is based on the child's daily experiences, which is a higher level of pretend play (Saltz, Dixon, & Johnson, 1977; Wyver & Spence, 1999). In sociodramatic play, children act out life situations with different roles, like pretending to go to school or being sisters (Wyver & Spence, 1999). Thematic pretend play differs in that their characters and situations are typically fantasy based, originating from books or movies (Saltz, Dixon, & Johnson, 1977; Wyver & Spence, 1999). The three types include varying levels of object involvement with object dependent having the most involvement; followed by sociodramatic and thematic pretend play having the least involvement (Wyver & Spence, 1999). Among the three pretend play classifications, sociodramatic and thematic pretend play were deemed as more complex form of pretend play.

Theories from Vygotsky and Piaget are still useful today, which demonstrated that children have their own cognitive function and needs in pretend play that could help them explore the world and understand things differently at an early age. There are still some limitations on the two theories. Researchers have criticized Piaget's theory, suggesting that young children's cognitive thinking is not too simple and they are more capable of imagining things then what Piaget supposed (Wood, Smith, & Grossniklaus, 2001). As for Vygotsky's theory, there still need to have more evidence to prove that three years old is an important year for the cognitive development, as some empirical researches have shown that there are some signs of pretend play before age of two (Fenson, Kagan, Kearsley, & Zelazo, 1976; Tamis-LeMonda & Bornstein, 1991; Tickle-Degnen & Cermak, 2010).

There is an assumption that there is a connection between pretend play and cognition. Pretend play utilizes many cognitive strategies such as problem-solving, goal seeking, creativity and joint planning, to transform objects and actions symbolically (Bergen, 2000). In particular, some cognitive abilities are thought to be influenced by pretend play, which include problem-solving, creativity, and self-regulation. This is in line with Vygotsky's (1966) theory in that "play is converted to internal processes at school age, going over to internal speech, logical memory, and abstract thought" (p. 13). The logical and abstract thinking, as well as the ability to use imagination to separate meanings and objects during pretend play, could facilitate problem solving and creativity.

The rule-based nature of pretend play could help children control themselves which leads to the improvement of self-regulation. Piaget also supports the important role of pretend play in the cognitive development. According to Piaget and Inhelder (1969), children develop mentally through repeated imitation and implementing it during playtime. In addition, children begin to use symbols to represent objects at the preoperational stage, which is similar to the creative process. Therefore, play, especially pretend play, has been regarded as the fundamental contributor to the development of the cognitive abilities.

This research uses Vygotsky's definition of pretend play as a framework to critically review the papers found, as I personally believe that Vygotsky's theory is more complete. The reasons why I chose Vygotsky's theory as a framework are because his theory claims that cognitive development occurs throughout one's lifetime, a consideration of culture and language in one's development, as well as valuing the importance of proper instruction and guidance.

Piaget places an emphasis on the different stages of cognitive development, which mainly occur during the preoperational stage through play (Piaget & Inhelder, 1969). However, I agree with Vygotsky that cognitive development occurs throughout one's whole life. I believe that we continually use our cognitive functions throughout our life, which would trigger some improvements in our cognitive ability. I also agree with Vygotsky, who emphasized on the role of culture and language in one's cognitive development (Davison, 2006; Gelman, 2009; Sample, 2002). As

discussed earlier, Piaget did not state the importance of culture and language influence, but his pebble-counting example contains the cultural background and language ability that allows children to count (Gelman, 2009). Therefore, it is important to take the cultural environment and language into account. Chinese culture and western culture are also different in the teaching methods, philosophy and believes, which could influence one's thinking. Piaget did not encourage teacher intervention, but Vygotsky encourages proper instruction and guidance (Sample, 2002). I agree with Vygotsky that instructions from more experienced and knowledgeable adults are necessary for one's development, since evidence showed that children could develop further with the help from adults (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977).

Research Questions

The preceding discussion shows that there is a hypothesis that pretend play could influence each cognitive ability, which are problem-solving, self-regulation, and creativity. To determine the validity of this hypothesis, three questions will be answered in the literature review:

How does pretend play influence problem-solving?

How does pretend play influence self-regulation?

How does pretend play influence creativity?

In the reflection part of the paper, the question of how adults could further enhance the quality of pretend play will be discussed. It is important to examine the best way adults could help children develop each cognitive ability, since Vygotsky (1978) have stated that learners are more capable with the right guidance in his theory of the Zone of Proximal Development (ZPD).

Research Path

The search engines used to find literature includes the University of Victoria library website, Google Scholar, Web of Science, and ERIC database. Various search terms were used to locate the appropriate sources. The initial search on the University of Victoria library website used the search term of "cognitive," "pretend play," "early childhood," "Vygotsky," "Piaget." The discipline is limited to "education" and "psychology," and the results are refined to "full text online." More than a thousand papers were found at first, but most of them are irrelevant to this paper. In order to find more relevant research papers, different synonyms of the terms were applied, such as using "symbolic play", "make-believe play", "fantasy play", "dramatic play", "sociodramatic play", "thematic play" to substitute pretend play. Another method used to find more related articles was to trace the references in some important articles. Meanwhile, more specific terms about each section were then added to limit the results. For example, "pretend play" and "creativity" were used on the ERIC database, there is only 44 research articles shown. Among 44 research articles, some of them would not be selected, as they are irrelevant or

does not contain empirical research. For example, an article was found to be relevant to pretend play, creativity, and the exanimation of Vygotsky's research, but it did not have empirical data that is suitable for literature review (Smolucha, 1992). Some other studies talked about play but did not emphasize the role of pretend play in the improvement of one's cognitive ability (e.g. Crain, 2010; Katz & Poag, 1979). The selected papers are specifically related to pretend play and each type of cognitive ability. After filtering through all the searched articles, there were around ten articles left for each section. Around forty papers found in total that are relevant to pretend play and each type of cognitive ability.

Literature Review

Cognitive abilities are the skills and mechanisms in the brain that relay on cognitive functions to help us finish tasks (Michelon, 2006). Cognitive functions are brain activities that acquire knowledge, such as attention, memory, thinking, and reasoning (Danili & Reid, 2006; Roy, 2013). On the other hand, cognitive factors are the features that influence one's behaviour, such as language ability and executive functions (Cheung, 2010). There is a hypothesis that some cognitive abilities, such as problem-solving, self-regulation and creativity, are influenced by pretend play, as they require some degree of cognitive functions to process internal information. The idea of the role of cognitive abilities in pretend play has a rich background in developmental theory (Vygotsky, 1966).

In Vygotsky's theory, internal speech and abstract thinking during pretend play could influence problem-solving and creativity, and the rule-based nature of pretend play is linked to one's self-regulation ability. Among the empirical research found about the relationship between pretend play and the three cognitive abilities, some results showed that participating in pretend play could lead to the improvement of the three cognitive abilities, such as problem-solving (Dansky & Silverman, 1973; Dansky, 1980; Pepler & Ross, 1981; Rosen, 1974;), self-regulation (Barnett, 1984; Berk, Mann, & Ogan, 2006; Bodrova, Germeroth, & Leong, 2013; Elias and Berk, 2002; Galyer & Evans, 2001; Saltz, Dixon, & Johnson, 1977), and creativity (Hoffmann & Russ, 2012; Johnson, 1976; Moore & Russ, 2008; Moran, Sawyers, Fu, & Milgram, 1984; Russ, Robins & Christiano,

1999). The reason for the correlation between pretend play and the three abilities is that children could practice several skills through pretend play, such as how to present things symbolically, planning, logical thinking, abstract thinking, etc. The skills children learn through pretend play will in turn influence the three abilities.

Others found that the influence from pretend play to the three cognitive abilities is not obvious and some conditions apply (Hoffmann & Russ, 2012; Lillard, Lerner, Hopkins, Dore, Smith, & Palmquist, 2013; Wyver & Spence, 1999). Therefore, I address three clusters of questions around pretend play and (a) problem solving, (b) self-regulation, and (c) creative ability.

(a) What is the relationship between pretend play and problem-solving? How does pretend play affect the development of problem-solving ability?

(b) What is the relationship between pretend play and self-regulation? How does pretend play affect the development of self-regulation ability?

(c) What is the relationship between pretend play and creativity? How does pretend play affect the development of creativity ability?

Problem-solving

This section reviews the relationship between pretend play and direct problem-solving, as well as associative fluency and counterfactual reasoning to test the relationship indirectly. The main sections include introduction, review, discussion, and

section conclusion. The review section is divided into four, which includes direct problem-solving, associative fluency, counterfactual-reasoning, and summary.

Introduction. Improvement in problem-solving ability has been considered as one of the main outcomes of participating in pretend play. Several empirical studies further tested the hypothesis that pretend play contributes to the development of problem-solving ability to some extent (Pepler & Ross, 1981; Rosen, 1974; Wyver & Spence, 1999). Although the general consensus agrees that pretend play contributes to the development of problem-solving skill, **t**he degree of contribution is still debated among scholars. Some say that constructive play is superior as children manipulate objects in advance and discover new strategies through repetition (Lillard, Lerner, Hopkins, Dore, Smith, & Palmquist, 2013). To determine the validity of the hypothesis that participating in pretend play leads to the improvement of cognitive abilities, it is vital that the method of several empirical research be reviewed.

Researchers test the relationship between pretend play and the development of problem-solving ability directly and indirectly. Problem-solving is divided into two types when they tested the relationship directly, which are divergent and convergent problem-solving (Pepler & Ross, 1981; Wyver & Spence, 1999). Divergent problems usually have several solutions, whereas convergent problems have a single solution (Pepler & Ross, 1981). Associative fluency and counterfactual reasoning were used to test the hypothesis of pretend play could influence problem-solving ability indirectly

(Buchsbaum, Bridgers, Weisberg & Gopnik, 2012; Dansky & Silverman, 1973; Dansky, 1980; Gopnik & Walker, 2013). Associative fluency is the ability to "form associative elements into new combinations which meet certain task requirements," which is important for divergent problem-solving ability and creativity (Dansky & Silverman, 1973, p. 39). Counterfactual reasoning refers to the ability to think of alternative or contradictory facts to the things that have already happened, whereas problem-solving ability regards to the process of using different strategies to solve different tasks (Epstude & Roese, 2008). Both of the associative fluency and the counterfactual reasoning require the ability to think of new ideas or using cognitive strategies, thus they are correlated to problem-solving ability. These two dimensions constitute the core of the following review.

Review. Since some researchers supported the hypothesis that pretend play could have positive influence on problem-solving ability, it is necessary to see how pretend play provides such influence. This section reviews the relationship between pretend play and problem-solving ability directly, and both the associative fluency and counterfactual reasoning are used to see the relationship indirectly. Four subsections are included in the review section, which are direct problem-solving, associative fluency, counterfactual-reasoning, and summary.

Direct problem-solving. There were three studies found that tested the relationship between pretend play and problem-solving ability directly (Pepler & Ross, 1981; Rosen,

1974; Wyver & Spence, 1999). Among the three studies, two of them found that pretend play has a stronger link to divergent than convergent problem-solving ability, especially in higher levels of pretend play (Pepler & Ross, 1981; Wyver & Spence, 1999). The other study also support that higher level of pretend play, which is sociodramtic play, is obvious to enhance one's problem-solving ability (Rosen, 1974). Thematic pretend play could influence semantic divergent problem-solving ability, as children use their internal speech when encountering a problem (Wyver & Spence, 1999). Two reasons could be associated to the result that pretend play have bigger influence on divergent problem-solving ability. One of the reasons is that higher levels of pretend play utilize more cognitive functions and rely less on objects, which increases one's imagination. Another reason is that one's social skill is an important factor for the improvement on problem-solving ability (Rosen, 1974).

The effects of pretend play on convergent problem-solving ability can be found in two studies (Pepler & Ross, 1981; Wyver & Spence, 1999). In both studies, pretend play was observed but the corresponding test results were inconsistent with one showing improvements whereas the other did not. One test found no correlation between the two variables (Wyver & Spence, 1999). The other one only found a slight correlation, but the study was focused more on the impacts of play experience rather than the impacts of pretend play (Pepler & Ross, 1981). Therefore, it can be said that the correlation between pretend play and convergent problem-solving ability is uncertain.

An interesting data that is different from other studies was found in one study, that is, the relationship between pretend play and problem-solving ability is reciprocal (Wyver & Spence, 1999). One of the sub-studies showed that increasing the problem-solving ability could lead to the improvement of pretend play behavior as well (Wyver & Spence, 1999). This reciprocal relationship is outside the scope of this review but future studies should explore this relationship.

Associative fluency. Due to the limited number of studies that focused on pretend play and problem-solving ability directly, it is important to find more results that show the relationship indirectly. Associative fluency is used to test the relationship.

Two studies were found to identify the relationship between associative fluency and pretend play (Dansky, 1980; Dansky & Silverman, 1973). Same result was found in the two studies: Children who played with the objects, where pretend play was involved, had better associative fluency ability and were more imaginative (Dansky, 1980; Dansky & Silverman, 1973). The control group in the two studies did not perform better than play group. On this basis it was concluded that children would not increase their associative fluency much if they were just given the materials to play with without involving their own thinking or without involving pretend play (Dansky, 1980; Dansky & Silverman, 1973). Although the results showed that children who engaged in pretend play had better associative fluency than other control groups, the results could not contribute to the

conclusions that engaging in pretend play will definitely lead to the increase of creativity as well as that pretend play is the only way to improve one's associative fluency.

Overall, children who participated in pretend play had better associative fluency than the control groups. This suggests that pretend play is a good way to help children gain more chances to have associations with the objects and assimilation during pretend play (Dansky, 1980; Dansky & Silverman, 1973). As divergent problem-solving ability relies on imagination, a better result in associative fluency after pretend play could be seen as a link to divergent problem-solving ability as well.

Counterfactual-reasoning. Two studies found that problem-solving ability and counterfactual-reasoning skill were connected (Buchsbaum, Bridgers, Weisberg & Gopnik, 2012; Gopnik & Walker, 2013). Results showed that most children were able to answer the counterfactual questions correctly in both studies using the information given by the researchers at the beginning (Buchsbaum, Bridgers, Weisberg & Gopnik, 2012; Gopnik & Walker, 2013). The correlation between counterfactual reasoning skill and pretend play showed that both imagination and logical thinking were used in the tasks.

The results in the two studies only showed that there is correlation between pretend play and counterfactual-reasoning skill, but not a causal relationship. One of the reasons for these vague results is that children were not engaged in or trained with pretend play prior to the test. As such, this test does not determine the level of improvement in the counterfactual-reasoning skill, only to see if using pretend play temporarily helps with

imagination and logical thinking. Likewise, the experimenter guided and gave many hints to help children learn how the toy works in both studies. It is possible for children to master the counterfactual reasoning skill before they started pretend play. Therefore, there is no proof that engaging in pretend play could lead to the development of counterfactual reasoning skill. The results from both studies could only show that the counterfactual reasoning skill that children learned in the beginning could be transferred to the pretend play later on.

Summary. In general, three studies showed that there is a correlation between pretend play and problem-solving ability in that pretend play could help children perform better in the problem-solving tasks to some extent (Pepler & Ross, 1981; Rosen, 1974; Wyver & Spence, 1999). Higher levels of pretend play, which include thematic and sociodramatic play, are considered to be more helpful for developing one's problem-solving ability (Pepler & Ross, 1981; Wyver & Spence, 1999). Divergent problem-solving ability was found to be correlated with pretend play but not convergent problem-solving ability (Pepler & Ross, 1981; Wyver & Spence, 1999). Counterfactual reasoning and associative fluency could be considered as the two factors that represent problem-solving ability, as they all require children to use some cognitive functions such as abstract and logical thinking. Results showed that experiencing pretend play yielded better associative fluency than those without (Dansky & Silverman, 1973; Dansky, 1980). The possible reasons for the result is that pretend play disconnects old associations while

also creating new and novel associations. Two studies found that the counterfactual reasoning skill children learned in the beginning could be transferred to the pretend play later on (Buchsbaum, Bridgers, Weisberg & Gopnik, 2012; Gopnik & Walker, 2013). Therefore, it can be concluded that pretend play could facilitate associative fluency, but the impact on counterfactual reasoning remains vague. More factors that influence the results should be taken into account in the future studies. For example, math skill is link to problem-solving ability, which could be used to see the relationship between pretend play and problem-solving ability.

Discussion. This section discusses and compares the methods and results from studies that tested the relationship between pretend play and problem-solving ability both directly and indirectly. The role of pretend play in facilitating one's problem-solving ability is discussed in the comparison section. Several reasons will be proposed based on Vygotsky's theory and the results from empirical research in the comparison section. Some limitations could be concluded based on the research methods and results in the studies, which could be used as a reference for future studies.

Comparison of studies. Some similarities and differences could be found in the studies. Similarities include results on divergent problem-solving and results with different environment. The differences include results on social ability and results on counterfactual-reasoning. Studies have shown that pretend play is linked to one's problem-solving ability, especially divergent problem-solving ability. Three studies have

shown that pretend play was considered to better facilitate divergent problem-solving ability than convergent problem-solving ability (Dansky & Silverman, 1973; Pepler & Ross, 1981; Wyver & Spence, 1999). One possible reason could be that divergent problem-solving ability relies heavily on imagination, which is found in higher levels of pretend play. One study stated that pretend play could help children form new links among different objects, which could give children diverse ideas when it comes to solving problems (Dansky, 1980).

Cognitive processes, such as divergent thinking, symbolism and fantasy, are used during pretend play as well as problem-solving (Russ, 2003). Convergent problem-solving ability on the other hand, is rooted in logical thinking. One study stated that pretend play give children the chance to practice and master the reasoning skill (Buchsbaum, Bridgers, Gopnik, & Weisberg, 2012). These results can then be used to explain the conclusion found in associative fluency. Associative fluency has closer ties with divergent thinking in that it emphasizes the use of imagination more than logical thinking. For example, the Alternate Uses Test (AUT) was used in several studies, which requires children to use their imagination to think of different uses for the objects. The AUT was used in the two studies that tested associative fluency (Dansky, 1980; Dansky & Silverman, 1973). The AUT was also used in other studies to test divergent problem-solving ability (Pepler & Ross, 1981; Wyver & Spence, 1999). Results also showed that pretend play has more influence on semantic but not figural problem-solving

ability (Wyver & Spence, 1999). Vygotsky's theory might explain the reason for the result. According to Vygotsky (1978), internal speech is one of the most important cognitive processes that children would have when they encounter problems, which is why better result was seen in the semantic problem-solving ability.

Different studies found similar results that showed environment could influence children's response in the tasks. Two studies have shown that children's performances in the tests that tested either associative fluency or counterfactual reasoning were linked to the environment (Buchsbaum, Bridgers, Gopnik, & Weisberg, 2012; Dansky & Silverman, 1973). Children's answers in the AUT were creative but all were based on daily life experience (Dansky & Silverman, 1973). Some answers children gave in the AUT were linked to the objects in the room, and the link is especially obvious for children in the play group (Dansky & Silverman, 1973). However, the link won't affect the conclusion that pretend play could influence problem-solving ability, as the play group still had better associative fluency even after the researchers deleted the results that involved the environment cue related answers (Dansky & Silverman, 1973). Even if the results will not be influenced much from the objects that put in the room, it is better for researcher to limit the variables. Another study then tried to limit the bias by using the objects, which were not put in the experiment room, in the AUT (Dansky, 1980). In another study, children's answers on counterfactual reasoning questions in the pretend play session were consistent with the causal roles about toys they observed in the real

world (Buchsbaum, Bridgers, Gopnik, & Weisberg, 2012). Environment could influence one's experience, thus influencing the results of the studies. Studies were taken under different environment. Some were taken indoors (Pepler & Ross, 1981), whereas others were taken outdoors (Wyver & Spence, 1999). Although there is no result showing that whether having pretend play indoor or outdoor will influence one's problem-solving ability, it is still important for researchers to control the environment for better results.

Social skill was found to have influence on the results. One study showed that the cooperation among children during sociodramatic play leads to solve problems effectively (Rosen, 1974). Although social skill does influence the result, the cognitive function was not taken into account in the study. Without considering the cognitive ability, it cannot be concluded that it is one's social but not cognitive ability influence the result. Even when children do the test alone, results showed that they still improved their problem-solving ability after pretend play (Wyver & Spence, 1999). Therefore, it is better to conclude that there are many variables that influence the relationship between pretend play and problem-solving ability other than just cognitive functions.

Unfortunately, the tests for counterfactual reasoning cannot be compared to the others as they used a different method of testing (Buchsbaum, Bridgers, Weisberg & Gopnik, 2012; Gopnik & Walker, 2013). The end results of the test are arguable as pretend play is not used as a means for improvement, but a testing criterion. Therefore, the test only determines the level of imagination a child has. A better method for future

research would be to create a control group and allow children to experience pretend play before the counterfactual tests. Overall, these tests partially support some of Vygotsky's theory. According to Vygotsky (1966), internal speech, logical thinking, imagination and abstract thinking could be developed during pretend play, which could facilitate problem-solving ability. Results from the studies showed that the role of imagination is greater than logical thinking in the relationship between problem-solving and pretend play, since more obvious result were found in divergent than convergent problem-solving. This phenomenon may not have been observed by Vygotsky because he did not differentiate between divergent and convergent problem solving. Regardless, it is still beneficial to implement pretend play for children to improve problem-solving ability. Pretend play is a way for children to explore and find their own connection with the objects, rather than learning how to solve problems through play directly.

Limitations. Some limitations could be seen in the studies, including different materials, types of play, small sample size, same research team, and adult guidance.

One of the main limitations in the studies is that children encountered the problem-solving materials beforehand, which could influence the test results. For example, one study allowed children to play with the problem-solving materials beforehand (Pepler & Ross, 1981). Allowing them to do so helped children to form basic understandings of the objects or problems, and less abstract thinking would be needed in the problem-solving task later on. In addition, playing with the objects repeatedly will

allow children to gain better understanding of the problems in the test later on, which might lower the need for abstract thinking process even further. Results in the study showed children have better problem-solving ability if they are allowed to play with the problem-solving materials beforehand, compare to the children who observe researchers playing with the objects (Pepler & Ross, 1981). In other studies, children were not exposed to the problem-solving materials first, which are better to research that it is the cognitive thinking in pretend play leads to the improvement of problem-solving ability (Rosen, 1974; Wyver & Spence, 1999). However, the problem-solving materials used in both studies were quite common that children most likely have had some previous experience with the materials. In this sense, there might be less abstract thinking required as previously discussed. It would have been ideal for researchers to not use the same materials that are used in the problem-solving test for pretend play. Using non-everyday objects as well to eliminate the possibility for children to utilize their previous experience.

Play is inherently a mix of several types of play, thus this will always be a problem when conducting an experiment. In different studies, researchers included different types of play. Some focused on both constructive and symbolic play (Pepler & Ross, 1981). Others allowed free play with a wide range of play types for the control test first, and then they focused on pretend play by actively monitoring and encouraging the children towards pretend play (Wyver & Spence, 1999). In another study, sociodramatic pretend

play was the only focus (Rosen, 1974). Pretend play is not the only type of play that could lead to the improvement of problem-solving ability. Results showed that cooperative play could lead to the improvement of problem-solving ability as well (Wyver & Spence, 1999). Since thematic pretend play and cooperative play are overlapped, it is hard to tell whether it is pretend play or cooperative play that lead to the improvement of problem-solving ability (Wyver & Spence, 1999). Moreover, children incorporate both constructive and pretend play to improve their problem-solving ability in some studies (Dansky, 1980; Wyver & Spence, 1999). In these cases, it is hard to specifically determine the role of pretend play in the improvement of one's problem-solving ability, as children incorporate different kinds of play in the studies. Overall, the inherent mix of play types could not be eliminated, unless active management was employed. It is better to train children different types of play together to improve their problem-solving ability.

The small sample size is another limitation. Due to the specific focus of this subject, there are not many empirical research papers available. The sample sizes in the studies are also relatively small. Around sixty preschoolers participated in four studies (Buchsbaum, Bridgers, Gopnik, & Weisberg, 2012; Pepler & Ross, 1981; Rosen, 1974; Wyver & Spence, 1999), and around 90 children participated in other two studies (Dansky, 1980; Dansky & Silverman, 1973). Having a small sample size might influence the results due to cultural effects, parental educational levels and socioeconomic

background, as these would impact the amount of resources available to the child. However, with a large enough sample size, these variables should have minimal impact. Therefore, it is important to strive for larger sample sizes to achieve a better conclusion.

Another limitation is that the same research team were used in the two studies in the associative fluency section and the two studies in the counterfactual reasoning section (Buchsbaum, Bridgers, Weisberg & Gopnik, 2012; Gopnik & Walker, 2013; Dansky & Silverman, 1973; Dansky, 1980). Therefore, no new insights were provided with regard to why the connections exist.

The limitation in the counterfactual tests is that the experimenter guided and gave many hints to help children learn how the toy works in both studies (Buchsbaum, Bridgers, Weisberg & Gopnik, 2012; Gopnik & Walker, 2013). There is a possibility that children have already mastered the counterfactual reasoning skill for this specific situation engaging in pretend play. Therefore, it remains uncertain whether engaging in pretend play could lead to the development of counterfactual reasoning skill.

Summary. Studies have found the similar results in that pretend play has a stronger link with divergent problem-solving compared to convergent problem-solving (Dansky & Silverman, 1973; Pepler & Ross, 1981; Wyver & Spence, 1999). One of the reasons for this link is that both pretend play and divergent problem-solving requires more imagination, symbolism and fantasy. Pretend play also has more influence on semantic but not figural problem-solving ability (Wyver & Spence, 1999), as children develop both

internal speech and social skill through pretend play. This result is in line with Vygotsky's framework, which stated that language, which is a tool for children to communicate between themselves and the surroundings, could facilitate learning and cognitive development (Vygotsky, 1978). Internal speech, following language acquisition, could help children to organize their thoughts and "become an internal mental function" (Vygotsky, 1978, p. 89). Language is a way for children to socialize with others, which plays an important role in one's cognitive development. Children experience different things in different surroundings, which could result in making different associations in their mind. Therefore, one's social ability and the surroundings should be taken into account when conducting the research.

Different studies have also found that the play and testing environment could influence the final results, and should be accounted for in future studies (Buchsbaum, Bridgers, Gopnik, & Weisberg, 2012; Dansky & Silverman, 1973). In general, pretend play plays an important role in one's improvement of problem-solving ability, as internal speech, logical thinking, abstract thinking, etc. are used during pretend play that are also needed for problem-solving. Some limitations found in the studies including previous encounters of test objects and children practicing other forms of play. Other variables that should be taken into account in the future includes: small sample size, same research team, and adult guidance.

Section conclusion. Vygotsky provided the framework that engaging in pretend play is important for one's cognitive ability, as it could help children to use their internal speech, logical thinking, imagination, affective expression, etc. Several papers also showed that pretend play could facilitate problem-solving ability to a certain degrees. Studies found that semantic divergent problem-solving ability has stronger link to pretend play, as it requires more imagination and language ability, compare to figural convergent problem-solving ability (Pepler & Ross, 1981; Wyver & Spence, 1999). Whereas more research is needed to further confirm the link between pretend play and semantic problem-solving ability, the reasoning that semantic problem-solving ability is developed through internal speech during pretend play is quite convincing.

Self-regulation

Besides problem-solving skill, self-regulation has been regarded as another ability that children could develop during pretend play. The main sections include introduction, review, discussion, and section conclusion. The review section is divided into three, which includes executive function based self-regulation, emotion regulation, and summary. In the discussion section, a comparison of studies and limitations are examined.

Introduction. Self-regulation is the ability to control one's own behaviour which includes "resistance-to-temptation, delay-of-gratification, and control of attention and motor activity" (Elias & Berk, 2002, p. 221). Self-regulation can be categorized into two,

which are executive function and emotion regulation (Lillard, Lerner, Hopkins, Dore, Smith, & Palmquist, 2013). Executive function mainly contains cognitive functions, which includes "inhibitory control, working memory, and attention" (Lillard et al., 2013, p. 22). Emotion regulation refers to the ability to control one's emotions. The role of pretend play in both categories of self-regulation could be traced back to Vygotsky's theory. As for the executive function, Vygotsky (1966) stated that pretend play is rule-based in nature, which could facilitate one's impulse control. For example, "children achieves the maximum display of willpower in the sense of renunciation of an immediate attraction in the game in the form of candy, which by the rules of the game the children were not allowed to eat because it represented something inedible" (Vygotsky, 1966, p. 14). Therefore, children have to reduce their immediate impulse, regulate themselves through internal language, and subject themselves to the rules to enjoy the pleasure of play at the end. As for the emotion regulation, Vygotsky stated that children would experience positive affect during pretend play, which serves the function of wish fulfillment. Children could regulate themselves easier if they could enjoy the pleasure from pretend play. The rule-based nature and internal speech could help children develop self-regulation ability through pretend play. Pretend play also serves the function of a "cognitive buffer" between the outside world and inner world, where a child could free themselves of their immediate surroundings and leap into their imagination (Saltz, Dixon, & Johnson, 1977, p. 379).

Several researchers agreed with Vygotsky's idea that participating in pretend play could help children suppress their immediate impulses and develop self-regulation ability. Among them, some have conducted research regarding executive function (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977; Vieillevoye & Nader-Grokinds, 2008), and emotion regulation (Barnett, 1984; Berk, Mann, & Ogan, 2006; Galyer & Evans, 2001). The method used by most researchers was to train children with pretend play first, and then apply different rules to test if children could follow those rules thus testing their self-regulation ability.

Review. This section reviews the relationship between pretend play and the two categories of self-regulation, which are executive function based self-regulation and emotion regulation. Three subsections are included in the review section, which are executive function based self-regulation, emotion regulation, and summary.

Executive function based self-regulation. Three studies have found the correlation between executive function based self-regulation and pretend play exist (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977; Vieillevoye & Nader-Grokinds, 2008), whereas one study found the correlation did not exist (Hoffmann & Russ, 2012).

One study found pretend play could help children, especially highly impulsive children, to improve self-regulation ability (Saltz, Dixon, & Johnson, 1977). Children in the experiment of "Trip to the Moon" showed higher impulse-control ability compare to the experiment of "Guardian of the Toy", one of the main reasons could be that there

were researchers accompanied the children in the “Trip to the Moon” (Saltz, Dixon, & Johnson, 1977, p. 371). Children have different levels of self-control ability in the studies, and for those who experienced pretend play before were able to display higher levels of self-control ability. However, there were some peculiar circumstances where children showed higher self-control. For example, children would perform better when they were under adult’s supervision, or when they were given other jobs to distract themselves and keep them busy if they were at their limits (Saltz, Dixon, & Johnson, 1977).

Another study found that higher level of pretend play, which is sociodramatic play, could help children develop self-regulation ability in the future but showed no instant improvement, and engaging in solitary pretend play does not help children improve self-regulation ability compared to sociodramatic play (Elias & Berk, 2002). Social context is an important factor that could influence one’s performance on self-regulation task. According to the Elias and Berk (2002), a child who was surrounded by other kids showed better self-regulation ability as not complying could make him or her feel excluded from the social group. As for the reason’s why there were no instant results is not clear, and the authors gave the explanation saying this process is similar to exercise in which it won’t give instant results but would improve over time if they keep working out (Elias & Berk, 2002). The frequency and persistence of pretend play are important in improving one’s self-regulation ability (Elias & Berk, 2002). In general, pretend play is only associated with sociodramatic but not singular pretend play. With

higher levels of pretend play, children's self-regulation ability could be improved in the long term.

One study also found there were positive correlations between self-regulation and pretend play in both intellectually disabled and normal children, and children's self-regulation ability improved when the level of pretend play increased (Vieillevoye & Nader-Grokinds, 2008). However, another study found no correlation between pretend play and self-regulation (Hoffmann & Russ, 2012). Children were asked to organize different cards into piles according to the hints to test their executive functions, and results showed that there was no significant connection between pretend play and executive function (Hoffmann & Russ, 2012) The reasons why the link does not exist is unclear. One possible reason given by Hoffmann and Russ was that the card-sorting task used was originally designed to test children with known difficulties, whereas normal children were the subjects of this study. To determine whether this possibility is true, a different test should be adopted. Alternatively, it is also possible that the initial hypothesis was wrong and that pretend play and self-regulation are irrelevant to each other (Hoffmann & Russ, 2012). Another reason why the correlation between pretend play and self-regulation does not exist is that the age span in the study varied widely and only girls participated in the study, which could influence the result to a large extent.

Emotion regulation. The emotion regulation is another type of self-regulation that has been recognized as relevant to pretend play by some researchers. Three studies

have found that pretend play and emotion self-regulation are correlated with each other (Barnett, 1984; Galyer & Evans, 2001; Hoffmann & Russ, 2012).

The first study observed how three-year-olds children behave when they were left by their mother on the first day of preschool, and found that the correlation between pretend play and emotional self-regulation exist among high impulsive but not low-impulsive children (Barnett, 1984). Results showed that high-impulsive children, who were more anxious when their mom left, were better at regulate their emotion after engaging in different sorts of play activities as opposed to just listening to a story (Barnett, 1984). Results also showed that high-impulsive children were not influenced by peer's presence and could still manage to regulate themselves through pretend play engagement, whereas low-impulsive children were more influenced by peer's presence and did not influenced much by the pretend play situation (Barnett, 1984).

The second study used pretend play as a context to test one's emotion self-regulation ability. In the twenty minutes session, teachers first introduced some toys to help children engage in pretend play, then a crocodile toy that could eat all the toys appeared as a negative emotion activator to see if children could remain playing without this disruption (Galyer & Evans, 2001). Children's response to the threat from the crocodile were scored based on how effective they deal with the threat and if they could fix the negative feelings and keep finding ways to go back to pretend play (Galyer & Evans, 2001). Then children were rewarded with prizes if they behave well, but the

authors did not mention if children knew that there would be a prize at the end. If children knew about the prize, they might show better behavior in the study. The study found that children who could manage their negative emotion could also perform better in the emotion regulation test later on, and the correlations between the duration of pretend play and emotion regulation test scores exists (Galyer & Evans, 2001). Children were also asked to have pretend play at home guided by their parents. Children with frequent involvement of pretend play at home scored higher on emotion regulation checklist, which showed that the frequency of engaging in pretend play is more important than the quality of pretend play (Galyer & Evans, 2001). One possible reason to explain this is that the abilities children learn through pretend play are being practiced constantly, thus children could transfer what they learned through pretend play to other situations when a problem occurs. The correlation between the scores on the emotion regulation checklist in the negative activator task and the scores tested after pretend play at home means that the self-regulation ability acquired through pretend play is also transferable to other situations.

The third study also found the correlation exists by examining one's behaviour in the pretend play sessions and emotion regulation test (Hoffmann & Russ, 2012). This study has been introduced earlier in the executive function section, which found that the correlation between executive function based self-regulation did not exist, however, the correlation between pretend play and emotion regulation exist (Hoffmann & Russ, 2012).

Results showed that children who had higher scores in pretend play sessions also had good score in the emotion self-regulation test, but the result could not confirm a causal relationship between the two, just a significant association between the two (Hoffmann & Russ, 2012).

In general, there is correlation between pretend play and emotion regulation. Pretend play could give children emotional comfort, which in turn helps the improvement of self-regulation ability. Children experience different emotions, affects and perspectives through playing different roles in pretend play. Children could learn how to regulate their emotion through acting out different themes or plots, which could help them express their feelings (Saltz, Dixon, & Johnson, 1977).

Summary. All in all, several studies have found direct positive relationship between pretend play and self-regulation, but the causal relationship is still not clear (Barnett, 1984; Galyer & Evans, 2001; Hoffmann & Russ, 2012; Saltz, Dixon, & Johnson, 1977; Vieillevoye & Nader-Grokinds, 2008). Another study stated that relationship did not exist (Hoffmann & Russ, 2012). One study found that the relationship had strict conditions, in which the correlation only exist between sociodramatic play and executive function based self-regulation in the long run and not in solitary pretend play (Elias & Berk, 2002).

Discussion. This section compares the similarities and differences among studies. It is important to examine the similarities and differences with regards to the research

methods and results among different studies to see the strength and flaws in the methods. The role of pretend play in the development of self-regulation ability is discussed in the comparison part. Limitations are discussed for future reference.

Comparison of studies. Some similarities and differences could be found in the studies. The differences include different research length, different research methods, different rules, different results with intellectual diversity, and different results with adult guidance. Similar results could be found among studies, and the role of pretend play could be found in studies. Studies also found no gender differences.

One of the differences is that different studies had different research length. In one study, children participated in different kinds of pretend play for fifteen minute a day, and lasts over three school years (Saltz, Dixon, & Johnson, 1977). Another study also lasted for a school year, but two phases were included (Elias & Berk, 2002). The first phase started in September and the second phase taking place five months after the first phase (Elias & Berk, 2002). The relatively long study length allows researchers to determine the development of play and self-regulation at different phases, and to better observe whether training children to participate in pretend play is helpful for the improvement of self-regulation ability in a long term. Results showed that four-year-old children had better self-regulation ability than three-year-old (Elias & Berk, 2002). In another study, children only joined in pretend play for one hour, which is too short for children to fully develop their potential during play (Vieillevoye & Nader-Grokinds,

2008). The differences in research length could influence the results. Two studies that have longer durations found higher level of pretend play have more influence on one's self-regulation ability. One of the studies found that there was no instant improvement on self-regulation ability after pretend play (Elias & Berk, 2002), which is contradictory to the study that has short duration that found pretend play could improve one's self-regulation ability instantly (Vieillevoye & Nader-Grokinds, 2008). Future studies could conduct more longitudinal studies and test the same children at different periods of time.

Different studies used different research methods. Among all the studies, some trained children to engage in pretend play sessions, whereas others allowed children to have free play where pretend play could be observed. In two studies, the pretend play sessions were designed by adults, which limit children's freedom of exploration (Saltz, Dixon, & Johnson, 1977; Vieillevoye & Nader-Grokinds, 2008). The play sessions developed by adults lead children into a pretend play scenario, which allows children to focus on pretend play easier. Free play was used in other studies, which gives children more chances of taking the initiative (Barnett, 1984; Elias & Berk, 2002; Hoffmann & Russ, 2012). In general, training children to participate in pretend play is a good way to make sure that pretend play is involved in the studies, whereas free play allows children to engage in pretend play spontaneously. As discussed earlier, constructive play or any other types of play could be mixed together with pretend play and influence the final test

result, thus blurring the role of pretend play. Future studies could explore the differences between the two methods on children's cognitive development, and examine whether participating in spontaneous pretend play or joining pretend play sessions designed by adults influence one's self-regulation ability more.

Studies have used different rules to test one's self-regulation ability. If children could follow the rules in the tasks, they are considered to have better self-regulation ability. Pretend play was used to help children improve their self-regulation ability, as both activities contain rules. Children practice following rules during pretend play, which could help them restrain their immediate impulses and regulate themselves (Vygotsky, 1966). In the self-regulation tasks, children also need to follow different kinds of rules in different studies. Although the external rules are different in pretend play and self-regulation tasks, the cognitive process used when following those rules are similar. Children have to learn how to control their impulse by using their internal language to regulate themselves to achieve the goals. Pretend play provides children with "roles, rules, and scenarios" that could help children regulate themselves (Berk, Mann, & Ogan, 2006). Therefore, children's performances on self-regulation tasks showed signs of improvement after pretend play, because they learned to internalize what they learned from pretend play and regulate themselves in turn.

Including intellectual ability in the studies is important, as children have different understanding of the tasks and their abilities to acquire the knowledge and skills can be

different depending on their intellectual ability. It was found that children with higher intellectual ability have better impulse-control ability after training with pretend play (Saltz, Dixon, & Johnson, 1977). This is confirmed in another study where intellectually disadvantaged children received lower scores on self-regulation than normal children during pretend play, despite their enthusiasm in participating in pretend play (Vieillevoye & Nader-Grokinds, 2008). The reason offered is that intellectually disadvantaged children do not fully comprehend the tasks set during pretend play, have lower persistence in achieving the goals, and are often easily distracted (Vieillevoye & Nader-Grokinds, 2008). Therefore, their cognitive functions were not fully used and the development is lower than those with higher intellectual abilities. However, one study found that intellectual factor does not affect the result that pretend play could influence problem-solving ability (Wyver & Spence, 1999).

Some researchers stated that it is important for adults to give enough guidance and instructions to children, as children could perform better in self-regulation test with the guidance (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977). Another study found that adult's guidance did not have big influence in the result (Vieillevoye & Nader-Grokinds, 2008). Children were given more guidance and instructions from teachers during one of the activities in the test, and children showed better self-regulation ability as a result (Elias & Berk, 2002). In another study, children from the pretend play group would regulate themselves better if adults could instruct them to think of some

stories in order to reduce their impulsive actions (Saltz, Dixon, & Johnson, 1977). Results showed that children had better self-regulation if adults accompanied them during one of the self-regulation test. The reason why children performed better under adult's guidance is because children could receive mental and emotional support from adults (Galyer & Evans, 2001). This theory is in line with Vygotsky's Zone of Proximal Development, which stated that children could achieve better development if they are "under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). With adults' help, children could transfer what they learned to internal speech, which better facilitates self-regulation. Therefore, it could be adult guidance that plays a more important role in one's self-regulation ability. The degree of adult involvement was not specified in the research studies and as such, it can be hard to compare the corresponding results. However, it was explicitly stated that adults did not provide any guidance to children in one study but the results still showed a positive correlation, which means that the relationship exists even without adult guidance (Vieillevoye & Nader-Grokinds, 2008).

One of the similar results among studies is that higher level of pretend play is better at facilitating self-regulation ability (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977). One study, which focused on thematic pretend play and sociodramatic play, showed that there was a slight difference between the two kinds of pretend play with the thematic pretend play group achieving better result in impulse control compared to other

groups (Saltz, Dixon, & Johnson, 1977). The reason could be that thematic pretend play requires more abstract thinking and imagination, uses more symbolic representation, and is further away from daily life experience. In another study, sociodramatic play was compared with solitary pretend play (Elias & Berk, 2002). Results showed that solitary pretend play is negatively linked to self-regulation, which means that the social factor plays an important role in the relationship (Elias & Berk, 2002). As for the reasons why no link between solitary pretend play and self-regulation, the authors stated that the appearance of other peers might make children have negative feelings, such as peer rejection or loneliness (Elias & Berk, 2002). Surrounded by other kids during the activities, it is easier for children to regulate themselves. Therefore, social factor play an important role in the result of the tests. Vygotsky also emphasised the importance of social interaction in one's cognitive development through the theory of zone of proximal development (Vygotsky, 1978). Children are able to achieve more with the help of more developed peers than what they could do alone, which could explain the reason why social pretend play is better than solitary pretend play when it comes to developing one's self-regulation ability found in one study (Elias & Berk, 2002).

Another similarity is that studies found the important role of internal speech in one's cognitive thinking process, which could help children to regulate themselves through pretend play (Vygotsky, 1966). One study showed that children always talk to themselves to control their negative feelings, such as "I'll get a chance soon" (Berk,

Mann, & Ogan, 2006, p.2). Another study also confirmed that children use speech to regulate themselves, and children with higher language scores in the language test also had better self-regulation ability (Vieillevoye & Nader-Grokinds, 2008). According to Vygotsky, pretend play is especially important because it is a source of language development and this development can be internalized to organize the child's thoughts.

No obvious gender differences were found in the studies. One study found that boys are more impulsive than girls based on teachers' rating, but in the end their self-regulation abilities did not differ much (Elias & Berk, 2002). An explanation for this seemingly conflicting result lies in the effectiveness of pretend play on impulsive children. Children do not improve their self-regulation ability instantly, but over several months of complex sociodramatic play (Elias & Berk, 2002). Moreover, this improvement seems to impact children with high impulse more than those with low impulse (Elias & Berk, 2002). This aligns with another study that showed self-regulation improvement in high-impulse children but not on low-impulse children (Barnett, 1984). Both researchers agreed that higher-impulse children could use pretend play to express affect and slowly control their emotions (Barnett, 1984; Elias & Berk, 2002). Two studies showed that the differences between the gender and pretend play were insufficient to change the final results (Buchsbaum, Bridgers, Gopnik, & Weisberg, 2012; Pepler & Ross, 1981). Therefore, no gender differences were seen due to the effectiveness of pretend play on high-impulse children.

Limitations. There are some limitations in the studies, such as different research methods, promise of a reward, and emotion types.

Different research methods were used in the studies. Two studies used pretend play as a tool to observe one's self-regulation (Hoffmann & Russ, 2012; Vieillevoye & Nader-Grokinds, 2008). Therefore, the conclusion that pretend play leads to the improvement of self-regulation could not be determined, as the study only determines the self-regulation ability of the child and not the effects of pretend play. One study used control groups to make comparison with the pretend play group (Saltz, Dixon, & Johnson, 1977), whereas the other study observed children over a period of time to see the development of self-regulation ability at different times (Elias & Berk, 2002). Both methods have their merits. Using a control group allows easy comparison among the different groups to determine the role of pretend play, whereas the method of observing the same child over a period of time could limit individual differences. However, the long age range in the longitudinal study could also influence the results as children develop through their individual life experiences. Another study that last three years long also did not include the age range (Saltz, Dixon, & Johnson, 1977). The reason why children's self-regulation ability increased in the third year could be due to the fact that they were getting older and more experienced, thus limiting the role of pretend play. Both Vygotsky and Piaget claimed that there is a correlation between age and pretend play. Vygotsky (1966) stated that pretend play emerges at around three years old, and Piaget's theory

stated that pretend play peaks in frequency at the age of three and four then declines. Therefore, it is necessary to include age as a variable that may influence the results. Another limitation with regards to the research method was found in one study, which tested one's emotion regulation ability based on the re-engagement of pretend play after children were interrupted by a negative emotion activator (Galyer & Evans, 2001). However, children might not feel anger or frustration as they could just ignore the negative emotion activator that came to interrupt them. Whether it is pretend play that plays an important role in helping children suppress those negative feelings and make them keep playing is not clear. Therefore, pretend play may not be the important factor that contributes to one's emotion regulation, but the correlation between the two still exists.

Another influential factor is the promise of a reward. In one study, children were given rewards if they could follow the rules (Saltz, Dixon, & Johnson, 1977). In the experiment of "Guardian of the Toy," children would be rewarded with another toy after the experiment if they could resist the temptation of playing with the toy that belongs to someone else during the experiment (Saltz, Dixon, & Johnson, 1977). In the experiment of "Trip to the Moon," children would be rewarded with some candies if children could follow the rules of not getting off the rocket during the trip for five minutes (Saltz, Dixon, & Johnson, 1977). However, rewards were not given in other studies (Elias & Berk, 2002; Hoffmann & Russ, 2012; Vieillevoye & Nader-Grokinds, 2008). Knowing that they will

be awarded allows children to be more motivated and focused on the task, effectively regulating themselves more than those without promised rewards. Therefore, whether it is pretend play or the reward that makes children control their impulse is not clear.

Studies only tested one's ability to regulate one's negative expressions such as anger, frustration, and scary feelings (Barnett, 1984; Galyer & Evans, 2001). A wider range of emotional expressions should be taken into account in future studies. This is because some children may be used to different ranges of emotions based on what they see. For example, children who watch cartoon characters that over emphasize their excitement might be inclined to do the same when they are excited. While negative emotions may be the easiest to observe, it should not be the only emotion type considered.

Summary. Some differences were found in the studies, which are different research length, different research methods, different rules, different results with intellectual diversity, and different results with adult guidance. Longer research length allowed researchers to examine the influence of pretend play at different period of times (Elias & Berk, 2002). Another difference is that some researchers designed specific sessions to train children engage in pretend play (Salt, Dixon, & Johnson, 1977; Vieillevoye & Nader-Grokinds, 2008), whereas others just let children to have free play (Barnett, 1984; Elias & Berk, 2002; Hoffmann & Russ, 2012). Both methods have their merits, and it would be better if researchers could combine two in the future. Pretend play

has its rule-based nature, which could be transfer to the ability for help children to manage the rules in different tests. Children with higher intellectual ability and more adult guidance could get more benefit from pretend play (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977).

Similar results were found in the studies of higher level of pretend play. Thematic pretend play and sociodramatic play are better at facilitating self-regulation ability (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977). Studies have found the importance of internal speech in the development of self-regulation (Berk, Mann, & Ogan, 2006; Vieillevoye & Nader-Grokinds, 2008). No obvious gender differences were found in the studies (Barnett, 1984; Buchsbaum, Bridgers, Gopnik, & Weisberg, 2012; Elias & Berk, 2002; Pepler & Ross, 1981), but children's original impulse level could influence the result (Barnett, 1984; Elias & Berk, 2002).

Some limitations could be found in the studies, including flaw in research method, reward giving, and emotion types. Two studies used pretend play as a tool to observe one's self-regulation ability, which did not conclude that pretend play leads to the improvement of self-regulation ability (Hoffmann & Russ, 2012; Vieillevoye & Nader-Grokinds, 2008). Another limitation is that studies did not control reward giving. Whether children know there will be reward following the test or not could influence their self-regulation ability. More types of emotion could be used in future studies.

Section conclusion. Overall, children's self-regulation abilities with regards to executive function and emotion regulation have been tested in the studies. Pretend play, especially higher level of pretend play, has been found to correlate with the self-regulation ability, but a causal relationship is still unclear due to conflicting test results (Barnett, 1984; Galyer & Evans, 2001; Saltz, Dixon, & Johnson, 1977; Vieillevoye & Nader-Grokinds, 2008). The studies that did find a correlational relationship stated that the relationship is only evident in long-term exposures and social pretend play, because children require practice and can develop further with more developed peers (Elias & Berk, 2002). In addition, this effect is more obvious in children with high impulse and high intelligence, as children need to fully understand the task and may have already developed this skill (Barnett, 1984; Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977; Vieillevoye & Nader-Grokinds, 2008). The unique role of pretend play in self-regulation ability is important and should be acknowledged by educators and researchers. Children practice regulating themselves from following the rules in pretend play, and then acquired the ability to obey the rules in self-regulation tasks. Internal speech, social interaction, and emotional comfort, which children experienced during pretend play, could all lead to the improvements of self-regulation ability.

Creativity

Besides problem-solving and self-regulation, creativity has been proposed as another ability that could be influenced by pretend play. The main sections include

introduction, review, discussion, and section conclusion. In the discussion section, comparison and limitations of the studies are examined.

Introduction. Creativity has been regarded by researchers to be associated with pretend play, as both of them require the use of imagination, divergent thinking, and affective expression. Pretend play could help children disconnect the meanings of what they see, so their perceptions of the objects are different after playing. For example, when "the word 'horse' is applied to a stick it means 'there is a horse' for the child before the age of three; i.e., mentally he sees the object standing behind the word" (Vygotsky, 1966, p. 13). Children then discover a new psychological process called imagination, which is not previously present. When children act out different roles in pretend play, creativity, abstract thinking and imagination can be observed (Anderson & Bailey, 2010). In pretend play, children usually separate reality and go through different internal processes, which could leave space for creativity and imagination (Vygotsky, 1966; Weisberg & Gopnik, 2013). Children who participated in pretend play would have higher chances of being more creative afterwards, as "physical actions and the manipulation of objects" could help young children have more symbolic play and become more creative (Howe, Abuhatoum & Chang-Kredl, 2014, p. 395). The "affective symbol system" developed during pretend play is important for creativity (Fein, 1987, as cited in Russ, Robins, & Christiano, 1999, p. 130). In general, pretend play and creativity are similar in many

different ways, and pretend play could offer the cognitive, interpersonal, and affective ability that are needed in the creativity (Russ & Wallace, 2013).

After realizing the importance of pretend play to creativity, it is necessary to determine the relationship between the two to see if participating in pretend play could help children improve their creativity. This can be accomplished by examining the methods and results in some empirical researches. Two methods were used for examining creativity in most studies, including the Alternate Uses Test (AUT) and storytelling. Children were asked to think of different ways of using the given objects in the AUT, and children were asked to complete stories in the storytelling task. As mentioned earlier in the problem-solving and associative fluency sections, the AUT was also used to test one's divergent thinking. Being creative also means one could think flexibly and could generate a variety of solutions, which is similar to divergent thinking (McCrae, 1987). Both pretend play and creativity requires divergent thinking, imagination and positive affect (Russ & Wallace, 2013). Therefore, the AUT that tests divergent thinking was also used when testing creativity (Russ, Robins & Christiano, 1999). However, using divergent thinking as a standard to test creativity has also been criticized to be too simple, as it only tests one aspect of creativity and there were no standard scoring criteria (Harrington, 1975). I believe that both the AUT and storytelling could represent creativity as they both use imagination as the core function. However, other methods, such as "Creative

Activities Checklist," should also be included to encompass broader varieties of creativity (Russ, Robins, & Christiano, 1999, p. 133)

Review. This section reviews the relationship between pretend play and creativity by examining the result from the AUT and storytelling task in different studies. Three studies supported the position that pretend play is correlated with one's creativity (Hoffmann & Russ, 2012; Johnson, 1976; Moran, Sawyers, Fu, & Milgram, 1984), whereas four studies did not support this or could not come to a conclusion (Christie, 1983; Moore & Russ, 2008; Russ, Robins, & Christiano, 1999; Smith & Whitney, 1987).

Three studies that found the correlation exists used similar research methods, which is to examine the scores between the result from pretend play observation and the creativity tests (Hoffmann & Russ, 2012; Johnson, 1976; Moran, Sawyers, Fu, & Milgram, 1984). One study found that the score on pretend play was related to creativity in both tests: children who had better organizing skill, more imaginative, and expressed more emotions in pretend play, also had higher scores in the AUT and storytelling (Hoffmann & Russ, 2012). Cognitive and affective process used during pretend play, such as organization, imagination, divergent thinking, transformational ability, and affective expression are correlated to the sub-scores in the AUT in the short term (Hoffmann & Russ, 2012). This study only measured children's level of creativity based on their typical pretend play and not the amount of creativity improvement children can gain if practiced pretend play. Therefore, results could not demonstrate that engaging in

pretend play will lead to the improvement of the creativity, but the correlation between the two exist.

In the second study, children were separated into social and solitary pretend play groups (Johnson, 1976). Result showed that social but not solitary pretend play was related to divergent thinking but not convergent thinking (Johnson, 1976). The same conclusion was found in the problem-solving section where pretend play was related to divergent and not convergent problem-solving (Pepler & Ross, 1981; Wyver & Spence, 1999), and social factor played an important role in the improvements of cognitive abilities (Rosen, 1974). Since social pretend play requires more cognitive and language abilities than solitary pretend play, the influence on creativity found in social pretend play is more obvious (Johnson, 1976). Internal speech developed during pretend play could also help children to become more creative. A narration of events allows children to practice their language development which is used when storytelling. Socializing with other children or adults results in higher levels of language development as opposed to solitary play because children learn new words and meanings. These new words and meanings can then be used in practice in their internal speech. Therefore, it is possible that the increase in creativity is largely due to the interaction between children when they are conducting pretend play instead of pretend play itself. However, the result from this study also means that pretend play may not be the main contributor to the improvement of divergent thinking, as the socialization factor was not controlled.

In the third study, pretend play elements and levels were scored after four weeks of observing children during free play, and the AUT combined with a pattern meanings test were used to test creativity (Moran, Sawyers, Fu, & Milgram, 1984). Only two common objects were involved in the AUT, and only 15 children with similar intelligence attended the task (Moran, Sawyers, Fu, & Milgram, 1984). The result showed that the scores of pretend play observed during free play time is correlated to the creativity tests (Moran, Sawyers, Fu, & Milgram, 1984).

Although several studies discussed above have shown that pretend play is related to creativity, there are some studies show that the correlation does not exist (Moore & Russ, 2008; Smith & Whitney, 1987). In one study, children were separated into three groups, which were affect, imagination, and control group (Moore & Russ, 2008). In the affect group, children were encouraged to use some toys to engage in pretend play that included more affective themes. In the imagination group, more imaginative themes were encouraged, whereas no pretend play was involved in the control group. The AUT was used to test creativity. The results suggested that practicing pretend play would not help children gain creativity in the long run, and control group performed even better than the play group in the AUT (Moore & Russ, 2008). The authors gave the reason that this unexpected result could be because some cognitive abilities, such as organization, logical thinking, and self-control, hindered the creative process.

In a second study, children were divided into four groups, which were pretend play, free play, imitation, and control groups (Smith & Whitney, 1987). Some encouragement and instructions were given to help children engage in pretend play. The AUT was conducted to measure one's divergent thinking and creativity twice. The first was tested right after play sessions, and the second occurred a week after the first one. Four objects were used in the test, with two new objects and two old objects that children have played with before. Results showed that the control group had the best results compared to other groups, which did not support the hypothesis that pretend play could help divergent thinking. One of the reasons could be that there are "experimenter effects" in the previous studies that support the hypothesis (Smith & Whitney, 1987, p.52). Smith and Witney (1987) stated that the researcher's assumption before the test and the involvement during the test might cause bias, while this research manage to control the bias by using people unrelated to the research to score and control the tests. Unlike the previous studies, some researchers could not determine an exact conclusion due to inconsistent results (Christie, 1983; Russ, Robins, & Christiano, 1999).

In a third study, children were separated into play group and skill training group (Christie, 1983). In the play group, children were guided and accompanied by adults to engage in sociodramatic play with themes from daily life experience. In the skill-training group, similar adult instructions were given, but no pretend play was involved. The purpose is to see if adult's instruction could influence the result. Creativity was tested at

three different periods of time to see whether the results developed over time. The tests were conducted before the session, right after the session, and three months later. A test called "Thinking Creatively in Action and Movement test (TCAM)" was used to test creativity, which required children to present different solutions to the problems given (Christie, 1983, p. 327). Results showed there is improvement in the scores of fluency but not the scores of originality and imagination in the TCAM test, and the improvement on the fluency score is stable over a three months period (Christie, 1983). The inconsistent result among fluency, originality and imagination subtests make it hard to determine whether pretend play could leads to the improvement of creativity.

A longitudinal study found that the correlation between pretend play and creativity is unclear (Russ, Robins, & Christiano, 1999). AUT, storytelling test, and "Creative Activities Checklist" were used in the study to test creativity (Russ, Robins, & Christiano, 1999, p. 133). Results showed that pretend play is linked to the scores in the AUT and storytelling test in the follow up tests (Russ, Robins, & Christiano, 1999). Although the affective and cognitive processes in pretend play are linked to the AUT in the long run, pretend play was not linked to the scores in the Creative Activities Checklist (Russ, Robins, & Christiano, 1999). Therefore, the correlation between pretend play and creativity is still unclear.

Summary. In general, three studies have found that the correlation between pretend play and creativity exist, two studies have found that the correlation does not

exist and two could not come to a conclusion. It can be concluded from the research that correlation between pretend play and creativity is blurred at best. AUT used in the studies found both correlated and non-correlated findings. Meanwhile, AUT was also used to test divergent problem-solving and associative fluency, where a correlation with pretend play was found. The conflicting results could be due to the fact that different objects were used in different studies, as well as individual differences.

Discussion. This section compares the studies, and discusses the role of pretend play in the development of creativity. Some limitations are discussed as well.

Comparison of studies. The inconsistent results in regards to whether a correlational relationship between pretend play and creativity exists could be concluded to several reasons, including types of play, adult guidance, and materials.

One of the reasons could be the different types of pretend play that involved in the studies. Children in most studies engaged in the pretend play that is similar to their daily life (Christie, 1983; Johnson, 1976; Moran, Sawyers, Fu, & Milgram, 1984; Smith & Whitney, 1987), whereas children in the other study were guided to engage in more fantasy based play that required higher level of cognitive functions (Moore & Russ, 2008). In the study that used higher fantasy level of pretend play, the result showed that control group performed better in the AUT than the play group (Moore & Russ, 2008). Therefore, the role of pretend play on creativity still remains doubtful as many other variables could all influence the result.

Another reason is that adult guidance influenced the result. One study was specifically conducted to see the influence of adults by giving children similar amount of instructions in both the play group and control group (Christie, 1983). The research found that adult intervention causes higher levels of development than pretend play (Christie, 1983). This theory is supported by two studies, which found that no correlation existed between pretend play and creativity when adult's interference was controlled (Smith & Whitney, 1987; Moore & Russ, 2008). Therefore, the role of adult interference should not be neglected. Some studies did not specify how much instruction was given from adults during play. For example, one study stated: "the tester began each story for the child in the same way and then prompted and encouraged the child to tell as much as he could" (Johnson, 1976, p. 1201). No detailed information about how the researchers gave out instructions, thus it is hard to decide whether children perform better in the storytelling task due to the instructions or pretend play. Similar problems were encountered during testing where "children were encouraged to give as many responses as possible" in the AUT (Moran, Sawyers, Fu, & Milgram, 1984, p. 92). Without mentioning how children were encouraged or the level of teacher involvement during testing, it is difficult to determine the level of influence instructors had on children.

The materials children used during the AUT could also influence the results. One study used two familiar and two new objects to test children's creativity, and the results showed that children produced more standard uses for familiar objects and more

non-standard uses for an object which they are unfamiliar with (Smith & Whitney, 1987). Therefore, it is important to distinguish the materials used as testing for non-standard uses using common objects may not yield statistically significant results. In order to fully test the child's ability in the test, a balanced number of common and unfamiliar objects should be used. For the unfamiliar objects, it is suggested that children be given objects, which is really uncommon in daily life so that the possibility of children coming across the object prior to the test is low.

All in all, variables such as types of play, adult guidance, and materials may have significantly influenced the end results. As discussed in the previous sections, many other variables should also be taken into account for future studies, such as one's personal background, test duration, age, personalities and gender, etc.

Limitations. Some limitations could be found in the studies, including the research method, small sample sizes, and wide age span. One of the main limitations is the research method used. In four out of the seven studies, the researchers only compared scores between pretend play observation and the creativity tests (Hoffmann & Russ, 2012; Johnson, 1976; Moran, Sawyers, Fu, & Milgram, 1984; Russ, Robins, & Christiano, 1999). This method only results in a correlational and not causal relationship between pretend play and creativity. While a correlational relationship might be useful as a primary study, it is not as useful in evaluating why the relationship exists. Therefore, more research should be conducted using different research method. A comparison

between play group and control group should be adopted, and longitudinal studies could also be conducted by testing the same group of children over different period of times for a generalized conclusion.

As the correlation between pretend play and creativity is vague, it is necessary to have larger samples sizes in order to make a generalized conclusion. In the seven studies, two had a sample size of 15 and 20, which is far too low (Christie, 1983; Moran, Sawyers, Fu, & Milgram, 1984). The two studies concluded conflicting results with one supporting the relationship between creativity and pretend play whereas the other one did not. It is possible that the results were influenced as individual differences have bigger role in the result. As such, having larger sample sizes is important, as it will allow averaging out individual differences found within the different studies.

The wide age span is another limitation that requires attention. In one study, children who joined the study were from five to ten, and results found the correlation between pretend play and creativity exists (Hoffmann & Russ, 2012). Children in another study were from six to eight years old, and results showed that no correlation was found in the study (Moore & Russ, 2008). In a second study, the creativity tests were taken twice, with the second one conducted four years later when children were at grade five and six, and correlation between pretend play and some of the creativity tests was found in the follow up test (Russ, Robins, & Christiano, 1999). Results among those studies showed that differences exist in different age groups, but the comparison among those

studies could not be made since they did not specify the influence of different age to the creativity.

Summary. In general, different types of play, adult guidance, and materials influenced the results in different studies. Children who engaged in more fantasy-based play that required higher level of cognitive functions showed better result in self-regulation test (Moore & Russ, 2008). Adult intervention causes higher levels of development than pretend play (Christie, 1983), and no correlation existed between pretend play and creativity when adult's interference was controlled (Smith & Whitney, 1987; Moore & Russ, 2008). The materials children used during the AUT could also influence the results. Children produced more standard uses for familiar objects and more non-standard uses for unfamiliar objects (Smith & Whitney, 1987). Some limitations were found in the studies, such as the research method, small sample sizes, and wide age span. One of the main limitations is that four out of the seven studies only compared scores between pretend play observation and the creativity tests (Hoffmann & Russ, 2012; Johnson, 1976; Moran, Sawyers, Fu, & Milgram, 1984; Russ, Robins, & Christiano, 1999), which is limited in demonstrating the relationship between pretend play and creativity. Small sample sizes and wide age span also influenced the results.

Section conclusion. Overall, the correlation between pretend play and the development of creativity still remain doubted. Several empirical researches have shown that pretend play is important for children to perform better in creativity, but engaging in

play does not guarantee the better performance (Hoffmann & Russ, 2012; Johnson, 1976; Moran, Sawyers, Fu, & Milgram, 1984), whereas other researchers did not find any positive relationship between pretend play and creativity (Christie, 1983; Moore & Russ, 2008; Russ, Robins, & Christiano, 1999; Smith & Whitney, 1987). Different creativity tests and other variables, such as types of play, adult guidance, and materials, could possibly explain the contradictory results. The studies used do not go into sufficient detail with regards to variables mentioned, and as such no conclusion can be made regarding the discrepancy. In addition to the types of play observed, level of adult guidance, and testing materials, future research should also determine the role of playing in groups and use a higher sample size.

Conclusion

Vygotsky provided the foundation research for the roles and benefits of pretend play in early childhood education. Several empirical researches have since been conducted to exam the relationship between pretend play and several cognitive abilities, such as problem-solving, self-regulation and creativity. The correlation between pretend play and the cognitive abilities were found in some studies, as they all use the similar cognitive and affective functions. Although the correlation was not found in other studies, researchers stated that the cognitive benefit from pretend play could be indirect and potential, which may take longer time for the benefit of pretend play to reveal (Elias & Berk, 2002; Moore & Russ, 2008; Russ, Robins, & Christiano, 1999). Despite the fact

that many researchers have already examined the relationship between pretend play and different cognitive abilities, there are still many limitations. One study stated that one of the main limitations of researching this relationship by examining some particular aspects is that they did not include social cultural factor during pretend play into consideration, which is one of the most significant contributions of Vygotsky's work (Nicolopoulou, 1993). Another limitation is that most studies were conducted in a short period of time, which could not demonstrate that the benefit from pretend play is stable. Therefore, more longitudinal empirical and large-scale studies that included more variables and social cultural factor should be done in the future.

Implications

Introduction

Pretend play has been regarded as a good way for children to acquire several cognitive abilities. As previously discussed, pretend play features a rule-based nature, symbolism, affective expression, and use of imagination, which are beneficial for one's cognitive development. Therefore, educators should encourage and help children engage in pretend play. From the literature review, it was found that adult's guidance and instructions are important for one's development of cognitive abilities. Therefore, teachers and parents should raise their awareness towards the importance of pretend play, and they could make adjustments in their instructions and daily lives to further increase the cognitive development of children. By discussing the implementation of pretend play, this section aims to provide suggestions for improving early childhood education both at home and in schools. I hope that the knowledge I have learnt about the importance of play could be applied to the situation in China.

This section is divided into three subsections, which are increasing awareness, implementation, and cultural differences. Raising awareness is important because some adults do not understand the full benefits of pretend play in children. Having a good attitude towards pretend play and be willing to help children engage in pretend play is the first step to a successful implementation. As children spend a majority of their time in school and at home, educating teachers and parents must be a priority. Some activities

and methods that could be adopted by adults to guide children to engage in pretend play will be discussed. The collaboration between teachers and parents is also important to better facilitate pretend play in children's lives. Since there are differences between Chinese and Western culture, different methods of implementing pretend play should be adopted to suit their differences.

Increasing Awareness

The first step of implementing pretend play into daily educational experience is to raise both teachers and parents' awareness on the importance of pretend play. Studies have shown that adult intervention during play directly influences the quality of play, and children would be more willing to play after adult's encouragement (Edwards, 2000).

Traditional line of thinking may assume that play hinders academic advances, and some Chinese adults do not understand the importance of play (Wu & Rao, 2011). They believe that play is only beneficial for physical development and value play simply as a stress relief from studies, not noticing the social and cognitive benefits associated with it (Wu & Rao, 2011). The Chinese educational system is exam-oriented, which could influence teachers and parents' opinion towards play. However, this is not restricted to China, some western educators also put great emphasis on academic learning and less on play, and they believe that feeding more knowledge to children could help them succeed in their academic and future life (Nicolopoulou, 2010).

According to my own experience, my parents did not realize that different categories of pretend play exist, and firmly believe that play is mainly for fun without knowing the associated cognitive benefits that comes with pretend play. My parents also emphasised academic learning and asked me to join different kinds of extracurricular classes when I was still young. My parents also did not recognize the importance of pretend play, and other interest classes replaced the time for play. To turn this situation around, it is necessary for adults to change their attitudes towards play and increase their awareness on the benefits of pretend play, as the development in cognitive abilities are necessary for children's learning and improvement in one's whole life. Results from a number of researches in the literature review showed that pretend play could facilitate the development of cognitive abilities, which could result in the improvement of academic ability (e.g. Pepler & Ross, 1981; Wyver & Spence, 1999). Therefore, it is necessary for teachers and parents to realize the importance of play. In order to raise adult's awareness, several measures should be implemented, including educating teachers and brochures handouts.

Educating teachers. Teacher's educational background is important, as they teach children directly and parents depend on them as the primary source of education for their children. Unfortunately, there are still many unqualified teachers in Chinese kindergartens partly due to the lower education requirement for the kindergarten teacher position and the lack of accessibility of early childhood education for those in rural areas

(Wang, 2014). Educating teachers on the importance of play could directly influence the frequency and quality of pretend play practiced by children. Some educational programs could be offered to train teachers on the benefits of play and its implementation in an educational setting. In this way, teachers could include pretend play in their classes and educate the parents as well. Furthermore, other teachers or administration staff could conduct some teaching assessments at the end of every semester to ensure that the teaching quality is maintained. Teachers could also learn from each other and improve their own teaching in this way. In short, teacher education should be the first step when trying to increase awareness as both parents and children look up to teachers as a source of knowledge.

Brochures and handouts. Sending informative brochures to parents is a good way to help parents increase their awareness on the importance of pretend play. Teachers who understand the benefits of pretend play could gather together and discuss the content of the brochure, which could include the role of pretend play, the benefits of pretend play, and suggestions for pretend play activities. The role of pretend play could emphasise on the imagination, divergent thinking, rule-based nature, internal speech, logical thinking, abstract thinking and affective expression, etc. used when conducting pretend play. The benefits of pretend play could include the improvement of cognitive abilities such as problem-solving, self-regulation, and creativity. As for the suggestions for pretend play activities, some examples, such as fantasy role play and storytelling could be listed on the

brochures to encourage parents to help children engage in pretend play. In addition, a list of community activities could be provided so that children could play with each other outside of school. Other suggestions could be spending more time playing with children and providing support when needed. Parents are always interested in what is best for their children. By acknowledging the suggestions, parents are possible to change their attitude towards play at home that will further improve the child's cognitive development.

Summary. Overall, play is an activity that is beneficial to children and should not be neglected by parents and teachers. Methods such as educating teachers and brochure handouts could be used to increase adult's awareness and help promote pretend play.

Implementation

Children spend most of their time in school and at home, which is why implementation of pretend play in these two places is critical. While children can practice pretend play by themselves or with a friend, children tend to develop more in the presence of an adult due to ZPD. This section discusses the various pretend play implementation strategies at both locations, which could be applied by teachers and parents and collaboration between the two.

Both teacher's and parent's intervention are important for cognitive development in children through pretend play. As shown in the literature review, many studies have found that instructions from adults influenced the results of the study. With adults' guidance, children could perform better on cognitive ability tests (Christie, 1983; Elias &

Berk, 2002; Saltz, Dixon, & Johnson, 1977). Results also showed that without the guidance and instructions from teachers, children are less likely to engage in higher levels of pretend play, such as thematic pretend play in schools (Wyver & Spence, 1999). Parents also play an important role in one's cognitive development through pretend play. Children will engage in pretend play more often if their parents are there for assistance by accompanying them and providing proper instructions. The importance of parenting at home should not be neglected. One study found that children are more willing to engage in play at home when parents are around (Daunhauer, Coster, Tickle-Degnen, & Cermak, 2010). Ideally, parents are encouraged to follow the same guidelines as the teachers. However, it is understandable that those who do not have a background in education may not understand how to maximise the development through pretend play. Therefore, parents are encouraged to learn how to provide instructions effectively, introduce pretend play activities, and spend more time accompanying children. Since adult's instructions and guidance are important to the implementation of pretend play, I hereby provide some suggestions that teachers and parents could integrate when teaching in school or playing at home. The suggestions include (a) providing guidance and instruction, (b) considering pretend play levels, (c) considering individual differences, (d) varying the types of activities, (e) evaluation, and (f) communication.

Providing guidance and instruction. Young children before the age of three are typically unfamiliar with the concept of imagination, and are slowly starting to dissociate

words from their physical meaning. As such, pretend play may still be strange and unfamiliar to them. It is then necessary to help children understand the concept by explaining and demonstrating pretend play with them.

Although imagination is an internal process, the content typically comes from everyday objects and life experiences. For example, Children start pretend play by repeating their parent's actions first, such as cooking foods or going grocery shopping (Newman & Newman, 2012). Children observing their parents cook dinner in the kitchen will often recreate that scenario by copying their actions such as chopping vegetables or cooking with the pan. Then pretend play becomes more complicated by involving other roles and symbols, depending less on objects (Newman & Newman, 2012). As such, adults could provide children with different objects and present different pretend play scenarios using different ways. For example, adults could read stories, use PowerPoint with audio or visual presentation, demonstrate with their coworkers, and interact with children. Different activities could be used for demonstrations as well, such as playing both indoors and outdoors, field trips, visiting museums. Therefore, children could gain more experience and encounter different situations, which can be used to create associations during pretend play. For example, adults could take children for a field trip to experience different scenarios first. Adults can show children what a fire station is, and then take children to a nearby fire station to meet up with the fireman. A fireman could then deliver a speech and show children around. Children could then come back to school

and discuss the trip based on the fire station, and take turns playing different roles that could generate deeper associations in this way. Adults could also giveaway some gifts to children who were well behaved throughout the activity, which is in line with the literature review that reward could possibly influence children's behaviour during the activity (Galyer & Evans, 2001; Saltz, Dixon, & Johnson, 1977).

For children who have already understood the concept, educators could direct children to take a more active role during pretend play and increase the depth of the pretend play by asking children open-ended questions such as "What do you want this pen to be if we play house?" If children do not provide answers, other leading questions could be given to help children engage in pretend play, such as "Maybe this pen could be a tree?" or "Do you want to be a superhero?" Adults could also join children's conversation during pretend play. For example, adults could say "Let's pretend to be in a hospital, and I will be the doctor, what do you want to be?" In this way, children could be positively encouraged to join in pretend play. When children have run out of ideas, adults could lead them by saying "maybe this table could be the counter in the hospital." In this way, children are encouraged to use their imagination.

Proper instructions should follow the concept of scaffolding. I remember I encountered this concept in my graduate class. The metaphor of scaffolding means that educators provide support when developing new abilities, and slowly decrease the amount of support as children master the abilities (Hammond, 2001). The necessary

leading questions and interactions could keep children engaged in pretend play, but adults should know when to stop providing help. In some cases, adults could just be an observer and give children the freedom to explore. For example, when children are already engaged in pretend play, adults could just sit at the side and only interfere if they need help.

In general, providing guidance and instructions could help children generate interest in pretend play so that they could engage in pretend play in the future. Sufficient demonstration and support should be given to children before and during pretend play when necessary. Some positive suggestions and feedbacks should also be given to encourage children and help them be more motivated.

Considering pretend play levels. When providing guidance to children, adults should consider the different levels of pretend play that is appropriate for the child at different ages. Adults should first observe the child's play behaviour during free play to see if they are ready for pretend play. Free play provides the opportunities for children to be familiar with all kinds of objects and scenarios, which could lead them to imitate daily life experiences and generate more associations in mind. This is in line with Piaget's theory that children initially develop through imitation and repetition (Piaget & Inhelder, 1969).

Giving children the freedom to explore also satisfies their curiosity and increases their imagination. Adults could then join with them and play together if the child shows

some pretend play behaviours. If the child has not initiated pretend play or have not shown any interest, adults should wait patiently and interact with children properly without pushing so hard. They could try several more times later on, and give some ideas of pretend play as well as ask some leading questions. They could also set examples by engaging in pretend play first, which could stimulate the child's interest. For example, when a child is carrying a doll, it would be appropriate to determine their level of pretend play by asking some questions such as "What is his/her name?" followed by "What are you and [doll's name] playing?" This engages the child by first acknowledging their friend and then seeing if they have created an imaginary situation. If the child is simply bringing the doll as a companion without creating an imaginary situation, then the child might not be ready to participate in pretend play. Otherwise, adults can help encourage pretend play by asking imaginative provoking questions or giving a demonstration when the child is struggling. For example, educators could ask what the child and the doll will be having for lunch and if the child does not know how to pretend cooking, then they could show the child how to pretend cooking.

Different toys could be used as cooking equipment, and educators could keep having conversations with the child to help the child engage in the process. Once the child is fluent in the cooking process, then the educator could start to limit the amount of toys used and ask the child to use their imagination for the process. Other toys or scenarios could be used as well according to the child's interest. By asking the questions,

having conversations, as well as giving demonstrations, adults could arouse the child's interest and encourage them to conduct pretend play.

The different levels of pretend play includes object dependent, sociodramatic play and thematic pretend play. In the literature review, results showed that higher levels of pretend play, which are sociodramatic play and thematic pretend play, could benefit more to one's cognitive ability compared to lower levels of pretend play (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977). Around the age of three and four, pretend play could be introduced with all kinds of demonstrations using everyday objects. This suggestion is in line with one study that shows the frequency of pretend play usually peaks at around the age of three or four (Fein, 1981). During this period, pretend play levels could be raised gradually, starting from lower level of pretend play to higher level of pretend play. Implementing lower level pretend play at the beginning helps children familiarize themselves with this type of activity using toys in everyday situations. For example, when the child is still young, adults could give him or her an empty bowl and pretend to eat alongside him or her. Then once the child has familiarized with pretend play, adults could move on to sociodramatic play by providing a doll and engage in playing house. In this scenario, the child could pretend to be the older sister and that needs to take care of the baby sister, played by the doll. Thematic pretend play could then be introduced by role-playing fantasy themes such as knights and dragons with other children.

In general, teachers and parents could allow children to engage in free play first and then introduce the different levels of pretend play based on their age and capabilities.

Considering individual differences. Adults should take children's individual differences into account when giving instructions, including the child's interests and personality differences. For example, a child might not like playing house but interested in pretending to be a super hero. In this case, if the child was force to play house, he could get bored and give up on playing quickly. Similarly, if a shy child was forced to socialize with others and take on a role that requires lots of communication in the role-play, he could be easily frustrated and be reluctant in participating in pretend play in the future. Therefore, considering children's interests and personality differences are important to better facilitate pretend play.

Adults should choose the toys and scenarios for pretend play based on children's interest. Asking them what toys and scenarios they want to play with and act out is the first step to gather the information. Satisfying the child's interests could motivate them to engage in pretend play, increasing the frequency and duration of pretend play the child is involved in. For example, adults could display different toys for children to choose prior to pretend play sessions. Children could be assigned to different groups that have different scenarios according to their interest. Teachers might not be able to accommodate each child's interests due to the large class size. Therefore, parents should provide more one-on-one instruction and provide a more direct play experience that suits

the child's need and interests. Parents could directly ask what children like to play or observe their interest in daily life. If the child uses fabric or paper to dress up their doll, then parents should realize that the child is interested in playing house. More theme related toys and materials could be provided in this way.

Adults should also take into account personality differences. Shy children could be asked to draw or write down imaginary scenes to train their imagination, since they might be better at thinking when they are alone. Outgoing children who like to socialize with people could be assigned as the leader during group discussion and asked to help other kids to follow the rules during pretend play. Outgoing children could also be paired up with shy children so that they could help each other and the shy children do not feel excluded in this way. Having kids playing together is in line with the result from one study in the literature review, which shows that the presence of peers was determined to influence children's behaviour in the self-regulation task (Barnett, 1984).

Besides considering whether the child is shy or outgoing, adults should also consider their impulse level. The preceding literature review shows that there are differences between high impulsive and low impulsive children with regards to pretend play duration and results (e.g., Barnett, 1984; Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977). High impulsive children tend to engage in pretend play longer and benefit more from pretend play (Elias & Berk, 2002; Saltz, Dixon, & Johnson, 1977).

Therefore, adults could encourage high impulse children to engage in pretend play more frequently.

In general, it would be helpful for adults to realize what the child's likes and dislikes, and think from the child's perspectives. Adults could group them according to their similar interests and have them play together. In this way, children will play longer and develop higher levels of pretend play. Additionally, the social aspect of pretend play could help children develop higher cognitive and social abilities (Elias & Berk, 2002; Rosen, 1974).

Varying the types of activities. While children have the freedom to explore all kinds of things through free play, it is still necessary for adults to design and deliver more diverse hands-on sessions. Exposing children to different activities could increase their imagination, thus increasing their level of pretend play and cognitive abilities. Some activities that could be integrated into the child's life includes incorporating cognitive development activities, combining academic subjects, utilizing technology and going outdoors. Adults could design some pretend play that geared towards developing their cognitive abilities, such as problem-solving, self-regulation, and creativity. For example, children could pretend to fly a plane using a chair. During the flight, the child is not allowed to exit the plane because they are in the air. Then the educator could encourage children to use their imagination and think what they see in the sky. Both pretend play and external rules were used in this scenario to develop the child's cognitive abilities.

Combining pretend play and academic subjects is a good way to arouse interest in academic subjects while playing. Technology could be adopted and combined with pretend play to better facilitate playing. Outdoor activities could be one of the main focuses by parents, as teachers might not have enough time to take children to a further place.

Different pretend play activities that focus on developing one's cognitive abilities could be introduced to children. For problem-solving task that involve pretend play, a child could be asked to design or find the best suitable clothes for a doll. In the task, the child would play with the doll and use different materials and objects that fit the doll. Several skills, such as divergent thinking, logical thinking, imagination and problem-solving, could be developed in this way. As for the pretend play task that focus more on the self-regulation ability, activities that contain pretend play and rules that the child has to follow could be adopted. In the literature review, children were asked to follow different rules when testing their self-regulation. For example, children were pretending to have a trip to the moon in one study, which involved both pretend play and self-regulation ability (Saltz, Dixon, & Johnson, 1977). Adults could introduce similar task as well. As for the creativity task, similar to divergent problem-solving tasks, children could design things to use in the pretend play scenarios. For example, children could design dolls and superheroes and use them during pretend play. Children could also engage in storytelling using their imagination and act out the stories later on, which is a

good way for children to expand their vocabulary and develop their inner speech. Proper instructions should be given throughout the tasks, such as asking leading questions, and interacting with children. Sufficient props and toys should be provided and changed out regularly, so that children are exposed to new and unfamiliar objects. In short, different activities that involve some cognitive skills, such as problem-solving, self-regulation, and creativity should be given to children frequently as a way to develop their cognitive skills, social skills, and affective expressions.

Since there is a tendency of introducing academic subjects from a young age, it is necessary for children to learn those subjects through a fun way. Combining pretend play and other academic subjects, such as literacy and math, is a good way to raise children's interest in learning and developing those skills. For example, in the literacy class, when children were asked to read a story to learn new words, a pretend play session could be acted out afterwards. Children could discuss with their peers first, and then act out the roles in the story using their imagination. In this way, both their social skill and divergent thinking abilities could be developed. As for the math class, adults could use blocks to represent knights where three knights are required to defeat the dragon, and children could learn maths by adding or subtracting knights through pretend play. In this way, children's logical thinking and abstract thinking are developed at the same time, and they could learn how to use symbols to represent things. Therefore, adults should combine

different subjects with pretend play, as it is important for children to generate interest in those subjects.

Adults could also help children engage in pretend play using technology, such as videos and video games. Different cartoon characters, songs, and stories from the videos and video games, could be used to raise children's interest. I remember during my internship in a private educational institution for children in Beijing, children could play with different games and read stories on a big touch screen in the classroom. Educators use the big screen to interact with children, and ask questions in the class. Most children were interested in the touch screen and answered questions eagerly. Some children even arrive earlier or did not want to leave after class in order to play more on the touch screen. Similar approach could be adopted when introducing pretend play. Adults could show some fantasy cartoons and stories on the screen and ask children to act them out. They could also design a game that contains pretend play if conditions allow. However, the amount of exposure to videos and video games should be controlled by adults, as over exposure could be harmful to children. Over exposure could lead to limited attention span, lower self-regulation, and harm children's eyesight, whereas the interaction between adults and children could be more beneficial (Courage & Troseth, 2016). Therefore, including new technology in pretend play is a good way to raise children's interest, and has many other benefits as long as adults could properly control it.

Adults could also take children to different places other than home and school while having pretend play. Since teachers might be not be able to take children to different places, parents should spend more time accompanying children to play outside. Adults could take children to different places to experience different things, such as going to a community center, going to the park, and going to a museum together. Children could socialize with their peers and other experienced adults, which could help them lay the foundation for imagination. Questions might arise when children encounter something new, and children have to figure out how to solve the problems if problems occur. Children could learn problem-solving skill from their daily life experience in this way. Playing outside is important for children, as they could develop their perspective of the world by connecting the nature to their own personal experiences and ideas (Alansari, 2015; Maynard & Waters, 2007). It was found that natural settings allowed children to have a sense of freedom while enabling them to observe and respond to the surroundings compare to indoor activities (Alansari, 2015). The confinement of a classroom was noted to confine the thinking and development capacities of the children while limiting the response processes (Maynard & Waters, 2007). Therefore, adults should take children to go out more often. For example, adults could guide children in pretend play by using the objects they see in the park, such as flowers, bees, trees, etc. Adults could point to a flower and guide children to imagine that it is a home for a bee kingdom. A story with queen bee and her soldiers could be created, and then they could use leaves and other

objects to create the kingdom and the characters in their story. In short, it is important for both teachers and parents to realize that letting children play outside is an indispensable experience in their life.

In general, various types of activities could be introduced to children, which includes integrating pretend play that focus on different cognitive abilities, combining pretend play and academic subjects, combining pretend play and technology, and encouraging have pretend play outside.

Evaluation. The level of pretend play conducted by children should be evaluated periodically to make sure that they are constantly improving. In the literature review, some researchers measured pretend play using different methods, such as "Affective in Play Scale (APS)" (Hoffmann & Russ, 2012, p. 178) or by simply examining the quality, duration and frequency. APS is a standardized test, which contains several measurements to determine the quality of pretend play, such as the ability of organization, imagination, and affect expression, etc. Measuring pretend play and cognitive abilities regularly could help parents and teachers stay on track, and give them different goals with regards to training children at different periods. Children's cognitive abilities such as problem-solving, self-regulation and creativity abilities could also be tested to see whether any improvements exist through pretend play. In this way, teachers and parents could understand the role of pretend play, and be more willing to integrate it into the child's life. If no significant improvement of cognitive abilities were seen, adults could

find out the possible problems and adjust their teaching strategies and methods. In general, evaluating pretend play and its cognitive abilities is a good way for adults to determine the child's cognitive level and better facilitates the implementation of pretend play.

Communication. Communication between parents and teachers allow them to exchange ideas and improve the different methods of implementation that are most beneficial to the child. I have seen some kindergartens provide a booklet for parents to show the child's achievements on a weekly basis. I remember my teachers also used a booklet that contains a commentary on children's behaviour and achievements in elementary school. A similar booklet could be used as a way for parents and teachers to communicate. Other ways for communication could be meeting up regularly, creating weekly reports, and using online platforms.

First of all, parents and teachers could meet up on a regular basis. They could meet at the beginning of each semester to discuss the child's specific interests and personality and at the end of each semester to share the results based on the assessment. In this way, teachers could know the different strategies to use when trying to implement pretend play, and parents could understand the child's development level.

Weekly comments and reports could also be given to the parents based on the child's activities in school, and teachers could provide suggestions on the activities the child should be doing at home. Similarly, parents could give teachers some updates on

the child's progress at home, so that teachers have a clear understanding on each child's progress. Difficulties in implementing pretend play at home could be discussed with teachers and other parents. A report might be designed as shown in Table 1.

Table 1

Weekly Activity Report

Weekly Activity Report			
Student name:	Cindy	**Date:**	2017 Aug 22
Play activity:	Flying in a spaceship		
What we did:	Today we asked children to pretend that they are flying in a spaceship. Children were asked to remain in their seats throughout the activity and describe the possible worlds they fly by. During this journey, children encounter different problems such as an approaching comet, and avoiding black holes. This activity tests their self-regulation, social ability, creativity and problem-solving skills.		
Student behavior: **★★★★ = excellent** **★★★ = satisfactory** **★★ = needs improvement** **★ = unsatisfactory**			
Follows instructions:	**★★★**		
Positive attitude:	**★★★★**		
Participation:	**★★★★**		
Shows creativity:	**★★★★**		
Solves problems:	**★★**		
Comments:	Cindy follows the instructions given by the teacher throughout the activity. She had a positive attitude		

	and was actively engaged with her peers in world building. She suggested a world with gummy bears living on lollipop mountains. However, she did not provide a possible solution when asked about the incoming comet.
Suggestions:	Cindy is very creative and social, her self-regulation and problem-solving ability could be further trained at home. As she enjoys role-playing as a princess, I would suggest creating a scenario where she is hosting other princesses for a tea party. One goal for this exercise is to learn self-regulation by displaying good manners to the other guests. Another goal is to get her actively involved in some problem-solving situations such as running out of tea and biscuits.

In addition, teachers could also create blogs or forums for parents to discuss parenting and share what children learned in the class. Parents could raise questions in the blogs when they encounter difficulties. Teachers and parents could also take videos when children were performing pretend play, and share with each other on those platforms.

Overall, communication is key in efficiently implementing pretend play in school and at home. Without information from parents, teachers might be wasting time trying to determine the child's interests. Similarly, parents might be encouraging the object dependent pretend play when the child is capable of thematic pretend play.

Summary. All in all, adults are essential to the child's overall cognitive development. Their presence and instructions are necessary to provide warmth and security for children, effectively encouraging more pretend play. Several methods could be implemented to enforce pretend play and increase personal development through pretend play, such as providing guidance and instructions, considering play levels, considering individual differences, varying the types of activities, combining subjects, evaluation, and communication. These guidelines should be implemented throughout childhood as the benefits of pretend play are not instantaneous and require time to develop (Elias & Berk, 2002). However, these are only guidelines and direct implementation should be based on the adult's best capabilities.

Cultural Differences

Implementation of pretend play is not simple due to cultural differences. A majority of the studies conducted in the literature review originates from Western countries such as Canada and United States. However, my aim is to try and integrate what I have learned to Chinese schools. Direct implementation may meet resistance by the community as they hold different values and traditions. Therefore, it is necessary to understand the differences between Chinese culture and western culture, and try to implement positive aspects of western culture into Chinese culture to better develop children's ability in early childhood.

Chinese culture and classes. There has been a long history of emphasising academic learning and exam-oriented education in China. With the influence from Confucian culture, which emphasises authority, obedience, compliance, and collectivism, teachers and parents decide what children should do with regards to education according to my own experience (Hsieh, 2004). When I was small, my parents enrolled me into all kinds of extracurricular interest classes instead of giving me more time to engage in play, as they believed that competence in all kinds of interest lessons are important for my future. They also ignore my feelings and interests sometimes, as they believed that being good at those interest lessons and higher academic scores could help me get into better schools in the future, which means better quality education, better job prospects and a better life. As most Chinese parents I know believe in this, competition between parents to ensure that their child is better than others is very fierce, with the cost of the child's enjoyment.

Western culture and classes. Western culture encourages diversity, self-esteem, and individuality, thus play-based learning are welcomed (Spielgaben, 2015). Some parents chose to send children to a more play-based kindergarten or preschool, such as the one with Montessori curriculum. Montessori curriculum is one of the child-centered curriculums that emphasizes the preservation of the child's unique attributes, where children could explore what they want to learn within the rational limits and experience the joy of learning through play (Spielgaben, 2015). My overall impression of western

parents also supports this theory, which conflicts with the attitude of traditional Chinese parents. Western parents give children the freedom to explore and play, and do not stress over academic subjects as much as Chinese parents. Many western parents enrol children in extracurricular activities but a majority of these activities are sports based and usually at the request of the child. I believe that this is because the educational system is quite different than that of China. When applying for university, I noticed that most universities take my personal interest into account, rather than simply judge me based on the school grades. Similar with job applications, some questions about my hobbies, goals and difficulties would be asked in the interviews. Therefore, good grades are not as important as personal development when aiming for a better life.

Integrating western culture into Chinese culture. Attempting to integrate western elements into Chinese culture is difficult because the goal of the educational system is vastly different. In western countries, the educational system is used to fulfill the child's goals and dreams, and good personal development is required. On the other hand, a good academic grade is more important in achieving a successful life in China. Therefore, parents and teachers from the two different cultures view education very differently. Although the Chinese method has its merits, I personally believe that western methods are superior because it encourages children to pursue their dreams according to their interests and following one's parents' dreams could lead to a life of regret and pity. Changing the societal standards and beliefs in China may be too complicated and take

decades to implement. However, I believe that this change has already starting and the best way to support this is to start with the new generation of children. Two changes that could be adopted in China are the integration of pretend play into daily life and moderation in extracurricular classes.

Preschool and kindergarten children in China are typically exposed to play on a daily basis. However, adults did not fully understand the types of play and the core values of play especially pretend play. Fixing this problem requires two steps that have been previously discussed, which are increasing awareness and implementation of pretend play. Between the two, I feel that increasing awareness is especially important in China because it goes against the social standards. Parents and teachers who allow children to play freely are often thought as irresponsible and not caring for the child's future. Fortunately, this mindset is slowly changing with the introduction of Montessori schools in China that emphasizes play. The introduction of Montessori schools has provoked the curiosity of parents for alternative teaching methods (Nylander, 2014). Regardless, I believe that the most reliable method is to educate teachers and parents on the methods of implementing pretend play, and they should spend more time with children and encourage them to participate in pretend play.

The second point is determining a fine balance between extracurricular lessons and play. It is understandable that attending different extracurricular activities may help children in the future. However, enrolling children in too many different activities does

not guarantee that they could develop the skills in this way. According to my own experience, I was forced to take piano lessons that I did not enjoy. In the class, I would sometimes pretend listening to teachers while actually just wandering around. Since I have lost interest in taking the piano lesson, it just ended up being a waste of time for me. If I was allowed to play freely for a time, there might be higher chances for me to fully engage in the activities that I am interested in and develop in that area. Therefore, it is necessary for adults to find a balance between extracurricular lessons and play, and they should realize that by enrolling the child in too many extracurricular lessons, the child might miss out on what he or she truly enjoys doing.

Overall, I believe that China is moving in the right direction. More and more people began to understand the importance of play in early childhood education. It is up to parents and teachers to ensure that children are actively involved in pretend play and that they are given enough support when doing so. By implementing pretend play at home and in school, children could develop in different aspects, which is necessary for a successful future.

Summary. Several cultural differences exist between Chinese and western teaching philosophies. The Chinese culture emphasizes on academic grades whereas western culture focuses more towards personal development for a better life, which is why different life goals exist between two cultures. While the Chinese method has its advantages, I believe that western philosophy is superior for child development and child

enjoyment. As such, I hope that Chinese teachers and parents could understand the importance of pretend play, implement it in the classroom and at home, and limit the amount of extracurricular lessons for the child.

Conclusion

The literature review shows that pretend play is correlated with several cognitive abilities, namely problem-solving and self-regulation. Interestingly, one study also found that the reverse was also true; that the development of cognitive abilities could also lead to the higher levels of pretend play (Wyver & Spence, 1999). Therefore, adults should actively encourage and guide children towards higher levels of pretend play. Implementing pretend play in China presents a few obstacles that stem from cultural differences. As children typically spend most of their time in school and at home, those two places should be the focus to implement pretend play.

Implementation requires two main stages, which are increasing awareness followed by the implementation of pretend play. Raising adult's awareness on the importance of implementing pretend play is required, so that there is less resistance during implementation. Raising awareness could be done by educating teachers and providing brochure handouts to parents. Implementation could start after teachers and parents understand the importance of pretend play on cognitive development. In the beginning, children may not understand how pretend play works. Adults could establish a relationship with children and have proper interaction with them first, instructing children

using the scaffolding concept by providing sufficient demonstrations. Using themes that the child finds interesting is a good way of keeping the child engaged in the activity. During this time, adults should consider the different levels of pretend play and implement them at different stages based on the child's progress. Combining pretend play with various types of activities could also exposes them to different concepts that are made easier through pretend play. Lastly, communication between teachers and parents is necessary to ensure that the child follows a proper progress in cognitive development. In short, these are the necessary steps provided in this paper for implementing pretend play effectively.

Implementation of pretend play in China is quite complicated due to some cultural differences. Traditionally, being successful in China depend on the child's achievement in the educational system. The competition between parents to ensure that their child receives the best education can sometimes lead to the child suffering from over studying. Over constraining children could lead to immaturity in other aspects of life. I believe that giving the child the freedom to play is essential to their overall development.

Coda

This section contains the reflection and limitation of this paper. In the reflection section, I discuss what I have learned from writing this paper, as well as the situation in China. In the limitation section, several limitations are discussed, including the limited cognitive abilities that were researched, out-dated educational information in China, and only providing suggestion based on experience.

Reflection

Before investigating this topic, I did not know the different levels of pretend play, or how they impact one's cognitive development. I just assumed that play is mainly just for fun and acts as a way to relive stress. However, after reading the papers on the cognitive development from Piaget and Vygotsky, and examining the different studies, I understand that play, especially pretend play, is crucial to one's development. In particular, most studies confirmed that a positive relationship exists between pretend play and the different cognitive abilities. Although some disagreements exist, the positive benefits of pretend play outweigh the negative and that it is worth implementing in early childhood education.

I find it quite frustrating to see that this knowledge on the role in play is not widely acknowledged in China. Personally, I did not spend much time with my parents and was enrolled in many different extracurricular classes because my parents wanted a good future for me. Being engaged in many different classes was exhausting and I did not

learn much from the lessons because I was too tired. If my parents knew about the importance of play, I believe that things would be different. I hope to influence more parents in China in the future, and suggest them to spend more time accompanying their children and actively guiding them during pretend play, as adult's guidance play an important role in helping children engage in play. Adults should realize that engaging in play could develop children's cognitive abilities, as well as other abilities that have not introduced in this paper.

Reading all these papers has also increased my interest in the subject. More questions emerged along with researching this topic. What other benefits can come from pretend play and other types of play? Are there other curriculums that proved to be beneficial for children? How do socializing with friends affect our development?

Limitations

There are multiple limitations to both the literature review and the implication section, including the limited cognitive abilities that were researched, out-dated educational information in China, and only providing suggestion based on experience.

In the literature review, only three cognitive abilities were investigated, which is not enough to understand the broader picture of pretend play with regards to its other benefits. Perhaps if more cognitive abilities were researched, we can then precisely determine the benefits from pretend play. Therefore, more longitudinal and larger sample

size papers that include more cognitive benefits could be used in the literature review in the future.

In the implementation section, China was compared to western ideologies. However, the education system in China is being updated constantly, and more western beliefs influenced many adults' attitudes and teaching methods. Therefore, more up to date articles should be found. China is also a vast country that has so many variables that could influence early childhood education in different kindergartens. For example, some private kindergartens in China have begun to adopt various kinds of curriculums, such as Montessori and Waldorf kindergartens (McMullen, Elicker, Wang, Erdiller, Lee, Lin, & Sun, 2005). However, those kindergartens are still lacking experience compared to their western counterparts, and some teachers do not fully understand how to adopt western philosophies (Nylander, 2014). There are also many other types of kindergarten schooling emerging in China, which has not been taken into account. For example, one of them focuses on training coding skill from an early age (Chen, 2015). Due to the improvements in technology, technology-based play is also starting to become popular among young children (Selwyn, 2012). Therefore, it is hard to gather samples from all kinds of kindergartens in China.

Another limitation is that I could only provide suggestions based on my own experience. Studies regarding this development have been largely limited due to the constant change and language limitation. China is constantly and rapidly changing that

not enough English papers were conducted or translated. More studies should be conducted in different parts of China, so that researchers could have first hand information regarding the new rules and policies enforced to early childhood education system by the government.

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