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**TAIWANESE YOUNG CHILDREN'S PLAY IN ECE SETTINGS:
A STUDY OF TEACHER AND CHILD BEHAVIOR AFFECTING
THE DEVELOPMENT OF SELF-REGULATION**

A Dissertation in

Curriculum and Instruction

by

Mei-Fang Cheng

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The dissertation of Mei-Fang Cheng was reviewed and approved by* the following:

James E. Johnson

Professor of Curriculum and Instruction

Dissertation Advisor

Chair of Committee

Robert L. Burgess

Emeritus Professor of Human Development

Vivian Yenika-Agbaw

Associate Professor of Literacy Education

Edgar Yoder

Professor of Agricultural and Extension Education

Rama Radhakrishna

Professor of Agricultural and Extension Education

Glendon W. Blume

Professor of Curriculum and Instruction

Coordinator of Graduate Programs in Curriculum and Instruction

*Signatures are on the file in the Graduate School

Abstract

Play has been recognized for its importance to children's development. In addition, self-regulation has been found to be associated with school readiness and future success. Research has supported that play is a vital context for the development of self-regulation. This study adopted a socio-cultural perspective to examine the relationship between play and self-regulation in Taiwanese young children. The research questions are as follows:

1. What is the developmental status of cognitive self-regulation, i.e., executive function and theory of mind, for Taiwanese 4- to 5-year-old children?
2. What is the developmental status of behavioral self-regulation, measured by observations in group time and teacher evaluations, for Taiwanese 4- to 5-year-old children?
3. What are the play types of Taiwanese 4- to 5-year-old children?
4. How are teachers involved in play and how do children react to teachers' involvement?
5. Is there any relationship between specific types of play and executive function in Taiwanese 4- to 5-year-old children?
6. Is there any relationship between specific types of play and theory of mind in Taiwanese 4- to 5-year-old children?
7. Is there any relationship between specific types of play and behavioral self-regulation in Taiwanese 4- to 5-year-old children?

A correlational design was used in this study, in which fifty 4- to 5-year-old typically developing Taiwanese young children participated. However, due to different social ecologies in the classroom age-grouping, data for only 34 children were analyzed in the study. The data collection began in May 2009 and ended in January 2010. Two phases were involved—the preparation phase and the data collection phase. In the latter phase, five procedures were involved: (1) observing children's play behaviors in free play, (2) observing teacher involvement in children's play and children's responses in free play, (3) conducting two

executive function tasks, two theory of mind tasks, and assessing children's verbal ability, (4) observing children's self-regulation behaviors in group time, and (5) teacher ratings of behavioral self-regulation for each participating child. The measures employed in this study included the Peabody Picture Vocabulary Test-Taiwanese version Form A, the Modified Social/Cognitive Scale of Play Behaviors, the Executive Function Battery, the Theory of Mind Battery, the Self-Regulation Coding System, and the Self-Control Rating Scale. Descriptive and correlation statistics were used to analyze the data in the study.

This study revealed seven results:

1. Taiwanese children aged 4 to 5 demonstrated an advanced development in the executive function tasks, but were slower in their theory-of-mind understanding compared to their American counterparts.
2. Taiwanese children aged 4 to 5 were attentive in group time in general and were assessed as controlling their impulsivity well by their classroom teacher after one semester of observation.
3. Taiwanese children aged 4 to 5 tended to perform sophisticated social levels of play like group play, and higher cognitive levels of play like constructive and dramatic play.
4. Teachers were not involved in children's play most of the time. This might relate to the fact that there was no free-play time in the arrangement of the daily schedule, and that teachers had to deal with administrative responsibilities or talk to parents during the time of observation.
5. A lack of relationship between executive function and any type of play was due to a ceiling effect on children's executive function tasks.
6. A positive relationship between two dramatic play types and theory-of-mind understanding might reflect some shared meta-representations existing, and also that they can reinforce each other.

7. Unexpectedly, a negative association between group play and teacher evaluation was found.

This might reflect an early stage of group play and the Chinese cultural pursuit of “a silent child.”

Although this was an exploratory study, it contributes to the following areas: to provide culturally persuasive evidence to support a play pedagogy in Taiwan; to provide timely results to inform ECE research; to give an example to study from a socio-cultural perspective; to provide a research by using multi-measures and multi-sources; and to inspire further thinking about the influence of Chinese cultural values. Several modifications regarding the limitations in this study were suggested for future studies. Recommendations for educators and parents were proposed as well: paying more attention to children’s socio-emotional development, and adopting a dramatic-play pedagogy to provide a great path for intrinsically-motivated self-regulation in a joyful environment.

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Chapter 1

Introduction

Statement of the Problem

There is growing recognition of the importance of children's play to their development. Many scholars have addressed the value of play in child development. For instance, Freud (1959) believed that play has a cathartic effect. It can help children deal with negative emotions and protect children from emotional disturbance. Piaget (1962) proposed that children engage in the types of play that correspond to their current level of cognitive development. He also believed that play allows children to practice and consolidate recently acquired concepts and skills. Erikson (1950) addressed how play progresses through stages that mirror children's psycho-social development. Vygotsky (1978) suggested that play can facilitate children's cognitive development and function as a context for socially assisted learning. Bruner (1972) explained that play can develop children's flexible problem-solving skills. Sutton-Smith (1967) similarly proposed that play prepares children for adult life by developing flexibility. He also proposed several assumptions and values such as play as progress or play as imaginary that underlie play in order to analyze and understand it (Sutton-Smith, 1997). All of these theorists emphasize the importance of play to children's development.

In addition, empirical studies have shown that high quality play is associated with positive functioning in children's development in many domains. For example, in the cognitive domain, play experiences positively relate to children's conceptual development (Saltz, Dixon, & Johnson, 1977), problem solving (Wyver & Spence, 1999), divergent thinking (Lloyd & Howe, 2003), and theory of mind (Jenkins & Astington, 2000). In the area

of language and literacy, researchers have found that play connects to oral language acquisition (Davidson, 1998) and to literacy skills (Bergen & Mauer, 2000; Roskos & Christie, 2001). Moreover, positive play relates to children's socio-emotional development, such as their peer popularity and social skills (Corsaro, 2003; DeVries & Zan, 2005), their self-regulation and control (Elias & Berk, 2002), and their coping and resilience (Russ, 1999). Furthermore, children's play is related to imagination and creativity (Singer & Singer, 2005). These findings show that play has an important role in children's development. Thus, early childhood practitioners usually view play as an educational and developmental process that helps children learn and perform in a variety of ways.

Self-regulation is also an important ability for young children to cultivate. Researchers (Saarni, Mumme, & Campos, 1998; Ladd, Birch, & Buhs, 1999) have demonstrated that young children lacking social-emotional regulation are more likely to behave aggressively and display a lack of social skills. The lack of cognitive self-regulation, such as executive function and attentional processes, is often related to school adjustment problems (Blair, 2002) and achievement problems (McClelland, Cameron, Conner, Farris, Jewkes, & Morrison, 2007). Research also shows that a child's executive functions are more strongly related to their school readiness than their intelligence quotient (IQ) or entry-level reading or math skills (Blair & Razza, 2007; McClelland, Morrison, & Homes, 2000). Kindergarten teachers rank skills like self-discipline and attention control as more critical for school readiness than content knowledge (Rimm-Kaufman, Pianta, & Cox, 2000). Executive functions are important throughout the school years. Working memory and inhibition independently predict math and reading scores in preschool through high school (Blair & Razza, 2007; Bull & Scerif, 2001). Moreover, children lacking in behavioral control often show external problems (Sayette, 2004; Hull & Slone, 2004).

Furthermore, self-regulation predicts success throughout a child's lifespan. Several

studies have shown that children who were better self-regulators in their preschool years have more self-confidence and self-esteem, better cognitive and social skills, more independence, better academic performance, and greater ability to handle stress and frustration during adolescence (McClelland, et al., 2000; Shoda, Mischel, & Peake, 1990). More remarkably, Caspi, Elder, and Bem (1987) have found that better self-regulation in early childhood even predicts occupational success and general life satisfaction during adulthood. In short, the ability to self-regulate is related to children's development in many domains and is important for life-long well-being.

Thus, some early childhood researchers have devoted themselves to exploring the relationship between play and self-regulation. Vygotsky (1978) was a pioneer who addressed play as a vital context for the development of self-regulation. He views children's self-regulation as originating in social interaction and later becoming internalized. Play is taught formally and informally within social contexts, and Vygotsky regards play, which he limits to dramatic or make-believe play (Bodrova & Leong, 2007), as the leading early childhood activity for the development of self-regulation. Unique features of make-believe play help develop this ability (Berk, Mann, & Ogan, 2006; Bodrova & Leong, 2007). For example, by taking on roles and enacting the rules of social life, children learn to self-regulate and behave in terms of the role rather than their own needs during play. According to this viewpoint, while pretending, in order to initiate and sustain their play children must renounce their impulses and follow social rules. Especially when such play continues for lengthy periods of times with other children, it builds self-regulation abilities. Hence, it may well be the case that children's greatest self-control occurs in make-believe play. Empirical evidence has demonstrated that mature pretend play is positively related to self-regulation (Cemore & Herwig, 2005; Elias & Berk, 2002; Jenkins & Astington, 2000).

Importantly, mature socio-dramatic play (though not immature play) predicts the

development of self-regulation (Bodrova & Leong, 2007). Elkonin (2005; cited in Bodrova & Leong, 2007) lists several characteristics of mature play, such as symbolic representations and symbolic actions, language used to create a pretend scenario, complex interwoven themes, rich multi-faceted roles, and an extended time frame.

Not only does make-believe play relate to self-regulation, but other play forms are associated with regulation also. For example, games with rules (Vygotsky, 1978), motor or movement activities (Riley, San Juan, Klinkner, & Ramminger, 2008), block building, and other kinds of constructive activities, particularly when done with others, promote self-regulation as play.

Need for the Study

However, children live within their contexts. Each child grows up in a different family, neighborhood, community, and culture. Contextual factors cannot be ignored if we hope to have a deeper understanding of children's development. From a socio-cultural perspective also referred to as the cultural-contextual perspective, development, environment, and culture are blended together and cannot function as separate parts. Growth and development occur through the interaction of the child, the environment, and the culture. Culture is a system of meaning and is not something outside the child.

Thus, cultural researchers call for the study of "play in context" (Schwartzman, 1978; Slaughter & Dombrowski, 1989). Slaughter and Dombrowski (1989) argue that if we base the findings of play studies on Western cultural norms, then any differences we find in the play of non-Western children can be misinterpreted as deficits (e.g., school achievement) (Sutton-Smith, 1983) unless we situate play within children's own cultural context (McLoyd, 1983).

Other researchers (Mesquita & Albet, 2007; Morelli & Rothbaum, 2007) have also

applied cultural models to study self-regulation. Morelli and Rothbaum (2007) suggest that there are at least two different cultural beliefs implicated in the cultivation of self-regulation. They point out that personal qualities such as autonomy and independence are important for the development of self-regulation in Western countries. However, interdependence and harmony are the qualities prized in non-Western cultures. Thus, people in different cultures regulate themselves in order to comply with their cultural norms. What cultural norms are and how they contribute to self-regulation varies across cultures.

Studies have shown that a play-emphasized curriculum, e.g., Tools of the Mind, is effective for fostering children's self-regulation across different ethnic groups within the US (Diamond, Barnett, Thomas, & Munro, 2007). However, only a few studies have explored the relationship between play and self-regulation in other cultures. Thus, the main purpose of this study is to examine the relationship between play and self-regulation in Taiwanese young children.

Chinese culture believes that "all things are beneath contempt, only education is to be esteemed" (Chen & Teng, 1995, p. 9). Academic excellence is highly valued and is a distinguished culture facet (Liu & Chien, 1998). Given this cultural value, both the educational system and adults (parents and teachers) pay much attention to children's academic achievement. It is not surprising to find that play, though recognized as an invaluable learning vehicle by Western early childhood educators, is not as commonly used as traditional teaching methods by Taiwanese kindergarten teachers (Pan, 1992). In Taiwan, classroom practices are to help children do well on exams rather than to play. If there is play, a great proportion is initiated and directed by teachers rather than by children (Barclay, 1989; Lin & Tsai, 1996).

Though cultural values might interfere with educators using play to enhance children's self-regulation, it is important to examine whether the relationship between play and

self-regulation in Taiwan is the same as it is in the US. Furthermore, it is also important to examine the relationships between different types of play and specific components of self-regulation in Taiwan.

Purpose and Objectives of the Study

The purpose of this study is to examine the relationship between play and self-regulation in Taiwanese young children. Children's play and self-regulation are the two variables of interest. Taiwanese culture, which is reflected in both teachers' involvement in play and children's responses to the level of teachers' involvement, is viewed as contextual variables, and children's verbal ability is considered a covariate variable.

Different types of play are coded nesting cognitive and social levels of play. Cognitive play includes four levels which are functional play, constructive play, dramatic play, and games with rules. Social play is categorized into solitary play, parallel play, and group play. Nonplay categories include unoccupied/onlooking/transition behavior, academic activities, and others. Two self-regulation components are assessed in this study: cognitive self-regulation, which includes executive function and theory of mind; and behavioral self-regulation, which is measured by observations in group time and teacher evaluations. The indexes of contextual variables are teachers' involvement in play and children's reactions to the level of teachers' involvement. Teachers' involvement is coded along with child's play. Levels of teachers' involvement include: not present, co-play, exerting individual control, exerting small group control, and exerting class control. Children's reactions are noted as positive, negative, and neutral.

The research questions are as follows:

1. What is the developmental status of cognitive self-regulation, i.e., executive function and theory of mind, for Taiwanese 4- to 5-year-old children?

2. What is the developmental status of behavioral self-regulation, measured by observations in group time and teacher evaluations, for Taiwanese 4- to 5-year-old children?
3. What are the play types of Taiwanese 4- to 5-year-old children?
4. How are teachers involved in play, and how do children react to teachers' involvement?
5. Is there any relationship between specific types of play and executive function in Taiwanese 4- to 5-year-old children?
6. Is there any relationship between specific types of play and theory of mind in Taiwanese 4- to 5-year-old children?
7. Is there any relationship between specific types of play and behavioral self-regulation in Taiwanese 4- to 5-year-old children?

Conceptual Framework of the Study

The following figure illustrates the conceptual framework of this study:

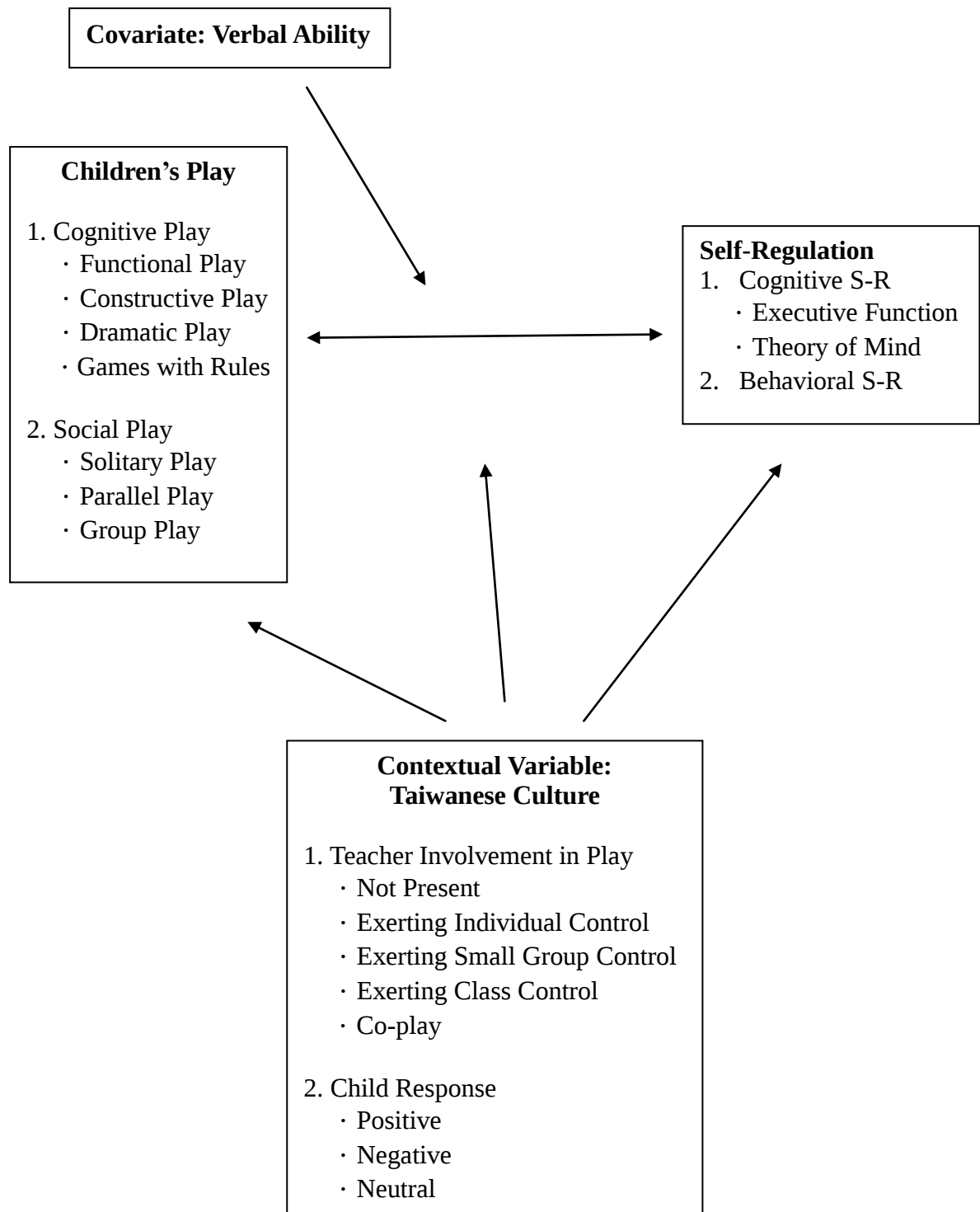


Figure 1-1: The Conceptual Framework of the Study

Assumptions of the Study

This study made the following assumptions:

1. The classrooms in Taiwan that were examined shared similar educational beliefs, curricula, and environments.
2. The classrooms in Taiwan that were examined scheduled free-play time and circle time into their curricula.
3. Teachers participating in the study assessed their children to the best of their ability.
4. Children accurately demonstrated their abilities during the play and self-regulation observations, and in their performance on the executive function and theory of mind batteries.

Glossary of Key Terms

The following terms used in the context of this study are defined as follows:

Play: referring to activities that have the following characteristics—non-literality, intrinsic motivation, process over product orientation, free choice, and positive affect.

Young children: referring to 4- to 5-year-old children in this study.

Cognitive play: according to children's cognitive levels, cognitive play is categorized into functional play, constructive play, dramatic play, and games with rules.

Functional play: repetitive muscle movements with or without objects; examples include (a) running and jumping, (b) gathering and dumping, and (c) manipulating objects or materials.

Constructive play: using objects (blocks, Legos) or materials (sand, dough, paint) to make something.

Dramatic play: role playing or make-believe transformations; examples include (a) role

playing (e.g., pretending to be a teacher, parent, dog, or monster) and (b) make-believe transformations (e.g., pretending a box is a car or using a block as a phone).

Games with rules: involving the recognition, acceptance, and conformity with pre-established rules (e.g., chess, kickball, “Simon says”, tag).

Social play: children playing with others. According to children’s social participation, social play is categorized into solitary play, parallel play, and group play.

Solitary play: playing alone with materials different from those of children within speaking distance; no conversation with others.

Parallel play: playing with toys or engaging in activities similar to those of other children who are in close proximity, but with no attempt to play with other children.

Group play: playing with other children, with or without assigned roles.

Unoccupied behavior: when children appear to do nothing and do not seem to be watching others, as in aimlessly wandering around the room.

Onlooker behavior: when children watch others and seem to take an interest in their play.

Transition: when children move from one activity to another.

Non-play activities: these activities conform to a pre-established pattern, as in academic activities or teacher-assigned tasks, such as activities involving coloring books, worksheets, computers, and educational toys (e.g., shoelace boards).

Self-regulation: the process of exercising control over one’s emotions, cognition, and behavior.

Executive function: a set of higher order cognitive skills that are responsible for conscious and effortful control of thought and behavior. The three core components include inhibition, working memory, and switching.

Theory of mind: an implicit and rudimentary awareness about one’s own and other people’s mental worlds.

Behavioral self-control: including both the ability to not do something and the ability to control the speed at which something is done.

Teachers' involvement in play: how the teacher, who is near the target child within two meters, engages in children's play. According to the levels of engagement, teacher involvement may include: not present, co-play, exerting individual control, exerting small group control, and exerting whole class control.

Not present: the teacher is not near the child within two meters.

Coplay: the teacher encourages, helps, or co-plays with the child.

Exerting individual control: the teacher tries to direct the child's play.

Exerting small group control: the teacher tries to direct the child and his playmates' play.

Exerting whole class control: the teacher tries to direct the whole class in free play.

Child's response: how the target child reacts to the teacher's involvement in his play.

The responses are noted as positive, negative, and neutral.

Positive response: the child shows positive affect and acceptance of the teacher's involvement.

Negative response: the child shows negative affect and rejection of the teacher's involvement.

Neutral response: the child does not show particular affect or behavioral reaction to the teacher's involvement.

Socio-cultural perspective: human development can only be understood by focusing on individual, interpersonal, and cultural-historical factors as they mutually influence one another.

Chapter 2

Literature Review

The purpose of this study is to examine the relationship between play and self-regulation in Taiwanese young children. Children's play and self-regulation are the two variables of interest. Identifying and understanding the development and the characteristics of children's play and self-regulation, as well as the relationship between them helps educators and parents support their children's development. Moreover, from a socio-cultural perspective, these two variables of interest are situated in their contexts. Contextual factors also impact the development of children's play and self-regulation. Clarifying the contexts helps understand the background of children's play and self-regulation in Taiwan. This chapter is discussed in the following sections: (1) Characteristics and Types of Play, (2) Development of Cognitive and Social Play in Preschool Years, (3) Components of Self-Regulation, (4) Development of Self-Regulation in Preschool Years, (5) How Does Play Influence Self-Regulation?—A Vygotskian Perspective, (6) Research on Play and Self-Regulation, (7) Socio-Cultural Perspective, (8) Cultural Studies on Children's Play, and (9) Cultural Studies on Self-Regulation. Each section is discussed in detail below.

Characteristics and Types of Play

Play is part of young children's lives. Children from every culture play. People can easily recognize play; however, many find it hard to actually define. Johnson, Christie, and Wardle (2005) elaborate upon five characteristics that are present in all types of play: positive affects, non-literality, intrinsic motivation, process orientation, and free choice. Play is usually fun

and enjoyable. Within play, children adopt an as-if stance towards reality that allows them to escape the constraints of external reality and to experiment with new possibilities. The motivation for play comes from within the players, and their attention focuses on the activity itself rather than on goals. In addition, when children are allowed to choose an activity they want rather than being assigned one by teachers, they often consider it to be play.

Piaget (1962) observed the development of children's play behaviors, and he categorized play from a cognitive perspective into functional play, constructive play, dramatic play, and games with rules. Functional or practice play, often seen in infancy, involves repetitive movements, e.g., gathering and dumping, or running and jumping. Constructive play, beginning at about 18 months of age, relates to the use of mental representation to pretend that one object stands for another in play; for example, building blocks stand for a house. In dramatic play, following closely on the heels of constructive play, children create imaginary roles and situations with complex themes, characters, and scripts. In games with rules, appearing at about the age of five or six, children recognize, accept, and conform to pre-established rules for activities such as tag, checkers, and kickball.

Parten (1932) observed children's play from a social interaction perspective and proposed several categories of behavior during play: onlooker, solitary, parallel, and two forms of group play. Onlooker behavior is when a child watches others play, either because of their reluctance to join or as a way of scanning for an opening. Solitary play refers to playing alone, without overt interaction with peers. Parallel play involves play with shared materials or physical proximity without attempts to coordinate play. Parten also differentiated two forms of group play. Associative group play is often seen when children share and coordinate materials and space in proximity to one another, whereas cooperative group play involves constructions with peers or negotiating play themes or roles.

Development of Cognitive and Social Play in Preschool Years

The period from infancy through the preschool years shows great progress in children's development of play. Vygotskians (e.g., Vygotsky, 1978; Leont'ev, 1981) view play as the leading activity in children's preschool years. Berger (2000) calls the preschool years “the most playful of all”. Research has shown that cognitive play and social play develop complex and advanced forms in the early childhood years.

Though researchers categorize the development of cognitive play and social play into several levels, we should be cautious not to view play in terms of levels of performance or hierarchies (Johnson, 1998). Children's play is complex and exceeds classification into categories. In real life, children can engage in several categories of play simultaneously (Takhvar & Smith, 1990). Furthermore, play episodes may include multiple categories that might go beyond either cognitive categories of play or social categories of play. But there is a need to note more information about both play settings and contexts (Johnson, 1998).

Development of Cognitive Play

Piaget (1962) described the development of cognitive play as ranging through functional play, constructive play, dramatic play, to games with rules. Functional play begins with the exploration and manipulation of objects in infancy. In the preschool years, functional play becomes more complex and goal oriented and incorporates constructive play. By age four, constructive play becomes the most prevalent form of play. Young children often engage in building with Legos and other interlocking building systems. With age, children become increasingly capable of building complex structures and producing recognizable products through painting, drawing, arranging designs, and building. In addition, they show increasing social interactions in their constructive play (Johnson, 1998; Rubin, Fein, & Vandenberg,

1983).

Along with the development of cognitive abilities, symbolic play also emerges prior to the preschool years. Symbolic play begins with the substitution or representation of one object for another and becomes more complex in dramatic play. Socio-dramatic play is the most advanced form of social and symbolic play. Children in socio-dramatic play carry out their imagination in their play episodes and their roles. Social interactions impact dramatic play, as do language and motor development.

Preschoolers can engage in simple games such as lotto and board games (Johnson, 1998). For young children, games must remain simple and easy to follow, with few rules and little skill or strategy required for entry-level participation. Games with rules, such as tag, hopscotch, or chess, are very popular with school-age children. Children need to cooperate with each other to follow the rules and exercise self-regulation as a game player.

Development of Social Play

Social development in the preschool years permits young children to include others in their play. As a child's social play becomes more complex, specific social behaviors become more pronounced, such as being able to take turns or to initiate, maintain, or end social interactions. Using language in socially appropriate ways also becomes more developed and elaborate.

Parten's (1932) classic study established four developmental levels of social play according to children's social participation. She found that a developmental progression exists: very young children (age 2 to 2.5 years) engage in solitary play; children aged 2.5 to 3 years old engage in parallel play; while children older than 3.5 engage in group play. Parten also identified two categories of non-play behaviors: unoccupied and onlooker.

These categories provided the first guidelines for understanding how young children

progress from playing by themselves to becoming social players. Researchers have continued to refine Parten's categories. According to Parten, solitary play is the least mature form of play. However, other studies (Moore, Evertson, & Brophy, 1974; Rubin, 1982; Rubin et al., 1976) show that solitary play may not simply be the result of social immaturity, but may also be a desirable form of play. Rubin (1982) found that socially competent 4-year-olds who are popular with their peers engage in solitary or parallel play activities such as art work and block construction as well. Moore et al. (1974) found that almost half of the solitary play which they observed consisted of goal-directed activities and educational play. Luckey and Fabes (2005) have identified different types of non-play as well as reasons why children engage in these activities. They differentiate solitary play into solitary non-constructive play and solitary constructive play, and they find that these two types of solitary play behaviors have different impacts on young children's development. Solitary non-constructive play, referring to repetitive muscle movement with or without an object (Lloyd & Howe, 2003), correlates negatively with mental age and cognitive ability, and children who frequently engage in high levels of non-constructive solitary play are rated by their peers as less popular than children who are more sociable (Katz & Buchholz, 1999). Luckey and Fabes suggest that solitary non-constructive play may reflect a need for intervention. On the contrary, solitary constructive play, e.g., artwork, puzzles, and block construction, is positively related to social contact (Katz & Buchholz, 1999) and to happier moods and increased alertness (Larson, 1990). They conclude that the key to understanding the impact of nonsocial play on young children lies in understanding the different types of nonsocial play and in understanding the reasons behind the play behaviors. Therefore, not all solitary play is the same or should be viewed as the least mature type of social play. It can be more mature than parallel play (Moore et al., 1974; Rubin, 1982; Rubin et al., 1976).

Role of the Teacher

Research shows that teachers have an important role in scaffolding children's play. Bodrova and Leong (2007) observed children in a variety of kindergartens, preschools, and Head Start classrooms revealing a generally low level of pretend play. They discuss how the low level of play in most classrooms is not sufficient to provide children the potential benefits of this important activity. For most children, the transition from lower levels of play to mature play is a gradual process that involves moving from using a great deal of assistance to slowly taking over until eventually no assistance is needed (Wood, Bruner, & Russ, 1976). Thus, the quality of teachers' involvement has a great impact on the results of children's play.

Some studies have associated teachers' involvement in children's play with positive results such as increased duration and elaboration (Sylva, Roy, & Painter, 1980), increased social interaction (Farran, Silveri, & Culp, 1991), associations with higher levels of cognitive activity (Howes & Smith, 1995) and increased literacy activity (Christie & Enz, 1992). Nevertheless, other studies have reported negative effects. Tegano, Lookabaugh, May, and Burdette (1991) found that when teachers imposed a high amount of structure on construction activities, the amount of constructive play decreased and non-play activity increased. File and Kontos (1993) found that when teachers put emphasis on the cognitive aspects of play, the social quality of play decreased. In addition, many studies have reported that over-involvement in children's play disrupts ongoing play (e.g., Jones & Reynolds, 1992; Schrader, 1990).

These findings elaborate the importance of the quality of teachers' involvement in play. When teachers intervene in appropriate ways, children's play tends to have positive outcomes. While teachers behave in a directive or insensitive manner, children's play may be impeded.

Research has identified several roles that can occur when teachers interact with children in play (Enz & Christie, 1997; Roskos & Neuman, 1993). These roles form a continuum

ranging from no involvement to taking control over play. The roles in the middle of the continuum, e.g., audience, stage manager, co-player, and play leader, were found to be the most effective for enriching children's play, while the roles on either end of the spectrum, e.g., uninvolved, and director/redirector, tended to have negative effects on play (Christie, 2006).

Components of Self-Regulation

Self-regulation is a multidimensional construct which includes the process of exercising control over one's emotions, cognition, and behavior (Bronson, 2000; Grolnick & Farkas, 2002; Riley et al., 2008). Since self-regulation is an overarching ability that includes many components, some researchers focus on specific components of self-regulation, such as behavior self-regulation or cognitive self-regulation, i.e., executive function and theory of mind, for the purpose of operationalizing and measuring children's self-regulation.

Executive function refers to cognitive processes that are necessary for purposeful, future-oriented behavior, including the regulation of attention, the inhibition of inappropriate responses, the coordination of information in working memory, and the capacities to organize, sequence, and plan adaptive behavior (Welsh, Friedman, & Spieker, 2006). This ability has three core components: inhibition, working memory, and switching (Oh & Lewis, 2008). A growing body of work has found developmental changes in inhibitory control ability at about four years of age (Diamond, 2002; Diamond, Carlson, & Beck, 2005).

Theory of mind is an implicit and rudimentary awareness about one's own and other people's mental worlds (Leslie, 1987). It involves understanding the knowledge and beliefs of others and realizing that these might be different from one's own knowledge and beliefs (Smith, 1999). Evidence has shown that the critical development in children's "theory of mind" takes place in the preschool years (Wellman & Gelman, 1998).

Behavioral self-regulation, or impulse control, includes both the ability to not do

something as well as the ability to control the speed at which something is done (Riley et al., 2008). Once children learn to regulate their behaviors—to slow down or stop an action and give themselves the chance to think—they will be able to plan and choose between alternative actions. Children who are generally identified as behaviorally well-regulated are attentive, display impulse control, and process the demands of the external environment.

Development of Self-Regulation in Preschool Years

The preschool years represent an important period in the development of self-regulation. By different assessments, researchers have shown improvements in self-regulation behaviors among preschoolers. Gerstadt, Hong, and Diamond (1994) found that 3-year-olds typically have difficulty with the classic Stroop task. They demonstrate longer response latencies and fewer correct responses when asked to say “day” to a card with a moon and stars, and “night” to a card with a sun. By age 6, however, children are already performing near the ceiling for this task. In addition, 3-year-olds perform more poorly than older preschoolers on the tapping task, in which children are instructed to tap once while the experimenter taps twice and vice versa (Diamond & Taylor, 1996). Other researchers have shown that children’s executive function on tasks such as “Simon Says” appears to emerge at approximately 44 months and is fairly good by four years of age (Posner & Rothbart, 1998; Reed, Pien, & Rothbart, 1984).

The theory of mind capacity undergoes a profound change toward the end of the preschool years as well. Children’s social understanding, as revealed in their talk about others’ thoughts, intentions, and desires, usually begins in the second year of life (Bartsch & Wellman, 1995; Bretherton, McNew, & Beeghly-Smith, 1981). Then, young children gradually learn to understand their own and other individuals’ mental states over the preschool years (Jenkins & Astington, 2000; Jenkins & Astington, 1996; Wellman & Liu, 2004). Jenkins and Astington (2000) conducted a longitudinal study and assessed three theory-of-mind tasks. They found

that theory of mind is gradually acquired when children are between the ages of 2 and 5 years. This result is the same as their prior study, where they tested a larger group of children on a series of theory of mind tasks (Jenkins & Astington, 1996). Recently, Wellman & Liu (2004) conducted two studies addressing the sequence of understanding evident in preschoolers' developing theory of mind. They also found a consistent developmental progression for about 3-year-olds to 6-year-olds; for most children at this age, if they passed a later item, they passed all earlier items as well.

Young children's behavioral control also improves in their preschool years. The best-known overview of early phases in the development of self-initiated regulation is that proposed by Clair Kopp (1982). She suggested that true self-control does not emerge until the preschool years, ages 3 to 4. During this period, children become capable of complying with others' requests and behaving appropriately in the absence of external monitoring. They are increasingly capable of internal self-regulation that uses rules, strategies, and plans to guide behavior, although not necessarily consciously. In other words, preschoolers need less continuous adult support and guidance to maintain control than toddlers and infants do, showing a gradual shift from external control to internal control. Research has demonstrated that children at this age are more able to control their behavior and the way they express emotions in their interactions with other people than are younger children (Achenback & Edelbrock, 1991; Eisenberg, Fabes, & Losoya, 1997). Moreover, their peers become increasingly important to preschoolers. The ability to regulate their emotions and control their behavior becomes increasingly necessary for age-appropriate interactions with other children (Eisenberg & Fabes, 1992), and an attitude of negotiation and reciprocity replaces the toddler's insistence on having her own ways.

A hallmark sign in the development of self-regulation is the experience of volition, whereby one willingly engages in a behavior rather than feeling coerced or controlled (Deci &

Ryan, 1985). Self-initiated regulation includes a feeling or experience of self-determination or choice. How do children develop their self-regulation along the trajectory from extrinsic-motivated to intrinsic-motivated? Researchers have shown that if children satisfy three basic innate needs--autonomy, competence, and relation to others (Deci & Ryan, 1985; Ryan & Deci, 2002)--they will gradually internalize an ability to regulate themselves. Gorlink and Farkas (2002) have noted that adults can provide a facilitative environment for cultivating self-regulation in children. Warmth, involvement and caring, and guidance rather than strict control facilitate children's intrinsic motivation and autonomous self-regulation.

Research on parenting styles confirms that positive and sensitive parenting style seems to promote the development of self-regulation throughout early childhood. For instance, research shows that positive maternal affect is related to committed compliance (i.e., internalized self-control) at age 2 (Kochanska & Aksan, 1995) and fewer behavior problems at age 4 (Pettit & Bates, 1989). In addition, when parents utilize positive guidance, e.g., praise, physical affection, and encouragement, children tend to use more constructive coping strategies in challenging or frustrating tasks (Calkins & Johnson, 1998).

On the contrary, when parents provide too much guidance, children may have difficulty learning to regulate their own emotions (Calkins, 2004). Furthermore, the absence of guidance which depressed parents may show, may contribute to self-regulatory difficulty, as expressed in externalizing behaviors (Shaw, Gilliom, Ingoldsby, & Nagin, 2003). Finally, rejecting, intrusive, or hostile-controlling parenting is also linked to externalizing behaviors in young children (Marchand, Hock, & Widaman, 2002; Shaw et al., 2003).

Thus, in preschools or kindergartens, it is reasonable to expect that teachers behave in a responsive and positive style which assists children when needed, but also gives them room to grow, will enhance children's self-regulation better than an absent or over-controlling discipline style.

How Does Play Influence Self-Regulation?—A Vygotskian Perspective

Vygotskians (Elkonin, 1972; Leont'ev, 1978; Vygotsky, 1978; Zaporozhets & Markova, 1983) view play as the leading activity of the preschool and kindergarten period. They believe that play promotes both mental and social abilities in children. Play, by which Vygotsky referred to dramatic or make-believe play, is both a symbolic and social activity. Vygotsky (1978) highly valued play because it influences development in many ways, e.g., self-regulation.

The Components of Play Help to Develop Self-Regulation

According to Vygotsky, play has three components (Bodrova & Leong, 2007):

- children create an imaginary situation,
- take on and act out roles, and
- follow a set of rules determined by specific roles.

These three components may help to develop children's self-regulation. Each imaginary situation contains a set of roles and rules. Roles are the characters that children play, such as a bus driver or a mother. Rules are the set of behaviors required by the roles or the play scenario. The imaginary situations created in play place constraints on children's behavior. In play, young children have to engage in self-restraint in order to adhere to the actions required by the roles, unlike other activities where children comply with instructions imposed from the outside. For example, a child can withstand the impulse to walk around if he is a "student" and is supposed to pay attention to what the teacher is teaching. Thus, children regulate themselves to behave like the role and inhibit their own impulses in play. In addition, they will regulate others' behaviors, noting when someone is playing inappropriately for the role. Because children have to follow the rules of the play and because play partners constantly

monitor each other's compliance to these rules, self-regulation develops in play.

Vygotsky suggested that other play forms such as constructive play, games with rules, or motor activities, although not leading influences, are also beneficial for the development of self-regulation during the preschool years (Bodrova & Leong, 2007). Games are similar to make-believe play, in that the players abide by explicit rules, but the imaginary situation and roles are hidden. For example, playing chess creates an imaginary situation since the knight, king, queen, and others can only move in a certain way. The player has to comply with the rules that the role requires. Constructive play, particularly when done with others, is good for the development of self-regulation as well. When children are assigned or assign themselves roles and are required to communicate with one another during the construction, constructive play has the same beneficial effects as socio-dramatic play (Brofman, 1993; cited in Bodrova & Leong, 2007). In addition, Vygotskians (Gal'perin, 1992; Leont'ev, 1978) suggest that motor activities that require the inhibition of impulses are particularly beneficial for the development of attention and self-regulation. Many motor activities can help to develop children's self-regulation, as in the following examples: traditional games such as "Red Light, Green Light", "Simon Says", and "Ready, Set, Go!"; freeze songs; songs that teach a regular beat or rhythm; or activities that involve changes in pace (Riley et al., 2008).

Play Creates the Zone of Proximal Development (ZPD) for the Development of Self-Regulation

Vygotsky (1978) suggested that in play the child is behaving beyond his age, and that play creates the zone of proximal development (ZPD), which refers to the distance between the actual developmental level at which the child can perform on his own and the potential developmental level at which the child can perform with help from others. Play provides a context for socially assisted learning. If adults or more competent peers can help the child, he

is able to engage in activities that he cannot do alone. This in turn extends the child's knowledge and skills to higher levels. According to Vygotsky, self-regulation originates in social interactions and later becomes internalized and practiced independently by children. Before children are able to self-regulate their behaviors, they engage in other-regulation, in which their behavior is guided by others. In other words, the development of self-regulation is a process from other-regulation to self-regulation, rather than happening spontaneously as a function of the classroom environment or evolving as the child matures. Play is a natural context in which scaffolding from adults or more competent peers can occur.

Moreover, play also functions as a self-help tool that promotes self-regulation. When children engage in play, they can create their own scaffolding, stretching themselves in self-control, cooperation with others, and using private speech to direct, control, and structure their play interactions. Play functions as a kind of magnifying glass revealing potential abilities before these same abilities become actualized in other real-life situations. For instance, one 5-year-old girl had trouble sitting at group circle time and could not sit for three minutes. While playing school with her friends, she pretended to be a good student and could concentrate for ten minutes (cited in Bodrova & Leong, 2007). In play, the child could control her impulses and engage in a higher level of behavior than without this scaffolding.

Using Private Speech to Regulate Oneself

Vygotskians have differentiated between two kinds of speech (Zivin, 1979). Public speech, referring to language directed to others, has a social and communicative function. It is spoken aloud and directs or communicates with others. Private speech, which describes self-directed speech that is audible but not intended for others, is a very important mechanism for the development of self-regulation. When children engage in private speech, the same words that adults once used to regulate children's behaviors are now used by children

themselves for the purposes of self-regulation. In a Vygotskian program, Tools of the Mind, teachers model the use of private speech when introducing new activities and encourage children to use private speech when they engage in these activities. Studies have shown a direct link between children's use of private speech and their self-regulatory abilities (Berk & Landeau, 1993; Berk & Spuhl, 1995; Winsler, Diaz, Atencio, McCarthy, & Chabay, 2000).

Private speech is used to facilitate children's play and self-regulation in the Tools of the Mind program. Before playing, children are taught to think about their play scenario ahead of time and plan the play scenario together. After the children agree, they act out the scenario. Children are taught this planning process in two ways. First, they draw a general plan for the scenario and the roles they will play. Teachers encourage children to think explicitly about their plans in advance and to discuss together who will do what and what will happen when. Second, teachers will involve themselves in the play and prompt discussion of what the children will do next. In this process, children engage in "thinking as they are talking" (private speech) and they also use the same words in their planning process that they will use later in both their private and public speech during play.

Research on Play and Self-Regulation

Research has shown a positive relationship between play and self-regulation. Diamond et al. (2007) examined the measures of executive functions of self-regulation in children and compared these measures between Tools of the Mind (Tools), a play-emphasized curriculum, and another curriculum (District's version of Balanced Literacy curriculum: dBL). They studied 24 classrooms in a low-income urban school district and randomly assigned teachers and students (n=147), aged 4 to 5, to these two curricula. Their outcome measures were for the Dots tasks and the Flanker tasks. Both tasks require executive function skills, such as inhibitory control, working memory, and cognitive flexibility. Their results showed the

following results: (1) On the Dots-Congruent task, which needs minimal executive functions, children performed similarly, regardless of curriculum. (2) When an inhibition demand was added to the Dots-Incongruent task, Tools children significantly outperformed dBL children. (3) Similar to the results for the Dots-Incongruent task, Tools children outperformed dBL children on the Flanker task. (4) Moreover, the most demanding Dots and Flanker conditions, Dots-Mixed and Reverse Flanker, showed the greatest differences. To summarize, Tools children performed better on measures of executive function than did dBL children. In other words, Tools children have a better capacity to regulate themselves than dBL children do.

Researchers have also shown that play is related to the development of theory of mind, another component of self-regulation. Youngblade and Dunn (1995) reported that children who practiced more role enactment play at 33 months performed better on the theory of mind task at 40 months of age than did children who played less pretending at 33 months. Dockett (1994) found that children who were trained to engage in pretend play passed the theory of mind task earlier than a control group. Astington and Jenkins (1995) have elaborated that in pretend-play, joint proposals and role assignments significantly relate to false belief understanding in 3- to 5-year olds, while controlling for age and language ability. In a longitudinal study, Jenkins and Astington (2000) concluded that theory of mind development in preschoolers and the extent of their pretend-play negotiations are positively related.

In addition to cognitive self-regulation, Elias and Berk (2002) have examined the relationship between make-believe play and later behavioral self-regulation (e.g., cleanup time classroom behavior). They observed 51 preschoolers in their classroom during the fall and spring of the school year. During the fall, each child's play in the block and housekeeping areas was observed for four 10-minute periods, assessing the quantity and maturity of their fantasy pursuits. In addition, during both the fall and the spring, observers rated children's behavior for self-regulatory maturity during four cleanup and circle-time periods. Moreover,

parents were asked to fill out the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, & Hersey, 1994) to rate their child's temperament. The study's results confirmed the contribution of make-believe play to future self-regulation. Controlling for verbal ability and fall self-regulation scores, the time spent in complex socio-dramatic play was positively correlated with spring cleanup performance. Furthermore, when the relationships between play and spring cleanup performance were computed separately for high-impulsive and low-impulsive preschoolers, the high-impulsive subgroup showed a strong positive correlation; in contrast, play and cleanup performance was unrelated for the low-impulsive children. Thus, these results reveal that preschoolers who engage more in complex socio-dramatic play show greater improvement in later self-regulation behavior, and that the association is particularly strong for highly impulsive children.

Barnett, et al. (2008) recently conducted a study to measure the relationship of behavioral self-regulation between children in two curricula: a play-emphasized curriculum--Tools of the Mind, and a non-play-emphasized curriculum. They compared the outcomes of seven Tools curriculum classrooms and eleven district curriculum classrooms in an urban school district in New Jersey. They randomly assigned teachers and children (aged 3 to 4, n=210) to classrooms before the start of school. Teachers were asked to complete the Problem Behaviors Scale of the Social Skill Rating System (SSRS) to rate each child at the end of the school year. The results showed statistically significant effects of the curriculum on the SSRS. Further analyses indicated that both externalized and internalized behavioral problems were substantially less common for the children in the Tools classrooms than for those in the control classrooms. In short, children in the play-emphasized classrooms showed fewer internalized and externalized behavioral problems.

Fewer studies have worked on the relationship between other play forms and self-regulation. Gal'perin (1992) and Leont'ev (1978) have found that motor activities are

particularly useful for the development of attention and self-regulation. They suggest that there is a relationship between motor control and the later control of mental processes. Thus, activities like asking children to turn into statues or freeze are helpful in promoting self-regulation (Michailenko & Korotkova, 2002; Riley et al., 2008).

Socio-Cultural Perspective

According to the socio-cultural perspective, which draws heavily on the work of Vygotsky, human development can only be understood by focusing on individual, interpersonal, and cultural-historical factors as they mutually influence one another (Tudge & Scrimsher, 2003). Vygotsky has argued that a child's development cannot be understood by a study of the individual only. We must also examine the external social world in which that child lives. The culture that surrounds a child at birth as everyday experiences invites the child to participate in a world of cultural tools that prepare him for lifelong learning. However, the child does not only rehearse cultural lessons and blindly carry on traditions. Rather, he is helped by others to reflect on what they are doing and seeing, and together come to imagine future possibilities (Scrimsher, College, & Tudge, 2003). In other words, from a bi-directional perspective on the relation between the child and the context and culture in which he lives, an active developing child constructs his own self using cultural means and in the process re-constructs his culture (Tudge, Putnam, & Valsiner, 1996).

In addition, Vygotsky has argued that development and learning occur in dialectical synthesis (Scrimsher et al., 2003). He explains that not only does development impact learning, but that learning can impact development. There is a complex, nonlinear relationship between development and learning. Though Vygotsky does not ignore the existence of developmental prerequisites that limits a child's ability to learn, he also believes that learning facilitates and even causes development (Bodrova & Leong, 2007). Moreover, he views that

learning is a social process before it is an individual function. This viewpoint does not mean that development is imposed by the world outside the child. Instead, the child is part of the social world and is helped to develop by a combination of his own motivations and prior experiences in conjunction with those of other people (Scrimsher et al., 2003).

Vygotsky's perspective could have a transformative effect on educational practices, because he proposes that culture influences development, and that there is dynamic interaction between learning and development. Many studies have been conducted to apply Vygotsky's theory to different areas of education, e.g., play (Bodrova, Leong, Hensen, & Henninger, 2000), private speech for self-regulation (Winsler, Carlton, & Barry, 2000), and school readiness (Carlton & Winsler, 1999).

Cultural Studies on Children's Play

Play researchers (e.g., Goncu, Tuermer, Jain, & Johnson, 1999) have attempted to explain what play is from a socio-cultural perspective. Goncu et al. view play as cultural activity and interpretation, which therefore requires interdisciplinary thinking and research in order to catch the meaning of play within a cultural context. Children's play is actually an activity in a social context that is shaped by economic, social, and political factors functioning within the larger culture. In order to understand the meaning of play in a particular culture, we need to examine how beliefs and values about play are communicated to children and how children represent their experiences of the world in their dramatic play.

Scholars have examined and compared children's play in different cultural contexts. For example, Halls (1977) has suggested that there are high-context and low-context cultures. Low-context cultures, which include Western Europe, North America, Australia, and Canada value individualism, independence, and success. High-context cultures, including Asian, African, southern European, and Latin American countries emphasize interdependence and

group harmony. Thus, play beliefs in these two cultures are different. In high-context cultures, qualities like cooperation, sharing, and group loyalty are emphasized in play. Children learn to subsume individual needs for the collective good. On the other hand, play in low-context cultures focuses on developing an individual's skill and competencies, individuality, leadership, self-expression, and independence (Kaiser & Rasminsky, 2003).

In another example of recent research, Gaskins, Haight, and Lancy (2007) present three case studies of children's play in order to explain the cultural construction of play. These studies were based on their in-depth observations of children in their daily lives and the meanings the participants ascribed to the observed behaviors. These three examples differ dramatically concerning the roles of adults in permitting, facilitating, and participating in children's play, which strongly impacts children's play in their daily lives. They describe the three different cultural play practices as: culturally curtailed play, culturally accepted play, and culturally cultivated play.

In cultures in which play is curtailed, adults will tolerate only minimal amounts of play and encourage children to participate in productive activity. For instance, a Yucatec Mayan village in Mexico provides this type of cultural context for play (Gaskins, 2001). The Yucatec Maya consider that development is a natural process of unfolding the child's inner abilities and character, with little input from the environment. Parents do not provide materials or ideas, do not mediate ongoing play, and do not participate in play. Adults will tolerate only a minimal amount of play, and children only play with peers who live together.

A second type of cultural context for play is found in cultures in which adults accept play and even value play, but invest little in it. Lancy's (1996) work on the Kpelle in Liberia provides a good example. The Kpelle are a population of slash-and-burn agricultural people. Adults must always trade off the investment in living offspring versus preserving their own well-being. They view play as a way to keep children busy and safe, so they accept peer or

sibling play, but they invest little in it. For them, making a living is much more important than children's maximum development. Gaskins et al. (2007) concluded that play among Kpelle children looks similar to the play found in a U.S. school playground; however, parents and other adults are missing from the picture. In other words, Kpelle children play a lot, but to adults, although play is accepted, it is unimportant and almost invisible.

In cultivated play cultures, play is encouraged and has culturally specific features. This type of play has been extensively studied in cultures in which adults invest heavily in children's play. Haight and her colleagues (Haight & Miller, 1992, 1993; Haight, Parke, & Black, 1997; Haight, Wang, Fung, Williams, & Mintz, 1999) have focused on pretend play in two such contexts: urban, educated, and middle-class Euro-American and Taiwanese families. They find that pretending is easily seen in both cultures, but has specific cultural emphases. In Euro-American families, parents provide many toys and large spaces, and they participate directly in pretend play. They emphasize individuality, independence, and self-expression in play. Whereas in Taiwanese families, mothers do not expect their children to interact with them as equals and are heavily didactic in their interaction with their children relative to Euro-American mothers. They extensively expose their children to explicit models of proper conduct, often focusing on the acquisition of those values and behaviors necessary for group acceptance and participation (Fung, 1994; Wang, Golden-Meadow, & Mylander, 1995). Taiwanese caregivers tend to lead the play and initiate most of the episodes, even as their children's initiations of pretend play and abilities to elaborate play themes increase over the preschool years. In addition, Taiwanese mothers use pretend play to practice proper conduct with young children. The play themes of Taiwanese mothers and children revolve not around fantasy, but around everyday social routines, such as addressing and responding to a teacher, or interacting with a vendor (Gaskins et al., 2007).

Other studies have also shown similar results: that children's play is easily observed in

Taiwan and other Asian countries that are influenced by Confucian thought, but that the play has different focuses. Pan (1994) contrasts the play of kindergarteners in Taiwan with the findings of Rubin, Watson, and Jambor's (1978) earlier play study of comparable American children. She finds that constructive play is found in both samples and that there is no difference between the two samples, but that group-dramatic play and group-constructive play are more prevalent in the US, while parallel constructive play is more popular in Taiwan. She explains some of the differences due to maternal attitudes towards play in the two cultures. For Taiwanese mothers, constructive toys require more mature mental participation, which they perceive as being a significant aspect of play. Moreover, because of insufficient play space in cities, constructive play may be encouraged by mothers since it is suitable for individual pursuit.

Farver, Kim, and Lee (1995) compared Korean- and Anglo-American children's play behavior. They concluded that Anglo-American children show more social pretend play, while Korean-American children display more unoccupied behavior and parallel play. Moreover, they observed that Korean-American children will offer objects to initiate play and are more cooperative than their Anglo-American counterparts. In addition, in comparison with Anglo-American parents, Korean-American parents believe academics to be more important than play, and they engage in less pretend play with their children.

Recently, Parmar, Harkness, and Super (2004) examined Asian- and Euro-American parents' beliefs and practices about play. They found that the Euro-American parents believe that play is an important vehicle for early development, whereas Asian parents see little developmental value in it. Asian parents believe more strongly than Euro-Americans in the importance of an early start in academic training for their children. As for the environment in the two different groups, though children in both groups have toys to play with, Asian families provide fewer toys than do Euro-American families, while Asian families have more toys for

educational play than their counterparts. Furthermore, when comparing the amount of time spent on play activities per week between the two groups, the results show that there are no differences between the two groups for physical play, constructive play, board games, social play, and organized sports/lessons, but that there are significant differences for pretend play.

In short, from a socio-cultural perspective, the meaning and types of play are different across cultures. Play beliefs in a culture influence the way adults support and engage in children's play. Thus, play studies should take cultural factors into consideration. Taiwanese parents and teachers tend to be didactic in their interactions with children and, though they do encourage play, they tend to direct children's play and aim for academic purposes.

Cultural Studies on Self-Regulation

Cultural models have also been applied to study self-regulation (Mesquita & Albet, 2007; Morelli & Rothbaum, 2007). Self-regulation is always embedded in the meanings and practices that constitute the socio-cultural world. Morelli and Rothbaum (2007) have described two different "self-ways", independence or interdependence (also described as individualism or collectivism), for the cultivation of the self in the world. Independence emphasizes autonomy (internal control, individual choice, and personal agency), while interdependence advocates heteronomy (conformity, obligation, reciprocity, and loyalty). Thus, people in different cultures regulate themselves differently in order to comply with their cultural norms.

Morelli and Rothbaum (2007) suggest that there are at least two different cultural beliefs implicated in the cultivation of self-regulation. They use self-determination theory to explain the psychological process for the development of self-regulation in Western countries. This theory explains that personal qualities such as autonomy and independence are important to healthy development. However, they point out that interdependence and harmony are the

qualities emphasized in non-Western cultures. People in these cultures learn to be sensitive to situational cues and fitting in to achieve relational harmony. What is important for the person to regulate is the self-in-context. Thus, what and how a person needs to regulate are consistent with the cultural contexts in which one is situated.

The development of executive function has been found to be different across cultures. Oh and Lewis (2008) have recently assessed executive function between Korean and British preschoolers. The results show that on three of the four inhibitory measures, there is not only a difference between the two cultures, but that on each measure, the younger Korean 3-year-olds performed above the level of their British counterparts who were almost 5 years old. They explain that Confucian cultures which emphasize respect for elders and obedience to authority figures, including teachers and parents whose aim is fostering attention skills and executive processes, appear to promote early executive skills. Thus, Korean children would display better inhibitory performance than Western children.

In another study, Sabbagh, Xu, Carlson, Moses, and Lee (2006) compared the development of executive function between Chinese and US preschoolers. They also concluded that Chinese children's performance is clearly more advanced than their American age-mates; that is, on all 7 executive-functioning tasks, Chinese children's performance was consistently on par with that of US children who were on average 6 months older.

Although evidence shows that the developmental trajectory of theory of mind is the same across different cultures (e.g. Chinese, Japanese, Korean, Mofu, Quechuan) that have been studied so far (Flavell, 2004; Tardif & Wellman, 2000; Vinden, 2002; Wellman, Cross, & Watson, 2001), some studies show that there is timing variation across cultures (Liu, Wellman, Tardif, & Sabbagh, 2008; Wellman et al., 2001), while others do not (Callaghan et al., 2005; Sabbagh et al., 2006). For example, Sabbagh et al. (2006) conducted a false-belief battery to compare the development of children's theory of mind between Chinese and US preschoolers.

The results showed a significant main effect of age, but no significant main effect of country nor the interaction between age and country. This study indicates that there is no evidence that Chinese preschoolers are different from their US counterparts in theory-of-mind reasoning.

In another study, Liu et al. (2008) have recently shown parallel developmental trajectories for false-belief understanding for children in China (Mainland China, Hong Kong) and North America (the United States, Canada). However, there was a significant pattern of timing differences across the four locales. Specifically, the timing of development for children in mainland China and children in the United States was very similar, the same as shown by Sabbagh et al.'s (2006) findings. However, Canadian children developed earlier than mainland Chinese and U.S. children, whereas Hong Kong Chinese children developed much later. Canadian children began performing above chance around 38 months of age, while Hong Kong children did so around 64 months, a difference of more than 2 years, and the difference continued to 80 months of age. In another study, Vinden (2001) has explored the relationship between maternal parenting attitudes and children's understanding of theory of mind through a comparison of Korean-American and Anglo-American families. Results show that Korean-American mothers are generally authoritarian, though not exclusively so, and that their 5-year-olds performed better on theory-of-mind tasks than their Anglo-American age-mates. These studies indicate that there is timing variation in children's self-regulation across cultures.

In addition, cultural differences account for varied behavioral control. When comparing communication styles, Americans focus on the speaker who must make himself heard and understood, whereas some other cultures, such as the Japanese (Clancy, 1986) and New Guinean (Ochs & Schieffelin, 1984), emphasize the listener who must be sensitive and respond to others and situational cues.

Fitting in, rather than standing out, is important as well to relational harmony in

non-Western cultures. Self-reflection or self-criticism, which means that the person is aware of his shortcomings and is willing to improve, is a way to achieve this. A person will be sensitive to the expectations of others and to the demands of situations through the process of self-criticism. Research has shown that East Asian people criticize themselves more than American people do. Stiger, Smith, and Mao (1985) have revealed that Chinese primary students rate their competence in the cognitive, physical, and general domains lower than do their North American counterparts. In the socializing process, adults encourage children toward self-reflection in these cultures. Heine, Markus, Lehman, and Kitayama (1999) provide evidence that Japanese children are given time to reflect on what they have not done to meet idealized standards and to consider ways to improve in the future.

Other forms of self-discipline in non-Western cultures include perseverance and endurance, which help children strive to meet the expectation of others. Tobin, Wu, and Davidson (1989) described an observation of Chinese preschoolers who work silently for 20 minutes, build and tear down piece by piece, and rebuild. The attention to work and perseverance are important parts of learning self-regulation and social harmony. However, this type of perseverance goes against beliefs in autonomy and may be viewed as hindering adaptive development from the perspective of Western culture (Morelli & Rothbaum, 2007). In addition, Americans view children's resistance as a way to establish personal boundaries or to seek autonomy, whereas Japanese adults tend to see it as selfish and egocentric (Yamada, 2004) or as a sign of immaturity (Osterweil & Nagano, 1991). This view is the same in several African cultures, where noncompliance is considered to be a moral transgression (Nsamenang, 1992). In short, how a person regulates his behavior is related to his cultural values. Western cultures encourage children to be speakers and to stand out, whereas non-Western cultures cultivate them to be listeners, to fit in, to be self-criticizing and perseverant.

When comparing Western and Confucian cultures, the findings seem to suggest that in Confucian cultures, children have better inhibitory control, executive function, self-criticism and perseverance than do their Western age-mates. However, findings in the theory of mind measures are mixed. Scholars explain that Chinese cultural beliefs emphasizing interdependence and group harmony influence how adults cultivate children's self-regulation. Chinese adults are more directing and controlling than Western adults.

In short, the review of the literature reveals that different forms of children's play are related to several components of self-regulation for US participants. However, children are situated in cultures, and non-Western cultures have different focuses on play and self-regulation.

Chapter 3

Methodology

This chapter describes the methodology used to conduct this study and includes the following sections: (1) Research Design, (2) Participants, (3) Data Collection Procedures, (4) Measures, and (5) Data Analysis.

The purpose of this study is to examine the relationship between play and self-regulation in Taiwanese young children. Children's play and self-regulation are the two variables of interest. Taiwanese culture, which is reflected by teachers' involvement in play and children's responses to the level of teachers' involvement, is viewed as contextual variables. Children's verbal ability is viewed as a covariate variable.

Different types of play are coded nesting cognitive and social levels of play. Cognitive play includes four levels which are functional play, constructive play, dramatic play, and games with rules. Social play is categorized into solitary play, parallel play, and group play. Non-play categories include unoccupied/on-looker/transition behavior, academic activities, and others. Two self-regulation components are assessed in this study: cognitive self-regulation, which includes executive function and theory of mind; and behavioral self-regulation, which is measured by observations in group time and teacher evaluations. The indexes of contextual variables are teachers' involvement in play and children's reaction to the level of teachers' involvement. Teachers' involvement is coded along with child's play. Levels of teachers' involvement include: not present, co-play, exerting individual control, exerting small group control, and exerting class control. Children's reactions are noted as positive, negative, and neutral.

The research questions are as follows:

1. What is the developmental status of cognitive self-regulation, i.e., executive function and theory of mind, for Taiwanese 4- to 5-year-old children?
2. What is the developmental status of behavioral self-regulation, measured by observations in group time and teacher evaluations, for Taiwanese 4- to 5-year-old children?
3. What are the play types of Taiwanese 4- to 5-year-old children?
4. How are teachers involved in play, and how do children react to teachers' involvement?
5. Is there any relationship between specific types of play and executive function in Taiwanese 4- to 5-year-old children?
6. Is there any relationship between specific types of play and theory of mind in Taiwanese 4- to 5-year-old children?
7. Is there any relationship between specific types of play and behavioral self-regulation in Taiwanese 4- to 5-year-old children?

Research Design

The study aims at examining the relationship between play and self-regulation in Taiwanese young children. A correlational research design is used in this study. The purpose of a correlational study is to describe the direction and strength of association between two variables (Creswell, 2008; Huck, 2008). This design does not attempt to control the variables to examine the cause-effect connection; instead, it examines the tendency for two variables to vary consistently (Creswell, 2008; Huck, 2008). The conceptual framework of this study is depicted in Figure 1-1.

This study follows Creswell's (2008) suggested procedures for conducting a correlational design to answer a research question.

1. Determine if a correlational study best addresses the research problems: Because the purpose of the study is to examine the relationship between child play and self-regulation, a correlation design is appropriate to answer the research problems in this study.
2. Identify individuals to study: The participants for this study are described in the next section.
3. Identify two or more measures for each individual in the study: The measures for this study are the play and self-regulation variables which are described in the 'Measures' section.
4. Collect data and monitor potential threats: The data collection procedure for this study is described in the 'Data Collection' section.
5. Analyze the data and present the results: The results of the data analysis for this study are described in Chapter 4.
6. Interpret the results: The discussion and recommendation for this study are described in Chapter 5.

Participants

Two concerns guided this study in targeting children aged 4 to 5. First, only children aged 4 to 6 can enroll in kindergartens in Taiwan, so children younger than 4 were excluded. Second, according to studies (Gerstadt et al., 1994; Diamond & Taylor, 1996; Jenkins & Astington, 2000; Wellman & Liu, 2004), children's self-regulation develops in the preschool years and is almost well-developed by age 6. To catch the developing ability, this study excluded children aged 5 to 6 years to avoid a ceiling effect. Under these considerations, children aged 4 to 5 became the target group.

After receiving parents' consent forms, 52 out of 68 parents agreed to have their children join the study. The researcher excluded two children: one was identified as and the other was suspected to be with special needs. In the beginning of the fall semester of 2009, fifty 4- to 5-year-old typically developing Taiwanese young children who were enrolled at the research site participated in this study. At the end of the semester, four children were excluded due to either transferring to another school district, arriving too late to be observed during free play time, or having a very low verbal ability test score (PPVT Score=13). A total of 46 children were thus included in the analysis: 25 boys and 21 girls from four classes (Table 3-1).

Table 3-1 *Participants from Mixed-age and Same-age Classes*

	Zebra Class (mixed age)	Penguin Class (mixed age)	Sheep Class (same age)	Rabbit Class (same age)	Group Total
Boy	2	3	10	10	25
Girl	5	2	8	6	21
Group Total	7	5	18	16	46

After observing the children for one semester, the researcher found that the four classes which included 4- to 5-year-old children had different social ecologies. Two classes, Zebra and Penguin, contained mixed-age children from 4 to 6 years old, while the other two classes had children aged 4 to 5 years old. In order to avoid the confounding influence of peers and classroom dynamics, the researcher decided to exclude the data from the mixed-age classes. Thus, data for 34 children, comprised of 18 boys and 16 girls, aged 4 to 5 years old, were analyzed in the study (Table 3-2). An adequate number of participants for using correlational statistics is 30 (Creswell, 2008). The number of participants in this study met Creswell's guidance.

Table 3-2 *Participants from Same-age Classes*

	Sheep Class	Rabbit Class	Group Total
Boy	10	10	20
Girl	8	6	14
Group Total	18	16	34

Data Collection Procedures

The data collection began in May 2009 and ended in January 2010. Two phases were involved: the preparation phase and the data collection phase.

The Preparation Phase: May 2009 to mid-October 2009

In this phase, five main goals were set and attained.

1. Only one research site was purposely selected. In order to minimize the influence of different school cultures and curricula, only one public kindergarten was selected for the study. The criteria used to choose the research site were: (1) it was a typical Taiwanese kindergarten reflecting the impact of a combination of Chinese cultural values and the Western ECE theories that ECE teachers had learned from their education (it was not a kindergarten inspired by Western play programs such as Waldorf or Reggio Emilia). The intention was to clarify the cultural contexts of child play in a traditional kindergarten; (2) it had more than fifty 4- to 5- year-old children to satisfy the study requirement; (3) it was a public kindergarten that had children attending from different family backgrounds, such as parental vocation, parental education, and family income; (4) it had sufficient free play time in the kindergarten;

(5) the school district was located on the outskirts of Taipei city, exhibiting a typical population distribution in Taiwan-- a mix of city and county demographics; and (6) its principal, director and kindergarten teachers were willing to collaborate in the study.

2. Consent forms were collected from the principal, teachers, and parents of the kindergarteners. The researcher received approval from the principal of the kindergarten first. Then, a briefing regarding this study was given to kindergarten teachers, and the researcher received signed consent forms from four class teachers (Blank Teacher Consent Form, see Appendix A). These teachers helped in disseminating the recruitment letter to parents of every 4- to 5-year-old child in their classes at the beginning of fall semester 2009, and they collected the signed parental consent forms (Blank Parental Consent Form, see Appendix B).
3. In order to be familiar with all measures and assess the time for a child to complete the self-regulation tasks and a verbal test, seven 4-to 5-year-old children who did not participate in the formal study were pretested by the researcher and a research assistant, a graduate student majoring in Early Childhood Education at the National Taipei University of Education in Taiwan. The research assistant had been a student teacher at the school research site.
4. To assess the inter-rater reliability of play and self-regulation observations, the researcher and her assistant spent one hour per day in one classroom for two weeks to develop expertise in making observations and obtain a high level of observation agreement. In the first week, they observed children's play and self-regulation behavior together and discussed the definition of each observation category. In the second week, they observed children's behaviors at the same time but made observations separately to produce data to calculate the percent-agreement score, an

inter-rater reliability estimate (Huck, 2008). For play observation, the inter-rater reliability score was 84.6%, and for self-regulation the reliability score was 87%. Traditionally, agreement was regarded as acceptable if it met or surpassed 80% (Johnson, Penny, & Gordon, 2009; Kazdan, 1982).

5. Before the study began, the researcher and her assistant spent one hour daily for 6 days in total to become familiar with the children, teachers, and parents. Adhering to the request of the kindergarten director, the study started six weeks after fall semester began because the participating children were all new enrollees in the kindergarten. Kindergarten teachers wanted to help children adjust to the new environment before this study commenced.

The Data Collection Phase: Mid-October, 2009 to January, 2010

In this phase, five different procedures were involved:

1. Observing children's play behaviors in free play.
2. Observing teachers' involvement in children's play and children's responses in free play.
3. Conducting two executive function tasks, two theory of mind tasks, and assessing children's verbal ability using the Peabody Picture Vocabulary Test-Revised Taiwanese version (PPVT-T, Lu & Liu, 1998).
4. Observing children's self-regulation behaviors in group time. These four procedures were implemented concurrently during mid-October 2009 to January 2010.
5. In addition, the fifth procedure occurred at the end of the fall semester in January 2010.

Two kindergarten teachers were asked to complete a questionnaire to rate each participating child's self-regulation behavior.

Observing children's play behaviors in free play

A time-sampling procedure (Bentzen, 1997) was used for the play observation. A total of forty 15-second intervals of each child's play behavior was originally planned to be coded during the free-play period.

At the request of the kindergarten director, children's play behavior was observed before class began, from 8:00 a.m. to 9 a.m., which was a time for children to play freely. Teachers often used this time to talk to parents, prepare for their teaching, participate in an administrative meeting, deal with paper work, or, if there was time, stay with children in the classrooms. Usually children were required to come to school between 8:00 a.m. to 9 a.m. Some of them came near 9:00 a.m., thus there was less time for child observations. It took almost four months, two or three times per week, to observe all children's play behavior.

The researcher and her assistant waited until at least half of the class of children arrived and the class volunteers had completed their cleaning tasks. Then the observations started, usually around 8:20 a.m. The observation procedure was as follows. According to the sequence of the class list, the two observers started from the beginning of the class list and the selected child was observed for 15 seconds, then his/her play behavior was recorded on the coding form. The observers then shifted to the next child on the class list. If the child who was supposed to be observed had not arrived, then the observers would shift to the next child. Once a skipped child arrived, the observers would add him/her back into the observation sequence. At the end of the semester, a total of thirty-nine 15-second intervals of each child's play behavior were coded. This accumulated to 9.75 minutes of observation for each child. Children were observed on three or more different days. The researcher was responsible for observing and recording children in the Rabbit class, while the research assistant was responsible for those in the Sheep class.

Observing teachers' involvement in child's play and children's responses in free play

Along with observing children's play, teachers' involvement in children's play and children's responses were coded concurrently. A total of 39 observations of teachers' involvement and children's responses were recorded. This added up to 702 observations for the Sheep class teacher (39 observations $\times$ 18 children = 702 observations) and 624 observations for the Rabbit class teacher (39 observations $\times$ 16 children = 624 observations). Again, the researcher was responsible for observing and recording children in the Rabbit class while the research assistant was responsible for those in the Sheep class.

Conducting cognitive self-regulation tasks and a verbal test

All participating children were asked to complete four cognitive self-regulation tasks in which two tasks were designed to examine executive function and two were designed to examine theory of mind. Children were also asked to complete one verbal test, which was administered first during November 2009 and took about 15 to 20 minutes to complete. The four cognitive tasks, which were administered during December 2009, also took about 15 to 20 minutes to complete. Children were tested individually in a separate room while other children were attending class. All the cognitive tasks and the verbal test were administered by the research assistant under the supervision of the researcher.

Observing children's behavioral self-regulation in group time

The same time-sampling procedure was used in observing children's self-regulation behaviors, which were coded at 15-second intervals, yielding ten minutes of observation per child. At the request of the kindergarten director, the observation was implemented during 8:00 a.m. to 9:30 a.m. in a 50-minute extra language class or during a 30-minute regular group time. The researcher was responsible for observing and evaluating children in the

Rabbit class, while the research assistant was responsible for evaluating children in the Sheep class. The researcher spent approximately three months of two days per week to complete observing the children to assess their behavioral control.

Teachers' ratings at the end of the fall semester 2009

Kindergarten teachers in the two classrooms were asked to complete a scale to assess each participating child's self-regulation behavior in general domains at the end of the fall semester in January 2010. The scale was given to these kindergarten teachers in the first week of January 2010 and received back one week later. During this week, the researcher was there for three days and informed the two teachers that if they had any questions, they could ask the researcher for clarification.

Measures

Verbal ability

The Peabody Picture Vocabulary Test-Taiwanese version Form A (PPVT-T, Lu & Liu, 1998) was used to assess children's verbal ability. The researcher chose this as the verbal test for the following reasons: (1) it is a legitimate tool authorized by the publisher of the PPVT-R in the US. (2) It has an established Taiwanese norm. In addition, (3) it is a popular and widely-used verbal test in Taiwan. Thus, the researcher decided to use the PPVT-T as the instrument to test children's verbal ability.

This test was revised from the Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1981) and had established a national norm from 886 samples in Taiwan in 1988. The split-half reliability of the PPVT-T Form A was .90 to .97, and the test-retest reliability was .90. Its alternative reliability with Form B was .60 to .91. The correlation between PPVT-T Form A and the Wechsler Intelligence Scale for Children-Revised was .61 to .69. The PPVT-T is a

commonly used tool to assess children's verbal ability and intelligence in Taiwan.

When conducting the test, the research assistant worked with each child individually in a separate room. The child was asked to select from a set of four pictures the one that best illustrated the meaning of an orally presented word. The vocabulary measure was planned to be used as a control variable, because verbal ability might influence the ability to communicate in socio-dramatic play (Bretherton, 1989; Gottman, 1986) as well as the ability to self-regulate (Berk, 1992; Kopp, 1982).

The Modified Social/Cognitive Scale of Play Behaviors

Based on Piaget's (1962) cognitive play categories and Parten's (1932) social-participation scale, Rubin and his associates developed the Social/Cognitive Scale (Rubin, Maioni, & Hornung, 1976; Rubin, Watson, & Jambor, 1978), which features a two-dimensional matrix to observe children's play. The cognitive levels of play include functional play, constructive play, dramatic play, and games with rules. The social levels of play include solitary play, parallel play, and group play. Johnson, Christie and Yawkey (1999) suggested adding two additional categories into the scale, which were unoccupied/onlooking/transition behavior and non-play activities. In this study, the researcher modified non-play activities into three categories: unoccupied/onlooking/transition behavior, academic activities, and others. Thus, observers would record 12 categories of play behaviors and 3 non-play behaviors on this scale (Appendix C: The Modified Social/Cognitive Scale of Play Behavior).

Furthermore, in order to specify the contextual variable of Taiwanese culture, two sections, which were teachers' involvement in children's play and children's responses to the level of teachers' involvement, were added on the Social/Cognitive Scale of Play Behavior. Levels of teachers' involvement included the following: not present, co-play, exerting

individual control, exerting small group control, and exerting class control. Children's reactions were noted as positive, negative, and neutral (see Appendix C).

Teachers' involvement in children's play and children's responses to the level of teachers' involvement were coded along with observing children's play.

Executive Function Battery

Day/Night task. For 16 trials of the day/night task (Gerstadt et al., 1994), each child was instructed to say "day" when they saw a picture of a moon, and "night" when they saw a picture of a sun. Two practice trials were given. The script of the task was as follows: Hi, I will play a game with you. When I show you a picture with a sun, please tell me "night". If I show you a picture with a moon, please tell me it is "day". Let's see how many scores you can win. The dependent measure was the number of correct responses ranging from 0 to 16 (see Appendix D: The Scoring Sheet of Executive Function Tasks).

Tapping task. In the tapping task, every child was instructed to tap a stick on the table once when the researcher tapped twice, and to tap twice when she tapped once. Sixteen test trials were administered, presented in a sequential order. The script of the task was as follows: Hi, I would like to play a tapping game with you. Each of us has a stick. When you hear me tap once, please tap twice. When you hear me tap twice, please tap once. Let's see how many scores you can win. The dependent measure was the number of correct responses ranging from 0 to 16 (see Appendix D: The Scoring Sheet of Executive Function Tasks).

Theory of Mind Battery

Location False-Belief tasks. Two tasks were implemented to test young children's location false belief. In the first task (Wimmer & Perner, 1983), each child was asked where a puppet

thought his ball was after it was moved in his absence. The script was as follows: Hi, let's play a game with the puppet. He put his ball here and then leaves. If we put the ball there, where will he try to find his ball, here or there? (Wait for the child's answer.) Could you tell me where the ball really is?

In the second task (Wellman & Bartsch, 1988), each child was told that a boy thought a dog was in one place, although it was really in another, and then he/she was asked where the boy would look for the dog. Finally, a reality control question was asked to see whether the child knew the reality. The script was as follows: Tom likes his dog 'Doggie' very much. Tom thinks Doggie is in the kitchen. However, Doggie is actually in the living room. Where will Tom try to find Doggie, kitchen or living room? (Wait for the child's answer.) Could you tell me where Doggie really is? Credits for tasks were given only in the case of giving a correct answer to the reality control question. The score for the two tasks for location false belief was the total correct responses from both tasks, scores ranging from 0 to 2 (see Appendix E: The Scoring Sheet of Theory of Mind).

Content False-Belief task. For this task (Gopnik & Astington, 1988), each child was shown a closed chocolate box and asked "What do you think is inside?" Then the researcher assistant opened the box and took a pen out of it. After the child identified the true object inside the box, the researcher assistant put the pen back and closed the box. Then the child was asked about their own prior false belief and others' current false beliefs about the chocolate box. Again, each child was asked the reality control question "What is actually inside the box?" The script was as follows: Hi, I have a box with me. What do you think is inside? (Wait for the child's answer.) Actually, inside the chocolate box is a pen. (Open the box and take a pen out of it. Then, put the pen back and close the box.) Now, could you tell me what you thought was inside the box before I opened it? (Wait for the child's answer.) What if your brother sees

the box, what will he think is inside the box? (Wait for the child's answer.) Do you know what it really is inside? Credit for both self-belief and other-belief questions would be given only in the case of giving a correct answer to this reality control question, scores ranging from 0 to 2 (see Appendix E: The Scoring Sheet of Theory of Mind).

Behavioral Self-Regulation

Observation in group time. Researchers suggest that circle time, a group discussion time, is a naturalistic context in which to assess self-regulation (Alessandri, 1992; Elias & Berk, 2002; Huston-Stein, Friedrich-Cofer, & Susman, 1977). Alessandri's (1992) coding system was adapted in this study.

Children's behavioral self-regulation in group time was rated from 1 to 5: (1) overt disruptive activity or leaves group; (2) inattention, no overt disruption; (3) follows teacher visually; (4) follows teacher, facial expression shows interest; and (5) follows teacher and adds to instruction through appropriate verbal or motor activities. The score was the sum of ratings across 40 observation intervals (see Appendix F: The Observation Coding Sheet of Behavioral Self-Regulation).

Teachers' measure. The Self-Control Rating Scale (SCRS; Kendall & Wilcox, 1979) was completed by children's teachers at the end of fall semester 2009. The 7-point Likert-type scale has 33 items. Class teachers were asked to rate each child for the presence of impulsive behaviors, such as: "Does the child butt into games or activities even when he or she hasn't been invited?" "Does the child grab for the belongings of others?" "Does the child think before he or she acts"? Score from 1 to 7 were rated from 'Agree' to 'Disagree'. The original coding was that the more impulsive a child was, the less self-controlled he/she was. In order to reflect intuitive thinking and the purpose of the study, the researcher re-coded the score as

the higher the score, the more self-regulated a child was. The internal consistency for the SCRS was .98; test-retest reliability over three-four weeks was .84. Validity studies of the SCRS showed that students with a higher rate of off-task behaviors were referred for assessment and intervention because their impulsive behaviors were rated significantly less self-controlled on the SCRS than were non-referred children. These reliability and validity indicators suggested that the SCRS was effective in assessing children's self-regulation.

In this study, the researcher translated the contents of the SCRS into Chinese first. Then, two experts who are familiar with both English and Mandarin (one is a PhD majoring in Early Childhood Education and the other is a Masters majoring in Teaching English as a Second Language) ensured the SCRS Taiwanese version was acceptable both in content and understanding.

The researcher further asked the two participating teachers to read this scale and provide feedback regarding the contents and their understanding before they assessed the children. Both teachers judged the content appropriate. There were no problems in the understanding of the content. The relationship between the participating teachers and the researcher was close and the researcher stayed at the research site at least two days per week. If there were any questions, the teachers could easily find the researcher for clarification. The internal consistency reliability was calculated as .94 in this Taiwanese version (see Appendix G: The Self-Control Rating Scale).

Summary of Measures

The following table summarizes the measures used in this study to collect data for each variable.

Table 3-3 *Summary of Measures*

Variable	Data Collection Method	Tools/Measure
Covariate: Verbal ability	Psychological test	PPVT-T: Peabody Picture Vocabulary Test – Taiwanese version
Children's play	Observation in free play	The Modified Social/Cognitive Scale of Play Behaviors
Executive function	Executive function battery	Day/Night Task Tapping Task
Theory of mind	Theory of mind battery	Location False-Belief Task Contents False-Belief Task
Behavioral self-regulation	Observation in group time Teacher's rating	The Self-Regulation Coding System The Self-Control Rating Scale
Context Variable: Teacher Involvement in Children's Play and Children's Responses	Observation in free play time	The Modified Social/Cognitive Scale of Play Behaviors

Data Analysis

The Statistical Package for Social Science (SPSS) for Windows was used to code and analyze the data. Descriptive statistics, including frequency, means, and percentages, were used to describe the results for each variable and to provide information to answer research questions 1, 2, 3, and 4. Inferential statistics, i.e., correlations, were implemented for questions 5, 6, and 7 (Table 3-4).

Table 3-4 *Statistical Techniques Used to Address Objectives*

Research Question	Source of Information	Scale of Measurement	Analysis Technique
1. What is the developmental status of cognitive self-regulation, i.e., executive function and theory of mind, for Taiwanese 4- to 5-year-old children?	Executive function battery Theory of mind battery	interval interval	Mean SD Median IQR Percentage
2. What is the developmental status of behavioral self-regulation, i.e., observation in group time and teacher evaluation, for Taiwanese 4- to 5-year-old children?	Behavioral self-regulation observation Teachers' ratings	interval interval	Mean SD Median IQR Percentage
3. What are the play types of Taiwanese 4-	Play observation	interval	Mean SD

to 5-year-old children?			Percentage
4. How are teachers involved in play and how do children react to teachers' involvement?	Observation	interval	Mean SD Percentage
5. Is there any relationship between specific types of play and executive function?	Play observation Executive function battery	interval interval	Correlation
6. Is there any relationship between specific types of play and theory of mind?	Play observation Theory of mind battery	interval interval	Correlation
7. Is there any relationship between specific types of play and behavioral self-regulation?	Play observation Behavioral self-regulation observation Teachers' rating	interval interval interval	Correlation

Chapter 4

Results

The purpose of this study is to examine the relationship between play and self-regulation in Taiwanese young children. In this chapter, results are summarized in the following sections: (1) Analysis of cognitive self-regulation: descriptive statistics from the results of the cognitive self-regulation measures, i.e., executive function and theory of mind tasks, were employed to answer research question 1; (2) Analysis of behavioral self-regulation: descriptive statistics from the results of behavioral self-regulation measures, including observations during group time and teacher evaluations at the end of fall semester 2009 were used to answer research question 2; (3) Analysis of play types: descriptive statistics from the results of examining play types were analyzed to answer research question 3; (4) Analysis of cultural context: teachers' involvement and children's responses were analyzed to answer research question 4; (5) Covariate check: the results of the verbal test, PPVT-T, were reported in this section. Additionally, correlation statistics were calculated between the PPVT-T score and every other variable in this study; (6) Analysis of the relationships between play types and self-regulation variables: Pearson's correlation (r) and Spearman's correlation (r_s) were used to answer research questions 5, 6, and 7. Finally, (7) Summaries of Chapter 4: the results are summarized in the last section of this chapter.

Analysis of Cognitive Self-regulation

Research Question One (The Development of Cognitive Self-regulation)

In this study, two cognitive self-regulation indicators, executive function and theory of mind, were examined. Executive function was measured using the day/ night task and the

tapping task, while theory of mind was assessed by the false belief of location task and the false belief of content task. According to Huck (2008), a skewness value between -1.0 and +1.0 may be considered as approximating a normal distribution. Therefore, the mean and standard deviation (SD) were reported for normally distributed interval scale variables. As for a skewed distribution, the mean is pulled in the direction of the tail while the median will not be affected by the skewness (Urdan, 2010); thus the median and interquartile range (IQR) are reported for a skewed interval scale variable.

The descriptive statistics for cognitive self-regulation are summarized in Table 4-1. The results showed that the skewnesses of the day/ night task and the tapping task were -2.7 and -1.4 respectively. A negative skewness score lower than -1 means the tail of the distribution is pulled toward the lower end of the distribution, with a clustering of scores at the higher end. The median and interquartile range (IQR) were reported for a skewed distribution instead of the mean and SD in this study. The median of the day/night tasks was 15 (IQR=2) with a total possible score of 16. The median score of the tapping task was 14 (IQR=4) with a total possible score of 16. The IQR represents the difference between the score that marks the first quartile and the score that marks the third quartile. In the day/night tasks, the score of the 25th percentile was 14 and that of the 75th percentile was 16. In the tapping tasks, the score of the 25th percentile was 12 and that of the 75th percentile was 16. In other words, in these two executive function tasks, the medians were all close to the highest possible score and the results of the IQR also indicated that the scores of a majority of participants (the middle 50% of the scores) were near the total score. The mode of both executive function tasks was 16, indicating that the highest score frequency was 16 in the two tasks. These results reflect a ceiling effect for the day/night tasks and the tapping tasks in the study.

The skewnesses of the false belief of location tasks (location tasks) and the false belief of content tasks (content tasks) were 1.70 and .18 respectively, which indicated a skewed

distribution for the former and a normal distribution for the latter. Thus, the median and IQR were reported for the location tasks, while the mean and SD were reported for the content tasks. A positively skewed score higher than 1 means most scores are clustered at the lower end of the distribution. The median for the location tasks was 0 and the IQR was 1, for a total possible score of 2. The results also found that the scores of 50% of the participants were all 0, which meant that half of the participants failed in all of the location tasks. The score difference between the median and the third quartile was 1, which indicated that 25% of participants responded with one correct answer out of a total possible score of 2. While examining the frequency of the location tasks, results showed that only 5.9% of participants answered correctly for all of these tasks. Moreover, the mode was also 0 in these tasks. This means that a score of 0 occurred the most frequently. These results indicate that a “floor effect” existed in the location task and it was hard for Taiwanese 4- to 5- year-old children to pass. On the other hand, the results of the content task showed a normal distribution with a mean of 0.9 (SD=0.9) and a skewness of 0.2 (Kurtosis=-1.8). These results suggested that the false belief of content ability was developing for Taiwanese 4- to 5- year-old children.

Table 4-1

Descriptive Statistics for Executive Function Tasks and Theory of Mind Tasks (n=34)

Assessment	n	Skewness	Median	IQR	Mode	Mean	SD
Day/Night Tasks	34	-2.7	15	2	16		
Tapping Tasks	34	-1.4	14	4	16		
False Belief of Location Tasks	34	1.7	.00	1	0		
False Belief of Content Tasks	34	0.2			0	0.9	0.9

Note. A. The total possible score for the day/night tasks and the tapping task was 16.

B. The total possible score for the false belief of location and content tasks was 2.

C. Box-plots, see Appendix H.

In order to compare this study with other studies in Chapter 5, the investigator calculated the pass rates (Huang, 2000; Wellman et al, 2001) for the location and content tasks (Table 4-2). If a child answered one or two questions correctly out of two, then this study treats him/her as “Pass” due to being equal to or higher than chance. In the location tasks, 67.4% of 4- to 5-year-old children failed and 32.7% passed. In the content tasks, 39.1% children did not pass and 60.9% was treated as “Pass” due to their results being equal to or higher than randomly correct. The location tasks were clearly harder for Taiwanese young children to pass than the content tasks.

Table 4-2

Frequency of Theory of Mind Tasks (n=34)

Pass or Not	Value	Correct Percentage	Location Tasks Frequency	Content Tasks Frequency
Not Pass	0	0%	67.4%	39.1
Pass	1-2	50%-100%	32.6%	60.9

Analysis of Behavioral Self-regulation

Research Question Two (The Development of Behavioral Self-regulation)

Behavioral self-control was assessed by observation during group time (SR observation) and by teacher evaluations at the end of fall semester 2009. The observation coding sheet for behavioral self-regulation, a 5-point check list, was used to record observations. Scores of 1 to 5 indicate the following: (1) overt disruptive activity or leaves group, (2) inattention, no overt disruption, (3) follows teacher visually, (4) follows teacher, facial expression shows interest,

and (5) follows teacher and adds to instruction through appropriate verbal or motor activities. Every child was observed on at least three different days across 40 observation intervals. Table 4-3 presents the descriptive statistics from the SR observation. The skewness of the score of the SR observation was -0.1, indicating a fairly normal distribution in the behavioral observation. Thus, the mean and SD were reported. The results showed a mean score of 3.5 (SD=0.3) which indicates that participating children typically behaved between 'follows teacher visually' and 'follows teacher, facial expression shows interest.' In other words, Taiwanese children aged 4 to 5 regulated themselves fairly well during group time and paid attention to the teacher in general. Moreover, there was not any minor or major outlier in the observation.

In addition to the observations, kindergarten teachers were asked to assess participating children at the end of fall semester by using the Self-Control Rating Scale (SCRS), a 7-point Likert-type response scale with 33 items. Scores from 1 to 7 were rated from 'Agree' to 'Disagree'. In order to reflect intuitive thinking and the purpose of the study, the researcher re-coded the responses so the higher the score, the more self-regulated a child. The results found that the skewness of the teacher evaluations was -.2, which indicates a normal distribution. Again, the mean and SD were reported for the results of the teacher evaluations. The mean for the teacher evaluations was 4.5 (SD=0.9), showing that teachers thought in general that children could control their impulsivity and regulate themselves well in class.

Table 4-3

Descriptive Statistics for Observations in Group Time and Teacher Evaluations (n=34)

	n	Mean	SD	Skewness
Observation in Group Time	34	3.5	0.3	-0.1
Teacher Evaluations	34	4.5	0.9	-0.2

Note. A. A 5-point coding sheet was used for observations in group time.

B. A 7-point Likert-type response scale was implemented for the teacher evaluations.

C. Box-plots, see Appendix I.

Venturing beyond the study's statistical results, this researcher is concerned about a cultural issue. Although the SCRS has an acceptable content validity and reliability, several culturally sensitive items were identified by a Taiwanese ECE faculty and the researcher. For example, Taiwanese ECE teachers spend a lot of effort to make children sit still and follow teachers' instructions. The Taiwanese ECE faculty is an assistant professor teaching at the Gainesville State College in Georgia. She identified eight items, numbers 7, 9, 11, 12, 18, 22, 27, and 30, which were important in Taiwanese ECE settings. The researcher has been an ECE educator for more than ten years and also identified eight items, numbers 7, 9, 10, 11, 12, 20, 27, and 30, as salient cultural issues. The descriptive statistics were analyzed for the same six items, numbers 7, 9, 11, 12, 27, and 30, in the SCRS (Table 4-4). Within the six items, numbers 9, 11, 12 and 27 were reverse coded. The results showed that the means for these six items were all above 4, from 4.24 to 5.45, in a 7-point Likert-type response scale. In other words, teachers agreed that children could control themselves in general. In addition, the skewnesses of these six items were all between -1.0 and +1.0, indicating the score distributions were all normal.

Table 4-4

Descriptive Statistics of Culturally Sensitive Items in the SCRS (n=34)

Item	n	Skewness	Mean	SD
7. Won't interrupt inappropriately.	34	.15	4.24	1.94
9. Follow instructions.	33	-.87	5.45	1.12
11. Wait in line patiently.	34	-.80	5.06	1.70
12. Sit still.	33	-1.1	5.24	1.70
27. Play well with peers.	34	-.61	5.03	1.60
30. Won't disrupt games.	34	-.68	4.97	1.59

Analysis of Play Types*Descriptive Statistics for Play Variables*

The Modified Social/Cognitive Scale was used to examine children's play behavior in free play across 39 observations. The cognitive levels of play contained functional play, constructive play, dramatic play, and games with rules. The social levels of play included solitary play, parallel play, and group play. In addition to analyzing the four cognitive levels and the three social levels of play, 12 play categories (4 cognitive levels of play $\times$ 3 social levels of play) were also calculated. However, the frequencies of three "games with rules" categories were very infrequent: these were 1 for games/solitary, 0 for games/parallel, and 24 for games/group. Thus the analysis excluded these three items. Furthermore, three non-play categories, unoccupied/onlooking/transition behavior, academic activities, and others, were examined as well. In sum, a total of 19 play variables were analyzed in the study.

Table 4-5 displays the mean (SD) or median (IQR) and skewness for each play variable.

Again, the mean (SD) was reported for a normally distributed variable, while the median and interquartile range (IQR) were reported for a skewed variable. The results showed nine play variables were normally distributed, while the other ten play and non-play variables were not normally distributed.

Table 4-5 *Descriptive Statistics for Play Variables (n=34)*

	Funct. / Sol.	Funct. / Par.	Funct. / Grp.	Con. / Sol.	Con. / Par.	Con. / Grp	Dra. / Sol.	Dra. / Par.	Dra. / Grp	Unoccupied/ Onlooking/ Transition
n	34	34	34	34	34	34	34	34	34	34
Mean (SD)		2.9 (2.8)	2.8 (3.1)			3.8 (3.1)				
Median (IQR)	1.5 (4.0)			1.0 (3.3)	4.0 (7.5)		.0 (2.0)	.50 (1.0)	7.0 (10)	4.0 (4.0)
Skewness	1.8	.6	.8	1.5	1.2	.3	1.5	4.3	1.6	3.4
	Academic Activities	Others	Functional	Constructive	Dramatic	Games with Rules	Solitary	Parallel	Group	
n	34	34	34	34	34	34	34	34	34	
Mean SD			7.9 (5.9)	10.6 (7.2)	9.9 (7.6)		5.6 (4.4)	8.8 (5.9)	14.7 (6.4)	
Median IQR	.0 (.0)	3.0 (5.0)				.0 (1.0)				
Skewness	5.8	1.6	.2	.1	1.1	2.1	.8	.5	.4	

Note. A. Funct.=Functional Con.=Constructive Dra.=Dramatic Sol.=Solitary Par.=Parallel Grp.=Group

B. Regular font = a skewed distribution

Bold = a normal distribution

C. Box-plots, see Appendix J.

Research Question Three (The Play Types)

Table 4-6 summarizes the frequency of play behaviors. When examining the cognitive levels of play, the results indicated that constructive play occurred the most frequently (36.3%), followed by dramatic play (33.9%) and functional play (27.2%), while games with rules were the least frequently observed (2.5%). In analyzing the social levels, one-half was group play (50.6%), approximately one-third was parallel play (30.3%), and the least frequent was solitary play (19.2%). These findings suggest that the most often seen cognitive and social levels of play in Taiwanese children aged four to five are constructive play and group play.

Table 4-6

Frequency of Play Behaviors (n=34)

Social Level of Play	Cognitive Level of Play									
	Functional		Constructive		Dramatic		Games With Rules		Total	
	n*	%	n*	%	n*	%	n*	%	n*	%
Solitary	76	7.7	68	6.9	45	4.5	1	0.1	190	19.2
Parallel	98	9.9	164	16.5	38	3.8	0	0.0	300	30.3
Group	96	9.7	128	12.9	253	25.5	24	2.4	501	50.6
Total	270	27.2	360	36.3	336	33.9	25	2.5	991	100.0

Note. n* here referred to the number of observations for 34 children across 39 time frames.

Furthermore, for each play category (cognitive level by social level), within 12 play categories, dramatic/group play occurred the most frequently (25.5%), followed by constructive/parallel (16.5%), and constructive/group (12.9%): these three play types summed

up to over 50% of the observed play with respect to the frequency of occurrence. In addition, three categories of games with rules occurred the least frequently: games with rules/group (2.4%), games with rules/solitary (0.1%), and games with rules/parallel (0.0%). The analysis reveals that qualitatively mature play types for the preschool years are easily found in this study. However, play types of games with rules are not well developed in Taiwanese 4- to 5-year-old children. Table 4-7 summarizes the ranking of the play categories.

Table 4-7

Ranking of Play Categories (n=34)

Play Category	Frequency	%	Ranking within Play Category Based on Frequency
Functional Solitary	76	7.7	6
Functional Parallel	98	9.9	4
Functional Group	96	9.7	5
Constructive Solitary	68	6.9	7
Constructive Parallel	164	16.5	2
Constructive Group	128	12.9	3
Dramatic Solitary	45	4.5	8
Dramatic Parallel	38	3.8	9
Dramatic Group	253	25.5	1
Games with Rules Solitary	1	0.1	11
Games with Rules Parallel	0	0	12
Games with Rules Group	24	2.4	10
Total	991	100	

In addition to play behaviors, children showed non-play behaviors as well. Within the non-play behaviors, about one-half was “unoccupied/onlooking/transition” behavior (51.9%), “others” was 46.6%, and “academic activities” was the least frequent (1.5%). Table 4-8 summarizes the frequency of non-play behaviors.

Table 4-8

Frequency of Non-play Behaviors (n=34)

Unoccupied/Onlooking/Transition		Academic Activities		Others		Total	
Frequency	%	Frequency	%	Frequency	%	Frequency	%
174	51.9	5	1.5	156	46.6	335	100

When considering the 15 categories of play and non-play behaviors together, dramatic/group play was still first (19.1%), followed by unoccupied/onlooking/transition behavior as second (13.1%), constructive/parallel as third (12.4%), others (11.8%) as fourth and constructive/group (9.7%) as fifth (Table 4-9). The results found that in addition to play behaviors, two non-play categories, unoccupied/onlooking/transition behavior and others, were observed frequently during free-play time.

Table 4-9

Ranking of Play and Non-play Categories (n=34)

Play and Non-play Category	Frequency	Percentage	Ranking Within Total Categories
			Based on Frequency
Functional Solitary	76	5.7	8
Functional/Parallel	98	7.4	6
Functional/Group	96	7.2	7
Constructive/Solitary	68	5.1	9
Constructive/Parallel	164	12.4	3
Constructive/Group	128	9.7	5
Dramatic/Solitary	45	3.4	10
Dramatic/Parallel	38	2.9	11
Dramatic/Group	253	19.1	1
Games with Rules/Solitary	1	0.1	14
Games with Rules/Parallel	0	0	15
Games with Rules/Group	24	1.8	12
Unoccupied/Onlooking/Transition	174	13.1	2
Academic Activities	5	0.4	13
Others	156	11.8	4
Total	1326	100	

Analysis of Cultural Context

Research Question Four (The Cultural Context of Children's Play)

This study also focused on the context in which play occurred. Teachers' involvement and children's responses were coded concurrently as contextual variables while observing children's play during free-play time. The results found that teachers were involved in only 6 out of 1,326 observations, and that the children all responded positively to teachers' involvement. The percentage of teachers' involvement was very low (0.4%) for the total observations. Among these six teacher involvements, the teacher was involved as a co-player in three of them, one was an individual guidance role, one was a small group guidance role, and one was encouraging. Teachers showed diverse types of involvement; however, the frequency was extremely low. According to observation, the researcher found that the two teachers in each classroom shared different responsibilities whereby one teacher would communicate with parents to exchange information regarding their child, while the other might participate in an administrative meeting or deal with administrative business. The two of them had little time to stay with the children in class during 8:00 to 9:00 a.m.

Covariate Check

Children's verbal ability was the other concern in this study. The PPVT-T was employed to examine each child's verbal ability. The analysis found a mean of 74.4 (SD=15.7). The minimum score was 45 and the maximum 99. According to the established norm published in the test manual, all participating children were normal in their developing verbal ability. The PPVT-T scores showed a normal distribution (skewness=-0.2; kurtosis=-0.9).

Before analyzing the relationship between play and self-regulation variables, a covariate check was analyzed first. The PPVT-T was used to examine children's verbal ability, which

was anticipated to be a covariate in this study. Thus, the correlation between the PPVT-T and each variable in the study was examined first. While analyzing the correlation, Pearson's product-moment correlation (r) was the test for the relationship between two interval/ratio variables with normal distribution. On the other hand, Spearman's correlation (r_s) was used either between one interval/ratio variable with normal distribution and the other variable without normal distribution, or between two variables without normal distribution at the same time (Glass & Hopkins, 1996; Salkind, 2011). The results indicated that none of the correlations between PPVT-T and each variable in the study were statistically significant (Table 4-10). Thus, the PPVT-T score was not used as a covariate in the following analysis.

Table 4-10

Relations of PPVT-T with Each Variable (n=34)

	Day / Night	Tapping	Location	Content	SR Observation	Teacher Evaluation	Funct. / Sol.	Funct. / Par.	Funct. / Grp.	Con. / Sol.	Con. / Par.	Con. / Grp	Dra. / Sol.
PPVT-T	.15	.33	.02	.24	-.01	-.07	.04	-.05	-.32	-.08	.16	.13	.20
	Dra. / Par.	Dra. / Grp	Unoccupied/ Onlooking/ Transition	Academic Activities	Others	Funct.	Con.	Dra.	Games with Rules	Sol.	Par.	Grp.	
PPVT-T	-.10	-.04	-.03	.08	.20	-.20	.23	-.20	.19	.14	.02	-.23	

Note. A. Funct.=Functional Con.=Constructive Dra.=Dramatic Sol.=Solitary

Par.=Parallel Grp.=Group

B. Regular font = Spearman's Correlation; bold = Pearson's Correlation

C. No correlation was significant at $\leq .05$ alpha level

Analysis of the Relationship between Play Variables and Self-regulation Variables

Research Question Five (The Relationship Between Play Types and Executive Function)

In order to answer research question five, correlations were employed to test the association between the executive function tasks and each play variable (Table 4-11). Because the skewnesses of the day/night tasks and the tapping tasks were -2.7 and -1.4 respectively, indicating a non-normal distribution, although some play variables were normal distribution, Spearman's correlation was used (Glass & Hopkins, 1996; Salkind, 2011). The results indicated that significant correlation was not found between the day/night tasks and any play variable ($p > .05$), and nor any significant correlation between the tapping tasks and any play variable. In other words, statistically significant relationships were not found between these executive function tasks and each play variable in this study.

Table 4-11

Relations of the Executive Function Tasks with Each Play Variable (n=34)

	Funct. / Sol.	Funct. / Par.	Funct. / Grp.	Con. / Sol.	Con. / Par.	Con. / Grp	Dra. / Sol.	Dra. / Par.	Dra. / Grp	Unoccupied/ Onlooking/ Transition
Day/Night	.33	.04	-.20	.03	-.30	-.27	-.01	.18	-.19	.17
Tapping	.09	-.03	-.09	.19	.07	-.05	.30	.04	-.09	-.06
	Academic Activities	Others	Functional	Constructive	Dramatic	Games with Rules	Solitary	Parallel	Group	
Day/Night	.20	.15	.06	-.22	-.16	.11	.26	-.26	-.32	
Tapping	.18	.20	-.05	.09	.02	-.04	.32	-.04	-.22	

Note. A. Funct.=Functional Con.=Constructive Dra.=Dramatic Sol.=Solitary

Par.=Parallel Grp.=Group

B. No correlation was significant at .05 level.

Research Question Six (The Relationship Between Play Types and Theory of Mind)

To answer research question six, correlations were used to examine the association between the theory of mind tasks and each play variable (Table 4-12). Again, Pearson's correlation was calculated for a pair of variables with normal distribution, and Spearman's was used when one or two variables of a pair did not have normal distribution. The analysis uncovered a negative relationship between the location tasks and constructive/solitary play ($r_s = -.44$, $p < .01$), a positive relationship between the location tasks and dramatic/group play ($r_s = .36$, $p < .05$), and a positive relationship between the content tasks and dramatic/solitary play ($r_s = .36$, $p < .05$). In other words, the two theory-of-mind tasks were positively associated with play types which implement higher representational abilities and negatively associated with a play type that is the lack of social interaction.

Table 4-12

Relations of the Theory of Mind Tasks with Play Variables (n=34)

	Funct. / Sol.	Funct. / Par.	Funct. / Grp.	Con. / Sol.	Con. / Par.	Con. / Grp	Dra. / Sol.	Dra. / Par.	Dra. / Grp	Unoccupied/ Onlooking/ Transition
Location	.01	-.18	-.09	-.44**	-.24	-.15	-.05	.19	.36*	.19
Content	.06	.12	.03	.11	-.23	-.16	.36*	.21	-.06	.19
	Academic Activities	Others	Functional	Constructive	Dramatic	Games with Rules	Solitary	Parallel	Group	
Location	-.10	.07	-.15	-.31	.27	.27	-.32	-.13	.18	
Content	-.18	.20	.05	-.11	-.07	-.05	.31	-.16	-.22	

Note. A. Funct.=Functional Con.=Constructive Dra.=Dramatic Sol.=Solitary

Par.=Parallel Grp.=Group

B. Regular font = Spearman's Correlation; bold = Pearson's Correlation

C. * significant at .05 level; ** significant at .01 level

Research Question Seven

(The Relationships Between Play Types and Behavioral Self-regulation)

To answer research question seven, correlations were also used to examine the relationships between behavioral self-regulation variables and play variables (Table 4-13). The results indicated a significant negative relationship between SR observation and constructive/parallel play ($r_s = -.38$, $p < .05$). In addition, a negative association was found between teacher evaluation and constructive/group play ($r = -.42$, $P < .05$), while a positive relationship was found between teacher evaluation and unoccupied/onlooking/transition behavior ($r_s = .49$, $p < .01$). Furthermore, the results also showed a negative relationship between teacher evaluation and group play ($r = -.51$, $p < .05$). To summarize, SR observation in a specific domain, group time, is negatively associated with a less mature play type, while teachers' evaluations of children's SR in general domains are negatively related to group play and positively related to unoccupied/onlooking/transition behavior.

Table 4-13

Relations of Behavioral Self-regulation Variables with Play Variables (n=34)

	Funct. / Sol.	Funct. / Par.	Funct. / Grp.	Con. / Sol.	Con. / Par.	Con. / Grp.	Dra. / Sol.	Dra. / Par.	Dra. / Grp.	Unoccupied/ Onlooking/ Transition
SR Observation	.01	-.02	.03	-.11	-.38*	-.18	-.08	.07	.21	-.01
Teacher Evaluation	.14	-.10	-.13	.32	.10	-.42*	.06	-.11	-.23	.49**
	Academic Activities	Others	Functional	Constructive	Dramatic	Games with Rules	Solitary	Parallel	Group	
SR Observation	-.02	.20	-.00	-.29	.17	.01	-.05	-.31	.19	
Teacher Evaluation	.17	-.26	-.08	-.03	-.19	-.05	.19	.06	-.51**	

Note. A. Funct.=Functional Con.=Constructive Dra.=Dramatic Sol.=Solitary

Par.=Parallel Grp.=Group

B. Regular font = Spearman's Correlation; bold = Pearson's Correlation

C. * significant at .05 level; ** significant at .01 level

Because this study is interested in the Taiwanese cultural context, the three significant results involving teacher evaluation and play variables were examined further using the six culturally sensitive items of the SCRS (Table 4-14). The correlation analyses showed that item 7, “Won’t interrupt inappropriately” was positively related to unoccupied/onlooking/transition behavior ($r_s=.51, p<.01$), though negatively related to group play ($r=-.54, p<.01$). Moreover, item 11, “Wait in line patiently” was negatively related to constructive/group play ($r=-.35, p<.05$) while positively related to unoccupied/onlooking/transition behavior ($r_s=.41, p<.05$). In addition, item 12, “Sit still” was negatively related to Constructive/Group Play ($r=-.47, p<.01$) and positively related to unoccupied/onlooking/transition behavior ($r_s=.44, p<.01$). Finally, item 30, “Won’t disrupt games” was negatively related to group play ($r=-.45, p<.01$). In sum, unoccupied/onlooking/transition behavior had a positive relationship with items related to being quiet and alone, and group play was negative related to the “Won’t interrupt inappropriately” item.

Table 4-14

Relations of Culturally Sensitive Items in SCRS with Play Variables (n=34)

	Con./ Grp.	Unoccupied/ Onlooking/ Transition	Group Play
7. Won't interrupt inappropriately	-.31	.51**	-.54**
9. Follow instructions	-.04	.08	-.04
11. Wait in line patiently	-.35*	.41*	-.27
12. Sit still	-.47**	.44**	-.30
27. Play well with peers	-.29	.29	-.20
30. Won't disrupt games	-.19	.23	-.45**

Note. A. * Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

B. Regular font = Spearman's Correlation; bold = Pearson's Correlation.

Summary of Chapter 4

In this section, the findings of the seven research questions are presented. Descriptive statistics and correlations were employed in the data analyses. The results are summarized as follows.

Research Question One (The Development of Cognitive Self-regulation)

The median score of the day/night tasks was 15 out of 16, and that of the tapping tasks was 14 out of 16. These results demonstrated a ceiling effect for both the day/night tasks and the tapping tasks in this study. On the contrary, the median score for the location tasks was 0 out of 2. This result indicated that a floor effect existed for the location task, which was hard

for Taiwanese 4- to 5- year-old children to pass. The results for the content tasks suggested that the false belief of contents ability was still developing for Taiwanese 4- to 5- year-old children.

Research Question Two (The Development of Behavioral Self-regulation)

The results of SR observation showed a mean score of 3.5 on a 5-point Likert-type response scale. In other words, children regulated themselves fairly well during group time and paid attention to the teacher in general. In addition, the mean score of the teacher evaluation was 4.5 on a 7-point Likert-type response scale, showing that after observing them for one semester, teachers generally thought that children could control their impulsivity and regulated themselves well in class.

Research Question Three (The Play Types)

When examining the cognitive levels of play, the results found that constructive play happened most often, followed by dramatic play and functional play, and that games with rules were the least observed. While analyzing the social levels of the play, about one-half was group play, approximately one-third was parallel play, and the least was solitary play. These findings suggest that the most often seen cognitive and social levels of play in Taiwanese children aged 4 to 5 were constructive play and group play. Furthermore, when examining each among the 12 play categories, dramatic/group play occurred most frequently, followed by constructive/parallel, and then constructive/group: these three play types summed up to over 50% of the observed play with respect to the frequency of occurrence. Comparatively mature play types for the preschool years were often observed in this study. However, the play types of games with rules were not well developed in Taiwanese 4- to 5-year-old children.

Research Question Four (The Cultural Context of Children's Play)

Teachers showed diverse types of involvement; however, their frequency of involvement in children's play was extremely low (0.4%). Moreover, children all responded positively to teachers' involvement.

Research Question Five (The Relationship Between Play Types and Executive Function)

Significant correlation was not found between the day/night tasks and any play variable, nor between the tapping tasks and any play variable.

Research Question Six (The Relationship Between Play Types and Theory of Mind)

The results revealed a negative relationship between the location tasks and constructive/solitary play and a positive relationship between the location tasks and dramatic/group play, as well as a positive relationship between the content tasks and dramatic/solitary play. In other words, the two theory-of-mind tasks were positively associated with play types that exert higher representation abilities, and negatively associated with a play type which was the lack of social interaction.

Research Question Seven

(The Relationships Between Play Types and Behavioral Self-regulation)

A significant negative relationship was found between SR observation and constructive/parallel play. In addition, a negative association was found between teacher evaluation and constructional/group play, while a positive relationship was found between teacher evaluation and unoccupied/onlooking/transition behavior. Furthermore, the results also showed a negative relationship between teacher evaluation and group play. To summarize, SR observation in a specific domain, group time, is negatively associated with a less mature

play type; while teachers' evaluation of children's SR in general domains are negatively related to group play and positively related to unoccupied/onlooking/transition behavior.

In sum, this study uncovered that Taiwanese children aged 4 to 5 were advanced in their development of executive function, but slower at the development of theory-of-mind understanding compared to their American age-mates. Constructive play and group play were often observed, and teachers were not involved in children's play most of the time. A significant relationship was not found between executive function and play; however, a positive relationship was revealed between comparatively mature play types and theory-of-mind understanding. In addition, a negative relationship was found between teacher evaluations and group play.

Chapter 5

Discussion

The purposes of this chapter are to discuss the findings described in Chapter 4, to indicate the contributions and limitations of this study, and to provide recommendations for practice and future research. This chapter is organized as follows: (1) Discussion of Findings; (2) Contributions; (3) Limitations; (4) Recommendations for Practice and Future Research; and (5) Summary of Chapter 5.

Discussion of Findings

Research Question One

What is the developmental status of cognitive self-regulation, i.e., executive function and theory of mind, for Taiwanese 4- to 5-year-old children?

Two executive function tasks, the day/night task and the tapping task, were examined in this study. With a high correct percentage for these two tasks, the results show that Taiwanese young children aged 4 to 5 performed at the level of a ceiling effect in the EF tasks used in the study. The findings revealed a median score of the day/night task was 15 out of 16, or 94% correct, and that of the tapping task was 14 out of 16, or 88% correct. Although the findings revealed a lower correct percentage in the tapping tasks than that in the day/night tasks, this difference may be because the study examined the day/night tasks first. Due to this order effect on a total of nearly 20-minute testing, it is expected that the children may have deteriorated in their performance of the later tasks.

Table 5-1 summarizes a comparison of the percentage correct of the day/night tasks in

four studies. Compared to a classical day/night task study conducted by Gerstadt, et al. (1994), Taiwanese children outperformed their American counterparts. In Gerstadt et al.'s study, the age groups equivalent with this Taiwanese study were 4, 4.5, and 5 years, and their percentages correct were 69, 63 and 78 respectively. A more recent study by Jahromi and Stifter (2008) showed a similar result. They found that American children aged 4.5 were 66 percent correct. These two studies showed that American children aged 4-5 had a correct percentage below 80. However, Taiwanese young children responded 94% correctly in these tasks. When examining Oh and Lewis's (2008) study, Korean children also revealed a high correct percentage, which was 93 for 4-year-olds and 96 for 4.5-year-olds. Another study (Sabbagh et al., 2006) conducted with Chinese children also showed a performance on par with that of US children who were on average 6 months older, although the study did not provide information about the percentage correct. These studies tend to show an advanced developmental pace in the day/night tasks in Asian children, i.e., Taiwan, Korea, and China, when compared to American children.

Table 5-1

Comparison Among the Percentage Correct of Day/Night Tasks in Four Studies

Study/Sample	Age/Sample Size	Mean/Median Percentage Correct
Gerstadt, Hong, & Diamond (1994)	4 Years (n=10)	69
American Children	4.5 Years (n=20)	63
	5 Years (n=17)	78
Jahromi & Stifter (2008)	4.5 Years (n=92)	66
American Children		
Oh & Lewis (2008)	4 Years (n=22)	93
Korean Children	4.5 Years (n=17)	96
This Study	4-5 Years (n=34)	94
Taiwanese Children		

Note. No information from other studies regarding the skewness could be obtained. In this study, a median correct percentage was used due to a skewed distribution. However, in a normal distribution, the mean and median have the similar value.

When examining the results of the tapping tasks, the results are similar, in that Asian children had better performance than their American counterparts did (Table 5-2). Diamond and Taylor (1996) found American children aged 4, 4.5, and 5 had a correct percentage of 79, 72, and 87 respectively. In a 2008 study, Jahromi and Stifter found that 4.5-year-old American children had 73 percentage correct with the tapping tasks. Though American children performed better in the tapping tasks than in the day/night tasks (Diamond & Taylor, 1996; Jahromi & Stifter, 2008; Passler, Issac, & Hynd, 1985), Asian children from Taiwan and Korea still had a higher correct percentage in the tapping tasks. For example, Taiwanese 4- to

5-year-old children had a correct percentage of 88 (this study). Korean 4-year-old children had a correct percentage of 88 and Korean 4.5-year-olds of 91 (Oh & Lewis, 2008). These findings also revealed higher performance on the tapping tasks for Taiwanese and Korean young children than for their American counterparts.

Table 5-2

Comparison Among the Percentage Correct of Tapping Tasks in Four Studies

Study/Sample	Age/Sample Size	Mean/Median Percentage Correct*
Diamond & Taylor (1996)	4 Years (n=12)	79
American Children	4.5 Years (n=7)	72
	5 Years (n=14)	87
Jahromi & Stifter (2008)	4.5 Years (n=92)	73
American Children		
Oh & Lewis (2008)	4 Years (n=22)	88
Korean Children	4.5 Years (n=17)	91
This Study	4-5 Years (n=34)	88
Taiwanese Children		

Note. *No information from other studies regarding the skewness could be obtained. In this study, a median correct percentage was used due to a skewed distribution. However, in a normal distribution, the mean and median have the similar value.

Why do Taiwanese children perform better than their American counterparts on these two tasks? On one hand, it might relate to genetic reasons; on the other hand, cultural difference might play an important role. First, some studies have addressed how genetic factors were related to attention-deficit hyperactivity disorder (ADHD; Faraone, Doyle, Mick,

& Biderman, 2001; Swanson et al., 1998), which was linked to poor executive functioning (Barley, 1997; Schachar, Tannock, Marriot, & Logan, 1995). The genetic pattern of ADHD was shown to be more prevalent in the US, at 48%, than in the East Asia, at 1.9% (Chang, Kidd, Livak, Pakastis, & Kidd, 1996). Due to this connection, there might be a genetic influence on the executive function tasks for Taiwanese young children. Although there are disagreements regarding the causes of ADHD, some scholars believe that ADHD is a social construct which is shaped through the process of socialization. I do not have in-depth knowledge to discuss genetic factors or the causes of ADHD. Therefore, I will turn the attention to cultural influences. In the tradition of Confucianism which values respect for elders and obeying authority figures such as parents and teachers, children are instructed by parents to master their impulsivity beginning as young as two years old, much earlier than American parents do (Chen et al., 1998; Ho, 1994; Wu, 1996). It was also found to be the same situation in preschool practices. Tobin et al. (1989) found that impulse control was more highly valued and encouraged in Chinese preschool settings than it was in Americans' settings. In other words, Taiwanese children have more cultural opportunities and were constantly reinforced to exert executive function.

Turning to the findings on the two theory of mind tasks, location and content, we see a different story. The median score for the location tasks was 0 out of 2, suggesting a floor effect; the location task was very difficult for Taiwanese 4- to 5- year-old children to pass in the present study. As for the content task, data suggested that the false belief of content ability was higher but still developing for Taiwanese 4- to 5- year-old children. These findings are consistent with other Taiwanese studies (Table 5-3): location tasks are evidently more difficult for Taiwanese young children to pass than the content tasks (Wu, 2000; Huang, 2000; Wang, 2005). Although the three studies listed in Table 5-3 compared different age-groups, the pass rate across age-groups on the location tasks was lower than it was on the content tasks.

Table 5-3

Comparisons of the Pass Rate in the Theory of Mind Tasks Among Three Taiwanese Studies

Study	Task	Age (Year)	Pass Rate (%)
Wu (2000)	Location	3.5-4.5	32
		4.5-5.5	58
	Content	3.5-4.5	41
		4.5-5.5	77
Huang (2000)	Location	5-6	24
	Content	5-6	54
This Study	Location	4-5	32.6
	Content		60.9

Why are content tasks easier than location tasks for Taiwanese young children to pass? Perhaps the reason is related to the different concepts assessed by the two tasks. In the location tasks, the researcher asked about the understanding of “others”; for example, “Where will Tom try to find Doggie, kitchen or living room?” On the other hand, in the content tasks, the researcher asked about both the understanding of “self” and “others”. For example, “Could you tell me what you thought it was inside the box before I opened it?” (self-understanding). “What if your brother sees the box, what will he think it is inside the box?” (other-understanding). Harris (1992) explained from a stimulation theory perspective that first-person experiences are immediate and vivid, which not only informs one’s own understanding but also stimulates the understanding about others. Thus, self-understanding is easier to reach and can serve as a building block to other-understanding. It is not surprising that young children in the same age group passed the content tasks more readily than they did

the location tasks.

Many studies (Flavell, 2004; Jenkins & Astington, 1996) have confirmed the trend that most 3-year-old American children tend to fail the false belief tasks, while 4-year-olds tend to pass. Compared with American children, Taiwanese children in this study are behind in their development of theory of mind. My data are similar to the finding from Tsou (2005). Other studies have also shown this pattern of performance on the theory of mind tasks across different cultures. For instance, Wellman, et al. (2001) conducted a meta-analysis with theory of mind studies across seven cultures, and they concluded a developmental trajectory in the preschool years, but with a different pace across different cultures. They used the results from US and UK children as a baseline and found that Korean children performed similarly, while Australian and Canadian children performed somewhat better, and those in Austria and Japan performed somewhat worse. In another study, Liu et al. (2008) also did a meta-analysis of false belief tasks across America, Canada, China, and Hong Kong. They concluded that the timing of development for children in China and those in the US is very similar; however, Canadian children develop earlier than Chinese and US children do, whereas Hong Kong children develop much later. The differences in timing do not have a straightforward cultural explanation, especially when examining the results from those countries sharing the same Confucian culture like Taiwan, China, Hong Kong, Korea, and Japan. Some (e.g., China and Korea) are similar to the US, while other results (Taiwan, Hong Kong, and Japan) are not. This points to other factors which are more specifically linked to children's ecology like siblings, parenting styles, and parental SES. This can be explored in future studies.

Research Question Two

What is the developmental status of behavioral self-regulation, measured by observations in group time and teacher evaluations, for Taiwanese 4- to 5-year-old children?

Behavioral self-control was assessed both by observation during group time (SR observation), which was a 30-minute group time or a 50-minute extra English class, and by teacher evaluation at the end of fall semester 2009. Taiwanese 4- to 5-year-old children generally regulated themselves fairly well in group time for a long period and paid attention to the teacher. Furthermore, the results of the teacher evaluations showed that after observing them for one semester, teachers thought in general that the children could control their impulsivity and regulate themselves well in class. The SR observation analysis indicated that participating children typically behaved between ‘follows teacher visually’ and ‘follows teacher, facial expression shows interest.’

That 4- to 5-year-old Taiwanese children are good at paying attention to teachers’ instructions can be related to the development of their executive function. As Rueda, Posner, and Rothbart (2004) explained from a neurological perspective, the neural functions of attention overlap with those of executive function. Children with good executive function are expected to have the same progress in their attentive behavior. Moreover, teachers’ playful pedagogy may be another factor that keeps children being attentive. Studies (Sohlberg, McLaughlin, Pavse, Hedrick, & Posner, 2000; Sturm, Williams, Orgass, & Hartje, 1997) have shown that instruction or training can enhance attentive behaviors effectively. According to the observations made by the researcher, during group time the teachers were using several playful pedagogies such as dancing, singing, games, drawing, and group discussion, and they were also using behavioral modification skills like tokens and time-out to keep children being

attentive.

Lastly, the Confucian cultural tradition plays an important role. Morality and proper conduct are the emphasis in the Chinese normative tradition. Many ancient standard ritual texts such as *The Books of Rites (Li-chi)* and *A Myriad Rites for the Family (Chu-chia ts'a-i)* addressed the proper behaviors in ceremony and at home. Especially after the Ming Dynasty, a system to serve as a government official by passing examinations was developed. Academic achievement has become an important goal to cultivate the young under this cultural impact.

Accordingly, three important characteristics were observed in early childhood education in late-imperial China under this normative perspective (Hsiung, 2000):

(1) Academic achievement as a life goal: academic achievement was not only a symbol of prestigious social status, but it also brought economics benefits. Thus, social mobility attracted parents from all levels to make efforts to cultivate their child from an early age.

(2) To keep a child silent rather than active: in order to reach the goal of academic achievement, adults would encourage young children to sit still and pay attention to study rather than to play outside with peers. They thought that to cultivate good attentive habits as early as possible was beneficial to their children's future success.

(3) Only one interest is encouraged: Chinese adults treated learning as the only interest allowed for their children. Other interests such as physical games, outdoor play, or even reading leisure books were not encouraged.

As reflected above, adults' expectations were very clear—to stay focused on academic success. Multiple influences from the government system, from social norms, and from the family all strove for a good early start to cultivate traits of hard work and discipline in the young. These characteristics are still often seen in modern Taiwan, even as many adults are influenced by Western early childhood education philosophy to honor the value of play and allow their children to play. However, they usually treat children's play as serving the purpose

of learning. Under this cultural cultivation, Taiwanese young children are taught beginning at a very young age to inhibit their impulsivity in order to conform to the social norms to pay attention to and obey adults' instructions. Hence, my finding that Taiwanese children aged 4 to 5 could be attentive in a 30-minute group time or in a 50-minute extra English class is not surprising. It is not unexpected to learn that their teachers rated the children as reasonably well-regulated and able to control their impulses after observing them for one semester. Moreover, consider further that these participating children were all new enrollees in their first semester; they have been already cultivated by the normative cultural context to practice self regulation and fit the social norm from a very young age.

Research Question Three

What are the play types of Taiwanese 4- to 5-year-old children?

When examining the cognitive levels of play, analysis showed that constructive play happened most often, followed by dramatic play and functional play, with the least observed in this study being “games-with-rules” play. Other studies (Pan, 1991; Rubin et al., 1978) have also suggested that constructive play happens most often in Taiwanese and American preschoolers (Table 5-4). In an American study, Rubin et al. (1978) found that in preschoolers, constructive play took place the most, followed by solitary play and dramatic play. Pan (1991) observed 62 Taiwanese children aged 41-78 months and found the same pattern. In other words, constructing with blocks or Legos, drawing, or playing with dough or clay are the modal play types in preschools across Taiwan and the US. Teachers encourage these cognitive types of play. Constructive play requires mental participation, which is valued as a preparatory ability to learning and is encouraged under Chinese and American cultural values. Abundant constructive materials like blocks, construction kits and train/rail kits, and fine-arts materials like crayons, paper, and scissors are put in classrooms to encourage children's play.

The second most observed cognitive level of play in both Pan's and Rubin's studies was functional play, followed by dramatic play as third. My study, however, revealed a reverse pattern—dramatic play was more prevalent than functional play. This might reflect a better representational ability in Taiwanese young children than that found 20 years ago in Pan's study, or than that in American children found 30 years ago in Rubin et al.'s study. According to my observations, children would pretend to be a transformer or a superhero, or they would interact as a group to play house. These pretending abilities reflect a higher level of cognitive development than does manipulating objects in functional play. In addition, this finding might be due to the classroom arrangement (see Appendix K). The two classrooms where the researchers observed included five activity corners: pretending, blocks and construction, cutting and drawing, story books, and games. The researchers found that children's pretense happened most in the pretending corner, and then in the blocks and construction corner. Taiwanese young children were easily attracted by the rich materials in the classroom and performed pretending frequently.

Finally, the play type of games with rules, which relates to memorizing and adhering to rules, becomes increasingly popular in school-age children (Johnson et al., 2005). It is expected to start developing in the preschool years with simple and easy forms. This play type was the least observed in my study.

Table 5-4

Comparison of the Percentage and Ranking of Cognitive Level of Play Among Three Studies

Cognitive Level of Play	Pan (1991)		Rubin et al. (1978)		This Study	
	Taiwanese Children		American Children		Taiwanese Children	
	41-78 months		45-59 months		48-60 months	
	n=62		n=27		n=34	
	%	Ranking	%	Ranking	%	Ranking
Functional Play	29.7	2	20.7	2	27.3	3
Constructive Play	52.9	1	60.0	1	36.3	1
Dramatic Play	14.7	3	17.2	3	33.9	2
Games with Rules	2.7	4	2.3	4	2.5	4

The results from analyzing the social levels of children's play revealed that about one-half was group play, approximately one-third was parallel play, and the least frequent was solitary play. The most often seen social level of play in Taiwanese children aged 4 to 5 was group play; in other words, children interacting with each other was more often observed than children playing alone or in parallel fashion. This result is similar to Rubin et al.'s (1978) finding, but differs from Pan's (1991). Pan found the most frequent type of social play to be parallel play, followed by solitary play and then group play (Table 5-5). The difference between the two Taiwanese studies might due to better social development in young children in recent years.

Table 5-5

Comparison of the Percentage and Ranking of Social Levels of Play Among Three Studies

Social Level of Play	Pan (1991)		Rubin et al. (1978)		This Study	
	Taiwanese Children		American Children		Taiwanese Children	
	41-78 months		45-59 months		48-60 months	
	n=62		n=27		n=34	
	%	Ranking	%	Ranking	%	Ranking
Solitary Play	30.0	2	28.9	3	19.2	3
Parallel Play	51.5	1	30.5	2	30.3	2
Group Play	18.5	3	40.6	1	50.6	1

Examining each play type within the 12 play types, we see that dramatic/group play occurred most frequently, followed by constructive/parallel and constructive/group: these three play types summed up to over 50% of the observed play with respect to the frequency of occurrence, similar to Rubin et al.'s finding (Table 5-6). More mature play types in the preschool years were often observed in this study.

More study of the types of play among preschoolers is needed. I noticed a frequent shifting back and forth between parallel and group play during both constructive and dramatic play during my observations. Due to the time-sampling requirement in this quantitative study, the researcher coded a child's behavior in 15-second intervals and did not observe a child long enough to catch the whole picture and observe a total play script. I noticed that children would construct a train rail alone and interact with other child to talk about the plan of the train-rail construction. Thus, when children built the rail separately and were observed by a time-sampling method, they would be coded as constructive/parallel play; whereas actually

they might work on an agreed goal and it should be considered constructive/group play in essence. This method of coding based on quantitative observation targets the segments of children's play behaviors, but loses the overall theme of the play. Future research can help to clarify the close link between parallel and group play. Nevertheless, in my study the first three play types were a combination of constructive and dramatic play, and of parallel and group play, suggesting that comparatively mature play types were popular among Taiwanese young children in this study.

Table 5-6

Comparison of the Percentage and Ranking of Play Types Among Three Studies

Social Level of Play	Pan (1991)		Rubin et al. (1978)		This Study	
	Taiwanese Children		American Children		Taiwanese Children	
	41-78 months		45-59 months		48-60 months	
	n=62		n=27		n=34	
	%	Ranking	%	Ranking	%	Ranking
Funct./Sol.	12.9	3	9.6	5	7.7	6
Funct./Par.	12.3	4	8.2	6	9.9	4
Funct./Grp	4.5	6	2.9	7	9.7	5
Cons./Sol.	14.3	2	17.0	3	6.9	7
Cons./Par.	35.1	1	20.6	2	16.5	2
Cons./Grp.	3.5	8	22.4	1	12.9	3
Dra./Sol.	2.8	9	2.4	8	4.5	8
Dra./Par.	4.1	7	1.7	10	3.8	9
Dra./Grp.	7.8	5	13.1	4	25.5	1
Games with Rules	2.7	10	2.3	9	2.5	10

Note. a. Funct.=Functional Con.=Constructive Dra.=Dramatic Sol.=Solitary

Par.=Parallel Grp.=Group

Unoccupied/onlooking/transition behavior is another grouping of activities in this study worthy of further study. Combining play and non-play categories together brings out that this grouping of three together was the second most often seen activity in this study: the frequency percentage was 13.1%. In Rubin et al.'s study, it was the fifth often seen activity (9.0%).

Unoccupied behavior was coded when children appeared to do nothing and did not seem to be watching others, as in aimlessly wandering around the room. Onlooker behavior was defined as when children watched others and seemed to take an interest in their play. Transition behavior was observed when children moved from one activity to another. The three have common characteristics in that they are not play activities and are quiet. The Chinese cultural pursuit of a silent and sitting-still child, rather than an active child, might be one of the reasons to encourage children to be unoccupied, an onlooker, or in a transition moment.

Research Question Four

How are teachers involved in play and how do children react to teachers' involvement?

This study included attention to the context in which play occurred. Teachers' involvement and children's responses were coded as contextual variables concurrently while observing children's play during free play time. The results showed that teachers were involved in only 6 out of 1,326 observations, and that children responded positively to each of the very rare instances of teachers' involvement. The percentage of teachers' involvement was extremely low for the total observation (0.4%), although they showed diverse types of involvement.

This brought about a further analysis to see how play was treated in relation to the teachers' role in this kindergarten. The kindergarten routines across the day were scheduled from 9:00 a.m. to 15:50 p.m. daily with no free-play time (see Appendix L). Teachers were permitted to adjust their curriculum flexibility. When I asked teachers in the two classrooms about their adjustment, teachers in one classroom responded that they would try their best to arrange a half-hour break daily for children to play freely in a play room with many physical facilities like bikes, jump ropes, slides, and climbing to have fun. However, this did not happen in the

other classroom. Also, note that when I asked for a free-play time in order to observe, the director of the kindergarten only allowed from 8:00-9:00 a.m. She mentioned her concerns that the observation might interfere with teachers' teaching during the regular curriculum hours. It is typical in the public kindergartens in Taiwan to not schedule a free-play time on a daily-routine basis, but to allow children to play freely indoors before and after class. Note, however, that physical exercise, emphasized for health reasons, was arranged for twice a week in the program's schedule.

In addition to these schedule constraints, every teacher in the kindergarten had certain administrative responsibility in addition to being a classroom teacher. Thus, teachers typically use the time before class to deal with those issues. According to my observations, the two teachers in each classroom took turns and shared different responsibilities: one teacher would communicate with parents to exchange information regarding their child, and the other might participate in an administrative meeting or deal with administrative issues. The two of them had little time to be involved in children's play between 8:00 and 9:00 a.m.

To sum up, due to the school regulations, no free-play time was arranged in the daily schedule, and every teacher had to share certain administrative responsibilities, so teachers were not able to be involved in children's free-play. This is a common situation in kindergartens in Taiwan.

Research Question Five

Is there any relationship between specific types of play and executive function in Taiwanese 4- to 5-year-old children?

A significant correlation was not found between the day/night tasks and any play variable, nor between the tapping tasks and any play variable. Taiwanese 4- to 5-year-old children were so good at the measures of the day/night and tapping tasks that the percentage of correct responses was around 90 in this study. The variations between children's performance were very low. A correlation calculates the difference between an observed value and mean value (Field, 2000; Glass & Hopkins, 1996). Very little covariation in one variable makes it difficult to find an association with the second variable. Thus, the ceiling performance of executive function in Taiwanese young children is the reason we find a lack of significant correlation here.

Research Question Six

Is there any relationship between specific types of play and theory of mind in Taiwanese 4- to 5-year-old children?

Analysis revealed a negative significant relationship between the location tasks and constructive/solitary play, and a positive relationship between the location tasks and dramatic/group play. In addition, a positive relationship occurred between the content tasks and dramatic/solitary play. In other words, the theory of mind task scores were negatively associated with play lacking in social interaction and positively related to play demanding symbolic representational ability.

Examples of constructive/solitary play include playing blocks or drawing alone. When lacking in experiences of interacting with others, children have little chance to understand

others' beliefs, intentions, or emotions. Therefore, opportunities for social play may be present but children do not use them. It is understandable that a negative relationship was found between play lacking in social interaction and the theory of mind task.

Dramatic play may involve more sophisticated representational abilities than functional play or constructive play. In pretense, for example, children may role-play being a teacher. They enact make-believe transformations like pretending a box is a car. "Theory of mind" refers to an understanding of one's and others' mental states like beliefs, intentions, and emotions. Scholars (Leslie, 1987; Lillard, 1993; Plaut & Karmiloff-Smith, 1993) have indicated that pretense shares some similar cognitive abilities with theory-of-mind ability. Lillard (1993) pointed out three skills that are implicated in both of them: (1) the ability to represent one object as two things at once; (2) the ability to see one object as representing the other; and (3) the ability to represent mental representations. Leslie (1987) proposed a meta-representation model to stress the representational mechanism underlying pretense and understanding others. The meta-representational system functions by separating the pretend worlds from the real worlds so that children can internally represent the external environment.

Empirical studies support the notion that pretense and theory-of-mind ability share some similar cognitive abilities. For example, observer ratings of imaginativeness and transformation in play were related to the success rates for the theory of mind task (Schwebel, Rosen, & Singer, 1999). Additionally, the mental state lexicon has been associated with the theory of mind and pretense (Nielsen & Dissanayake, 2000). Therefore, shared cognitive abilities are a possible reason that a positive relation was found between theory of mind tasks and dramatic play in this study.

Another reason that explains the relationship between pretense and theory-of-mind ability is that both of them facilitate the development of each other. On one hand, dramatic play enhances children's ability to feel affects and desires they may not currently have, and to

imagine states of worlds not currently existing. These abilities lead to the development of theory of mind, which allows children to have a better understanding that others may not have the same feelings and beliefs as they do. In short, dramatic play may enhance the development of theory-of-mind ability (Harris, 1991). Also, false-belief understanding may facilitate pretending. Developing an understanding of others changes the nature of children's play. For example, the ability to represent multiple beliefs might lead to generating explicit joint plans and making specific role assignments in pretend play. Jenkins and Astington (2000) revealed that theory-of-mind understanding predicted joint planning and role assignment in pretend play. Thus, the relationship between pretend play and theory-of-mind ability is "complex and interdependent" (Jenkins and Astington, 2000).

Although Parten's classic study of social play (1932) described a developmental progression from solitary to parallel to group play, this does not mean that solitary play is necessarily immature in nature. On the contrary, some scholars (Luckey & Fabes, 2005; Moore et al., 1974) have identified some reasons for the idea that solitary play can have a good impact on children's development. Not all solitary play is the same, nor should it be viewed as the least mature play type of social play. It can be more mature than parallel play (Moore et al., 1974; Rubin, 1982; Rubin et al., 1976). Although here I cannot report enough information regarding the qualities of dramatic/solitary play, it is possible that dramatic/solitary play was not immature in this study. Accordingly, the reported positive relationships with the theory-of-mind task of dramatic/solitary play and of dramatic/group play, but not of dramatic/parallel play, make sense. Furthermore, Taylor and Carlson (1997) also pointed out that both solitary and social pretenses are related to theory-of-mind ability.

In sum, lacking of social interaction might be a component underpinning the negative relationship of constructive/solitary play with theory-of-mind ability. Moreover, some shared cognitive abilities or interdependence between pretense and theory-of-mind understanding

may be a component that positively links the two together, as seen in the positive significant correlation between two dramatic types of play and the false belief task.

Research Question Seven

Is there any relationship between specific types of play and behavioral self-regulation in Taiwanese 4- to 5-year-old children?

A significant and negative relationship was found between SR observation scores and constructive/parallel play scores. In addition, a negative association was found between teacher evaluations and constructional/group play, while a positive relationship was found between teacher evaluations and unoccupied/onlooking/transition behavior. Furthermore, the results also showed a statistically significant and negative relationship between teacher evaluations and group play. To summarize, SR observation scores in a specific domain, group time, were negatively associated with less mature play, while teachers' evaluation of children's SR in general domains was negatively related to more mature play types and positively related to unoccupied/onlooking/transition behavior.

Analysis revealed that SR observation was negatively related to parallel play, specifically constructive/parallel play. The more constructive/parallel play a child displayed, the less attentive he/she was in group time. As mentioned, some scholars (Moore et al., 1974; Rubin, 1982; Rubin, et al., 1976) have suggested that parallel and not solitary play is the less mature play form. One reason is the possible positive developmental outcomes of solitary play (Larson, 1990). Another reason is because research suggests that some children alternate between solitary and interactive play as they outgrow a tendency to engage in simple parallel play (Smith, 1978). Parallel and not solo play might be a less mature form of social play. Barnett et al. (2008) and Elias and Berk (2002) have reported that mature play is related to greater improvement in later self-regulation behavior and fewer behavioral problems.

Although my study did not find a significant positive relationship between more mature social play and self-regulation behavior, it did find that less socially mature play was related to less attentive behavior in group time. This result is consistent with other studies (Barnett et al., 2008; Elias & Berk, 2002).

Why did I find a negative correlation between teacher evaluations of self-regulating behavior and group play? This might be due to an early stage of group interaction and the Chinese cultural pursuit. Let me explain. Children in this study were new enrollees at this kindergarten in the fall semester of 2009. The researcher started the observation six weeks after the start of this fall semester, when they were supposed to become adjusted to the new environment, teachers, and classmates. These children engaging in group play required time to learn to deal with conflicts, negotiation, and problem-solving, and they were in an early stage of learning to interact with others. Without teachers' involvement in free-play time, these children had to develop problem-solving ability by themselves, and this would be a long process--more than six weeks. Besides, the researcher noticed that when children needed to be reminded to be attentive in group time, mostly due to their behaviors of initiating interactions with others such as talking to others or playing with others. They were actually seeking interactions, but at the wrong time. This means that the children in my study may have needed time to learn to interact with others in appropriate situations and ways.

The second possible reason for a negative correlation between teacher evaluations of self-regulation behavior and group play might relate to cultural pursuits. One of the goals of Chinese ECE is cultivating a 'silent' child following adults' instructions, paying attention to learning, and not playing. Studies in Taiwan (Ho, 2003; Sun, 1995) did show that first grade teachers expected that children could pay attention to teachings, raise their hands before talking, refrain from quarreling with classmates, and be polite. Considering this cultural impact, the negative relationship of teachers' evaluation of children's self control with group

play would not be unreasonable. The children in this study needed to learn to interact in appropriate ways and situations, and teachers may have reasonably expected a silent and sitting-still child. Child-initiated interaction in the wrong situations and with the wrong timing would be assessed as lacking self-regulation.

Looking into the six culturally sensitive items in the SCRC, only two, items 7 and 30, were significantly and negatively related to group play. In other words, the more group play a child was observed engaging in, the less “Won’t interrupt inappropriately” (item 7) the teacher assessed; also, the more group play, the less “Won’t disrupt games” (item 30). These two situations might reflect children engaging in group play needing to learn to interact in a culturally acceptable way according to the teachers’ views. On the contrary, unoccupied/onlooking/transition behavior may be seen as fooling around, watching others, or taking a break between two activities. Children performing these behaviors would not be interrupting others but keeping quiet, which is encouraged by Chinese cultural values. Thus, the reported positive association of unoccupied/onlooking/transition behavior and teacher evaluations of self control makes some sense. It is recognized, however, that these are post hoc interpretations and not foreseen relations. Further studies are needed to check out my speculations about the Chinese pursuit of “a silent child” being implicated in low teacher regard for child-initiated peer play in group time.

To sum up, this study revealed seven interesting results: (1) Taiwanese children aged 4 to 5 demonstrated an advanced development in the executive function tasks, but were slower in their theory-of-mind understanding compared to their American counterparts; (2) Taiwanese children aged 4 to 5 were attentive in group time in general and were assessed as controlling their impulsivity well by their classroom teacher after one semester of observation; (3) Taiwanese children aged 4 to 5 tended to perform sophisticated social levels of play like group play, and higher cognitive levels of play like constructive and dramatic play; (4)

teachers were not involved in children's play most of the time. This was related to no free-play time in the design of the daily schedule and teachers needing to deal with administrative responsibilities or talk to parents during the time of observation; (5) a lack of relationship between executive function and any type of play was due to the ceiling effect on children's executive function tasks; (6) a positive relationship between two dramatic play types and theory-of-mind understanding might reflect some shared meta-representations existing between the two, and also that play and theory-of-mind understanding can facilitate each other; and (7) unexpectedly, a negative association between group play and teacher evaluations was found. This might reflect an early stage of group play and the Chinese cultural pursuit of "a silent child."

Contributions

This study is exploratory research trying to clarifying the relationship between self-regulation and play in Taiwan. The results could contribute to the following areas.

To provide persuasive cultural evidence to support a play-pedagogy in Taiwan

The study was proposed based on the researcher's educational belief that a play-curriculum, which is not encouraged in the Chinese culture, is valuable in ECE settings. The results of the study provide empirical evidence that dramatic play is closely related to the development of children's theory-of-mind understanding. To advocate a play-curriculum from a self-regulation perspective follows Chinese cultural values that encourage a child to fit into the social norms which focus on harmony and interdependence. This result will be persuasive and acceptable by parents and teachers to adopt a play-pedagogy with a cultural perspective.

To provide timely results to inform ECE research

Self-regulation has become a hot topic recently because of its close relationship to school readiness and future success. Cultivating self-regulation in a play curriculum has been shown to be successful in the Tools-of-Mind program in the US. This study provides timely information evaluating whether certain types of dramatic play are closely related to theory-of-mind understanding in Taiwan.

To give an example to study from a socio-cultural perspective

This study revealed a differently developing pace of self-regulation in Taiwanese young children and pointed out some possible cultural impacts. Moreover, it verified the positive relationship between mature play types and theory-of-mind understanding. Furthermore, this study observed and discussed the difference that unlike American ECE teachers, teachers were not involved in children's free play most of the time in Taiwan. The socio-cultural perspective will contribute to the knowledge of cultural contexts and enhance understanding across cultures.

To provide a research by using multi-measures and multi-sources

This study employed different measures such as scales, observation, and tasks to assess children's self-regulation; in addition, the data were collected from teachers, children, and the researcher. A multi-measures and multi-sources methodology provides more chances to ascertain comprehensive, reliable and valid results.

To inspire further thinking about the influence of Chinese cultural values

The researcher tried to explain the results of this study from a Chinese cultural perspective. It seems that under cultural influences, Taiwanese young children tend to inhibit their impulses very well and show more advanced development than Western children. Paying attention to learn is cultivated by the whole society; thus, executive function is well developed under Chinese cultural contexts. However, play is not encouraged in the traditional pursuit of a silent and sitting-still child. Thus, even though ECE teachers were familiar with Western ECE theories and agreed with a child-centered approach, they could not be involved in children's free play due to practices under the cultural framework including the design of the daily schedule and their administrative responsibilities. This exploratory study provides interesting cultural contextual information which is worthy of further study.

Limitations

Due to its exploratory characteristics, this study was found to have several limitations after it had been conducted. The following discusses the participants and variables accordingly.

Participants

1. Limited age range of the participating children: Due to the age range constrained in kindergartens in Taiwan and some research findings on the development of self-regulation in the US, children of a limited age range were selected for this study.
2. Limited numbers of participating children: Data of only 34 children were analyzed in this study. This study recruited 50 children in the beginning. However, after observation for

one semester, the researcher found that mixed-age classes were different from same-age classes in their social ecology, and had to exclude children from mixed-age classes from the analysis.

Variables

1. An overarching concept of self-regulation ability: Self-regulation ability has many components, which in this study were specified into three: executive function, theory of mind, and behavioral control in this study. Yet, after analysis, the results showed that these three are still too broad to be examined in one study.
2. A constrained free-play time: Due to practical constraints, available time for observing free play was before class began in this study. Participating children did not arrive in class as a whole class at the same time, thus the play dynamic would be interrupted by the coming child, and usually the observers had to wait for 20 minutes until half of the children arrived before starting the observation. Therefore, the observations took a long time and accumulated only approximately ten minutes of observation for each child.

Recommendations for Practice and for Future Research

After conducting this study, I make the following recommendations for educators and parents, as well as future research.

For Educators and Parents

It is perhaps somewhat surprising to learn that the development of executive function in Taiwanese young children is advanced, but that theory-of-mind understanding is later developing when compared to relative American age-mates. This result provides a clear message that ECE teachers and parents in Taiwan need to pay more attention to children's

socio-emotional development, especially to interpersonal social skills and communication skills among young children. Theory-of-mind understanding is a key cognitive base of social interaction. With this prerequisite ability, children can develop empathy and friendship. My findings in this area reflect a traditional emphasis on learning pursuits and the neglect of children's interpersonal development in Taiwan. This study may serve as a wake-up call. Educators and parents ought to realize and adjust the imbalance in practices and educate children from a whole-child approach.

Moreover, as expected, my study shows a positive relationship existing between dramatic play and theory-of-mind. This result suggests to educators and parents that a good way to support young children's interpersonal understanding is by encouraging pretending in groups. Through self-initiated and mature dramatic plays, children are afforded the opportunities to learn each other's emotional status, intentions, and perspectives; in addition, they can learn and practice how to communicate, negotiate, and problem solve by themselves, not according to teachers' instructions. Most importantly, play provides children a joyful environment to develop these interpersonal understandings and abilities.

Boekaerts (2006) discussed a top-down process and a bottom-up process of self-regulation. A child-initiated self-regulation through a bottom-up process is intrinsically motivated, while a top-down process tends to be other-regulated. In the Chinese cultural tradition, teachers and parents employ direct teaching to coach children's behaviors and ask for good conduct. Children might follow these teachings under authority and obey reluctantly. However, dramatic play provides teachers and parents an excellent bottom-up path to develop children's intrinsic motivation to self-regulate in a joyful environment. Therefore, a dramatic-play pedagogy is recommended for educators and parents.

For Future Research

According to the discussion in the Limitations section, several modifications are suggested regarding participants, variables, and research design for future studies.

Participants. Taiwanese children aged 4 to 5 have been proven to be advanced in executive function and slower in theory-of-mind understanding than their American age-mates. If the age range extended to include younger and older children in future studies, the findings would result in more developmental information on Taiwanese children. In addition, to meet the statistical requirements, a group with a minimum of 25 children is recommended. In other words, if a future study aims at comparing the difference between two or more variables, at least 25 children for one variable are required.

Variables. Self-regulation is an overarching ability and includes many components. This study broke it down to cognitive and behavioral levels. However, the two variables examined in this study, cognitive self-regulation, i.e., executive function and theory of mind, and behavioral control, measured by observation in group time and teacher evaluations, are still too broad to be examined in one study. This study showed a different developmental pace and cultural impact regarding these components of self-regulation. Thus, based on the results of the study, to clarify one specific self-regulation component at a time will provide more and detailed information.

In addition, this study chose a typical kindergarten to explore the Chinese cultural context; however, this research site, like most traditional kindergartens, did not design a free-play time in the daily routine. Thus, the available time for free-play observation was not long enough to demonstrate children's real play abilities. It will be interesting to examine the

relationship between play and self-regulation in a play-emphasized kindergarten which views free play as part of the curriculum and schedules it long enough to last at least for 30 minutes. The relationship between the two variables and the contextual influences can then be examined and compared to the results of this study.

In a future study like this, finer calibration of the play levels to score play maturity would also help to further evaluate the relation of play with cognitive functioning.

Research Design. Because the relationship between play and self-regulation is not clear in the Taiwanese sample, this exploratory study examined the development of play and self-regulation variables and the relationship between them by employing a quantitative design. The results of this study are informative to understand the developmental pace of play and self-regulation variables, and the relationship between them; however, there remained many unclear issues. For example, I explained the advanced development of executive function in Taiwanese young children and the absence of teachers' involvement in children's play from a cultural perspective. More in-depth qualitative study can explore the contexts to contribute to a better understanding of the cultural impacts on ECE practices in Taiwan. I will recommend exploring how free play is viewed and designed at the school level and the teacher level. It would also be beneficial to study teachers' own beliefs about play and the practices they employ in their curricula in both traditional kindergartens and in play-emphasized kindergartens inspired by Western programs.

Summary of Chapter 5

To sum up, this study revealed seven interesting results: (1) Taiwanese children aged 4 to 5 demonstrated an advanced development in the executive function tasks but were slower in their theory-of-mind understanding compared to their American counterparts, (2) Taiwanese

children aged 4 to 5 were attentive in group time in general and were assessed as controlling their impulsivity well by their classroom teachers after one semester of observation, (3) Taiwanese children aged 4 to 5 tended to perform sophisticated social levels of play like group play, and higher cognitive levels of play like constructive and dramatic play, (4) teachers were not involved in children's play most of the time. This is due to no free-play time in the design of the daily schedule and also because teachers had to deal with administrative responsibilities or talk to parents during the time of observation, (5) a lack of relationship between executive function and any type of play was due to the ceiling effect on children's executive function tasks, (6) a positive relationship between two dramatic play types and theory-of-mind understanding might reflect some shared meta-representations existing, and also that they can facilitate each other, and (7) unexpectedly, a negative association between group play and teacher evaluation was found. This might reflect an early stage of group play and Chinese cultural pursuits of "a silent child."

Although this was an exploratory study, it contributes to the following areas: to provide culturally persuasive evidence to support a play pedagogy in Taiwan; to provide timely results to inform ECE research; to give an example to study from a social-cultural perspective; to provide a research by using multi-measures and multi-sources; and to inspire further thinking about the influence of Chinese cultural values. Several modifications regarding limitations in this study were suggested for the future studies. Recommendations for educators and parents were proposed as well: paying more attention to children's socio-emotional development, and adopting a dramatic-play pedagogy to provide a great path for intrinsically-motivated self-regulation in a joyful environment.

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Appendix A Teacher Consent Form (English Version)



Informed Consent Form for Social Science Research
The Pennsylvania State University

ORP OFFICE USE ONLY
DO NOT REMOVE OR MODIFY
IRB#30365 Doc. #3
The Pennsylvania State University
Office for Research Protections
Approval Date: 03/26/2008 D. Maney
Expiration Date: 02/18/2010 D. Maney
Social Science Institutional Review Board

Title of Project: Taiwanese Young Children's Play in ECE Settings: A Study of Teacher and Child Behaviors Affecting the Development of Self-Regulation

Principal Investigator: Mei-Fang Cheng, Doctoral Candidate, Curriculum and Instruction
E-mail: muc206@psu.e
Phone: 011-886-2-26337042 (Taiwan)
Address: 4 F., No. 106, Lane 16, Sec. 3, Kangning Rd., Neihu District, Taipei, 114, Taiwan.

Advisor: Dr. James E. Johnson; Professor, Curriculum and Instruction
E-mail: jej4@psu.edu
Phone: 0021-814-865-2230 (USA)
Address: 145 Chambers Building
University Park, PA 16802 U. S. A.

Purpose of the Study: The purpose of this research study is to examine the relationship between play and self-regulation in Taiwanese young children.

Procedures to be followed: This research study involves the following procedures to collect data: (1) observing children's play behaviors in free play; (2) observing teachers' involvement in child's play and child's response in free play; (3) playing games with children to understand their ability of executive function and of theory of mind, and assessing their verbal ability; (4) observing children's self-regulation behaviors in circle time. In addition, (5) at the end of the semester, class teachers will be asked to complete a questionnaire to rate each child's self-regulation behavior.

I would like to ask for your participation at the end of the semester to fill out a "Self-Control Rating Scale" for each participating child in your class.

Discomforts and Risks: The classroom teachers will introduce the investigator and explain that she will stay for a period of time before the research starts. The investigator will not start observing children in the first two visits in order to let children get used to the investigator. Once data collection begins, the investigator will observe children's behaviors in their classroom and will not bother or disrupt the class activities. Moreover, the investigator will play playful games with them in their free time so that there are no discomforts/risks in this study.

Benefits: The results will provide parents and educators with useful and practical implications in the development of play pedagogy and children's self-regulation. In turn, children will learn to regulate themselves in a more intrinsic-motivated way.

Duration: The "Self-Control Rating Scale" will take you approximately 15 minutes to fill out.

Statement of Confidentiality: Your participation in this research is confidential. The data will be kept in a locked file cabinet and stored in password protected computer of the investigator. Penn State's Office for Research Protections, the Social Science Institutional Review Board and the Office for Human Research Protections in the Department of Health and Human Services may review records

related to this research study. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.

Right to Ask Questions: Please contact Mei-Fang Cheng at 011-886-2-2633-7042 with questions, complaints or concerns about this research. You can also call this number if you feel this study has harmed you. Questions about your rights as a research participant may be directed to Penn State University's Office for Research Protections at 0021-814- 865-1775.

Voluntary Participation: Your decision to be in this research is voluntary. You can stop at any time.

You must be 18 years of age or older to take part in this research study. If you agree to take part in this research study and the information outlined above, please sign your name and indicate the date below.

You will be given a copy of this consent form for your records.

Participant Signature

Date

Person Obtaining Consent

Date

Appendix A Teacher Consent Form (Chinese Version)



Informed Consent Form for Social Science Research
The Pennsylvania State University

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The Pennsylvania State University
Office for Research Protections
Approval Date: 03/26/2008 D. Maney
Expiration Date: 02/18/2010 D. Maney
Social Science Institutional Review Board

教師同意書

賓州州立大學(The Pennsylvania State University)

研究計畫名稱：台灣幼教場域中的遊戲：教師與幼兒行為影響自我調整之發展

研究計畫主持人：鄭美芳

美國賓州州立大學課程與教學系博士候選人

電子郵件：muc206@psu.edu

電話：011-886-2-26337042 (台灣)

地址：台北市內湖區康寧路三段 16 巷 106 號 4 樓

論文指導教授：Dr. James E. Johnson

美國賓州州立大學課程與教學系教授

電子郵件：jej4@psu.edu

電話：0021-814-865-2230 (美國)

地址：145 Chambers Building

University Park, PA 16802

U. S. A

1. 研究目的：本研究目的在探討台灣幼兒遊戲行為與自我調整之發展的關係。

2. 研究步驟： 本研究資料收集的步驟為：(1) 觀察幼兒在自由遊戲時間的遊戲行為。(2) 觀察教師參與幼兒遊戲的行為及幼兒的反應。(3) 跟幼兒玩遊戲以了解其自我調整的認知功能，並且評量其語文能力。(4) 觀察幼兒在團體時間的行為控制能力。此外，(5) 期末時，將請教師評量每位幼兒的自我調整能力。

誠摯地希望您參與本研究。如蒙同意，將請你於期末時填寫「自我控制評量表」評量每位參與本研究之幼兒。

3. 不舒適及風險： 在研究開始前，教師將介紹研究者並說明她將會進班與幼兒相處；在前兩次進班時間，研究者將與幼兒相處熟悉，並不進行觀察。

一旦研究開始，研究者將在自由遊戲時間及團體時間觀察其行為，並不影響課程進行；此外，研究者將於空檔時間與幼兒玩遊戲。因此，本研究並無不舒適或風險存在。

4. 利益： 預期本研究結果將增進台灣家長及教師採用遊戲教學法以增進幼兒的自我

調整能力，進而協助幼兒自發的學習。

5. 研究期間： 填寫一份「自我控制評量表」約需十五分鐘。

6. 機密保證： 參與本研究的資料將獲保密。本研所得資料將安全地儲存於上鎖檔案櫃及有鎖碼保護的電腦檔案中。美國賓州州立大學研究保護處(Penn State University's Office for Research Protections)的社會科學審查委員會(Social Science Institutional Review Board)及美國賓州州立大學健康與人類服務系的人類研究保護處(the Office for Human Research Protections in the Department of Health and Human Services)有可能審閱與本研究相關的資料。研究結果在刊物或研討會中發表，都不會揭露任何可辨認個別身份的資料。

7. 詢問的權利： 若對本研究有任何疑問、抱怨或關切，請聯絡本研究主持人鄭美芳 011-886-2-2633-7042。若你覺得在本研究中受到傷害，或對研究參與者的權利有疑問，亦可直接撥打美國賓州州立大學研究保護處(Penn State University's Office for Research Protections) 0021-814- 865-1775。

8. 自願參與： 參與本研究的決定是自願的，你可在任時間停止參與本研究。

研究參與者須年滿十八歲。若你同意參與本研究，請你簽署本同意書。你將會收到一份同意書影本，作為資料保存。

教師簽名

日期

計劃主持人簽名

日期

Appendix B Parental Consent Form (English Version)



Informed Consent Form for Social Science Research The Pennsylvania State University

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DO NOT REMOVE OR MODIFY
IRB#30365 Doc. #1 Parent English
The Pennsylvania State University
Office for Research Protections
Approval Date: 03/26/2008 D. Maney
Expiration Date: 02/18/2010 D. Maney
Social Science Institutional Review Board

Title of Project: Taiwanese Young Children's Play in ECE Settings: A Study of Teacher and Child Behaviors Affecting the Development of Self-Regulation

Principal Investigator: Mei-Fang Cheng, Doctoral Candidate, Curriculum and Instruction
E-mail: muc206@psu.edu
Phone: 011-886-2-26337042 (Taiwan)
Address: 4 F., No. 106, Lane 16, Sec. 3, Kangning Rd., Neihs District, Taipei, 114, Taiwan.

Advisor: Dr. James E. Johnson; Professor, Curriculum and Instruction
E-mail: jej4@psu.edu
Phone: 0021-814-865-2230 (USA)
Address: 145 Chambers Building
University Park, PA 16802
U. S. A.

1. **Purpose of the Study:** The purpose of this research study is to examine the relationship between play and self-regulation in Taiwanese young children.
2. **Procedures to be followed:** This research study involves the following procedures to collect data: (1) observing children's play behaviors in free play; (2) observing teachers' involvement in child's play and child's response in free play; (3) playing games with children to understand their ability of executive function and of theory of mind, and assessing their verbal ability; (4) observing children's self-regulation behaviors in circle time. In addition, (5) at the end of the semester, class teachers will be asked to complete a questionnaire to rate each child's self-regulation behavior.

I would like to ask for your permission to allow me to access to your child so that I may carry out this research. If you agree, your child will involve in the first four procedures. I will observe his or her behavior during free play and circle time. Moreover, I will play games with your child to collect the data of procedure #3 in his or her free time.

3. **Discomforts and Risks:** The classroom teachers will introduce the investigator and explain that she will stay for a period of time before the research starts. The investigator will not start observing children in the first two visits in order to let children get used to the investigator. Once data collection begins, the investigator will observe children's behaviors in their classroom and will not bother or disrupt the class activities. Moreover, the investigator will play playful games with them in their free time so that there are no discomforts/risks in this study.
4. **Benefits:** The results will provide parents and educators with useful and practical implications in the development of play pedagogy and children's self-regulation. In turn, children will learn to regulate themselves in a more intrinsic-motivated way.

5. **Duration:** The investigator will observe children in free play time and in circle time. It will take approximately three to four months, two times per week, to collect data. Time used to observe and code each child's play and self-regulation behavior will be up to a total of 20 minutes. In addition, the investigator will play several games with each child in free time. It will take about 30 minutes for each child.
6. **Statement of Confidentiality:** Your child's participation in this research is confidential. The data will be kept in a locked file cabinet and stored in password protected computer of the investigator. Penn State's Office for Research Protections, the Social Science Institutional Review Board and the Office for Human Research Protections in the Department of Health and Human Services may review records related to this research study. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.
7. **Right to Ask Questions:** Contact Mei-Fang Cheng at 011-886-2-2633-7042 with questions, complaints or concerns about this research. You can also call this number if you feel this study has harmed you. Questions about your rights as a research participant may be directed to Penn State University's Office for Research Protections at 0021-814- 865-1775.
8. **Voluntary Participation:** Your decision to be in this research is voluntary. You and your child can stop at any time.

If you agree to allow your child to take part in this research study and the information outlined above, please sign your name and indicate the date below.

You will be given a copy of this consent form for your records.

I give permission for my child _____(your child's full name) to participate in this research.

Participant Signature

Date

Person Obtaining Consent

Date



Informed Consent Form for Social Science Research
The Pennsylvania State University

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The Pennsylvania State University
Office for Research Protections
Approval Date: 03/26/2008 D. Maney
Expiration Date: 02/12/2010 D. Maney
Social Science Institutional Review Board

家長同意書

賓州州立大學 (The Pennsylvania State University)

研究計畫名稱：台灣幼教場域中的遊戲：教師與幼兒行為影響自我調整之發展

研究計畫主持人：鄭美芳

美國賓州州立大學課程與教學系博士候選人

電子郵件：muc206@psu.edu

電話：011-886-2-26337042 (台灣)

地址：台北市內湖區康寧路三段 16 巷 106 號 4 樓

論文指導教授：Dr. James E. Johnson

美國賓州州立大學課程與教學系教授

電子郵件：jej4@psu.edu

電話：0021-814-865-2230 (美國)

地址：145 Chambers Building

University Park, PA 16802

U. S. A

1. 研究目的：本研究目的在探討台灣幼兒遊戲行為與自我調整之發展的關係。

2. 研究步驟：

本研究資料收集的步驟為：(1) 觀察幼兒在自由遊戲時間的遊戲行為。(2) 觀察教師參與幼兒遊戲的行為及幼兒的反應。(3) 跟幼兒玩遊戲以了解其自我調整的認知功能，並且評量其語文能力。(4) 觀察幼兒在團體時間的行為控制能力。此外，(5) 期末時，將請教師評量每位幼兒的自我調整能力。

誠摯地希望您能同意貴子弟參與本研究。如蒙同意，與貴子弟相關的部分是前四項步驟。研究者將於自由遊戲時間及團體時間觀察其行為；此外，研究者並將於空檔時間與貴子弟玩遊戲，以便蒐集前述第三項資料。

3. 不舒適及風險：

在研究開始前，教師將介紹研究者並說明她將會進班與幼兒相處；在前兩次進班時間，研究者將與幼兒相處熟悉，並不進行觀察。

一旦研究開始，研究者將在自由遊戲時間及團體時間觀察其行為，並不影響課程

進行；此外，研究者將於空檔時間與幼兒玩遊戲。因此，本研究並無不舒適或風險存在。

4. 利益:

預期本研究結果將增進台灣家長及教師採用遊戲教學法以增進幼兒的自我調整能力，進而協助幼兒自發的學習。

5. 研究期間:

研究者將在自由遊戲時間及團體時間觀察幼兒行為，行為觀察預計每週進行兩次，資料收集共需約三到四月的時間，累計個別幼兒的觀察時間為二十分鐘。此外，研究者將於空檔時間與幼兒玩遊戲，此項資料收集需約三十分鐘。

6. 機密保證:

貴子弟參與本研究的資料將獲保密。本研究所得資料將安全地儲存於上鎖檔案櫃及有鎖碼保護的電腦檔案中。美國賓州州立大學研究保護處(Penn State University's Office for Research Protections)的社會科學審查委員會(Social Science Institutional Review Board)及美國賓州州立大學健康與人類服務系的人類研究保護處(the Office for Human Research Protections in the Department of Health and Human Services)有可能審閱與本研究相關的資料。研究結果在刊物或研討會中發表，都不會揭露任何可辨認個別身份的資料。

7. 詢問的權利:

若對本研究有任何疑問、抱怨或關切，請聯絡本研究主持人鄭美芳 011-886-2-2633-7042。若你覺得在本研究中受到傷害，或對研究參與者的權利有疑問，亦可直接撥打美國賓州州立大學研究保護處(Penn State University's Office for Research Protections) 0021-814- 865-1775。

8. 自願參與:

參與本研究的決定是自願的，你跟你的孩子均可在任時間停止參與本研究。

若你知悉上述訊息，同意讓貴子弟參與本研究，請你簽署本同意書。你將會收到一份同意書影本，作為資料保存。

我同意我的孩子_____ (請註明貴子弟姓名)參與本研究。

家長簽名

日期

計劃主持人簽名

日期

Appendix C The Modified Social/Cognitive Scale of Play Behavior (English Version)

Coding Number:_____ Observation Date:_____

Observer: _____ Activity Corner: _____

Child's Play Behavior

		Cognitive Level			
Social		Functional	Constructive	Dramatic	Games with Rules
Level	Solitary				
	Parallel				
	Group				

Unoccupied/Onlooking/Transition

Activities

Others

Nonplay			
---------	--	--	--

Teacher Involvement in Child's Play

☐ Present ☐ Audience ☐ Encourage Peer Play ☐ Co-play

☐ Individual Control ☐ Small Group Control ☐ Class Control

Child's Response to Teacher Involvement

☐ Positive ☐ Negative

(Modified from Johnson, Christie, & Yawkey, 1999)

Appendix C The Modified Social/Cognitive Scale of Play Behavior (Chinese Version)

遊戲行為—社會/認知檢核表

幼兒編號：_____ 觀察日期/時間：_____

觀察者：_____ 活動地點：_____

幼兒的遊戲行為

		認知層面			
社會 層面		功能性的	建構性的	假扮性的	有規則的遊戲
	單獨的				
	平行的				
	團體的				

非 遊 戲 行 為	無所事事/旁觀/轉換階段	學業活動	其它

教師參與幼兒遊戲的類型

☐ 在場 ☐ 在旁鼓勵 ☐ 鼓勵同儕互動 ☐ 一同遊戲

☐ 個別控制 ☐ 小團體控制 ☐ 課堂控制

幼兒對教師參與的反應 ☐ 偏正面的 ☐ 偏負面的

(修正自 Johnson, Christie, & Yawkey, 1999)

Appendix D The Scoring Sheet of Executive Function Tasks (English Version)

Coding Number:_____ Observation Date:_____

Observer: _____

Day/Night Tasks

Practice	1 (	2 ○															
Trial	1 ○	2 ○	3 (	4 ○	5 (	6 (	7 ○	8 ○	9 ○	10 (	11 (	12 ○	13 (	14 ○	15 (	16 (	Total

Tapping Tasks

Practice	1 I	2 II															
Trial	1 I	2 II	3 I	4 I	5 I	6 II	7 II	8 I	9 II	10 I	11 II	12 II	13 II	14 II	15 I	16 I	Total

Appendix D The Scoring Sheet of Executive Function Tasks (Chinese Version)

執行功能作業計分表

幼兒編號：_____ 觀察日期/時間：_____ 觀察者：_____

執行功能作業

「日/月」作業計分

試 1	試 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	總分
(	○	○	○	(	○	(	(	○	○	○	(	(	○	(	○	(	(	

「敲擊」作業計分

試 1	試 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	總分
I	II	I	II	I	I	I	II	II	I	II	I	II	II	II	II	I	I	

Appendix E The Scoring Sheet of Theory of Mind (English Version)

Coding Number:_____ Observation Date:_____

Observer: _____

Location False-Belief Task

Task One		Subtotal	Tasks Two		Subtotal	Total
Where will the puppy try to find his ball?			Where will Tom try to find Doggie?			
Could you tell me where the ball really is?			Could you tell me where Doggie really is?			

Content False-Belief Task

Self Belief		Subtotal	Other Belief		Subtotal	Total
What do you think is inside?			What will your brother think it is inside the box?			
Could you tell me what you thought it was inside the box before I opened it?						
Do you know what it really is inside?						

Appendix E The Scoring Sheet of Theory of Mind (Chinese Version)

心智理論作業計分表

幼兒編號：_____ 觀察日期/時間：_____ 觀察者：_____

心智理論作業

「位置錯誤信念」作業計分

作業一		小計	作業二		小計	總分
玩偶會去 哪找？			小明去哪裡 找狗狗？			
球到底在 哪裡呢？			狗狗到底在 哪裡？			

「內容錯誤信念」作業計分

自我信念		小計	他人信念		小計	總分
猜猜盒子裡裝 什麼？			弟弟會以為 盒子裡裝什 麼？			
原來以為它裝 什麼？						
盒子裡真正裝 什麼？						

Appendix F The Observation Coding Sheet of Behavioral Self-Regulation
(English Version)

Code Number: _____ Observation Date/Time: _____

Observer: _____

15-sec. Intervals	1. overt disruptive activity or leaves group	2.inattention, no overt disruption	3. follows teacher visually	4. follows teacher, facial expression shows interest	5. follows teacher and adds to instruction through appropriate verbal or motor activities
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

(Modified from Alessandri, 1992)

Appendix F The Observation Coding Sheet of Behavioral Self-Regulation
(Chinese Version)

自我調整計分系統

幼兒編號：_____ 觀察日期/時間：_____

觀察者：_____

15-秒 /次	1. 外顯 的搗亂 行為或 離開團 體	2. 不專 心，但 未表現 出搗亂 行為	3. 眼神跟 隨老師	4. 跟循老師，臉部 表情顯示感興趣	5. 跟隨老師，透過 適當的表達或動 作遵循老師的指 示
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

(修正自Alessandri, 1992)

Appendix G The Self-Control Rating Scale (English Version)

Self-Control Rating Scale

Please rate this child according to the descriptions below by circling the appropriate number. The underlined 4 in the center of each row represents where the average child would fall on this item. Please do not hesitate to use the entire range of possible ratings.

	Agree-----Disagree						
1. When the child promises to do something, can you count on him or her to do it?	1	2	3	<u>4</u>	5	6	7
2. Does the child butt into games or activities even when he or she hasn't been invited?	1	2	3	<u>4</u>	5	6	7
3. Can the child deliberately calm down when he or she is excited or all wound up?	1	2	3	<u>4</u>	5	6	7
4. Generally, is the quality of the child's work all about the same rather than varying a lot?	1	2	3	<u>4</u>	5	6	7
5. Does the child work for long-range goals?	1	2	3	<u>4</u>	5	6	7
6. Generally, when the child asks a question, does he or she jump into something else (e.g., a new question) before waiting for an answer?	1	2	3	<u>4</u>	5	6	7
7. Generally, does the child interrupt inappropriately in conversations with peers rather than wait his or her turn to speak?	1	2	3	<u>4</u>	5	6	7
8. Does the child stick to what he or she is doing until he or she is finished with it?	1	2	3	<u>4</u>	5	6	7
9. Does the child follow the instructions of responsible adults?	1	2	3	<u>4</u>	5	6	7
10. Does the child have to have everything right away?	1	2	3	<u>4</u>	5	6	7

	Agree					Disagree	
11. When the child has to wait in line, does he or she do so patiently?	1	2	3	4	5	6	7
12. Does the child sit still?	1	2	3	4	5	6	7
13. Generally, can the child follow suggestions of others in group projects rather than insist on imposing his or her ideas?	1	2	3	4	5	6	7
14. Does the child have to be reminded several times to do something before he or she does it?	1	2	3	4	5	6	7
15. When reprimanded, does the child answer back inappropriately?	1	2	3	4	5	6	7
16. Is the child accident prone?	1	2	3	4	5	6	7
17. Does the child neglect or forget regular chores or tasks?	1	2	3	4	5	6	7
18. Are there days when the child seems incapable of settling down to work?	1	2	3	4	5	6	7
19. Would the child more likely grab a smaller toy today rather than wait for a larger toy tomorrow, if given the choice?	1	2	3	4	5	6	7
20. Does the child grab for belongings of others?	1	2	3	4	5	6	7
21. Does the child bother others when they are trying to do things?	1	2	3	4	5	6	7
22. Does the child break basic rules?	1	2	3	4	5	6	7
23. Does the child watch where he or she is going?	1	2	3	4	5	6	7
24. In answering questions, does the child give one thoughtful answer rather than blurt out several answers all at once?	1	2	3	4	5	6	7
25. Is the child easily distracted from his or her work or chores?	1	2	3	4	5	6	7

	Agree				Disagree		
26. Would you describe the child more as careful rather than careless?	1	2	3	4	5	6	7
27. Does the child play well with peers (follows rules, waits turn, cooperates)?	1	2	3	4	5	6	7
28. Does the child jump or switch from activity to activity rather than sticking to one thing at a time?	1	2	3	4	5	6	7
29. If a task is at first too difficult for the child, will he or she get frustrated and quit, rather than first seek help with the problem?	1	2	3	4	5	6	7
30. Does the child disrupt games?	1	2	3	4	5	6	7
31. Does the child think before he acts?	1	2	3	4	5	6	7
32. If the child paid more attention to his or her work, do you think he or she would do much better than at present?	1	2	3	4	5	6	7
33. Does the child tend to do too many things at once rather than concentrate on one thing at a time?	1	2	3	4	5	6	7

(Modified from Kendall & Wilcox, 1979)

Appendix G The Self-Control Rating Scale (Chinese Version)

幼兒自我控制評量表

幼兒編號: _____

本量表目的在評量幼兒的自我控制行為。請依據下列的描述，圈選適當的數字，說明此幼兒的表現。數字 4 表示一般幼兒的表現，請儘量辨別幼兒的差異，分散使用 1 到 7 的數字。

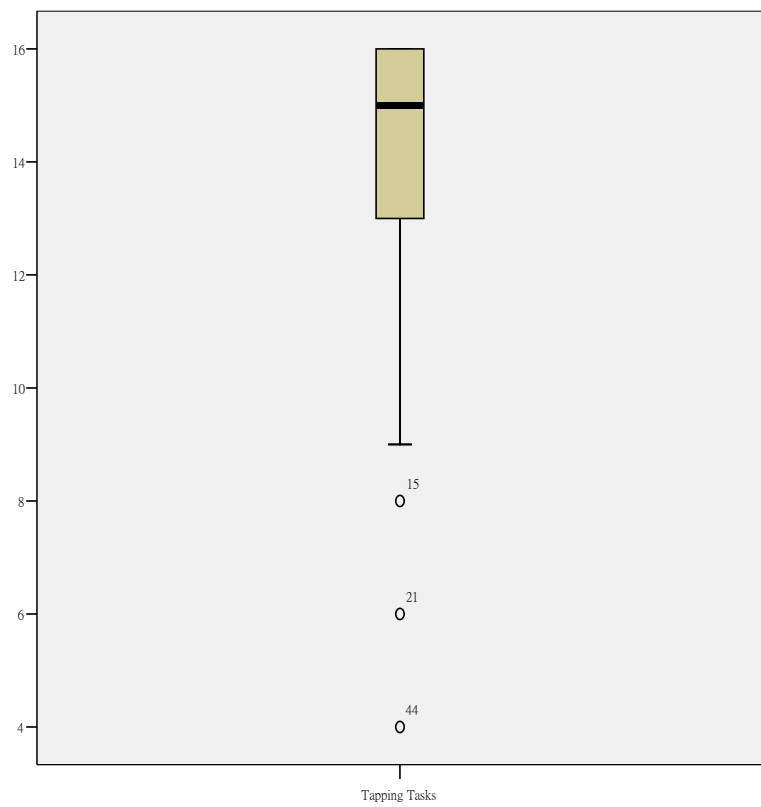
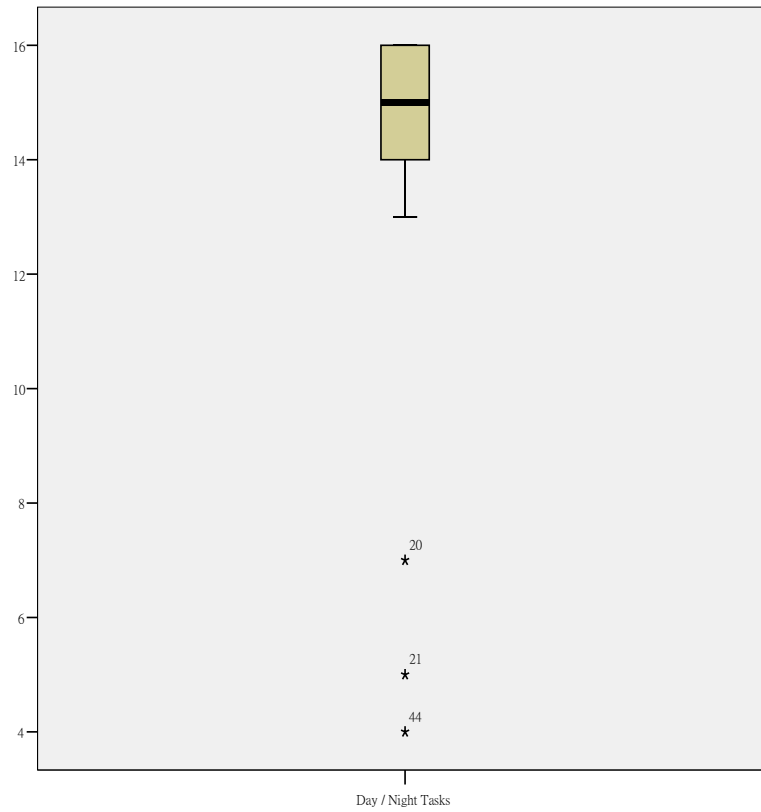
同意-----不同意

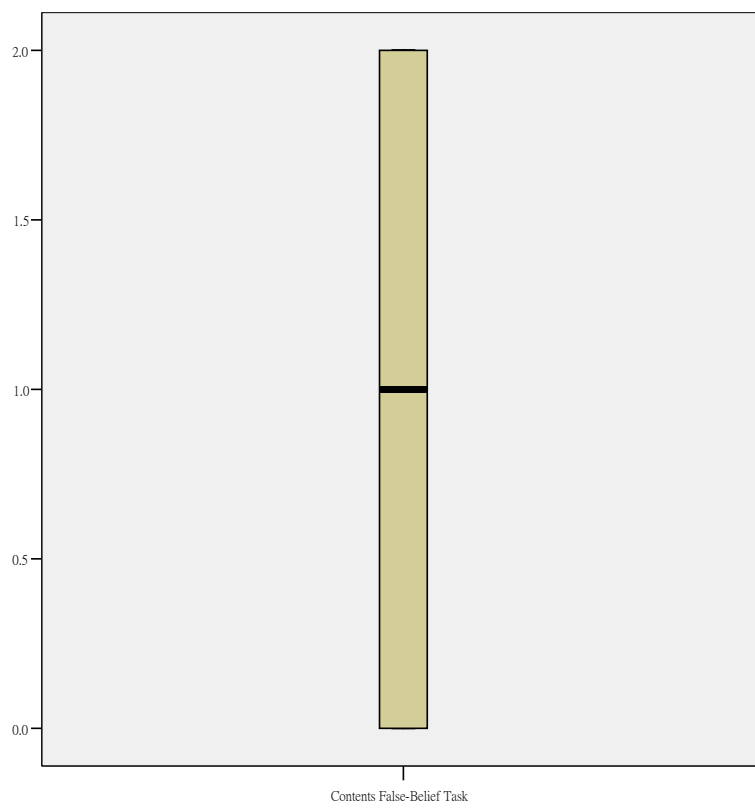
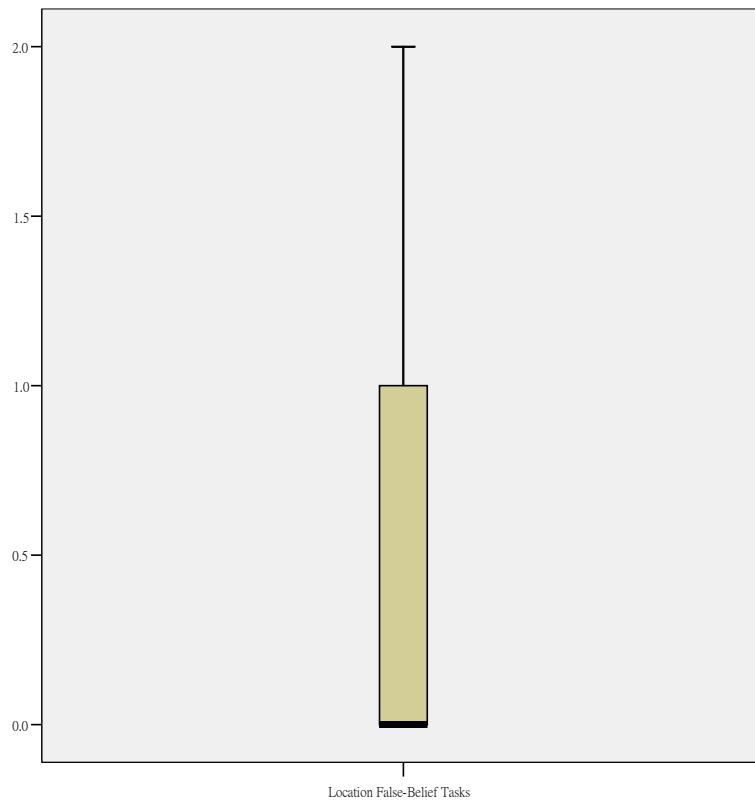
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. 當他答應做某件事，你能信任他 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. 即使未被邀請，他還是會一頭熱的參與遊戲或活動 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. 當覺得興奮或受傷害時，他會注意到然後讓自己平靜下來 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. 一般而言，他的作品品質很穩定而不會差異很大 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. 他會為較長遠的目標而努力 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. 一般而言，當他問問題還未等到回答時，就會跳到別的事情上，例如問新的問題 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. 一般而言，當他跟同儕講話時，會不適當的打斷別人，而非等到輪到他講時才講 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. 他會堅持他在做的事直至作完為止 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. 他會遵循大人的指示 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. 他會馬上就要想要東西 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. 當他必須排隊等待時，會耐心地等 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. 他能乖乖坐好 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. 一般而言，在做團體工作時，他能遵循他人的建議，而非堅持要人聽他的 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. 他需要人提醒幾次後，才會開始做該做的事 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. 當被責備時，他會不當的回嘴 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

	同意	-----	不同意	
16. 他常常有小意外事故發生	1	2	3	4 5 6 7
17. 他會忽略或忘記做例行鎖事或工作	1	2	3	4 5 6 7
18. 有時候，他會無法定下來工作	1	2	3	4 5 6 7
19. 如果有選擇，他會傾向今天拿到一個小禮物，而不是等到明天拿個大一點的禮物	1	2	3	4 5 6 7
20. 他會搶奪別人的東西	1	2	3	4 5 6 7
21. 當別的同學在做事時，他會去吵別人	1	2	3	4 5 6 7
22. 他會違反基本的規定	1	2	3	4 5 6 7
23. 他會注意他要去哪裡	1	2	3	4 5 6 7
24. 當回答問題時，他會提供一個仔細思考過的答案，而非一下蹦出好幾個答案	1	2	3	4 5 6 7
25. 他很容易在工作或作瑣事時分心	1	2	3	4 5 6 7
26. 你會形容他是比較小心的而非較粗心的	1	2	3	4 5 6 7
27. 他可以跟同儕一起好好玩遊戲 (遵守規則、輪流、合作)	1	2	3	4 5 6 7
28. 他會一下子從一個活動轉換或跳到另一個活動，而不是堅持在一個活動上	1	2	3	4 5 6 7
29. 假如一個工作開始時，對他而言太難，他會受挫而放棄，而不是先尋求協助以解決困難	1	2	3	4 5 6 7
30. 他會打斷遊戲的進行	1	2	3	4 5 6 7
31. 他會在行動前先思考	1	2	3	4 5 6 7
32. 你認為，如果他能更專注於工作上，他會做的比現在更好	1	2	3	4 5 6 7
33. 他比較會一次做很多事，而非專心把一件事做好	1	2	3	4 5 6 7

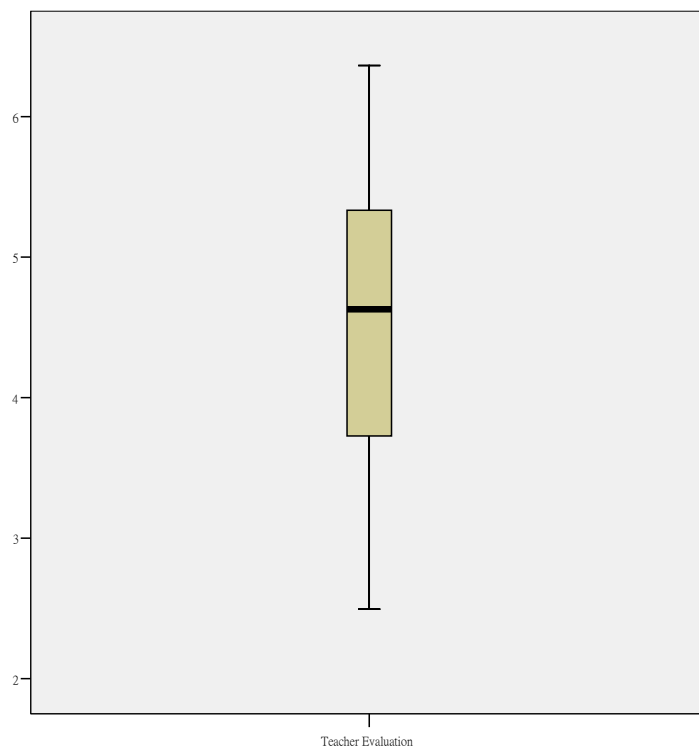
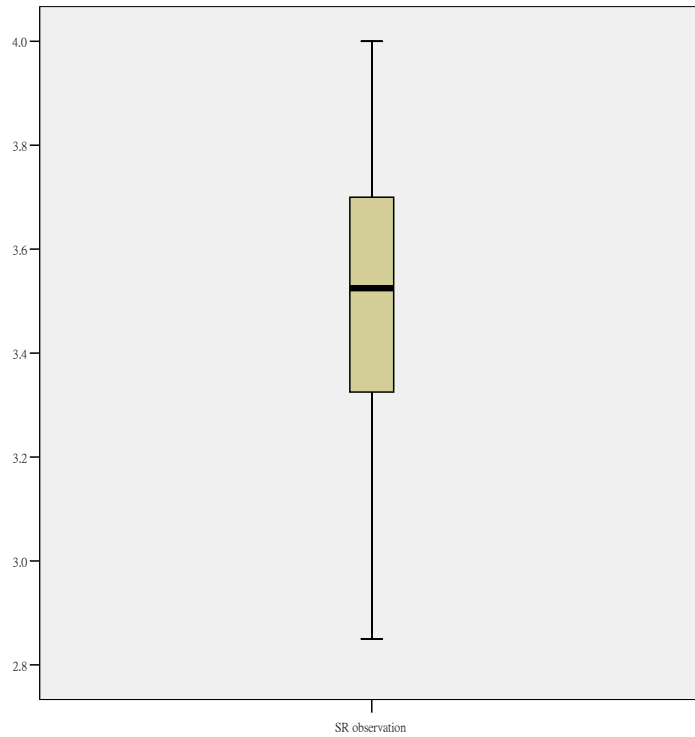
(修正自 Kendall & Wilcox, 1979)

Appendix H Box-plots for Executive Function Tasks and Theory of Mind Tasks

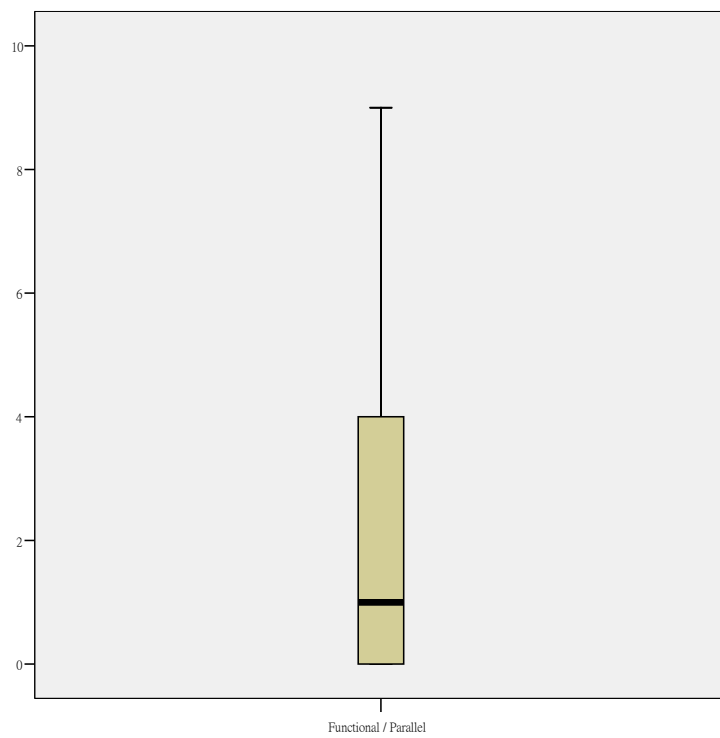
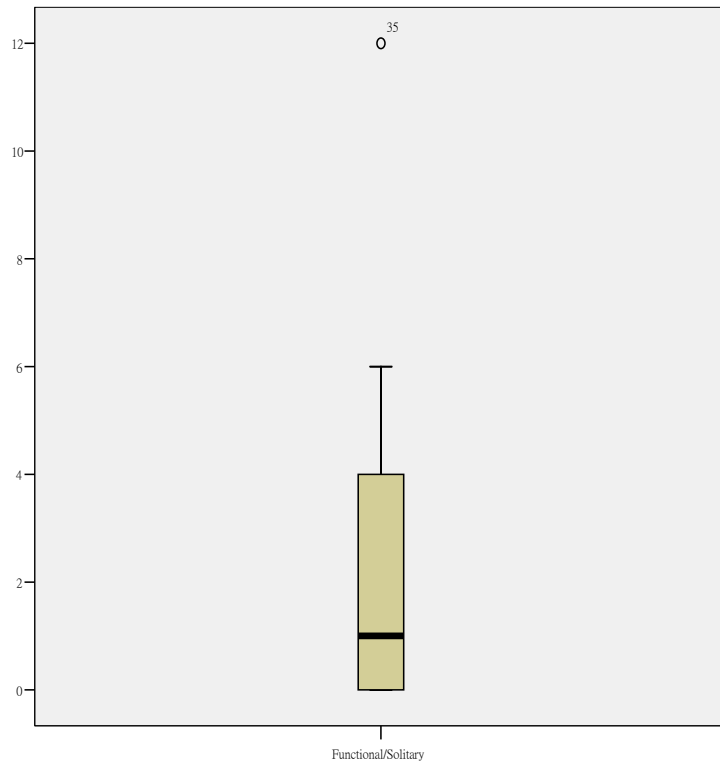


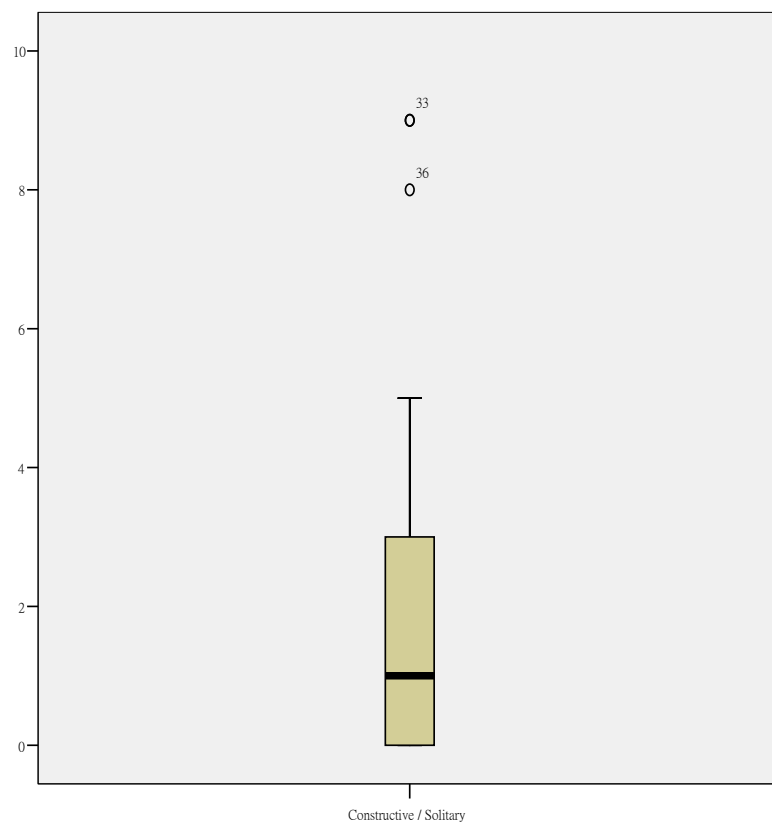
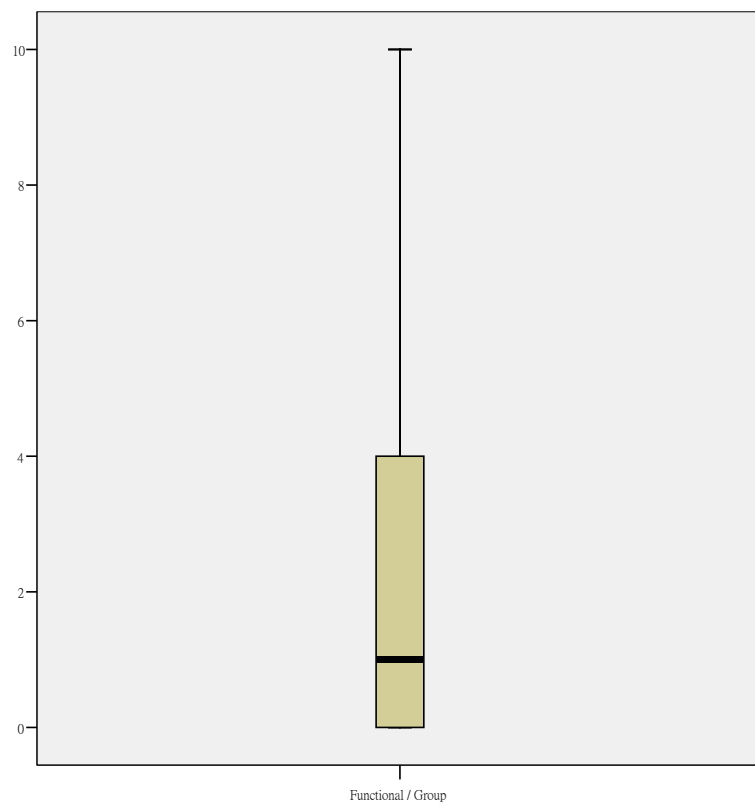


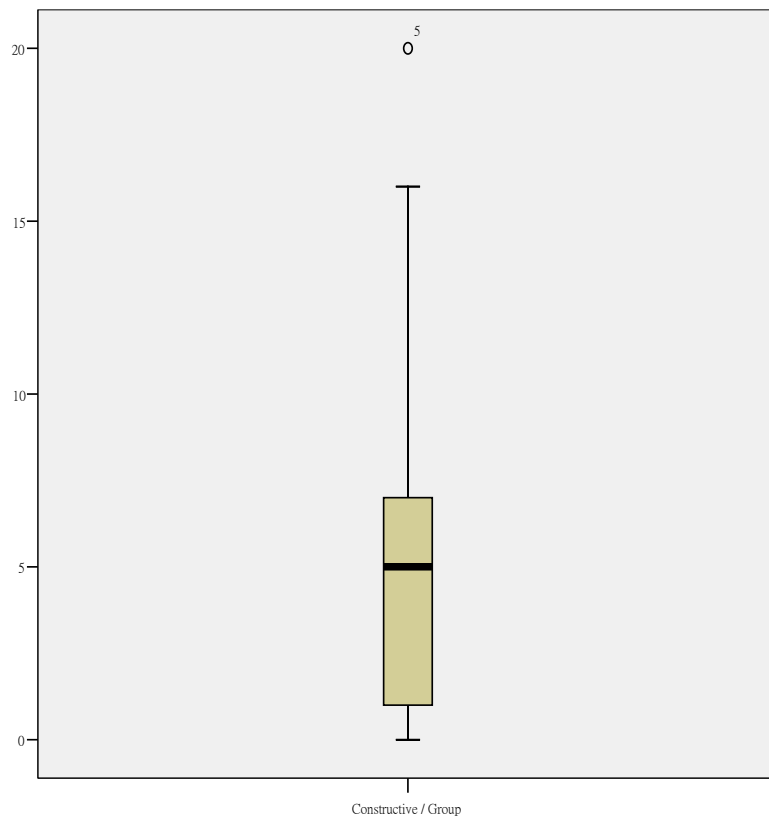
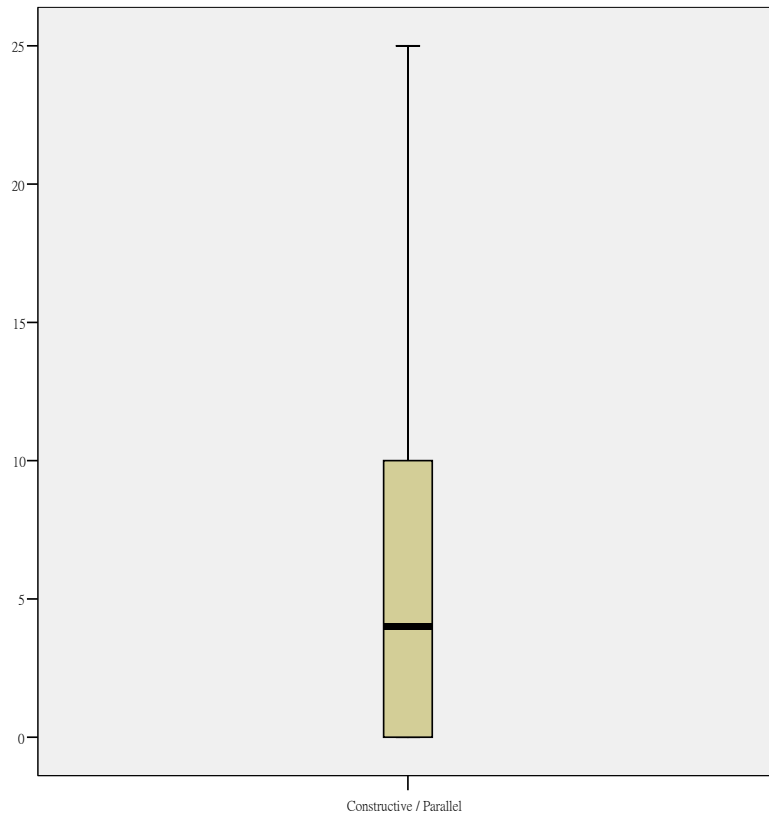
Appendix I Box-plots for Observations in Group Time and Teacher Evaluations

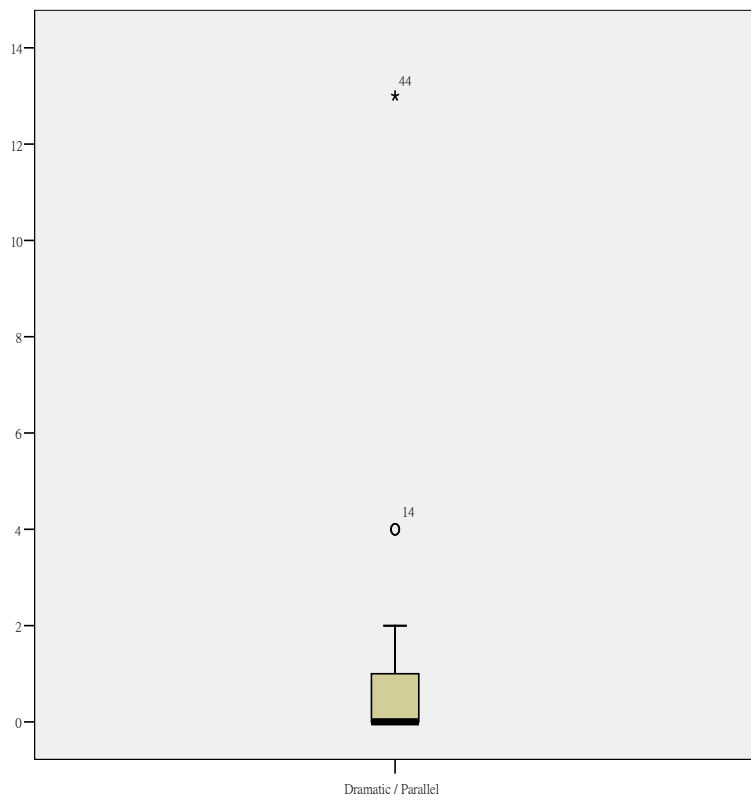
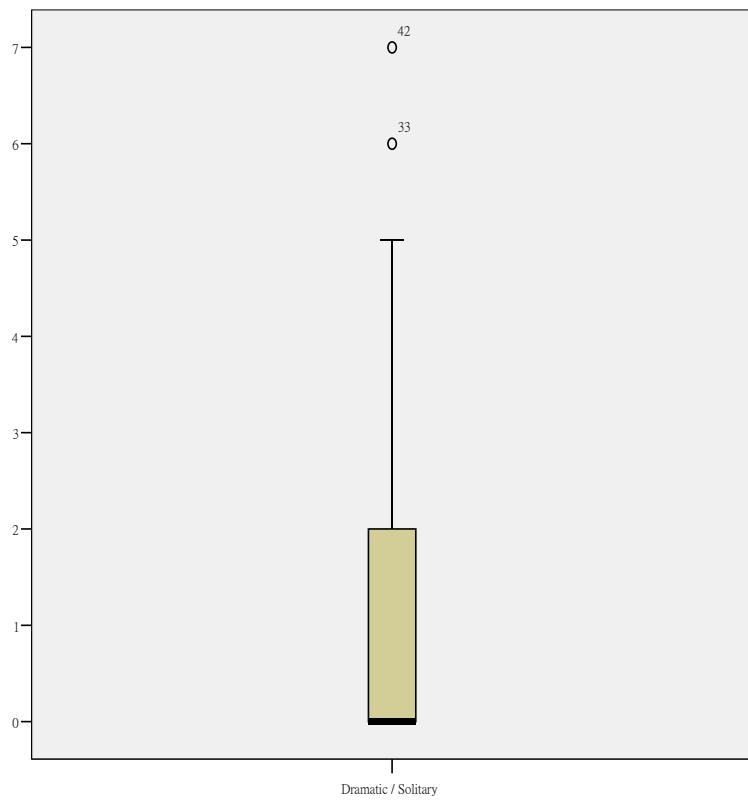


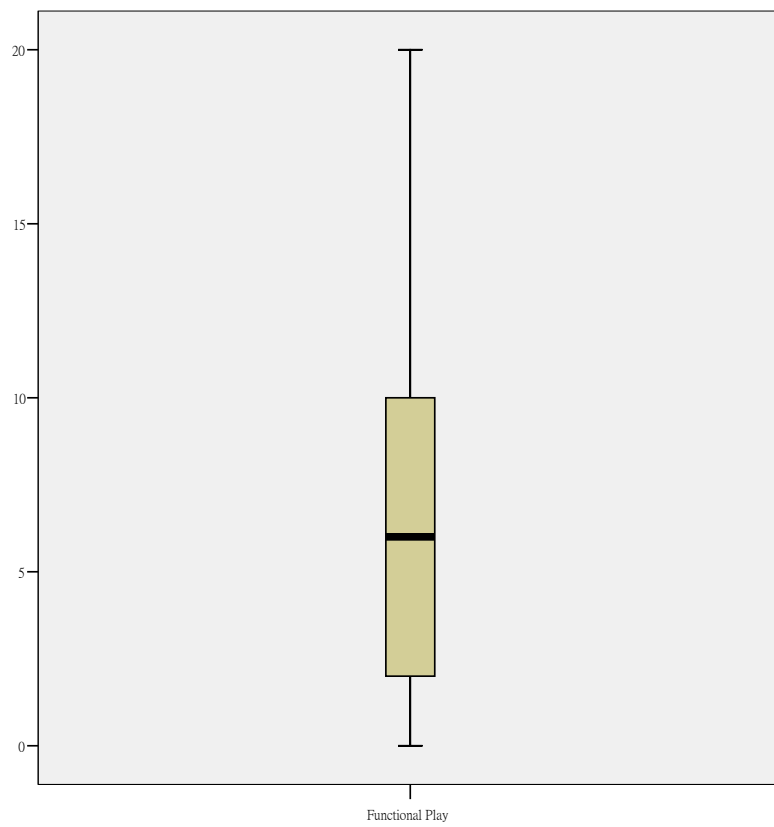
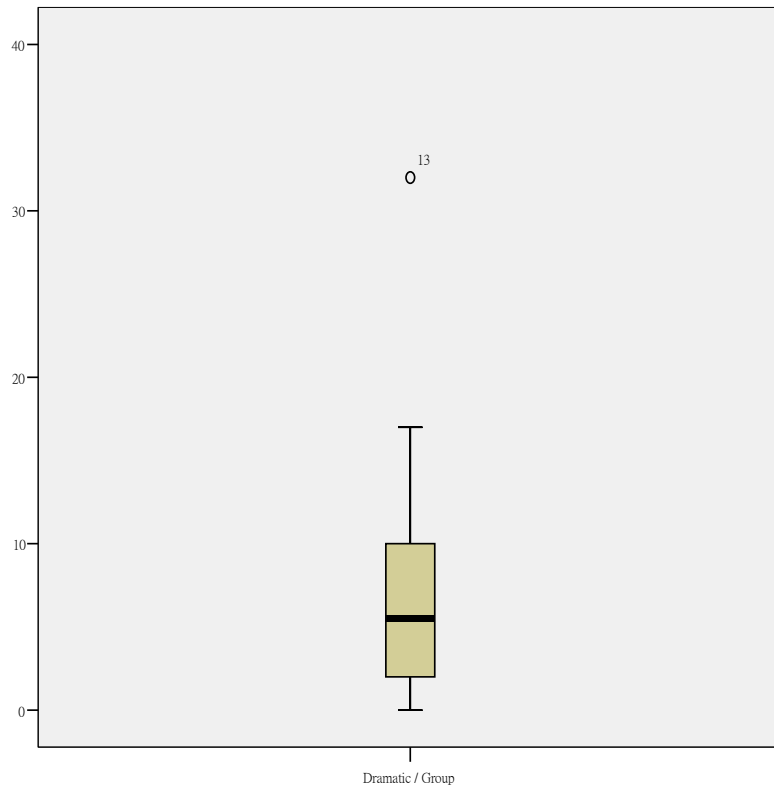
Appendix J Box-plots for Play Variables

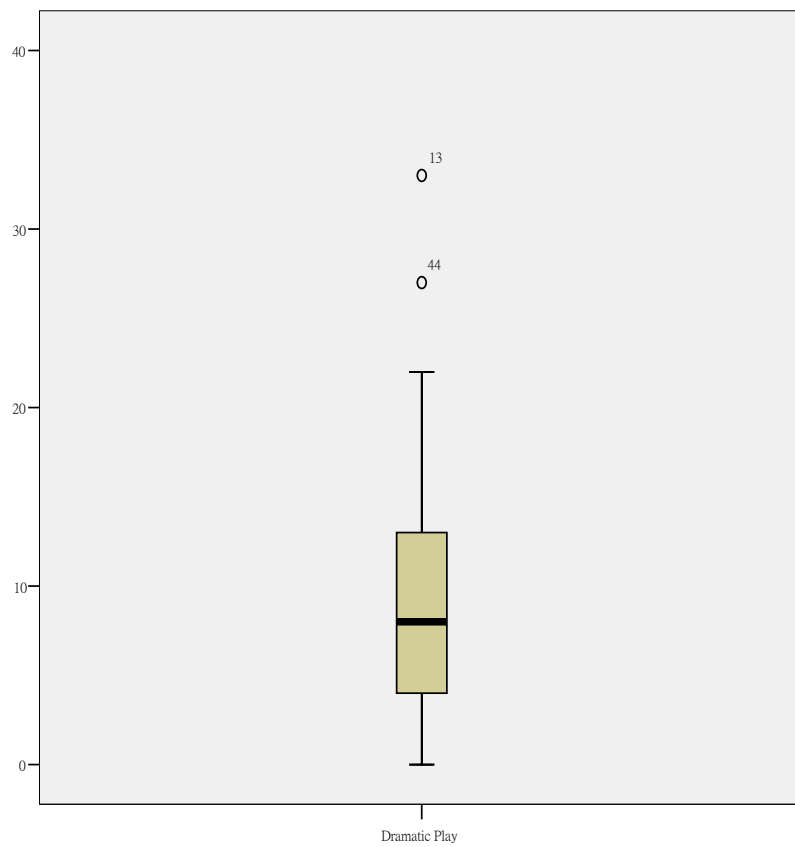
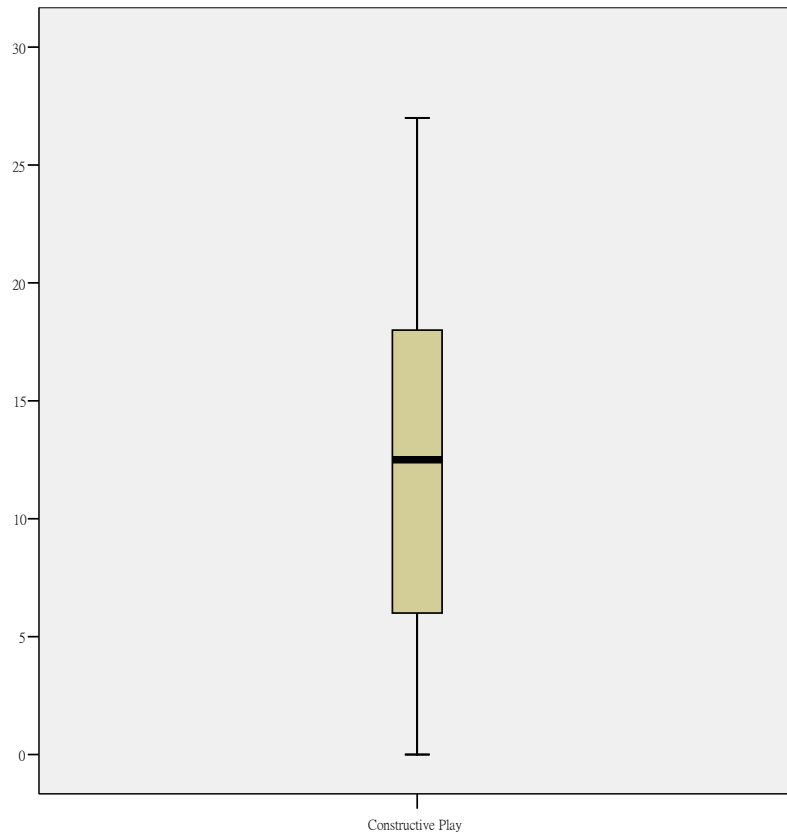


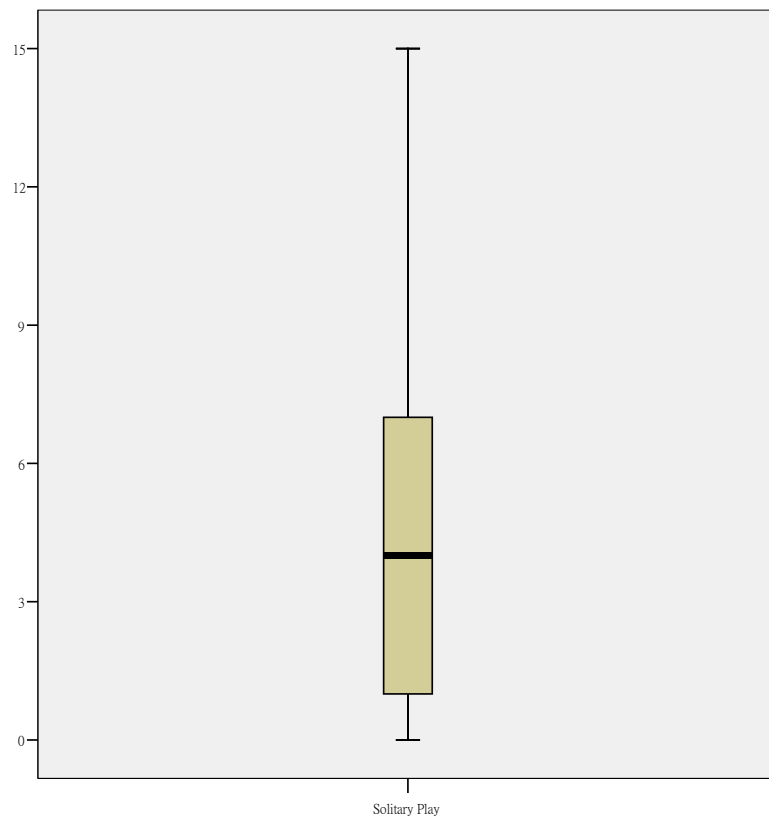
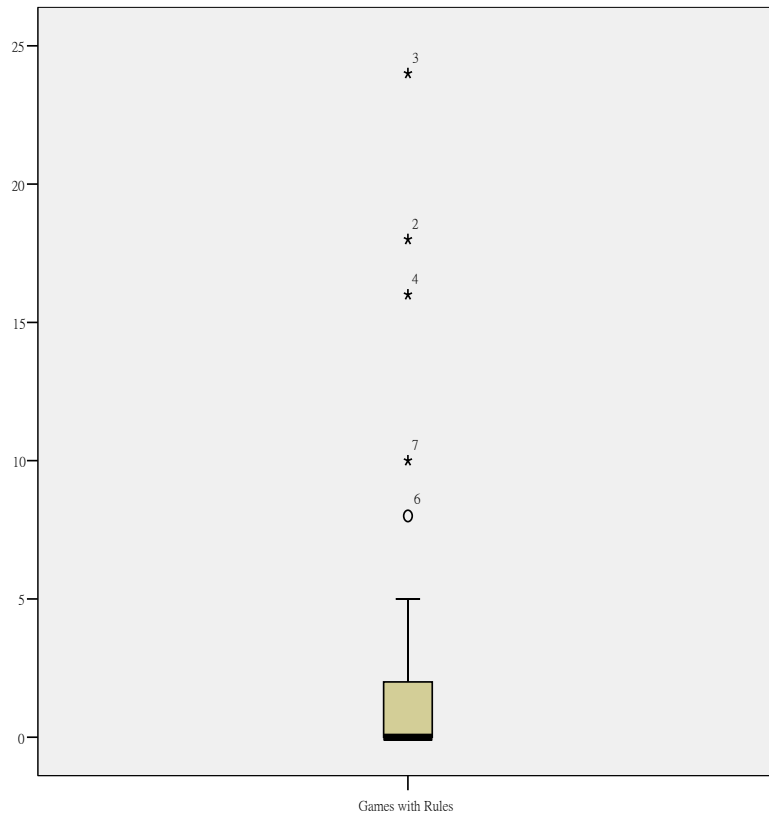


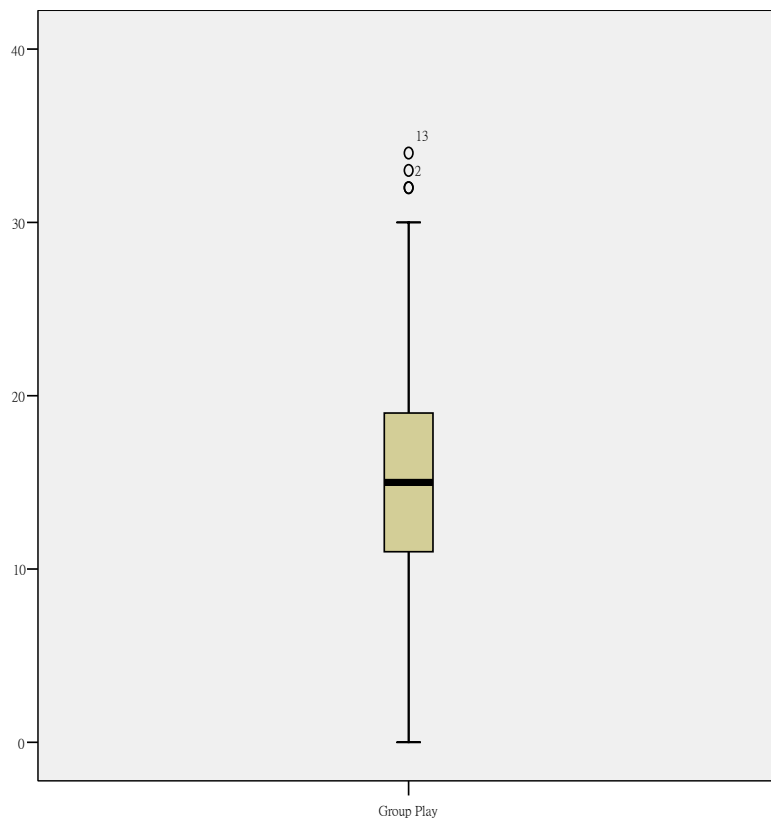
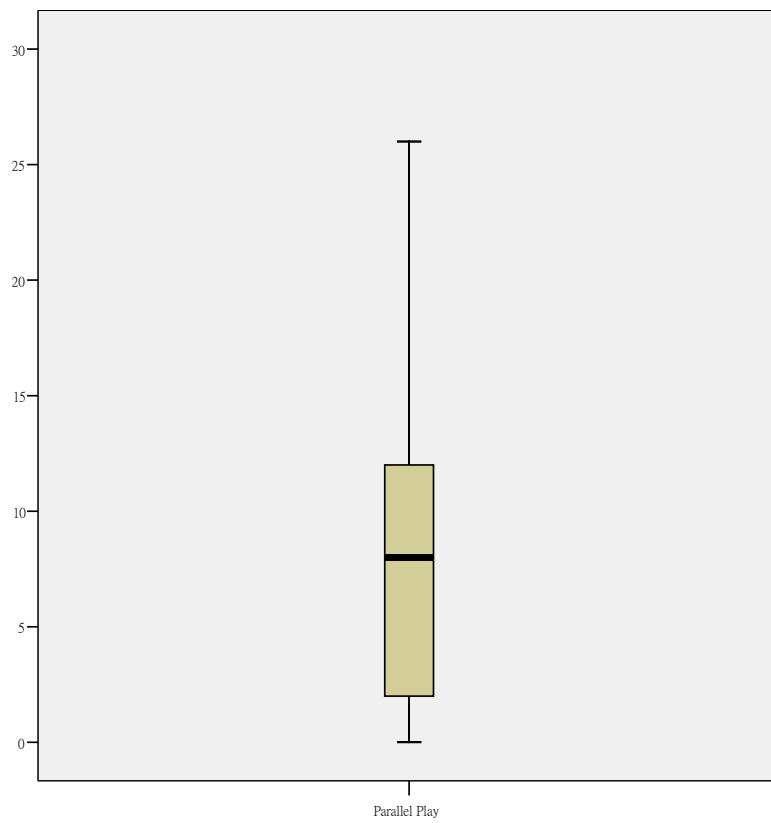




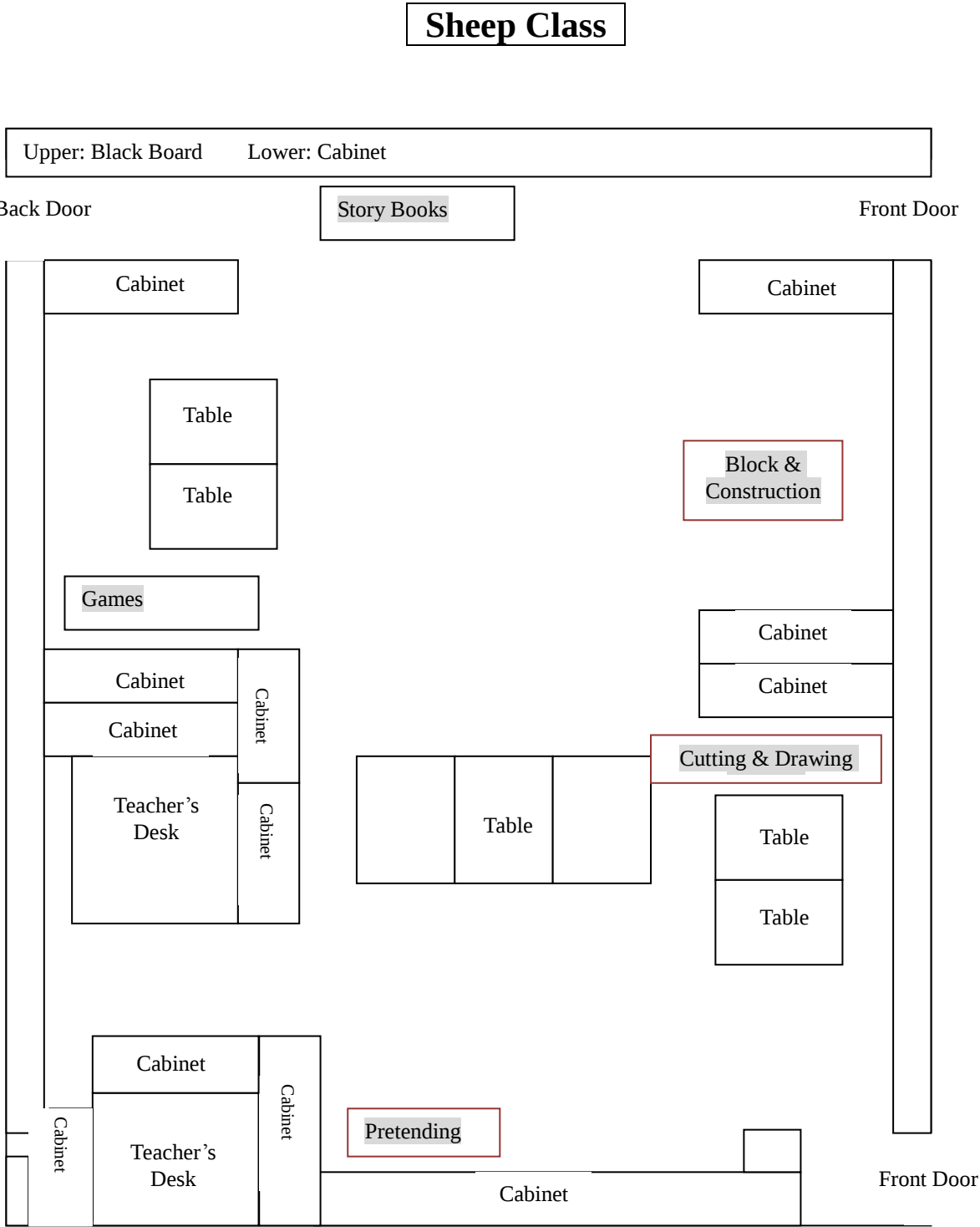








Appendix K Classroom Arrangements—Sheep Class



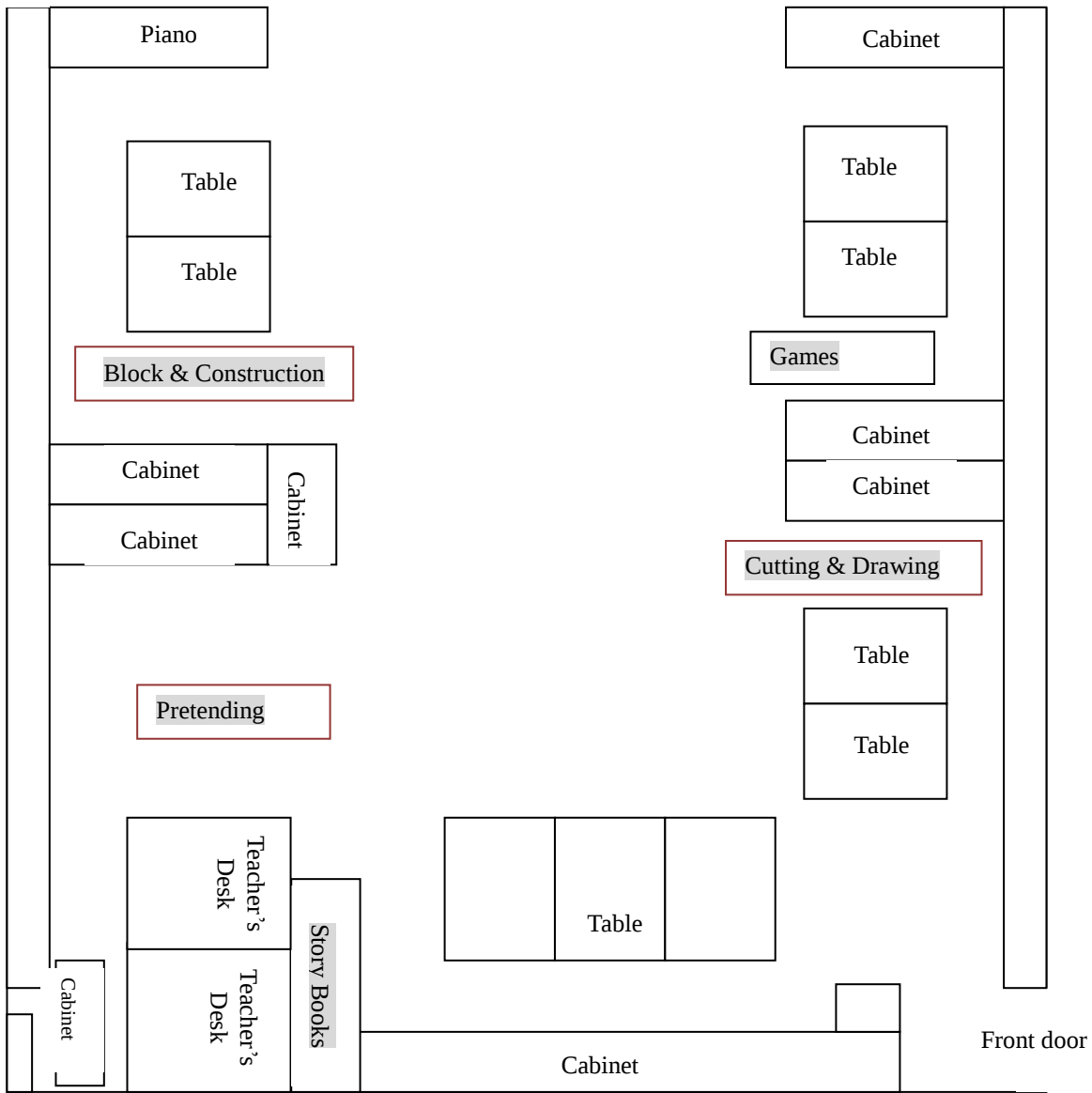
Appendix K Classroom Arrangements—Rabbit Class

Rabbit Class

Upper: Black Board Lower: Cabinet

Back door

Front door



Appendix L Daily Schedule in the Kindergarten

Daily Schedule

(From Monday to Friday for Half-Day and Whole-Day Programs)

Time	Activity	Memo.
07:50—08:50	Arriving school	
09:00—09:25 (Tue. & Thur.)	Snack time	
09:00—09:25 09:25—09:50 (Mon., Wed., & Fri.)	Happy morning Snack time	Physical activities or group activities for the whole kindergarten
09:25—09:35	Outdoor activities	
09:35—10:10	Discussion activities	Flexible to teachers
10:10—11:30	Teaching activities	
11:30—11:40	Preparing to go home for half-day programs Preparing to have lunch for whole-day programs	Parents picking-up their children in half-day programs
11:40—14:30	Lunch and nap	
14:30—15:10	Group activities	
15:10—15:40	Snack	
15:40—15:50	Integrating activities	
15:50—	Back home	Parents picking-up their children in whole-day programs

Note. This schedule is flexible. Teachers may adjust it if needed.

VITA

Mei-Fang Cheng

EDUCATION

Doctor of Philosophy in Curriculum and Instruction 2011
The Penn State University, University Park, PA, U.S.A.

Master of Science in Psychology 1988
National Chengchi University, Taipei, Taiwan

Bachelors in Business Administration 1984
National Chengchi University, Taipei, Taiwan

WORK EXPERIENCE

Kang-Ning Junior College of Medical Care and Management (KNJC)
1996-2006 Lecturer, Department of Early Child Care and Education

Huafan University
1991-1996 Chair, Student Counseling Center

PROFESSIONAL PRESENTATIONS

March 10-13, 2010 Co-Presenter
The 36th Annual Meeting of TASP (The Association for the Study of Play)
“Young Children’s Play and Self- Regulation in Kindergarten Classrooms
in Taiwan: Preliminary Findings”
February 25-28, 2009 Co-Presenter
The 35th Annual Meeting of TASP (The Association for the Study of Play)
“Exporting Play to East Asia to Improve Early Childhood Education”
March 5-8, 2008 Co-Presenter
The 34th Annual Meeting of TASP (The Association for the Study of Play)
“Analysis of Education and Development Research Articles on Children’s
Play Over the Past Three Years”
November, 2005 Co-Presenter
National Council of Family Relations 67th Annual Conference, U.S.A.
“A Comparison of Sibling Relationships among Three Cultural Groups”
April, 2005 Co-Presenter SRCD 2005 Biennial Meeting, U.S.A.
“Perceived Partner Parenting Style and the Marital and Parenting
Relationship in a Taiwanese Sample”

PUBLICATIONS

Cheng, M., & Johnson, E. J. (2010). Research on children’s play: Analysis of developmental and education journals from 2005-2007. *Early Childhood Education Journal*, 37, 249-259.