An Exploratory Study of Toy Type, Focused Attention, and Temperament in Young Children

Nathalie Di Francesco

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Abstract

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This exploratory investigation was conducted to uncover the influence of toy type, level of toy difficulty, and temperament on the duration of focused attention in young children. A total of 28 children, all attending childcare centers, participated in this study and were aged between 33 and 39 months. Each child participated in two play sessions and played with two types of toys of two different levels of difficulty for a 4-minute period. The children's parents and educators were asked to complete a temperament questionnaire for each child. The duration of focused attention for each child was calculated through analysis of the recoded play sessions. Results indicated that children showed a longer duration of focused attention during play with construction toys than during play with puzzles. Also, the children were found to display a longer duration of focused attention when the puzzle was easier and when the construction toy was more difficult. There were two temperament characteristics found to be related to the children's duration of focused attention: perceptual sensitivity and inhibitor control.

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To all of you, I thank you from the bottom of my heart ☺

My motto: *Be kind, for everyone you meet is fighting a harder battle.*

Dali Lama, 1999.

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Overview

Over the years, specialists have scrutinized countless aspects of young children's development in the areas of physical, emotional, and social growth. The exploration of cognitive development in young children for instance has been a compelling and abiding topic in infancy and early childhood studies for many decades (Sutherland, 1992). This phenomenon has emerged to some extent because cognitive development is essential to all other areas of development; without mental processes, no other aspects of development can occur successfully and completely to its full potential (Bornstein, 1989).

According to Piaget's (1962) developmental framework, cognitive processes are defined as the means of gaining and organizing information about the environment and oneself in relation to one's environment. During this process, an individual displays distinctive cognitive styles that determine a person's way of processing information, and represents an integrated component of an individual's mode of functioning (Saracho, 1985). In accordance with this concept, young children's learning depends on the manner in which they manipulate and process incoming-information (Van Horn, Scales, Nourot, & Alward, 2000). This having been said, the information processing approach includes one critical component that enables subsequent processing such as encoding and retaining to occur; this process being attention (Richards & Casey, 1992). Attention has been shown as a key element in determining the processing of information by young children and the skills have been shown to be essential to the development of children's cognitive skills (Bornstein & Sigman, 1986).

The subject of attention has intrigued researchers in the field for more than a century, however the last decade there has been a thriving interest in attention. Parents, educators, psychologists even toy manufacturers such as Fisher-Price and Playschool, have focused on this aspect of cognition for various reasons. For some, the motive is to uncover and identify how to increase children's attention, for example by developing toys that sustain children's attention, while others wish to understand the underlying factors inherent in attention, by investigating the different levels of attention for instance. Nonetheless, the main interest remains the impact early attention may have on children's development and its influence on academic performance.

In any field that concerns children, the first and most important component professionals are alerted to is children's play. Play is a meaningful activity for children's development. This aspect of young children's lives is one of the most prominent and important components of their development, and play is one way that children can enhance the development of cognitive skills. Play is broadly defined as being "an activity serving no immediate purpose, not serious, and is an exaggerated version of its functional equivalent or where the means of the activity is stressed over the ends" (Pellegrini & Bjorklund, 1998, p.192). Play is said to take place when one engages in diversion and amuses oneself. Children frequently use toys or play materials in this process, which are considered as an integral vehicles to play. Toys are customarily fundamental to children's play. In being the essence of play, toys attempt to stimulate learning and cognitive growth and because toys often mediate and stimulate children's play experience, the use of toys to study attention is appropriate and developmentally meaningful.

However, each child behaves differently in response to various play situations and the items in his/her environment. Some children prefer physical activities to quiet activities; others choose artistic, creative playthings over symbolic playthings. The reasons for these choices may vary, and might include influences from the environment, the availability of play materials, and even peers. Children's individual differences such their temperament, may be one element that influences the type of toy children prefer playing with as well as how long children will attend to this toy.

The following study attempted to determine if there was a relation between the temperament characteristics of young children, the type of toy, and the level of difficulty of these toys that the children play with, and children's subsequent duration of focused attention. The study set out to investigate if children who played with construction toys, which were goal-directed that is, possessed a defined goal with an end product, and could result in a playful outcome (e.g., Builder System), would be more likely to display more focused attention than while playing with goal-directed toys with no playful outcome (e.g., puzzles). In addition, the study investigated if the level of difficulty of these two types of toys would influence focused attention and if children would focus their attention differently depending on their temperament characteristics.

In the present study, the literature review will begin with an overview of the topic of attention, and define some fundamental components of attention. Theoretical and empirical research helps convey the significance of attention in the lives of young children. Thereupon, the issue of individual differences in the study of attention and young children was addressed, focusing on the concept of temperament. Then, the importance and implication of toy structure in young children's lives, as well as the

association with the examination of attention is discussed. This section also presents the three research questions that the study addressed. The research methodology including information about the study's participants, the materials employed, the settings, the measures, and the procedures of this study are presented. Finally, this study reports results and discusses the implications of these results.

Literature Review

The Components of Attention

Attention is a frequently used concept in educational settings. Words and expressions such as "concentrate", "pay attention", "take notice" or "distracted" and "preoccupied " are part of everyday vocabulary, especially in domains involving children's attentional kills (Ruff & Rothbart, 1996). Educators, teachers, and parents seem to naturally emphasize actions such as listening carefully or looking closely. Individuals working with children often assume that if children are not actively looking at them or listening, the children may not understand the lesson or the guidance that is being conveyed. However, what is attention and why is it important? For many years, researchers from various domains have tried to answer these and similar questions. Also, with the seemingly increasing number of attention deficit disorders (ADD) diagnosed in young children, it is no wonder that in our society, individuals who work with children such as educators and toy manufacturers are directing increasing efforts to the issue of attention.

Most agree with the words of William James "that everyone knows what attention is" but surprisingly, the definition and comprehension of attention is as elusive today as it was 100 years ago (Hale & Lewis, 1979). Attention has been a major issue in psychology

for many years and has long been conceived as one avenue to the study of cognitive development. Indeed, among experts in psychology and education, testing attention has traditionally been construed as a potential index of mental ability (McCall, 1971). More particularly, because of its potentially central role in the development of cognitive skills, attention has been the focus of a number of studies on young children (Bornstein & Sigman, 1986; Choudhury & Gorman, 2000; Ruff, 1986; Ruff, Capozzoli & Weissberg, 1998; Tamis-LeMonda & Bornstein, 1989).

Hence, infancy and early childhood studies about cognition have primarily concentrated on behaviors of attention because details of information processing in young children are particularly difficult to uncover (Pashler, 1998). Young children lack communication proficiency and as such, render the examination and analysis of the manner in which they process information difficult. Consequently, attention serves as an observable entity to facilitate the study of whether infants and young children appear to process the information from their surroundings. In addition, it enables us to attempt to compare and predict various children's cognitive skills from this initial element of information processing (Bornstein & Sigman, 1986). Attention enhances selectivity and maximizes the intake and use of information therefore, researchers agree that attention plays an important role in learning (Ruff & Lawson, 1990a).

Attention refers to a complex set of physiological and behavioral responses to environmental stimuli. Its purpose is to direct cognitive resources to events or situations with the intention of gathering information about the event (Choudhury & Gorman, 2000). A majority of the literature on attention focuses on two precise measures of attention: (1) decrement attention, known as habituation and, (2) focused attention also

known as visual sustained attention. These two observable measures of attention have been found to reflect central mental capacities and possess predictive validity for mental functioning in childhood (Bornstein & Sigman, 1986). Lansink and Richards (1997) established the distinction between the behaviorally defined periods of "attentive" activity, which they referred to as "focused attention" versus the heart-rate-defined periods of "attentive" activity termed "sustained attention". Although these two terms are used interchangeably in the attention literature, because this study focuses on the behavioral aspect of attention, the term "focused attention", defined as object-directed behavior that involves intent facial expression with object manipulation will be used.

Holly A. Ruff, a renowned author and researcher on the topic of attention in early childhood, describes focused attention as "directing the eyes toward a source of information and maintaining a visual focus long enough to acquire information" (Ruff & Rothbart, 1996, p.4). Additionally, focused attention is described as attention that is directed exclusively to one target or task and is not divided or shared between targets or tasks (Ruff & Rothbart, 1996). In the most recent study of the development of attention and distractibility in young children, Ruff and Capozzoli (2003) refined the definition of attention into smaller entities and created a more precise definition of focused attention. In this latest study, the total duration of general attention was divided into three categories; casual, settled, and focused attention. Casual attention was defined as "looking at a toy without being engaged" (Ruff, & Capozzoli, 2003, p.879). Settled attention was defined as "a pause in the child's casual attention to look at and manipulate a particular toy, looking is steady but not necessarily intent, extraneous movement tended to diminish but might have been present, and there might have been some talking" (Ruff,

& Capozzoli, 2003, p.879). Focused attention was defined as "concentrated attention that involved an intent facial expression, minimal extraneous bodily activity, a posture that enclosed the object of interest and brought it closer to the eyes, with either no talking or soft talking clearly directed to the self" (Ruff, & Capozzoli, 2003, p.879).

At the focused attention phase of processing, the individual directs his/her cognitive resources to the stimulus and processes information associated with this stimulus (Choudhury & Gorman, 2000). The majority of information about the stimulus and cognitive processes such as encoding, storage, planning and problem solving, takes place during periods of focused attention (Lansink & Richards, 1997). Therefore, extensive and prolific periods of focused attention are beneficial and virtually crucial to proficient cognitive processes.

The Importance of Attention

The study of attention as a behavior is essential in the identification of how to help promote the development of attention in young children and therefore assist in their cognitive development. The consequences of attentiveness can extend through many domains but the most significant are cognitive development, abilities, and performance (Ruff, 1990). The assessment of cognitive ability early in life and the prediction of mature cognitive stature from early performance are enduring topics in early childhood studies. In the last decade, a number of studies have demonstrated longitudinal associations between measures of early childhood focused attention and measures of childhood cognitive abilities (Choudhury & Gorman, 2000; Palisin, 1986; Ruff, Capozzoli, & Weissberg, 1998; Tamis-LeMonda & Bornstein, 1989).

In one study, Choudhury and Gorman (2000) recruited sixty-one toddlers (17-24 months old) and held 8- minute play sessions in the children's homes. The play sessions consisted of two age-appropriate tasks with toys (i.e., stacking cups and sorting shapes). These were videotaped to enable the recording of instances of on- and off-task glances (i.e., focused attention and distraction) and problem solving abilities during the tasks. In addition, the researchers administered the Bayley Scales of Infant Development-II (BSID-II) in order to obtain measures of cognitive skills. The results demonstrated that toddlers who attended to tasks for longer periods of time were more successful at problem solving and also obtained higher scores on the cognitive scales of the BSID-II than children with shorter attention spans. Based upon this positive correlation between attention and problem solving abilities and attention and scores on the cognitive scales of the Bayley, it is possible to assume that toddlers who display higher duration levels of attention may exhibit more advanced cognitive abilities. In a similar study by Ruff (1986) conducted with 9-month-old infants, results demonstrated a positive correlation (r = .55) between the duration of children's focused attention during exploratory play with toys and Stanford-Binet IQ scores at 3 years of age, once again underlining the importance of attention as related to cognitive development at an early age (Ruff, 1986).

Moreover, other research conducted with preschool children has associated early levels of attentiveness with later school achievement (Ruff, 1990). Results from a study by Palisin (1986) on preschool temperament and performance on achievement tests, support the findings by Ruff (1990). This longitudinal study used three standardized tests (the Stanford-Binet, Wechsler Intelligence Scale-R and the Peabody Individual Achievement Test) at two different time periods, at 48 months of age and during second

grade. In addition, the children's mothers completed temperament questionnaires and a psychiatrist conducted observations of free-play situations. The study revealed that children who were rated as having "good" (i.e., long) attention-spans by their mothers and the psychiatrist at 48 months, performed better on the standardized cognitive and problem solving tasks at both time periods than children reported as having lower attention-spans (Palisin, 1986). This suggests that children with longer durations of attention in early childhood perform at higher cognitive levels at school age in comparison to children who displayed shorter durations of attention at 48 months.

Findings from a very compelling study by Parrinello and Ruff (1988) help reinforce the reasons as to why it is important to study focused attention in young children. Their study conducted with 10-month-old infants established that infants, who were low attenders to objects at the beginning of the study (i.e., first observation), were more influenced by an adult's attempt to stimulate and encourage attention than children who were high attenders at baseline. These arguments regarding the positive consequences of early levels of attentiveness suggest that early intervention by an adult or possibly through interaction with a specific type of object or toy promoting attentive behaviors (i.e., focused attention), can be beneficial for a child's cognitive development and future cognitive abilities. A study focusing on the types of toys and their relation to children's attention has yet to be conducted.

Furthermore, these findings provide evidence to suggest that focused attention during interactions with objects such as toys, is a positive trait and is associate with higher cognitive abilities (e.g., academic achievement and intellectual quotient-IQ) (Ruff, 1990). However, another factor must be taken into consideration when examining the

consequences of focused attention. Findings from the study mentioned above by Choudhury and Gorman (2000) suggest that individual differences may have been a major factor influencing the children's on/off-task behaviors and their task performances. Therefore, this suggests that individual differences should be examined and taken into consideration when observing focused attention in young children.

The Relation Between Attention and Individual Differences in Temperament

Two key characteristics of focused attention that distinguish it from other levels of attention are that (1) it is voluntary and (2) controlled by the individual. As a result, it can be concluded that individual differences, in temperament for example, will play a major role in focused attention (Ruff & Rothbart, 1996). As any parent or educator can confirm, each child is unique, and different, and what explains one child's behavior will not necessarily explain another's behavior. One of the most overt individual differences related to a child's behavior is temperament (Goldsmith et al., 1987).

Renowned temperament researchers Chess and Thomas characterize temperament as "the way in which an individual behaves, having biological underpinnings, stable across a life span but, largely influenced by environmental factors" (Chess & Thomas,1996). In accordance with Chess and Thomas' definition, Bates (1989) describes temperament as a concept primarily explained as patterns of behavior that can be observed in living beings, which are relatively stable across various kinds of situations and over the course of time. The term temperament is most often applied to behavioral qualities of emotion, activity, and attention, which are considered to be three significant areas of behavior (Bates, 1989). Researchers have come to an agreement that there is a biological underpinning to temperament, and consequently have emphasized the

importance of including temperament as a factor when considering behaviors such as focused attention (Bates, 1989; Goldsmith et al., 1987).

However, as complex as it is to describe temperament, it is equally difficult to accurately rate and evaluate temperament in young children. Certain researchers, such as Chess and Thomas, state that children can be categorized into three temperament clusters: easy, difficult, and slow-to-warm up. Other researchers such as Rothbart, prefer to describe children's temperament through temperament characteristics, which refer to a number of distinct variables such as activity level, attentional focusing, and attentional shifting (Goldsmith et al., 1987; Rothbart et al., 2001; Rothbart & Mauro, 1990). Nonetheless, attention is one aspect that is included in all definitions of temperament. Numerous researchers specialize in the subject of temperament. They have developed questionnaires, observations, empirical research, theory, and all authors, without exception, include attention in their investigations (Rothbart & Mauro, 1990). The parent questionnaire developed by Rothbart et al. (2001) includes two categories of temperament characteristics specific to attention, these are (1) attentional focusing, and (2) attentional shifting, each of which is composed of 12 items. Therefore, this questionnaire seems to be appropriate when investigating the relation between children's temperament and duration of children's focused attention.

Furthermore, another important aspect in the evaluation of a child's temperament is method for gathering the information. Studies and literature reviews by Goldsmith et al. (1987) and Presley and Martin (1994) have concluded that a parent questionnaire inquiring about their child's temperament is the most valid and reliable way of making inferences in a most cost effective and time efficient manner. A child's temperament can

be most thoroughly assessed through extensive observations of behaviors across time and in various situations and so parents and caregivers are perceived as good sources for accurate information (Goldsmith et al., 1987; Presley & Martin, 1994). Investigations by Goldsmith, Rieser-Danner and Briggs (1991) and Matheny, Wilson and Nuss (1984) have suggested that longitudinal studies with day-to-day observations would be the best manner to accurately observe temperament. However, they also found significant correlations between day-to-day observations in natural settings and parent questionnaires. Therefore, they have acknowledged that parent questionnaires are a good alternative as they have yielded valid and reliable results.

In the past decade, the social sciences have seen an increase in studies on temperament and temperament has been viewed as an intervening variable that defines differences between individuals (Hinde, 1989; Rothbart & Mauro, 1990). Since temperament in the early years of life has been suggested to be a predictor and/or precursor of many developmental outcomes, it is often used as an important variable in assessing cognitive abilities (Derryberry & Reed, 1994; Ruff & Lawson, 1990). Research has concluded that temperament and cognition appear to be mediated by attention, thus making attention a crucial factor in the study of cognitive abilities and individual differences.

Findings from a study by Derryberry and Reed (1994) suggest that individuals with temperaments representative of positive motivational behavior showed higher levels of selective and focused attention, which is related to higher cognitive abilities than individuals who do not exhibit these temperaments (Derryberry & Reed, 1994). In a longitudinal study exploring the early measures of attention and evidence of stable

individual differences in attentiveness, Ruff and Lawson (1990) found that certain components of temperament in the first 2 years of life were significantly correlated with the duration of children's focused attention at 3.5 years of age. In this study, the parents were asked to rate their child on various temperament variables. Levels of activity, attention, and distraction, were found to be correlated with attentiveness observed two years later (Ruff & Lawson, 1990). Palisin (1986) also found positive correlations between performance on achievement tests in preschool children and two other components of temperament, attention span, and persistence. This evidence supports the idea that children's temperament may be a factor in their level of attention, and perhaps even associated with their future cognitive abilities.

Moreover, it is interesting to note that the majority of studies conducted with young children from infancy to preschool use play situations or tasks with toys in order to observe and assess attention, cognitive abilities, and the intervening variable of temperament. In their longitudinal study of individual differences in sustained attention, Ruff and Lawson (1990) used toys (e.g., blocks, cups, commercial toys) in three separate free play sessions (i.e., at 1 year, 2 years, and 3.5 years of age). Choudhury and Gorman (2000) used seriated cups and shape sorters in their study of toddlers' individual differences, sustained attention, and cognitive performance. Ruff, Capozzoli and Weissberg (1998) also used toys in a play context in comparison with television or a reaction time task to uncover relations between age and individuality (e.g., temperament) in sustained attention. These authors indicated that to study young children's behavior, the condition must resemble children's daily experiences thereby facilitating the

investigation of the behavior. Thus, a play situation in a familiar setting using familiar objects such as toys, should satisfy this condition.

The Essence of Play Situations: Toys

As previously stated, attention plays an important role in the processing of information and it has been researched through various situations and settings. Play is one condition that has been shown to be reliable and valid in providing evidence of the relation between attention and cognitive development in young children (Pashler, 1998; Ruff & Lawson, 1990; Vaughn & Waters, 1981).

Play is an important medium in young children's lives. It is during their play with different types of materials that young children learn about the world around them and develop fundamental skills, such as problem solving and attending to a task. Although children are intrinsically motivated to "play around", some tools can help support, develop and enhance children's play and can play an important role in their lives. Newson and Newson (1979) stated: "We do not play because we possess toys-toys are just tools to attach the play to", therefore play happens to come first and the use of toys merely follows (Newson & Newson, 1979). Studies have shown that children's environment, and the materials made available to them, can help bring forth specific behaviors as well as stimulate children and can even work toward enhancing specific cognitive abilities such as focused attention. Interestingly, the Nordic Center for Research on Toys and Educational Media (Brodin, 1999) reported that many children in diverse countries have 500 to 1,000 toys in their homes, clearly illustrating that toys are a salient part of young children's lives. As such, it would be wise for researchers to initiate investigations as to how toys can foster children's cognitive development.

One factor that could be studied and that can help influence the impact a toy may have on the development of cognition is the level of focused attention displayed by children while playing with a specific toy. Focused attention has been conceptualized as a basic cognitive process that is relatively stable across situations, but that can be enhanced through cues such as the interest and motivation to attend to a specific task or object (Meadows, 1993). Children's interest and motivation will determine whether they will firstly interact with a specific toy or not; in turn this may support specific play behaviors and help foster focused attention. One study revealed that toddlers with higher levels of motivation for exploring toys (manipulation of novel objects) scored significantly higher on the Binet IQ tests at 42 months, in comparison to toddlers with lower levels of motivation for exploring the same play materials (Yarrow et al., 1975). This finding provides evidence to suggest that children need toys that have motivating qualities such as a fun and interesting end product, and are motivating to them individually in order for them to first want to explore the toys, then focus their attention on the specific toys, and develop cognitive skills supported by these toys.

Ultimately, the characteristics of a toy such as the physical aspects and the objective of the toy, can be determining factors in whether children will be initially attracted to the toys. This may also tell whether children's focused attention and their time will be allotted to the toy, which may be associated with various cognitive outcomes. If a toy is attractive and stimulates children with qualities such as bright colors or an interesting end product, they may likely to spend more time observing and analyzing the toy (Abrams & Allen-Kauffman, 1990; Frost, Worthham & Reifel, 2001). As such, the more children experience situations that foster focused attention, the higher

their level of attention may become. This could help support and may even increase levels of cognitive ability and performance as many studies have previously suggested (Choudhury & Gorman, 2000; Palisin, 1986; Ruff, et al., 1998; Tamis-LeMonda & Bornstein, 1989). Therefore, it would be important to ascertain what type of toy motivates children to attend to the problem solving tasks associated with it.

The impact of a toy's characteristics varies depending on the user' s age. Infants and young toddlers, for instance, rely on their senses to guide them toward a certain toy and focus their attention on this toy (Choudhury & Gorman, 2000; Smith, Cowie, & Blades, 1998). The shape and color of the toy and the sound that it makes are merely a few of the many characteristics that attract and capture young children's attention. Round shapes, bright colors, and a variety of tones are all characteristic of attractive toys for this age group (Smith et al., 1998; Bronson, 1995). A study by Ruff (1984) demonstrated that 12-month-old infants adjusted their behaviors to the particular characteristics of the toy presented to them. This suggests that children's behaviors can be influenced by the characteristics or type of toy they play with. But as children mature and develop cognitively, bright colors and round shapes become insufficient characteristics to hold children's attention (Bronson, 1995). Other characteristics such as the toy's objective, function, level of difficulty, and the children's individual preferences associated with their temperament become influential factors involved in attending to a toy (Gianvecchio, 2002; Moyer & Gilmer, 1955; Vlachou & Farrell, 2000).

Piaget (1962) stated that children in the pre-operational stage (approximately three years of age) develop representational insight (Shaffer, 2000). This mature cognitive function is observed to emerge in the ability to develop mental representations,

mental schemes of past events, situations, absent objects, and people in the child's surroundings (Belsky & Most, 1981; Tamis-LeMonda, & Bornstein, 1993). Therefore, children of this age are able to think of the toy's objective and end goal such as in the completion of a puzzle or a construction toy; these factors can affect the child's level of focused attention toward the toy (Bronson, 1995; Jennings, 1991).

In addition, a study by Jennings (1991) found that 3-year-old children demonstrated increased periods of attention during play with toys that had specific problems to be solved such as achieving the goal of completing a task and/or putting a puzzle together (Jennings, 1991). Having a specific problem to solve or a defined goal motivated the children to focus their attention on the task at hand. Consequently, it can be suggested that a toy with a defined goal would be motivating for a 3-year-old, therefore encouraging focused attention (Choi & Anderson, 1991).

A toy with a "defined goal" (goal-directed toy) signifies that the toy essentially has one purpose to it, that is to put together pieces and create a picture as done with a puzzle, or build an object, such as with a construction toy. A construction toy, such as a building system, is defined as having a defined goal and a playful outcome. The contrast between the two types of toys is evident once the main goals of these toys have been met. Once a puzzle has been completed, there is very little else, that can be done. Some children may opt to redo the puzzle, while others may use the shapes symbolically in dramatic or sensori-motor play. However, once a child has completed the construction toy, the creation can usually be used by the child for many different scenarios. This contrast of having or not having a playful outcome may act as a motivating aspect that

could influence the duration of focused attention children exhibit while playing with both types of toys.

Further to this notion, if a toy is goal-directed, but in addition includes a playful outcome such as a truck to play with as an end result in the case of a construction toy, would children be more likely to display longer durations of focused attention? Can the type of toy and the level of difficulty of the toy children play with influence the duration of children's focused attention? Can an intervening variable, such as temperament, be a determining factor regarding which type of toy children focus their attention on for longer periods of time? Does the level of difficulty of a toy play a role in the level of children's focused attention towards different types of toys and is this related to children's specific temperament characteristics?

Summary Statement

The impact of toy characteristic and toy type has rarely been studied in the context of attention, and individual differences in temperament, furthermore, there are no investigations of this nature with children beyond the age of 24-months-old. For these reasons, observing 36-month-olds' level of focused attention associated with different types of toys in relation to children's temperament is the topic of this study. Consequently, the current study attempted to provide some answers as to the type of toy that may elicit longer durations of focused attention and also provide insight into what type of toy is best suited for particular temperament characteristics.

The present exploratory research sought to determine the relation between a child's temperament characteristics, the type of toy a child plays with, and the consequent duration of children's focused attention. Solitary play with toys, the setting for this study,

provided an opportunity to observe changes in the duration of children's focused attention while playing with two different types of toys with two levels of difficulty. The present study was conducted in seven childcare centers in the Montreal area with a total of 28 children participating. Four conditions were established with two types of toys and two levels of difficulty; the sessions with puzzles and construction toys were conducted one week apart. The children were asked to play by themselves with one toy at a time and the sessions were video taped.

The study set out to examine three research questions regarding the duration of children's focused attention during play with toys. The first research question asked if there would be a difference between the duration of children's focused attention toward a toy with a defined goal (i.e., puzzles) and a toy with a defined goal and a playful outcome (i.e., construction toys). A second research question asked if there would be a difference between the duration of children's focused attention towards each type of toy depending on level of difficulty of the toy. The third and final question explored if there would be a relation between the child's temperament characteristics, the type of toy, the level of difficulty of the toys, and the duration of children's focused attention.

Method

Participants

There were 28 children who participated in this study (17 boys, 11 girls) from seven Anglophone childcare centers in the Montreal metropolitan area. The centers were selected from a list of childcare centers that had participated in research projects involving Concordia University students. A total of 99 packages was distributed to eight childcare centers. The educators and directors gave the packages to the parents of

children who were 33 to 39 months of age at the time of the study. The number of packages given to each classroom and daycare was in accordance with the information given by the directors of the centers concerning how many children were of the appropriate age for the study.

The response rate was 36.36% therefore, initially 36 parents agreed to have their child participate in the study and complete the consent forms, however only 28 children were included in the study. A total of eight children were not included in the analyses. An entire sample ($n = 2$) from one daycare was dropped from the study because the parents of both children did not complete the questionnaires by the end of the study. Another child participated in both play sessions but the parents subsequently decided that they did not want to complete the questionnaires. One child did not want to participate in the second play session, one child did not want to participate in either of the play sessions and another child began each of the four play conditions but did not want to play with each toy more than a few seconds and could therefore not be included in the analyses.

The children who participated in this study were all English and French speaking and were between the ages of 33 to 39 months ($M = 36.07$ mos., $SD = 2.26$ mos., *Range* = 6 mos.). This age range was established in order to reduce any maturational issues that could have arisen with a wider age variation. There were 11 girls ($M = 35.73$ mos., $SD = 2.1$ mos., *Range* = 6 mos.) and 17 boys ($M = 36.29$ mos., $SD = 2.39$ mos., *Range* = 6 mos.) who participated in this study. The majority of the participants had at least one sibling (67.86%) and of those, 68.42% were second-borns, 21.05 % were first-borns and 10.53% were third-borns. The majority of the children who participated in the present study were born in Montreal (96.42%). The 57.14% of participants had been, on average,

in childcare for 1 to 2 years at the time of the study, 17.86% had been in childcare for 6 months to 1 year, and 25% had 2-3 years of experience in childcare. In all, 16 educators participated in this study by completing the background and temperament questionnaires for each child in the study.

Testing Site

For the purpose of this research, the site selected to conduct this study was each child's childcare establishment, but not in his/her classroom. Since the main variable of this research involved children's focused attention in a specific play situation, a separate space, apart from the classroom, was requested from the director of each center and/or the educator. Therefore, it was requested that neither other children nor educators be present during the sessions as they could serve as possible influential factors on the duration of children's focused attention directed toward the toys. The play sessions were conducted in a teacher/staff lounge in four of the childcare centers, in empty classrooms in two of the centers and in a room used as a gym in one of the centers. The directors of three of the centers also requested that there be a second adult with the researcher and the child at all times during the play sessions. This second adult was either a Concordia research assistant, a volunteer from the center, or the director. Each person sat behind a cardboard divider with the researcher, which rendered the adults invisible to the child. The study was conducted in places in the centers with which the children were familiar. The goal of using a familiar setting was to help the children feel comfortable and at ease during the play sessions and therefore limit any external factors that could interfere with their typical duration of focused attention and their play.

Materials

Type of toy. The play materials used for this study consisted of four different toys grouped into two categories: Goal-directed toys (GD) and goal-directed toys with a playful outcome (GDPO). A goal-directed toy signifies that the toy essentially had one purpose to it or one function to it, which is to complete a task and create something. This type of toy, and the pieces included, guide children to complete the task and the end product essentially cannot deviate from what it was intended to be. It may, in some cases, be put together in an imaginative, unusual, and/or innovative way but will consequently not represent the anticipated picture or object, and will not function as intended. Hence, a goal-directed toy with playful outcome is a toy with a defined goal but in addition it has a playful outcome. This means that when children complete the task of putting the toy together, they may play with the finished product.

In this study, puzzles were used as goal-directed toys. There were two puzzles of graded difficulty. The number of pieces for this type of toy, which is 8 pieces, and 12 pieces determined the difficulty level. The 8-piece puzzle was considered easier and the 12-piece puzzle was judged to be more difficult. The puzzles used were by Galt, measured 154 x 217 mm, and featured colorful images of animals and their young from around the world: lions and monkeys.

The goal-directed toys with playful outcome (GDPO) were construction toys. There were two construction toys of two levels of difficulty. The construction toys used were two "Bob the Builder" building system construction toys. The number of pieces determined the difficulty level for this type of toy: 7 pieces and 12 pieces. The construction toys represented characters from the "Bob the Builder" children's television

show and all possessing human-like features: A roller pin named Roley and a tractor-trailer named Travis.

The levels of difficulty for these toys were established by taking into consideration the recommended age established by the toy manufacturers for each type of toy, as well as literature and research by toy specialist Martha Bronson who has established guidelines as to the appropriateness of each type of toy and number of pieces (Bronson, 1995). A pilot test was conducted prior to the beginning of the research in order to establish the appropriate levels of difficulty with these specific toys. In all, seven children between the ages of 33 and 40 months were asked to participate in solitary play with six toys, that is three puzzles, and three construction toys. The initial level of toy difficulty was disregarded because the children were able to complete the toys in a very short period and so, these toys were established as being too easy for this age group. Level 2 and 3 for both toys were observed to be reasonably challenging for all children and were chosen as being appropriate in complexity.

In addition, as part of this study examining the focused attention for a specific toy, a complex musical toy was used as a unimodal distractor. The distractor was a Fisher-Price Growing Smart Keyboard, which included a light-up keyboard, a selection of children's melodies or single music notes and displayed the eight characters featured in the melodies. This distractor is considered to be unimodal because only the auditory component of this toy was activated to distract the children.

Procedure

The initial phase of the study was recruitment of participants. Telephone contact was made with directors of 11 childcare centers in the Montreal metropolitan area and the topic of the study as well as the procedures was explained. The role the director and the educators would play during the study was made clear. Eight directors agreed to have children from their centers participate in the study and the researcher was informed of the approximate number of children of the appropriate age who would be available in each center. Two directors requested a copy of the proposal and ethics form and requested a meeting between the center's parent committee, research committee, and the researcher. Both centers and committees approved the study.

A letter explaining the study was given to the directors and they each assumed the role of gatekeeper (Appendix E) (Creswell, 2002). Relevant research materials were delivered to each childcare center to be distributed to the parents by the director and/or educators, and parents were instructed to return the materials to the educators. Each package included a letter to the parents (Appendix A), a consent form (Appendix B), a background questionnaire (Appendix C) and a child temperament questionnaire to be completed by the parents (Appendix D). In addition, a letter to the director (Appendix E), a letter to the educator (Appendix F) and background (Appendix G) and temperament questionnaires (Appendix H) to be completed by the educator concerning each individual child participating in the study were also included in the packages. When parents returned the completed consent forms, they were reminded by the educators to return the questionnaires on the day of the first play session. The majority of the parents respected this request but some were brought back a few weeks after the play sessions were

completed. As mentioned in the *participant* section, three parents, who had initially signed the consent forms and therefore agreed to have their child participate in the study, did not return the packages thus their children's play sessions were not analyzed. The educators were given packages as well, which included a letter explaining the study and their involvement as well as a background and temperament questionnaire for each child in their classroom who participated in the study. They were asked to complete these questionnaires by the time the play sessions were to begin.

In order to attain the number of participants necessary for data analysis, the recruitment period lasted six months. Prior to the play sessions, the researcher volunteered for a few hours in each of the childcare classes in which children were participants in the study. This was done in order to establish a rapport with the children prior to the play sessions. These visits, as well as all the play sessions, were scheduled with the director of the daycare and the educators.

Play sessions. For five of the eight centers, the researcher was the only adult involved in the play session and was therefore, responsible for the care of the children during the play sessions. Each child participated in two play sessions scheduled one week apart. The play sessions lasted approximately 20-40 minutes. The researcher began the play sessions by going into the classroom and introducing herself to each child and explaining the procedures of the session; " Hi (child's name), my name is Nathalie! Today I brought a few toys today to the daycare, and I was wondering if you would like to come and play with the toys? We are going to go to another room so you won't be interrupted while you play. Would you like to come with me? It should take a few minutes and then you'll come back to your classroom!" The researcher then accompanied

the child to the area where the session was to take place. If the child refused to take part in the play sessions, the child was informed that he/she did not have to participate if he/she did not wish to and the play session was cancelled. However, the child was also informed that if he/she wished to participate at a later time, that he/she could inform the educator or the researcher and the play sessions would take place. This occurred four times during data collections.

Each child was seated at a child-sized table and chair arranged by the researcher prior to the play session. The child was given a 4-minute free play period in which he/she could play with the warm-up toys provided, which was either a puzzle or a construction toy, depending on the play session that was to follow. This was done to ensure that the child felt comfortable with the researcher and the camera. During this time, the researcher set up the video camera at the child's eye level while the child was seated at the table. At the same time she explained to the child how the camera functioned, and gave a demonstration; "Okay (child's name), I have a few toys you can play with for a little while. I'm just going to set up my camera so I can see you in my screen right here, okay. Would you like to see what I can see in the camera?" The video camera was placed in front of the child at a distance of approximately 2 meters, depending on the size of the space provided to conduct the study. The camera was focused to record the objects that were placed in front of the child as well as the child's upper body and a clear view of the child's face and eyes. After the camera was set up, the researcher began the video recording, joined the child and interacted, and guided the child in putting the puzzle or construction toy together; " Okay (child's name), I am going to start the camera now. How are you doing with these toys? How about if you follow this image, where do you

think this piece goes? You can turn the pieces!" This procedure was intended to insure that the child understood and knew at least the basics of how to manipulate a puzzle and a construction set. This was done to eliminate the possibility that the children felt overwhelmed with the types of toys provided.

The toys used for the first play session were alternated between children. In all, 14 children began their first session with the goal-directed toys (i.e., puzzles) and 14 children began with the goal-directed toys with playful outcome (i.e., construction toys). Special attention was paid to alternating between genders, therefore 5 girls and 9 boys began with the construction toys (n = 14), and 6 girls and 8 boys began with the puzzles (n = 14). The two difficulty levels of the toys were presented in a systematic manner, starting with the easier play materials and finishing with the more difficult ones. After approximately 4 minutes of free play, the researcher told the child that it was time to play with another toy and exchanged the child's warm-up toy for one of the research types (i.e., puzzles or construction toys). At this point, the child was reminded that he/she could go back to his/her classroom if he/she did not feel like playing anymore; "Remember you can go back to your classroom whenever you want. All you have to do is tell me and we will go, okay!?

The child was reminded before each toy was presented that he/she had to play alone for 4 minutes, that the researcher could not help him/her and that if he/she finished the toy he/she could take it apart, do it again or play with it. Each toy was presented one at a time and the child was given 4 minutes of solitary playtime. In each condition, the researcher showed the completed toy to the child, disassembled, and reassembled the toy with the child to demonstrate the process and be sure that the child understood how to put

the toys together. "Okay, here is the toy, this is what it looks like once it is put together. I'll show you, see you put the pieces like this. Now you try to do it by yourself, okay!? Are you ready to play with this toy? You have to do it all by yourself because I can't help you, and we have 4 minutes of camera time, so whenever you finish you can play with it, take it apart, put it together again, okay?! Lets count to three..1..2..3...Okay, go ahead!"

There was minimal interaction between the researcher and the child once the child began to manipulate the toy. The researcher hid behind a cardboard divider to allow the child to engage in solitary play. The researcher pretended to be doing some work; "I am going to sit here, I have a little work to do while you play, Okay!" Some of the children asked the researcher questions, but she did not respond unless the child seemed distraught or repeated the questions more than three times. If the child did ask a question more than three times or said he/she had finished the toy, the research responded by simply informing the child how many minutes were left in the session; "Okay, there are 2 minutes left!" After 4 minutes from the beginning of the manipulation, the toy was removed; "Okay, that was very good. Now we are going to play with the other toy." The second toy was then introduced. If the child had not finished his/her toy after 4 minutes, the child was given an extra minute, but the camera was turned off. If, at any time, the child did not play with the toy, the researcher did not prompt the child and waited until the end of the 4 minutes to redirect the child's attention by presenting a new toy. In addition, during each of the 4-minute sessions, the researcher activated the distractor, which the child could not see (i.e., Fisher-Price Keyboard), at the time related to the level of toy difficulty. Thus, 2 minutes into the session with the first toy, and 3 minutes into the session with the second toy, the distractor was activated. The distractor's schedule was

established to ensure that the distractor could be activated before the child completed the task.

After the second 4-minute play period, the researcher stopped the video recording, and the play session ended; "Well that's it, that's the end of our play session, you did a very good job". The researcher then discussed the play session with the child; "How did you like the toys? Did you have fun? Was there anything you didn't like?" and discussed the next play session scheduled approximately for a week later; " I'm going to come back next week and we are going to play with two new toys. Now, we are going to go back to your classroom". The researcher accompanied the child to his/her room; "Thank you (child's name) very much for playing with these toys and I'll be back next week."

The second play session was conducted one week after the first session in the same manner as the first with the other type of toy. The camera was mounted during a 4-minute free play period. This was followed by showing the child the image of the completed puzzle or construction toy and a demonstration of the process to assure that the child understood how to put together the toys. The researcher activated the distractor at the established times during the session. After the second 4-minute play period, the researcher stopped the video recording and the play session ended.

ECERS. At the end of the data collection, the researcher evaluated the global quality of the children's classrooms using the Early Childhood Environment Rating Scale (ECERS). The researcher went to the centers twice to assess the environment accurately, once to observe a morning session, and once to observe an afternoon session for two hours each time. The researcher had copies of the ECERS score sheet for each of the centers and asked the educators and directors questions regarding information that was

not available through observations (e.g., professional development). The internal consistency of the ECERS-R is *alpha* = .92.

Measures and Scoring

Demographic questionnaires were used to gather pertinent information from the parents and educators concerning the children's experience with the types of toys used in this study.

Parent demographic questionnaire. The parent demographic questionnaire included 40 questions that focused on demographic information such as age, sex, siblings and health information (Appendix C). In addition, the questionnaire was used to gather information pertaining specifically to the availability in the home of the types of toys used in the study, and their child's behavior with these toys (e.g., attitude, interest, and experience).

Educator demographic questionnaire. The educator demographic questionnaire was completed by each child's educator (Appendix G). If the child had two or more educators with him/her everyday, the decision was made to have the questionnaires completed by the educator who was considered to know the child the best. This questionnaire included 28 questions and was used to gather information about availability of the types of toys, in the classroom and the specific child's behavior with these toys.

Scoring: Demographic questionnaires. The responses from the parent and educator demographic questionnaires were all inputted into SPSS and coded by the researcher.

Temperament questionnaires were used to gather information about the child's temperament and both the child's parents and educator completed separate versions of the questionnaire.

Parent temperament questionnaire. Individual differences such as temperament play a crucial role in the level of attention and/or distraction a child may exhibit during play with toys. Therefore, it was important to take this intervening variable into consideration when assessing focused attention in young children. The parents who agreed to have their child participate in the study completed a questionnaire regarding their child's temperament. The parents reported that the questionnaire took approximately 30 minutes to complete. This questionnaire was the "Early Childhood Behavior Questionnaire" (ECBQ) developed by Mary Rothbart at the University of Oregon as an expansion of the pre-existing "Toddler Behavior Assessment Questionnaire" (TBAQ) developed by Goldsmith (1996) (Putnam, Ellis, & Rothbart, in press). The internal consistency of the 18 scales was satisfactory; coefficient *alpha* ranged from .61 to .89, with an average Cronbach's *alpha* of .79 (Rothbart & Mauro, 1990). The questionnaire had 201 items divided into 18 categories (Appendix D):

1. Activity level/energy (12 items): Level (rate and intensity) of gross motor activity, including rate and extent of locomotion.

2. Attentional focusing (12 items): Sustained duration of orienting on an object of attention, resisting distraction.

3. Attentional shifting (12 items): The ability to transfer attentional focus from one activity/task to another.

4. Cuddliness (12 items): Child's expression of enjoyment in and molding of the body to being held by a caregiver.

5. Discomfort (10 items): Amount of negative affect related to sensory qualities of stimulation, including intensity, rate or complexity of light, sound, texture.

6. Fear (11 items): Negative affect, including unease, worry, or nervousness related to anticipated pain or distress and/or potentially threatening situations; startle to sudden events.

7. Frustration (12 items): Negative affect related to interruption of ongoing tasks or goal blocking.

8. High intensity pleasure (12 items): Pleasure or enjoyment related to situations involving high stimulus intensity, rate, complexity, novelty, and incongruity.

9. Impulsivity (10 items): Speed of response initiation.

10. Inhibitor control (12 items): The capacity to suppress inappropriate actions or responses.

11. Low intensity pleasure (11 items): Pleasure or enjoyment related to situations involving low stimulus intensity, rate, complexity, novelty, and incongruity.

12. Motor activation (11 items): Definition: Repetitive small-motor movements; fidgeting.

13. Perceptual sensitivity (12 items): Detection of slight, low intensity stimuli from external environment.

14. Positive anticipation (11 items): Excitement about expected pleasurable activities.

15. Sadness (12 items): Tearfulness or lowered mood related to exposure to personal suffering, disappointment, object loss, loss of approval, or response to other's suffering.

16. Shyness (12 items): Slow or inhibited approach and/or discomfort in social situations involving novelty or uncertainty.

17. Sociability (8 items): Seeking and taking pleasure in interactions with others.

18. Soothability (9 items): Rate of recovery from peak distress, excitement, or general arousal.

The parents circled their answer for each of the 201 questions on a 7-point scale, and the answers were: 1 = Never, 2 = Very rarely, 3 = Less than half the time, 4 = About half the time, 5 = More than half the time, 6 = Almost always, 7 = Always, NA = Does not apply. Each subscale is independent and each child could receive a score between 1, meaning that the children never exhibits that temperament characteristic, and 7, meaning that the child always exhibits that temperament characteristic.

Educator temperament questionnaire. The child's educator completed an abbreviated form of the questionnaire that only included temperament characteristics that were related to the topic of the study, *attentional focusing* and *attentional shifting*, with 24 questions in all (Appendix H). The educators reported to the researcher that it took approximately 5 minutes to complete. The answer format was the same as for the complete version of the questionnaire.

Scoring: Early Childhood Behavior Questionnaire (ECBQ). The responses to the temperament questionnaires (i.e., 201 from the parents, 24 from the educators) were input

into SPSS. Then, the scoring was conducted by using the scoring procedures provided by the author of the questionnaire (Appendix I). The scores were computed by summing all numerical item responses for a given category and dividing the total by the number of items that received a numerical response. Items indicated by an R were given a reversed score by using the *recode* function in SPSS; 7 became a 1, 6 became a 2, etc. Items that received an N/A or no answer were not included in the computation.

Observation: Focused attention. A young child must first and foremost attend to events and objects in his/her environment in order to process information. When the child is able to attend and sustain his/her attention on an object for example, he/she may then be able to work out the information accurately to solve a problem, such as completing a puzzle. In keeping with the objective of this study to determine whether specific types of toys help promote focused attention, the duration of focused attention displayed by the children was observed.

Duration of children's focused attention was measured by identifying focused attention behaviors and timing their duration through video recordings of the two play sessions, four conditions in all. The children were asked to play with four specific toys, described in the *materials* section of this paper, on two separated occasions one week apart. The recording instrument was a video camera, more specifically a Sony digital camera (with built-in timer), a tripod, and blank tapes.

The researcher used a detailed coding scheme pertaining to instances of start and end of focused attention behaviors in order to measure the duration of the focused attention on each of the toys (Appendix J). The researcher coded the two play sessions wherein the children played with the two categories of toys, and which was recorded by

digital video. Using a VHS machine, the researcher reviewed the videotapes and observed for focused attention behaviors, and noted the start and end times of each behavior. These instances of focused attention were recorded onto a coding sheet (Appendix K). On this sheet, the researcher recorded necessary information such as the child's identification number, session number, date of play session, type of toy, level of difficulty, and the start and end time of the play session. The duration of each instance was then calculated and summed in order to obtain a total duration of children's focused attention for each condition on a possible 4 minutes. Therefore, each child obtained four scores, one for each of the toys; Puzzle 1, Puzzle 2, Construction toy 1, and Construction toy 2.

The coding scheme used to establish an instance of focused attention was a combination of pre-existing focused attention schemes developed by Choudhury and Gorman (2000) and more recently by Ruff and Capozzoli (2003). An instance of focused attention was defined as concentrated attention that involves an intent facial expression, minimal extraneous body activity, a posture that encloses the object of interest and brings it closer to the eyes, and either no talking or some talking mostly directed to the self (Ruff , & Capozzoli, 2003). The child is said to be engaging in focused attention when he/she displays *one or more* of the following behaviors:

1. The child exhibits a posture that encloses the toy/pieces (e.g., body close to the toy/pieces-may be hunched over toy/pieces) and there is minimal extraneous body activity.

2. The child leans in towards and casts eyes on the toy/pieces, brings the toy/pieces closer to the eyes (e.g., looks actively and intently at toy/pieces, analyzing the toy/pieces)

3. The child's facial expression is one of concentration or interest, intent facial expression (e.g., knitting the brows together, biting or pursing one's lips, tongue out, shoulders raised/hunched, eyes analyzing the toy).

4. The child actively and intently engages in manipulation of the toy or pieces that directly relate to the goal of the task (e.g., touching and turning the pieces of puzzle/construction toy, examining and comparing the pieces, putting pieces together).

5. The child actively and intently engages in active play with the toy/pieces (e.g., symbolic play with the toy and/or pieces). This includes intentional actions such as bringing toy/pieces closer to body or eyes, reaching for pieces, turning pieces with a purpose, analyzing the place for pieces.

A detailed description of what was not considered to be focused attention such as behaviors of distraction was established. Moreover, in their most recent study of attention in young children, Ruff and Capozzoli (2003) made a distinction between general attention and general attention that has been divided into three levels; casual attention, settled attention, and focused attention. Therefore, for the purpose of this study, casual and settled were included in the description of unfocused attention behaviors. An instance of *distraction* is defined as when the child looks away from the toy and/or pieces, seems interested in something else in the environment than the toy/pieces, manipulates toy and/or pieces without looking at object, lets go of toy and/or pieces, gets up to walk around or to talk to the researcher. An instance of *casual attention* is defined as looking

at the toy but not being engaged. An instance of *settled attention* is defined as a pause in the child's casual attention to look at and manipulate the toy/pieces. In this case, looking is steady but not necessarily intent, extraneous movement tends to diminish but might be present and there may be some talking. The child is said not to be engaging in focused attention when he/she displays *one or more* of the following behaviors:

1. The child looks away from toy/pieces and/or periods in which there is no clear visual orientation towards the relevant objects.

2. The child manipulates toy and/or pieces in a way that is judged to be repetitive and non focused with/without looking (e.g., when child bangs pieces together without looking at them, rolls wheels on table without looking at the wheels).

3. The child stops engaging with the object and looks away (e.g., puts the object down, holds onto it passively without looking at it, steps away from toy, gets up to walk around in the room or gets up to talk to the researcher).

4. The child looks at toy/pieces, does not seem to be analyzing situation or pieces, without touching or engaging with toy/pieces usually accompanied by extraneous body movements such as hands doing something else not related to what child is looking at (e.g., child is looking passively at puzzle and plays with his lips).

5. The child looks at and/or manipulates toy/pieces in a manner that is passive and nonchalant.

Early Childhood Environment Rating Scale (ECERS-R). The Early Childhood Environment Rating Scale (ECERS) revised version developed by Harms, Clifford, and Cryer (1998) was used to evaluate the quality of the childcare environments. The ECERS includes seven subscales ; space and furnishings, personal care routines, language-

reasoning, activities, interaction, program structure, and parents and staff. These subscales are then divided into 43 items in all. The researcher completed this rating scale for each center and a research assistant did a second evaluation of two of the centers in order to ensure reliability. The ECERS was scored following the guidelines provided in the ECERS booklet (Harms, Clifford, & Cryer, 1998, p. 5-6). First, a rating was given for each item in accordance with the description of the indicators. Adding the ratings for each item and dividing by the number of items scored resulted in the rating for each subscale. A total score was computed by adding all scores on the seven subscales and dividing by the number of items scored.

Reliability

The primary researcher and two research assistants, who were unfamiliar with the study, conducted an examination of interrater reliability for focused attention during the four play conditions and the ECERS. The reliability was verified by calculating the number of answers that were in agreement on the number of answers that were in disagreement multiplied by 100 in order to convert the total score into a percentage.

A random and representative selection of seven of the 28 children (25%) was chosen for reliability purposes for the duration of children's focused attention. The mean reliability of the duration of focused attention for these children reached an average of 82% agreement. This indicates that was a good agreement between the duration of children's focused attention coded and calculated by the researcher and the research assistant. The mean reliability for the ECERS reached 79% for the ECERS. These values indicate that the researcher achieved a high reliability for both the duration of children's focused attention and the ECERS with both her research assistants.

Results

The results of this study are organized into three sections. The first section describes the preliminary data preparation. The second section presents the descriptive statistics about the participants, the temperament, focused attention, children's experience with toys in the home environment and in the childcare environment, and the childcare centers environment. Finally, the third section includes the quantitative analyses in accordance with the research questions.

Preliminary Data Preparation

Data were collected from three different sources: the child, the parents, and the educators. As well as from three different measures: background questionnaires, temperament questionnaires, and video observations. The data entry was verified on two separate occasions by the researcher and a research assistant in order to assure that all the data were entered and were properly entered. The data were inputted into one SPSS document and each variable was labeled according to the measure and the value. The one dependent variable was the duration of children's focused attention toward the toys and the independent variables were the type of toy, the level of toy difficulty and the children's temperament characteristics. The data set was verified to assure that it was normally distributed by looking at the distribution curves of the data using SPSS.

Descriptive Statistics

Participants. A total of 28 children participated in the study with a mean age of 36.07 months. There were 11 girls and 17 boys. The means, standard deviations and ranges are found in Table 1. There were more boys in this study simply because more consent forms were received from parents of boys than girls.

Temperament. Each child received 18 temperament characteristics scores from the Early Childhood Behavior Questionnaire (ECBQ) completed by their parents and two temperament characteristic scores from an abbreviated version completed by their educator. The mean scores for each of the 18 temperament characteristics can be found in Tables 2 and 3.

Focused attention. The focused attention for each condition (i.e., each toy) was computed by observing the video recordings of the play sessions, identifying the focused attention behaviors (Appendix J), and calculating the total duration of children's focused attention for each toy on a possible 240 seconds (i.e., 4-minute play session). On average, children exhibited focused attention during 67.55% of the time in play sessions with the goal-directed toys (GD) (i.e., puzzles) and on average the children exhibited focused attention during 80.45% of the time in play sessions with the goal-directed toys with playful outcome (GDPO) (i.e., construction toys). More specifically, children displayed behaviors of focused attention during 74.25% of the time while playing with Puzzle 1, and 60.83% of the time while playing with Puzzle 2 and children displayed focused attention during 75.60% of the time while playing with Construction toy 1, and 85.30% of the time while playing with Construction toy 2 (Table 4).

Furthermore, descriptive statistics for the duration of the children's focused attention by gender were also computed. The boys displayed focused attention during 68.98% of their time while playing puzzles and 79.57% of their time while playing with construction toys, whereas the girls exhibited focused attention during 65.32% of their time with puzzles and 81.80% of their time with construction toys. While playing with the puzzles, boys spent on average 75.40% of their time in focused attention with Puzzle

1 and 62.56% of their time in focused attention with Puzzle 2. During play with Puzzle 1, the girls spent 72.50% of the time in focused attention and 58.16% of the time in focused attention with Puzzle 2. Descriptive statistics by gender showed the following for the construction toys. The boys were found to focus their attention on average 74.95% of the time while playing with Construction toy 1 and 84.19% of the time while playing with Construction toy 2, whereas the girls displayed focused attention 76.59% of the time while playing with Construction toy 1, and 87.00% of the time while playing with Construction toy 2 (Table 5).

Children's experience with toys in the home environment. In order to ascertain prior experience with toys as a factor influencing the children's focused attention, the home environment was taken into consideration. This information was gathered through the background questionnaire (Appendix C) completed by the parents to gain information about the types of toys each child had at home, as well as how much he/she played with these toys. It was found that 96.42% of the children had some type of puzzle (i.e., goal-directed toys) available at home and 44.44% had more than 7 puzzles at home, 40.74% had 3 to 6 puzzles and 14.82% had 1 to 2 puzzles at home. Also, 82.14% of the parents reported that construction and/or put-together toys (i.e., goal-directed toys with playful outcome) were available in their home.

In addition, in order to determine if the children had previous experience with the puzzles and construction toys used in the study, parents were asked if they had the *First Puzzle-Animals* set by Galt or the *Bob the Builder* character building set by Brio and 100% of the parents reported that they had neither. It was reported that none of the

children who participated in this study had prior experience at home with these specific toys used in the study and therefore these specific toys were novel items for all children.

The combination of specific questions from the parent background questionnaire allowed the researcher to obtain two scores for each child's experience and interest toward the types of toys used in this study: goal-directed toys and goal directed toys with playful outcome (i.e., puzzle and construction toys). The experience and interest variable, which were given equal value, was created from a combination of questions from the background questionnaire about the puzzles (i.e., questions # 12,12a, 13, 1A, 2A, 3A), and the construction toys (i.e., questions # 14, 5A, 6A, 7A). A mean of 16.32 (*SD* = 3.91, *Range*= 17.00) was reported for the puzzles out of a possible total score of 24. A mean of 11.75 (*SD*=2.29, *Range*= 7.00) for the construction toys of a possible total score of 16. A score of 24 for the puzzles or 16 for construction toys on experience and interest would imply that the child has many of these toys at home, chooses to play with these toys very often, and exhibits a great deal of interest toward these specific toys.

Children's experience with toys in the childcare environment. Each child's educator completed a background questionnaire pertaining to the types of toys available in the classroom environment. It was reported that 100% of the classrooms had age appropriate puzzles (i.e., goal-directed toys) available; 67.86% had more than seven puzzles available and 35.14% had three to six puzzles available. In addition, 100% of the educators reported that their classrooms had construction toys and/or put-together toys available. All educators also reported that they did not have the *First Puzzle-Animals* set by Galt or the *Bob the Builder* character building set by Brio in their classrooms.

In addition, as for the home environment, a number of questions, which were given equal value, from the background questionnaire completed by the educators (Appendix G) were combined to form an experience and interest score for the puzzles and the construction toys. The questions # 5, 5a, 6, 1A, 2A, 3A were combined to create an experience and interest score for the puzzles, and questions 7, 5A, 6A, 7A were combined for the experience and interest score for construction toys. A mean of 15.36 (*SD*=2.86, *Range* = 12) was reported for the puzzles of a possible total score of 24 and a mean of 12.21 (*SD*=2.07, *Range* = 8.00) for the construction toys on a total possible score of 16. A score of 24 for the puzzles or 16 for construction toys on experience and interest would indicate that children have many of these toys available in their classroom, choose to play with these toys very often, and exhibit a great interest toward these specific toys.

Childcare center environment. To determine the quality of the childcare centers and whether children had similar experiences in childcare, the researcher evaluated the quality of each center by using the Early Childhood Environment Rating Scale (ECERS). The results from the ECERS revealed that all seven centers received a total rating score whether the 5 and 7 range, which is considered to be within *Good* to *Excellent* range of overall quality and described by the authors as being of developmentally appropriate to excellent quality (Table 6). Center # 1 catered to C.E.G.E.P. teachers, staff, and students and received an overall rating of 5.48 on the ECERS. Their lowest score was 4.44 in the space and furnishings subscale, as it was lacking in room arrangement and space for privacy. Center #2 catered to hospital staff and received an overall rating of 6.05. This center's lowest score was 5.25 in the activities subscale and was lacking in dramatic play

opportunities. Center #3 also catered to hospital staff and received a high score of 6.48. This center's lowest score was 6.00 for the indoor space. Center #4 catered to employees in a technology company and received an overall high rating of 6.50. This center's lowest score was in the activities subscale with a rating of 6.00 and was lacking in the dramatic play item. Center #5 catered to University professors, staff, and students and received the highest rating, 6.58. The lowest score for this center was 5.75 in the space and furnishings subscale as it lacked furnishings for relaxation and room arrangement. The center #6 also catered to University professors, staff and students and had a rating of 6.20. The lowest score was 5.50 in the space and furnishings subscale. Finally, the center #7 catered to a general population, a private center and received the lowest rating, 5.25. This center's lowest score was 4.00 in the activities subscale with low scores particularly on the math and number, dramatic play, and fine motor items. All these centers provide the children with generally *good* choices of activities including opportunities to play with puzzles and construction toys.

Analysis of Research Questions

Firstly, to ensure that the participants were comparable and that data was not influenced by other variables than the ones set out in this study, preliminary analyses were conducted on the data by organizing them by age, by childcare center, by toy used in session 1 and boys' and girls' temperament.

Age. In order to determine whether age played a role in children's focused attention to the toys, a one-way analysis of variance was computed. ANOVA tests showed that there were no significant differences between age groups (e.g., 33 month olds, 34 month olds, etc.) and the duration of children's focused attention to puzzles or

construction toys. Nor was there a significant difference between age groups and the duration of children's focused attention for Puzzle 1, Puzzle 2, Construction toy 1, and Construction toy 2. Results of these analyses can be found in Table 7.

Childcare centers. In order to determine whether the childcare centers that the children attended played a role on children's focused attention to the toys, ANOVA tests were computed. The findings indicated that there was no significant difference between children's focused attention on the puzzles or the construction toys across centers. More specifically, there were no significant differences between children's focused attention and Puzzle 1, Puzzle 2, Construction toy 1, or Construction toy 2 across childcare centers. Results of these analyses can be found in Table 8.

Toy in session 1. Also, to establish whether the toy used in the first session was a factor in the duration of children's focused attention on the toys, ANOVA tests were calculated even though the toys used in the first play session were counterbalanced. As expected, the findings revealed that there was no significant difference between the group that started with the puzzles versus the group that started with the construction toys on the duration of children's focused attention toward puzzles or construction toys. Moreover, there were no significant differences between children's focused attention on Puzzle 1, Puzzle 2, Construction toy 1, or Construction toy 2 across toys used in the first play session. Results of these analyses can be found in Table 9.

Boys' and girls' temperament. Lastly, in order to determine whether there was a significant difference between boys' and girls' temperament, ANOVA tests were conducted. There was no significant difference found between the girls' temperament and the boys' ratings of temperament characteristics. These results can be found in Table 10.

Research questions. This section will include quantitative analyses and results for each of the three research questions.

Question 1: Is there a difference between the duration of children's focused attention toward goal-directed toys (i.e., puzzles) and goal-directed toys with playful outcome (i.e., construction toys)?

First, a paired *t*-test looking at the durations of children's focused attention for puzzles (i.e., Puzzle 1 and 2) and construction toys (i.e., Construction toy 1 and 2) was computed. The results showed a statistically significant difference in the duration of children's focused attention for the types of toys used t (27)=-2.61, p = .014 (Table 11). Hence, the answer to the research question is that there is a difference in the duration of children's focused attention toward the toys depending on by type. Overall, the children had significantly longer focused attention toward the construction toys (M = 193.07 seconds) than the puzzles (M = 162.11 seconds).

Furthermore, paired *t*-tests were conducted between Puzzle 1 and Construction toy 1, as well as between Puzzle 2 and Construction toy 2. The independent variables were the types of toys: puzzles and construction toys. The dependent variable was the duration of children's focused attention on these toys. Findings from the paired *t*-test showed there was no significant difference between the duration of children's focused attention on Puzzle 1 (M =*178*.21) and Construction toy 1 (M = 181.43) t (27) = .27, p > .05. However, there was a significant difference between the mean of focused attention for Puzzle 2 (M=146.00) and Construction toy 2 (M = 204.71) t (27) = 3.86, p < .01 (Table 12). This indicates that the duration of children's focused attention toward the Construction toy 1 was not significantly longer than on Puzzle 1, but

that the duration of children's focused attention on Construction toy 2 was significantly longer than Puzzle 2.

In order to investigate these findings further, analyses were computed by gender. An analysis of variance was conducted to verify whether there were any significant differences between boys' and girls' (i.e., independent variables) duration of focused attention on puzzles and construction toys (i.e., dependent variables). No significant differences were found (Table 13). Paired *t*-tests were then conducted to reveal if there were differences between children's focused attention on the puzzles and construction toys based on gender. Findings showed that girls had a significant difference in their focused attention between puzzles ($M = 156.77$) and construction toys ($M = 196.32$) $t\,(10) = 2.27, p < .05$ whereas, it was found that there were no significant differences of focused attention for the focused attention of boys $t\,(16) = 1.57, p > .05$ between puzzles ($M = 165.56$) and construction toys ($M = 190.97$) (Table 14). This indicates that the girls had a significant difference in how long they demonstrated focused attention behaviors between the types of toys, they attended significantly longer to the goal-directed toys with playful outcome (i.e., construction toys) than to goal directed toys without a playful outcome. There was no significant difference between the duration of focused attention the boys display on the puzzles or the construction toys.

An ANOVA was done to verify if there was a difference between the boys' and girls' duration of focused attention in each condition. No significant difference was found for gender for any of the four conditions (Table 15). Paired *t*-tests were done between the Puzzle 1 and Construction toy 1 as well as between Puzzle 2 and Construction toy 2, for both boys and girls. Findings showed that there were no significant differences between

Puzzle 1 (boys $M = 180.94$, girls $M = 174.00$) and Construction toy 1 (boys $M = 179.88$, girls $M = 183.82$) for both genders; boys $t\ (16) = .066, p > .05$, and girls $t\ (10) = .519, p > .05$. However, there were significant differences between Puzzle 2 (boys $M = 150.18$, girls $M = 139.55$) and Construction toy 2 (boys $M = 202.06$, girls $M = 208.82$) for both genders; boys $t\ (16) = 2.61, p < .05$, and girls $t\ (10) = 2.82, p < .05$. Boys and girls attended longer to Construction toy 2 than to Puzzle 2 (Table 16).

Question 2: Is there a difference between the duration of children's focused attention towards the type of toys depending on their level of toy difficulty?

In order to determine if there was a difference between the duration of children's focused attention and toys of varying levels of difficulty, a paired *t*-test was conducted between Puzzle 1 and Puzzle 2 as well as between Construction toy 1 and Construction toy 2. The independent variables were type of toy and level of toy difficulty. The dependent variable was the duration of children's focused attention toward these toys. The findings from these paired *t*-tests demonstrated that there was a significant difference for duration of children's focused attention based on the level of toy difficulty. There was a significant difference in duration of children's focused attention between Puzzle 1

($M = 178.21$) and Puzzle 2 ($M = 146.00$) $t\ (27) = 3.05, p < .01$ and a significant difference in duration of children's focused attention for the Construction toy 1 ($M = 181.43$) and Construction 2 ($M = 204.71$) $t\ (27) = 2.31, p < .05$. When the type of toy and the level of toy difficulty were considered, it was evident that the children's focused attention differed by toy type and level. In the case of the puzzles, Puzzle 1 elicited more focused attention than Puzzle 2, whereas with the construction toys, Construction toy 2 elicited more focused attention than Construction toy 1(Table 17).

The data were also analyzed by gender for difference in duration of focused attention depending on the level of toy difficulty. Results from paired t-tests showed that there was a significant difference between duration of children's focused attention on Puzzle 1 ($M = 180.94$) and 2 ($M = 150.18$) for boys $t\ (16) = 2.55, p < .05$ but not between Puzzle 1 ($M = 174.00$) and Puzzle 2 ($M = 139.55$) for girls $t\ (10) = 1.71, p > .05$. Boys displayed significantly longer durations of focused attention on Puzzle 1 than Puzzle 2. There was no significant difference between focused attention on Construction toys 1 (boys $M = 179.88$, girls $M = 183.82$) and Construction toys 2 (boys $M = 202.06$, girls $M = 208.82$) either for boys $t\ (16) = 1.57$, $p > .05$ or for girls $t\ (10) = 1.76, p > .05$ (Table 18).

A more in depth statistical analysis, a repeated-measure ANOVA, was done in order to verify and confirm the findings from the paired *t*-tests. This statistical test was conducted because data from this study were based on repeated observations of the same subjects, which are two types of toys presented one week apart. The results from this test showed that there was a significant effect for the type of toy used ($F\ (1) = 6.83, p = .014$); no significant effect for the level of toy difficulty ($F\ (1) = .344, p = ns$), and a significant type of toy by level of toy difficulty interaction ($F = 15.82, p =< .00$) (Table 19). The effect for type of toy indicates that children spent significantly more time on the construction toys than on the puzzles. However, there was no significant effect for level of toy difficulty because as the toy's task became more difficult, the children spent less time on the puzzle, but more time on the construction toy. Order effect was not considered as a cause of these results because the toys used in the first sessions were counterbalanced.

Question 3: Is there a relation between temperament characteristics, level of toy difficulty, and the duration of children's focused attention?

In order to determine if there were relations between the duration of children's focused attention and the 18 temperament characteristics reported by the parents as well as two temperament characteristics reported by the educators, correlation tests were conducted. The findings showed that perceptual sensitivity, r (28) = -.50, p =.01 was negatively correlated with duration of children's focused attention to Puzzle 1 and inhibitor control r (28) =.43, p =.02 was positively correlated with duration of children's focused attention to Construction toy 1 (Table 20).

The specific questionnaire used to reveal children's temperament (i.e., ECBQ) included two categories specific to attention: attentional focusing and attentional shifting. These temperament characteristics are categorized, amongst others, as being self-regulatory behaviors that have been related to children's attention span (Putnam et al., in press). Attentional focusing is a composite of 12 items and in the ECBQ, it is described as sustained duration of orienting on an object of attention and resisting distraction. Attentional shifting is composed of 12 items and in the ECBQ, it is defined as the ability to transfer attentional focus from one activity or task to another (Putnam et al., in press). A high score on attentional focusing means that a child has a strong ability to focus on a task and not be distracted from that task, whereas a high score on attentional shifting would mean that a child is inclined to transfer his attention to multiple things and does not stay on task.

Consequently, this questionnaire was chosen because of these two particular categories, which were of interest to this study. The parents were asked to complete the

entire questionnaire, which resulted in 18 temperament characteristics for each child. In addition, the educators were asked to complete two categories of the questionnaire, which included the 24 questions related to the attentional focusing and attentional shifting temperament characteristics. This was done in order to gain additional information about the children's attention behaviors. However, surprisingly the results indicated that these two temperament characteristics were not related to the duration of the children's focused attention toward the specific types of toys of varying difficulty. No significant relation was found for either the parents' or the educators' report of attentional focusing or attentional shifting and the children's duration of focused attention on the four toys.

Therefore, in order to investigate this occurrence, paired *t*-tests were conducted to uncover differences between attentional focusing and attentional shifting scores reported by the parents and by the educators. It was found that attentional focusing scores (t (27) = 6.28, $p < 05$) and attentional shifting scores (t (27) = 4.54, $p < .05$) reported by the parents differed significantly from the scores reported by the educators. The educators reported lower scores of attentional focusing ($M = 3.77$) than the parents ($M = 4.77$) and they also reported lower scores of attentional shifting ($M = 4.00$) than did the parents ($M = 4.79$) (Table 21).

Table 1

Number of Participants and Means, Standard Deviations, and Ranges of Age (n=28)

	N	*M*	*SD*	*Range*	
Sample	28	36.07	2.26	33 - 39	
Boys	17	36.29	2.39	33 - 39	
Girls	11	35.73	2.10	33 - 39	

Note. The children's age is in months.

Table 2

Means, Standard Deviations, and Ranges of 18 Temperament Characteristics from ECBQ by Parents (n=28)

Temperament Characteristics	*M*	*SD*	*Range*
Activity level/energy	4.62	.75	3.25 – 6.09
Attentional focusing	4.77	.69	3.17 – 6.58
Attentional shifting	4.79	.49	3.67 – 5.82
Cuddliness	5.42	.86	3.67 – 6.67
Discomfort	2.58	1.04	1.20 – 5.20
Fear	2.65	.78	1.13 – 4.18
Frustration	3.71	.60	2.67 – 5.00
High intensity pleasure	4.81	.95	2.83 – 6.20
Impulsivity	4.96	.67	3.75 – 6.11
Inhibitor control	4.12	.72	2.83 – 5.50
Low intensity pleasure	5.00	.66	3.27 – 6.10
Motor activation	1.96	.55	1.18 – 3.36
Perceptual sensitivity	4.20	1.06	2.25 – 6.17
Positive anticipation	5.51	.58	4.36 – 6.67
Sadness	2.53	.74	1.17 – 3.89
Shyness	3.27	1.07	1.73 – 5.75
Sociability	5.82	.83	3.63 – 7.00
Soothability	5.19	.77	3.43 – 6.44

Note. The maximum score possible is 7.

Table 3

Means, Standard Deviations, and Ranges of Two Temperament Characteristics from ECBQ by Educators (n=28)

Temperament Characteristic	*M*	*SD*	*Range*
Attentional focusing	3.77	.37	3.13 – 4.27
Attentional shifting	4.00	.78	2.86 – 5.78

Note. The maximum score possible is 7.

Table 4

Means, Standard Deviations, and Ranges of Duration of Children's Focused Attention for Each Toy (n=28)

Type of Toy	*M*	*SD*	*Range*
Goal-directed toys (Puzzles)	162.11	62.56	50.00 – 240.00
Goal-directed toys with Playful Outcome 1 (Construction toys)	193.07	26.21	139.50 – 240.00
Goal-directed 1 (Puzzle 1)	178.21	54.01	75.00 – 240.00
Goal-directed 2 (Puzzle 2)	146.00	80.48	16.00 – 240.00
Goal-directed toy with Playful Outcome 1 (Construction toy 1)	181.43	36.48	97.00 – 240.00
Goal-directed toy with Playful Outcome 2 (Construction toy 2)	204.71	38.24	124.00 – 240.00

Note. The durations of focused attention are in seconds.

Table 5

Means, Standard Deviations, and Ranges of Duration of Children's Focused Attention by Gender (n=28)

	Boys			Girls		
Type of Toy	*M*	*SD*	*Range*	*M*	*SD*	*Range*
Puzzles	165.56	60.16	51.00 – 238.50	156.77	68.75	50.00 – 240.00
Construction toys	190.97	27.97	139.50 – 225.50	196.32	24.15	153.50 – 240.00
Puzzle 1	180.94	50.76	75.00 – 240.00	174.00	61.00	78.00 – 240.00
Puzzle 2	150.18	76.79	19.00 – 240.00	139.55	89.30	16.00 – 240.00
Construction toy 1	179.88	38.81	97.00 – 240.00	183.82	34.23	132.00 – 240.00
Construction toy 2	202.06	41.89	124.00 – 240.00	208.82	33.31	145.00 – 240.00

Note. The durations of focused attention are in seconds.

Table 6

Mean ratings of classroom environment for each child care center (n =7)

Center	Rating	*N*
Center #1	5.48	53
Center #2	6.05	60
Center #3	6.48	- -
Center #4	6.50	56
Center #5	6.58	80
Center #6	6.20	106
Center #7	5.25	43

Note. Dash indicates data was not obtained.

Table 7

Mean Differences of Focused Attention by Age (n =6)

Type of Toy	*Age*	*M*	*SD*	*F*	*p*
Puzzles	33	145.38	62.56	.551	.764
	34	152.33			
	35	129.25			
	36	148.60			
	37	151.50			
	38	166.17			
	39	198.86			
Construction Toys	33	181.38	26.21	.293	.933
	34	199.25			
	35	192.00			
	36	186.40			
	37	183.50			
	38	201.67			
	39	197.21			
Puzzle 1	33	171.50	54.01	.603	.725
	34	154.17			
	35	192.50			
	36	160.60			
	37	187.00			
	38	185.33			
	39	206.86			
Puzzle 2	33	119.25	80.48	.761	.609
	34	150.50			
	35	66.00			
	36	136.60			
	37	116.00			
	38	147.00			
	39	190.86			

Construction toy 1	33	181.50	36.48	.609	.721
34		187.83			
35		175.00			
36		188.60			
37		134.00			
38		204.00			
39		169.71			
Construction toy 2	33	181.25	38.24	.924	.498
34		210.67			
35		209.00			
36		184.20			
37		233.00			
38		199.33			
39		224.71			

Note. The children's age is in months. * $p < .05$, two-tailed. ** $p < .01$, two-tailed

Table 8

Mean Differences of Focused Attention by Childcare Center (n =7)

Type of Toy	*Center*	*M*	*SD*	*F*	*p*
Puzzles	1	117.38	62.56	1.47	.238
	2	196.17			
	3	238.00			
	4	170.50			
	5	169.50			
	6	154.92			
	7	102.25			
Construction Toys	1	168.38	26.21	2.08	.099
	2	175.00			
	3	215.75			
	4	211.92			
	5	194.50			
	6	195.08			
	7	180.75			
Puzzle 1	1	124.00	54.01	1.66	.188
	2	219.00			
	3	237.50			
	4	184.67			
	5	180.00			
	6	173.17			
	7	157.50			
Puzzle 2	1	110.75	80.48	1.25	.323
	2	173.33			
	3	238.50			
	4	156.33			
	5	159.20			
	6	136.67			
	7	47.00			

Construction toy 1	1	170.75	36.48	.56	.751
	2	187.00			
	3	198.50			
	4	199.67			
	5	182.40			
	6	166.83			
	7	164.00			
Construction toy 2	1	166.00	38.24	2.73	.061
	2	163.00			
	3	233.00			
	4	224.17			
	5	206.60			
	6	169.60			
	7	197.50			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 9

Mean Differences of Focused Attention by First Toy (n =2)

Type of Toy	*Toy*	*M*	*SD*	*F*	*p*
Puzzles	P	157.17	62.56	.127	.725
	C	165.81			
Construction Toys	P	194.38	26.21	.050	.825
	C	192.09			
Puzzle 1	P	173.25	54.01	.172	.682
	C	181.94			
Puzzle 2	P	141.08	80.48	.076	.785
	C	149.69			
Construction toy 1	P	173.83	36.48	.907	.350
	C	187.13			
Construction toy 2	P	214.92	38.24	1.52	.228
	C	197.06			

Note. P= Puzzles, C = Construction toys. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 10

Mean Differences of between Boys' and Girls' Temperament Characteristics (n =2)

Temperament Characteristics	*Gender*	*M*	*SD*	*F*	*p*
Activity level/energy	B	4.77	.75	1.75	.196
	G	4.39			
Attentional focusing	B	4.88	.69	.988	.329
	G	4.61			
Attentional shifting	B	4.87	.49	1.07	.310
	G	4.67			
Cuddliness	B	5.26	.86	1.39	.250
	G	5.65			
Discomfort	B	2.48	1.04	.416	.525
	G	2.74			
Fear	B	2.52	.78	1.12	.300
	G	2.84			
Frustration	B	3.87	.60	3.45	.075
	G	3.46			
HighIntensityPleasure	B	4.97	.95	1.18	.287
	G	4.56			
Impulsivity	B	4.97	.67	.001	.971
	G	4.96			

Inhibitor control	B	4.02	.72	.992	.328
	G	4.30			
LowIntensityPleasure	B	4.89	.66	1.49	.234
	G	5.20			
Motor activation	B	1.94	.55	.071	.792
	G	2.00			
Perceptual sensitivity	B	3.92	1.06	3.43	.076
	G	4.64			
Positive anticipation	B	5.56	.58	.292	.594
	G	5.43			
Sadness	B	2.49	.74	.134	.717
	G	2.59			
Shyness	B	2.96	1.07	4.02	.056
	G	3.75			
Sociability	B	5.66	.83	1.69	.205
	G	6.07			
Soothability	B	5.15	.77	.093	.762
	G	5.24			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed

Table 11

Mean Differences Between All Goal-Directed Toys (i.e., puzzles) and All Goal-Directed Toys with Playful Outcome (i.e., construction toys) (n=28)

Type of Toy	*M*	*t*	*df*	*p*
Puzzles	162.11	-2.61	27	.014*
Construction toys	193.07			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 12

Mean Differences Between Goal-Directed Toys 1 and Goal-Directed Toys with Playful Outcome 1, and Goal-Directed Toys 2 and Goal-Directed Toys with Playful Outcome 2 (n =28)

Type of Toy	*M*	*t*	*df*	*p*
Puzzle 1	178.21	-.266	27	.792
Construction toy 1	181.43			
Puzzle 2	146.00	-3.86	27	.001**
Construction toy 2	204.71			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 13

Mean Differences between Boys' and Girls' Duration of Focused Attention toward All Goal-Directed Toys (i.e., puzzles) and All Goal-Directed Toys with Playful Outcome (i.e., construction toys) (n=28)

Type of Toy	*Gender*	*M*	*SD*	*F*	*p*
Puzzles	B	165.56	67.56	.127	.764
	G	156.77			
Construction Toys	B	190.97	26.21	.271	.607
	G	196.32			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 14

Mean Differences between All Goal-Directed Toys (i.e., puzzles) and All Goal-Directed Toys with Playful Outcome (i.e., construction toys) by Gender (n=28)

Type of Toy	*M*	*t*	*df*	*p*
	Boys			
Puzzles	165.56	1.57	16	.136
Construction toys	190.97			
	Girls			
Puzzles	156.77	2.27	10	.046*
Construction toys	196.32			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 15

Mean Differences between Boys' and Girls' Duration of Focused Attention toward Goal-Directed Toys 1 and 2 (i.e., Puzzle1 and 2) and Goal-Directed Toys with Playful Outcome 1 and 2 (i.e., Construction toy 1 and 2) (n=28)

Type of Toy		*M*	*SD*	*F*	*p*
Puzzle 1	Boys	180.94	27	.113	.740
	Girls	174.00			
Puzzle 2	Boys	150.18	27	.107	.747
	Girls	139.55			
Construction toy 1	Boys	179.88	27	.075	.786
	Girls	183.82			
Construction toy 2	Boys	202.06	27	.203	.656
	Girls	208.82			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 16

Mean Differences between Goal-Directed Toys 1 and 2 (i.e., Puzzle1 and 2) and Goal-Directed Toys with Playful Outcome 1 and 2 (i.e., Construction toy 1 and 2) by Gender (n=28)

Type of Toy	*M*	*t*	*df*	*p*
	Boys			
Puzzle 1	180.94	.066	16	.948
Construction toy 1	179.88			
Puzzle 2	150.18	-2.614	16	.019*
Construction toy 2	202.06			
Girls				
Puzzle 1	174.00	-.519	10	.615
Construction toy 1	183.82			
Puzzle 2	139.55	-2.82	10	.018*
Construction toy 2	208.82			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 17

Mean Differences between Goal-Directed Toys 1 and 2 (i.e., puzzles) and Goal-Directed Toys with Playful Outcome 1 and 2 (i.e., construction toys)

Type of Toy	*M*	*t*	*df*	*p*
Puzzle 1	178.21	3.05	27	.005**
Puzzle 2	146.00			
Construction toy 1	181.43	2.31	27	.029*
Construction toy 2	204.71			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 18

Mean Differences between Goal-Directed Toys 1 and 2 (i.e., puzzles) and, Goal-Directed Toys with Playful Outcome 1 and 2 (i.e., construction toys) by Gender

Type of Toy	*M*	*t*	*df*	*p*
	Boys			
Puzzle 1	180.94	2.55	16	.021*
Puzzle 2	150.18			
Construction toy 1	179.88	-1.57	16	.136
Construction toy 2	202.06			
	Girls			
Puzzle 1	174.00	1.71	10	.119
Puzzle 2	139.55			
Construction toy 1	183.82	-1.76	10	.110
Construction toy 2	208.82			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 19

Changes in Mean Differences (Repeated Measure ANOVA) between Type of Toy, Level of toy difficulty, and Duration of children's focused attention.

Source	*df*	*F*	*p*
Toy Type (TT)	1	6.83	.014*
Level of toy difficulty (LD)	1	.344	.562
TT x LD	1	15.82	.000**

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 20

Interrelations between Toy Type, Focused Attention, and Temperament Characteristics (n=28)

Temperament Characteristic	P1	P2	C 1	C2
Activity level/energy	.25	.15	-.05	.07
Attentional focusing	-.06	-.12	.03	.13
Attentional shifting	-.09	.02	.03	.09
Educ. Attentional focusing	.11	-.11	.21	.01
Educ. Attentional shifting	-.05	.09	.20	-.19
Cuddliness	-.19	-.14	.00	-.17
Discomfort	-.22	-.04	-.14	-.22
Fear	-.23	-.29	-.18	-.32
Frustration	.08	.05	-.08	-.32
High intensity pleasure	.31	.11	.08	.19
Impulsivity	.23	.29	-.19	.26
Inhibitor control	.06	.12	.43*	.05
Low intensity pleasure	-.15	-.10	-.07	-.02
Motor activation	.07	.14	-.02	.05
Perceptual sensitivity	-.50**	-.16	.02	.09
Positive anticipation	.02	.28	-.17	.10
Sadness	-.01	.03	.01	.02

Shyness	-.17	-.03	-.01	-.29
Sociability	-.06	-.00	.06	.26
Soothability	-.21	-.02	.13	.08

Note. Correlation scores (*r*). P1= Puzzle 1, P2= Puzzle 2, C1= Construction toy 1, C2= Construction toy 2, Educ.= Educators' report. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 21

Mean Differences between Attentional Focusing and Attentional Shifting Scores as Reported by Parents and Educators (n=28)

Temperament Characteristic	*M*	*t*	*df*	*p*
Educator Att.Foc.	3.77	6.28	27	.000**
Parent Att.Foc.	4.77			
Educator Att.Shift.	4.00	4.55	27	.000**
Parent Att.Shift.	4.79			

Note. * $p < .05$, two-tailed. ** $p < .01$, two-tailed. Att.Foc. = Attentional Focusing. Att.Shift.= Attentional Shifting.

Discussion

In the literature on learning, young children's level of attention has been repeatedly related to cognitive development and future academic achievement (Choudhury & Gorman, 2000; Palisin, 1986; Ruff, Capozzoli, & Weissberg, 1998; Tamis-LeMonda & Bornstein, 1989). One recent study on attention even indicated that there are several levels of attention- casual, settled, and focused attention. Focused attention has been found to be the most elaborate and engaging level of attention because the majority of information is gathered, and cognitive processes such as encoding, storage, planning and problem solving, take place during periods of focused attention (Lansink & Richards, 1997; Ruff & Capozzoli, 2003). Therefore, the ways in which young children's focused attention might be enhanced is important to consider, particularly given the fact that toy manufacturers have made *attention* a selling point for their various products. Since contextual factors may exert an influence on focused attention, there is a need for research into which contextual factors may influence this level of attention (Ruff, Capozzoli, & Weissberg, 1998). Two studies have indicated that specific types of toys may be associated with the increased levels of attention (Jennings, 1991; Choi & Anderson, 1991). However, there is not enough empirical evidence on the association between children's focused attention and the use of different types of toys of varying levels of difficulty. In addition, no research was found that investigated the relation between the type of toy children play with, and the consequent duration of children's focused attention while taking into consideration the children's temperament. Therefore, given the importance of focused attention and the promotion of types of toys as a way of enhancing children's focused attention, the current study was undertaken.

The main topic was the difference between two different types of toys with two different levels of difficulty, the temperament of the children and the duration of children's focused attention on these toys. Several possible intervening variables (e.g., gender, quality of childcare, length of childcare attendance, experience and interest with these types of toys) were considered in this study.

The study addressed the following research questions: (1) Is there a difference between the duration of children's focused attention toward the goal-directed toys (i.e., puzzles) and the goal-directed toys with a playful outcome (i.e., construction toys)? (2) Is there a difference between the duration of children's focused attention towards each type of toy depending on the level of difficulty of each toy ? (3) Is there a relation between children's temperament characteristics, the type of toy, the level of difficulty of the toy, and the duration of children's focused attention? This section includes general information about the sample, quantitative findings and a discussion of each of these findings for each research questions as well as the limitations of this study, the implication of the findings for parents and educators, and directions for future research.

General Information Regarding the Sample

The study was conducted in Montreal, Quebec and, because a large population of preschool children attends childcare in Montreal, it was decided that childcare centers would provide the largest possible pool of subjects. In order to ascertain that the childcare centers were of equivalent quality, the Early Childhood Environment Rating Scale (ECERS) was used and the findings indicated that all of the centers in this study had a global environment rating at the upper end of the scale (i.e., 5-7 points). This indicated that the childcare environments these children attended ranged between developmentally

appropriate and excellent. As materials, activities, and time for free play are factors that are considered in the ECERS, and these are factors that might influence opportunities to use a variety of puzzles and construction toys, ratings at the upper level of the scale for all centers in the study can be translated to mean that participants in this study had good access to developmentally appropriate puzzles and construction toys. Thus, children in this study were considered to be in equally good childcare settings.

In addition, children's duration of focused attention was found not to be influenced by either their age, the childcare they attended, the quality of their childcare, the length of time they attended childcare, or the order in which the toys were presented. Also, ratings of children's temperaments were found to be very similar between boys and girls. Thus, the children in this study were essentially similar in important aspects and therefore comparable.

The issue of novelty of the play materials is of concern when investigating play materials with young children. The novelty of the toy can account for the manner in which children use the toy and their level of interest in the toy. In order to consider the novelty of the toy type in the current study, parents and educators were asked if the children had previous experience with both types of toys. Of concern for the researcher was the amount of experience children might have had with the specific toys to be used in the study. Therefore parents and educators were asked if the children had the specific toys at home or in the childcare centre (i.e., family of animals puzzles by Galt and Bob the Builder building systems by Brio). As all the parents and educators reported that none of the children had the specific toys used in the study at home or at the childcare center nor had they had the opportunity to play with these specific toys and were therefore novel

to all the children, familiarity and prior experience with these toys were eliminated as possible influential factors in the study.

In the present study, an element of distraction was used during the play sessions. However, it was found that the distractor did not divert the attention of the majority of children (93.75%) and this variable was therefore not included in the analyses. It was found that in only 7 out of the 112 play sessions (6.25%) (i.e., 4 play sessions per child) was the child's attention diverted by the distractor. Interestingly, observations of the videotaped play sessions revealed that all seven instances of distractions caused by the distractor were instigated while the children were either already distracted from the toys or in casual or settled attention. A recent study by Ruff and Capozzoli (2003) reported that while young children display behaviors of focused attention, it is difficult to distract them. The characteristic of the distractor may also explain the lack of response to the distractor. The findings from the Ruff and Capozzoli (2003) study suggested that *bimodal* distrators that include a combination of visual and auditory distraction may be more prone to divert a 3-year-old's attention than the *unimodal* distrator (i.e., visual or auditory) used in this study.

The Impact of Type of Toy on Duration of Children's Focused Attention

The first research question was: *Is there a difference between the duration of children's focused attention toward the goal-directed toy (i.e., puzzles) and the goal-directed toy with a playful outcome (construction toys)?*

In a study of children's attention during play with toys with specific problems to be solved such as completing a task (i.e., puzzle), Jennings (1991) had found that 3-year-olds attended for longer periods when playing with a toy with a defined goal (i.e.,

puzzles) that is, a specific task to be completed, in comparison to toys with no defined goal (Jennings, 1991). The current study explored toys with a defined goal in greater depth as it looked at toys with a defined goal and those with a defined goal and a playful outcome. Overall, the findings of the current study revealed that children exhibited longer durations of focused attention when they played with the goal-directed toys with a playful outcome (i.e., construction toys) than goal-directed toys without a playful outcome (i.e., puzzles). The playful outcome of the construction toy appears to have attracted the children's focused attention for longer periods. These results suggest that an element of the toy's characteristics such as end product, and/or play possibilities, encouraged the children to attend longer than those without a playful outcome. Observations of the videotapes revealed that in order to construct or build the construction toy, the children had to analyze the pieces, insert the pieces into the appropriate place, and then try out the end product. This series of actions may have been captivating, as with each connection made, this multidimensional item became a toy that could eventually be played with.

Moreover, not only did the children attend to the goal-directed toys with playful outcome for a longer period than to goal-directed toys, but also this attention was focused, which as described earlier in this paper, is the most engaged level of attention (Ruff & Capozzoli, 2003). Thus, this finding suggests that a goal-directed toy with a playful outcome may encourage children to display this engaged level of attention for longer durations in order to complete the task in comparison to goal-directed toy with no playful outcome. Children's environment should include a variety of goal-directed toys with playful outcome, given that it is during times of focused attention that children gain and process the majority of the information from their environment or the task, to

enhance children's focused attention, which is important for cognitive development. This can be accomplished by having toys that must be assembled by the child and which, once completed, can then be played with (i.e., construction and/or put-together toys), readily available at all times in the child's playroom or classroom.

Additionally, further analysis revealed that although children did, in general, attend longer to the construction toys than the puzzles, it was evident that the level of difficulty of the toy played a role in the amount of focused attention displayed by the children. The results showed that there actually was no significant difference in the duration of children's focused attention for Puzzle 1 and Construction toy 1, but there was a significant difference between Puzzle 2 and Construction toy 2. The children attended significantly longer to the Construction toy 2 than to Puzzle 2, yet this was not found with the

level 1 toys, where the children did not attend more to Construction toy 1 or to Puzzle 1. This finding may suggest that when a toy has a lower difficulty level the children focus their attention equally between types of toys but, when the difficulty level is higher, a toy with a playful outcome at the end of the task sustains children's focused attention. However, an examination of the mean scores of focused attention for both sets of toys reveal that children attended longer to Construction toy 2 but the significant difference with Puzzle 2 was caused by the mean of duration of focused attention for Puzzle 2 which was quite low, which accounted for the significant difference between level 2 toys. The issue of level of toy difficulty is discussed in the following section.

In addition, in order to determine whether boys and girls displayed different duration of focused attention on these toys, an analysis by gender was conducted. The

results indicated that the girls demonstrated significantly longer duration of focused attention on the construction toys than the puzzles. Whereas for boys there was no significant difference in duration of focused attention toward either type of toy. These findings may be attributed to the sample size as there were only 11 girls in the study versus 17 boys. However, other issues may be at play as well.

Girls are typically not expected to be interested in construction toys because construction toys are often categorized as male stereotyped toys. Girls are usually observed using puzzles more than boys and boys using blocks, wheeled toys and construction toys more than girls (Cherney et al., 2003; Johnson, Christie & Yawkey, 1999). However, research on gender and toy preference reveals that girls usually select a balance of toys categorized as being neutral, boy or girl stereotyped toys, whereas boys mainly select male stereotyped toys (Cherney et al., 2003). During the design of this study, advisors cautioned that the girls might not be interested in the construction toys however, the present findings suggest otherwise. The current study gave the girls an opportunity to use the construction toys in a solitary play situation, without interference from boys, and without the social pressure of gender appropriate play, and girls may have found the construction toys a novel challenge (Johnson et al., 1999). Therefore, they may have given it their focused attention and relished the opportunity to concentrate on the construction toy and see it through to completion.

The Impact of Level of Toy Difficulty on Duration of Children's Focused Attention

The study's second research question asked; *Is there a difference between the duration of children's focused attention on each type of toy depending on their level of toy difficulty?*

It is important to note that in this study, the number of pieces for each toy determined the level of difficulty of the puzzles and construction toys. The more pieces there were in the puzzle and construction toy, the more difficult, and complex the toy was considered to be for this age group.

The analyses conducted examined whether there was a difference between the duration of children's focused attention depending on each toy's level of difficulty (i.e., level 1 and 2). Overall, there was a significant difference in duration of children's focused attention on Puzzle 1 and Puzzle 2 as well as a significant difference in the duration of children's focused attention between Construction toy 1 and 2. However, the direction of the correlation differed significantly. The children attended significantly longer to Puzzle 1 than to Puzzle 2, whereas in the case of the Construction toys, children attended longer to Construction toy 2 than to Construction toy 1. Therefore, when level of toy difficulty is a factor, the playful outcome or lack thereof becomes an important factor in helping to promote children's focused attention. As the toys used in the first play session were counterbalanced, this finding can essentially be attributed to the characteristic of each type of toy where level of toy difficulty is a factor. The level of complexity of the toys seems to have affected and directed the duration of the children's focused attention. This difference was remarkable to see, as it illustrates that when the children were faced with a more challenging task using a toy without a playful outcome

(i.e., puzzles), they were more inclined to be easily distracted or perhaps exhibit lower levels of attention such as casual or settled attention (Ruff & Capozzoli, 2003). Conversely, when faced with a more challenging task using a toy with a playful outcome (i.e., construction toy), they stayed on task, focused, and persisted in their play. These behaviors toward the different types of toys and levels of difficulty demonstrate that if the toy has a playful outcome, the children may exhibit longer durations of focused attention. Perhaps a higher level of complexity promotes more focused attention behaviors when the children know there will be a playful outcome as compared to a toy with no playful outcome. In fact, on the videotapes of play sessions, the children were observed attaching pieces such as the wheels, and then rolling the base piece to verify if it was working. This suggests that children were readily aware of what they were building and what the outcome would be, which could have encouraged them to focus their attention on the task of building the truck.

Observations of the children using the puzzles indicated that the puzzles have a task-based outcome that may not be as appealing to the children as the playful outcome of the construction toy. The pieces of a puzzle must be put together to create an picture. It is not multidimensional in nature and has limited possibilities to support children's play. Perhaps the more complex the puzzle is, the more intimidating it is perceived to be by the children and they are more likely to lose their focused attention. Whereas, when a puzzle has a limited number of pieces, it is less daunting and the possibility for a successful outcome is more readily evident for children of this age. Evidence supporting this suggestion was found on the videotapes of the play sessions. One child was observed to be very distraught while playing with the puzzles, and at every failed attempt to place a

piece of the puzzle, would verbalize that his efforts were not working and displayed distracted behaviors (e.g., looked away from toy). However, when this child was observed playing with the construction toys, he did not demonstrate any distressed behaviors. He did verbalize that his efforts were sometimes not working, but he would quickly find a solution and continue with the completion of the construction toy.

This discovery challenges, as well as expands on, findings from previous research on children's attention and persistence regarding construction and problem solving situations with toys and tasks of varying difficulty. Generally, pre-school aged children work harder, are more persistent, and attend for longer periods to a more difficult task (Vlachou & Farrell, 2000; Gianvecchio, 2002). The study by Gianvecchio (2002) used maze puzzles and it was found that children demonstrated longer sustained attention when the puzzles were more complex. However, findings from the present study show that this was true for the construction toys not for the puzzles (Gianvecchio, 2002).

These latter findings were also confirmed by analyses looking at the intercept of multiple factors. Overall, the difficulty level as an independent variable by itself was shown not to have influenced the duration of children's focused attention. However, when combined with type of toy, the level of toy difficulty did affect the duration of children's focused attention. Thus, this interaction of toy type and level of toy difficulty reinforces the findings that the type of toy children play with has an influence on how long children will attend to the toy and consequently help increase the number of focused attention behaviors and therefore, lengthen the duration of children's focused attention. According to the study by Gianvecchio (2002), these findings may have been due to the lack of choice the children had during the current study. Gianvecchio's study (2002)

found that preschool age children exhibited longer sustained attention toward toys when given the opportunity to choose between various toys and level of toy difficulty versus when the type of toy and level of toy difficulty were imposed. Consequently, some children in the present study may have demonstrated shorter durations of focused attention in response to the lack of choice. Thus, the issue of choice as an influential factor in the duration of children's focused attention merits further consideration.

A closer examination of these results indicated that there was an interesting finding for gender. The boys showed a significant difference between the duration of their focused attention on Puzzle 1 than on 2, in that they attended longer to Puzzle 1 than 2, but no significant difference was found for their attention to Construction toy 1 and 2. For the girls, there was no difference in their duration of focused attention on both Puzzle 1 and 2 or Construction toy 1 and 2. Perhaps the difference between boys' and girls' experience with both types of toys may help explain this finding. It was reported by the children's parents and educators that all children had equal opportunities to experience these types of toys, and the evaluation of the environment reported that all centers provided the children with equal opportunities. There were no significant differences between the experience and interest scores for boys and girls at home and at the centers for both types of toys were comparable. However, it has been observed that in a childcare setting, when given the opportunity to select toys, boys tend to gravitate to blocks, construction toys, and wheeled toys (Johnson et al., 1999). This would give them more experience with construction toys than puzzles. Therefore, when *compelled* to play with a puzzle, if their experience was more limited, a more difficult puzzle may have

been more daunting, consequently they not have focused as intently on this type of toy. Further explanations may be related to individual differences such as temperament.

The Relationship between Toy Type, Level of Toy Difficulty, Focused Attention, and Temperament

The study's final research question was as follows; *Is there a relation between children's temperament characteristics, the type of toy, the level of difficulty of the toys, and duration of children's focused attention?*

Focused attention is said to be voluntary and controlled by the individual (Ruff & Rothbart, 1996). Thus, children's individual differences such as temperament can play an important role in the duration of children's focused attention towards contextual factors such as toy type and the toy's level of difficulty. The present study investigated children's temperament characteristics related to the duration of their focused attention on toys with and without playful outcomes. Overall, only two temperament characteristics were found to be related to the children's duration of focused attention toward the toys, these were perceptual sensitivity and inhibitor control.

A negative correlation was found between children's perceptual sensitivity, as reported by their parents, and their duration of children's focused attention on Puzzle 1. Perceptual sensitivity is a combination of 12 items and is described by the author of the questionnaire as being the " detection of slight, low intensity stimuli from external environment" (Putnam et al., in press). This finding indicates that children with a low rating of perceptual sensitivity showed longer durations of focused attention to Puzzle 1, and children with a high rating of perceptual sensitivity demonstrated shorter duration of focused attention toward Puzzle 1. This means that children who were less inclined to

detect distractors in their environment spent more focused time attending to Puzzle 1. When engaged in the solution of an age-appropriate, not overly complex puzzle, they were able to concentrate on the task and disregard even low intensity stimuli from their environment. Interestingly, this temperament characteristic was not found to be related to Puzzle 2. This may imply that when a toy without a playful outcome is not overly complex children's temperament plays a role in the amount of time children will attend to the task. However, when the toy without a playful outcome is complex, parents ratings of perceptual sensitivity does not play a role in how much time the child attends to the task. The toy's characteristics such as number of pieces, shape of pieces, end goal and level of toy difficulty may be at the source of what instigated a relation between the children's perceptual sensitivity and consequent focused attention.

The second temperament characteristic that was correlated with duration of children's focused attention was inhibitory control. Inhibitory control, which was positively correlated with Construction toy 1, is a combination of 12 items, and is described as "the capacity to suppress inappropriate actions or responses" (Putnam et al., in press). This finding reveals that children with high inhibitory control demonstrated longer duration of focused attention toward Construction toy 1, and children with low inhibitory control displayed shorter duration of focused attention toward Construction toy 1. Focused attention is described as a concentrated state, which includes intent facial expression and minimal extraneous bodily activity. Children who were rated high on this factor should be able to suppress actions and behaviors that are not related to the task and one would think that a relationship should have been evident between this characteristic and all the toys. However, it was only related to the less complex toy with the playful

outcome. Similar to the puzzles, it may be that when the goal-directed toy with playful outcome is more complex, the role of the children's temperament may not be as important in determining how much time they will attend to the task. The toy's complexity may be enough to sustain children's attention.

Therefore, because inhibitory control was only correlated with Construction toy 1 and not with Construction toy 2, the appropriate type of toy and level of toy difficulty were the influential factors.

Nevertheless, it is intriguing to find that only specific levels of difficulty were associated with these two temperament characteristics: perceptual sensitivity and inhibitory control. Interestingly, perceptual sensitivity was related with duration of children's focused attention on Puzzle 1 but not with Puzzle 2 and inhibitory control was related to Construction toy 1 but not for the more complex construction toy, Construction toy 2. These findings suggest that temperament characteristics may not play as much of a role when the toy is more complex. The increased challenge of the task may help sustain and focus children's attention, even if the children do not exhibit specific temperament characteristics that may support focused attention (Vlachou & Farrell, 2000; Gianvecchio, 2002). This may indicate that in order to sustain a child's focused attention, a toy must be appropriately challenging for that particular child.

Moreover, another possible explanation for this finding can be considered. Today, developmental psychology believes that biological and environmental factors interact and even though temperament is believed to be essentially controlled by genetics, however some studies suggest that temperament may be somewhat influenced by external stimuli (Derryberry & Reed, 1994). This means that temperament may be influenced, with time,

by factors in the environment or that children may adapt their behaviors depending on their environment. Therefore, children attending childcare may, over time, develop, or need to develop a certain level of control over their sensitivity to external stimuli (i.e., perceptual sensitivity) because of the ambiance of a childcare setting. In all seven childcare centers participating in this study, each classroom (i.e., 3-year-olds) had on average 12 to 16 children with two educators and the total population of the center ranged between 43 and 106 children. Being exposed to this type of eventful environment on a daily basis may cause children to develop the ability to block out unwanted distraction. Likewise, the children's inhibitory control may also have been influenced by their environment. Children may need to develop inhibitory control when attending childcare settings. A childcare environment offers children a setting in which they must interact with other children, respect their peers and the material in the classroom, and the capacity to suppress inappropriate actions or responses is a highly valued social attribute and may be reinforced by the adults in the setting.

In addition, due to the topic of this study it was expected that there would be relations between the scores of attentional focusing and attentional shifting and the duration of children's focused attention, however this was not the case. No correlations were found between these temperament characteristics and any of the four toys, nevertheless, an interesting finding was observed. Significant differences were found between the scores reported by the parents and the scores reported by the educators on attentional focusing and attentional shifting. This suggests that children may have adapted their temperament to their environment and may behave differently depending on the environment they are in. The educators rated the children as having lower attentional

focusing and attentional shifting than the parents reported. One possible explanation is that the educators saw the children in a different environment than the parents. They see and interact with the children in a setting that is often noisy, eventful, and filled with frequent distractions. Also, most activities in a childcare environment are group based and this setting often requires interaction with peers for long periods of the day and children may simply want some time out in these types of conditions. Therefore, the children may exhibit behaviors of focused attention or behaviors of high attentional focusing and attentional shifting in this type of environment. Additionally, young children attending childcare spend many of their waking hours with an educator, thus educators may have a better awareness of the children's temperament than the parents. Educators also have knowledge and understanding of child development as well as a broader perspective of children of this age group and may therefore be more exact in their rating of a child's temperament. Since parents and educators are important figures in children's lives and know them well, combined ratings of temperament characteristics from various sources (e.g., parents and educators) might be one means of achieving a more representative rating of children's temperament if they are childcare attenders.

Finally, the children in the sample were found to be similar and comparable in temperament and no significant differences were found between boys' and girls' temperament ratings. Therefore, relations between duration of boys' and girls' focused attention and the 18 temperament characteristics were not analyzed. In addition, the sample size of this study was small ($n = 28$), the number of boys ($n = 17$) and girls ($n = 11$) were uneven and the large number of temperament characteristics ($n = 18$) rendered it difficult to complete meaningful statistical analyses regarding relations between duration

of boys and girls' focused attention for the four toys and the 18 temperament characteristics.

Limitations of the Present Study

First, it is important to underline the fact that the sample size was quite small for an exploratory investigation. An initial 99 packages were sent out, but unfortunately, the response rate was very low, an initial 36 responses and then 28 participants included in the study. The educators, directors, and the parents themselves reported that the reason for this occurrence was the length of the temperament questionnaire (i.e., 201 questions) to be completed by the parents in addition to the specific age range. All parents expressed great interest in the study, however many did not feel they had the time to complete the questionnaire properly. A shorter version of this questionnaire consisting of only the factors relevant to the study might have yielded more positive responses from parents. Additionally, a longer than usual recruitment period might also have resulted in more families participating in the study. This is very important as a larger sample size as well as an equal number of girls and boys could help generalize the findings to a larger population.

Secondly, the study included participants who were very similar and the sample was fairly homogeneous. The seven childcare centers that participated in this study served two universities, a CEGEP, two hospitals, a technology company, and middle-class neighborhood therefore, the children are presumed to be from at least middle class homes with a similar standard of living. The results of the study may have been influenced by the children's prior experience with similar toys (e.g., motivation, confidence level) related to the parent's level of education, employment, and/or

awareness of child development. In addition, all seven childcare centers were evaluated as having *Good* to *Excellent* overall quality. While it was important for this study to have a homogeneous sample, a larger scale study that would include children who are in childcare centers of different quality, might result in findings that could be generalized to a larger population. Childcare centers of different quality might offer children varied levels of access to and opportunities to use the types of toys used in the study and this might have an impact on the findings. Additionally, it has been shown that centers of lower quality tend to have children from families with a lower socioeconomic status and this difference in SES may have resulted in different behaviors toward the toys used in the study.

Thirdly, this sample was drawn from children who attended childcare centers. Children who attend childcare are in group settings for the majority of their waking hours and as a consequence they are usually exposed to more noise, more situations in which toys must be shared than children who are not in childcare. Children in high quality centers also have a greater quantity and variety of toys available for their use than children who do not attend child care. Consequently, one must question whether children who do not attend childcare would behave differently in the solitary play sessions than the children in this study who attended childcare.

Fourthly, there are limitations related to the design of the study. Experimental research, like the present study, is conducted to investigate very specific elements of a topic. Customarily, these studies cannot be accomplished in natural settings and familiar situations in order to facilitate control over external elements that are not related to the goal of the study and that may influence the outcome. Therefore, the design of the

present study included pre-established time frames (i.e., 4-minute period), specific toys and a specific play situation. Each play session was limited to a 4-minute period because the study set out to investigate the duration of focused attention during a set period, however this cut off may have affected the results. This may be especially true for Construction toy 2 in which most children exhibited longer periods of focused attention, and may have consequently continued to attend to the toy if there had not been cut off time. In addition, the fact that types of toys and their level of difficulty had been preselected by the researcher may have affected the results (Gianvecchio, 2002). Although this was required to control for external factors and was necessary because the present study investigated the difference between two specific toys, some children's duration of focused attention may have been affected by their lack of choice of toys to play with. Also, children were asked to participate in solitary play sessions. This was done in order to ensure that behaviors of focused attention or distraction were not influenced by factors other than the type of toy and level of difficulty. However, this set-up did not replicate the real life situation that these children were in on a daily basis and therefore, may not really reflect how they function in a group setting when they are playing with a toy and are distracted by a peer. Nonetheless, if one is to study the set of factors researched in this project, it is hard to conceive of another design that would allow for detailed examination in other than a contrived solitary play session.

A final limitation is the temperament questionnaire completed by the parents. Past research suggested that the most appropriate way to investigate young children's temperament is by having the children's parents complete a questionnaire (Goldsmith et al., 1987; Presley & Martin, 1994). However, the lack of significant findings in regards to

temperament characteristics related to focused attention (i.e., attentional focusing and attentional shifting) may suggest otherwise. Since the educators rated the children differently than the parents on these two temperament characteristics, the results of the temperament questionnaire (i.e., ECBQ) may have been affected by parents' biased responses regarding their child's temperament, by the educators' perception of the child, or the children may simply behave differently at home than at the center, which would have accounted for the difference in scores. However, had the questionnaires been shorter, more parents might have participated and then the findings might have been less skewed. Additionally, had parents from a greater variety of SES backgrounds participated in the study, the responses may have differed.

Implication for Parents and Educators

The findings from this study have practical implications in settings such as childcare centers and homes. Our modern society offers an enormous variety of toys to choose from for our children, and parents and educators alike are often conflicted when trying to choose new toys for children. Parents and educators wonder if toys can actually support certain aspects of their children's development. This study's findings concerning the type of toy that can help promote young children's duration of focused attention can benefit parents and educators by illustrating the importance of choosing the proper type of toy and the appropriate level of difficulty for children. The findings are important because they suggest that goal-directed toys with a playful outcome such as construction toys help sustain young children's focused attention, which has been shown to be related to future cognitive abilities and academic performance. Parents and educators should be

encouraged to select challenging toys that have a playful outcome, especially toys that children can create by themselves and subsequently engage in various types of play.

The present study also found that the appropriate level of difficulty of a toy depends on the type of toy. A construction toy must be challenging enough in order for children to engage in focused attention however, puzzles that are overly challenging do not tend to hold the children's attention. Children were observed to become more distracted when the goal-directed toy (i.e., puzzle) was more difficult, yet the children focused for longer durations when playing with the more difficult goal-directed toy with a playful outcome (i.e., construction toy). The literature on play and child development often recommends toys with a specific number of pieces, which determines the level of toy difficulty, as being appropriate for particular age groups, however the findings of this study suggest that parents and educators should have toys of varying levels of complexity available for children. Young children become easily discouraged or disinterested with toys if they are too easy or too difficult. Thus, it is important for parents and educators to monitor what children play with and help them choose puzzles or construction toys that are appropriate for their age but also their individual abilities. Nevertheless, as the present study has shown, goal-directed toys with a playful outcome, even if complex, encourage children's focused attention since they offers children more flexibility in their play, more options as to how to create the object, and hence may encourage children to complete the object.

Over the course of this study, an important implication and suggestion for toy manufacturers has become evident. The findings suggest that construction toys may elicit longer durations of focused attention than puzzles, which can be highly beneficial for

young children's development. However, when searching for goal-directed toys with a playful outcome (i.e., construction toys) to use in this study, the researcher's choice was limited to male stereotyped toys or character toys. Unfortunately, few if any construction toys were found that were expected to appeal to young girls. At the time of the study a new and innovative set of construction toys for girls was released by Mattel named Ello was released on the market representing new construction toys for girls. Alas, these toys were geared to 5 year-old girls or older. Given that when the girls in this study were required to use the construction toys they attended to these toys for longer periods of time than the boys, perhaps toy manufacturers should consider the interests of young girls and design construction materials that would be appropriate and attractive to them.

Directions for Future Research

The purpose of the present study was to investigate what type of toy and level of difficulty elicited the longest duration of children's focused attention as well as which temperament characteristics were related to durations of focused attention. Even though this research had interesting findings, it is important to investigate these findings further. This study was conducted with children participating in solitary play sessions with pre-established types of toys in a defined time frame. Future research could expand on this study by investigating 3-year-olds' focused attention during free play sessions, during longer time periods, and including a larger selection of toys. This type of study may therefore help uncover the children's natural level of focused attention when using a toy of their choosing. In addition, future research on this topic may investigate what forms of play or type of play may elicit longer durations of focused attention.

Furthermore, since this study was conducted in childcare centers, future investigators on this topic may contemplate looking at children who attend family childcare arrangements as well as children who do not attend childcare of any type. Studies may consider comparing the groups of children in order to discover if exposure to childcare, childcare materials, and curriculum influences the duration of focused attention to specific toys. It would be interesting to verify if children, who are not exposed to a noisy, sometimes chaotic childcare environment, could disregard noises and distractors from their surroundings while participating in completing a task since it was demonstrated that the majority of the children from centers were, amazingly, not distracted by the distractor.

Moreover, as an extension to the present study, researchers may consider using a *bimodal* distrator (i.e., visual and auditory) versus *unimodal* distrator (i.e., visual or auditory) as suggested by recent research (Tellinghuisen & Oakes, 1997; Ruff & Capozzoli, 2003). However, the variability of the settings for the play sessions (e.g., gym, classroom, offices) and the fact that the researcher needed to activate the distractor from behind a cardboard divider, rendered the use of a *bimodal* distractor device impossible for this particular study.

Finally, it would be interesting to investigate children from various social economic status backgrounds. There may be a difference in duration of focused attention depending on children's general experience with toys given the fact that good, sturdy, educational toys are usually more readily available in high quality childcare centers or in homes considered to be at least middle class (Swiniarski, 1991; Wolfgang & Stakenas,

1984). Level of SES may influence the skills the children exhibit toward cognitively oriented play tasks such as completing puzzles or construction toys.

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Appendix A

Letter to Parents/Guardians

Dear Parent(s)/Guardian,

My name is Nathalie Di Francesco and I am a graduate student in the M.A. Child Study program in the Department of Education at Concordia University. As a requirement for the completion of my program, I am conducting a research project under the supervision of Prof. Ellen Jacobs. For my thesis, I have chosen to examine **the relationship between toys, and attention to these toys in children with different types of temperament.** The rational for this study is to determine whether certain types of toys are influential in helping children sustain their attention regardless of their specific temperament.

My project has been defended and accepted by my thesis committee as well as Concordia University's ethics board and I am therefore presently seeking participants between the ages of 33 to 39 months. Your child's participation would consist of participating in two separate 20-minute play sessions at the daycare. Your child will be asked to play with six different toys of varying difficulty; three closed-ended toys (puzzles) and three closed-ended with playful outcome (construction toys) and a distractor will be presented during the play sessions. During these play sessions, your child's involvement with the toys will be videotaped in order to assess the toys effectiveness in holding children's attention. In addition, the study will also require you, parent(s), to complete questionnaires pertaining to your child's temperament, attention and the availability of specific toys in their environment. These questionnaires contain approximately 200 questions with frequency scale responses and should take approximately 45 minutes to complete. This research will provide a deeper understanding of what can support a young child's level of attention as well as perhaps provide insight as to what type of toy could be provided to increase the level of attention for children of this age and with different temperaments.

This letter is also to inform you that if your child does participate in this study, you and/or your child possess the freedom to discontinue your participation in this study at any time without any consequences. All information gathered in this study will be kept strictly confidential that is the identity of you and your child will not be disclosed or connected to the information gathered because an identification number will be assigned to your child's information. It is also important to note that the data gathered during this study may be published at a later time. The findings from the present study will be available to all participants by contacting me or my thesis advisor. No individual results, observation or data collected will be divulged.

Therefore, I would like to request your child's participation in this study. Attached to this letter you will find a consent form to be completed where you may inscribe your agreement or disagreement to your child's participation. If you have any questions or concerns please do not hesitate to contact me at 514-961-2941 (ln_di@education.concordia.ca) or my thesis advisor Ellen Jacobs in the Department of Education, Concordia University at 514-848-2424 ext: 2016.

I would like to thank you for your time and consideration,

Sincerely,
Nathalie Di Francesco
M.A. Candidate Child Study
Concordia University, Montreal

Appendix B

Consent form for participation in research

CONSENT FORM FOR THE PARTICIPATION IN RESEARCH ID#___

This study, entitled "The Relationship between Toy Type, Attention, and Temperament in Young Children" is led by Nathalie Di Francesco and supervised by Professor Ellen Jacobs from the Education Department at Concordia University.

A. PURPOSE

The goal of this research is to study young children's focused attention during play. This research will investigate the level of focused attention toward specific types of toys, level of toy difficulty and the relation between these levels of focused attention and the children's individual temperament.

B. PROCEDURE

Prior to the play sessions, the parent(s)/guardian(s) will be required to complete two questionnaires pertaining to the child's temperament, attention and the availability of specific toys in their environment. These questionnaires contain approximately 200 questions with frequency scale responses and should take approximately 45 minutes to complete. The children's educators will also be asked to complete short versions of similar questionnaires pertaining to the toys available in the classroom and the child's attention and temperament. The educators will distribute the questionnaires to the parent(s)/guardian(s) of children of the required age group (33-39 months). The child's participation will consist of taking part in two separate 20-minute play sessions at the daycare. The sessions will be conducted in a separate room at ..... with the researcher present at all times. Firstly, the child will be asked if he/she would like to participate in the play sessions and will be informed of the details of the play sessions, about the toys and the videotaping material. In addition, the child will be reminded, before and during the play sessions, that he/she may go back to his/her classroom and end the play session whenever if the child does not feel comfortable with the play session, the toys or the task itself. The child will be asked to play with six different toys of varying difficulty; three closed-ended toys (puzzles), three closed-ended with playful outcome (construction toys) and a distractor will be presented during the play sessions. During these play sessions, the child's involvement with the toys will be videotaped in order to assess the toys' effectiveness in holding children's attention. This research will provide a deeper understanding of what can support a young child's level of attention, as well as perhaps provide insight as to what type of toy could be provided to increase the level of attention for children of this age and with different temperaments. The findings from the present study will be available to all participants by contacting my thesis advisor or me. No individual results, observation or data collected will be divulged.

C. PARTICIPATION CONDITIONS

The parent(s)/guardian of this child has been explained:

- that she/he is free to withdraw consent and discontinue participation at any time, without consequence and that her/his child is free to discontinue participation at any time, without consequence.
- that the participation in this project is CONFIDENTIAL (the researcher will know the identity of the participants, but will not reveal it).
- that the results of this study may be published at a later time and therefore the videotapes will be kept in a locked file cabinet at Concordia University until they will be erased, that is, when the original data will not be needed for verification.

If you, parent/guardian, and your child would like to participate in this study please write your child's name, your name and your signature below:

CHILD'S NAME _____
NAME (print) _____
SIGNATURE _____
SIGNATURE OF RESEARCHER_____
DATE _____

If you have any questions or concerns, please do not hesitate to contact me, Nathalie Di Francesco at 514-961-2941 (ln_di@education.concordia.ca) or my thesis advisor, Ellen Jacobs, at the Department of Education, Concordia University, at 514-848-2424 ext.: 2016.

Appendix C

Parent(s)/guardian questionnaire

Parent(s)/Guardian Questionnaire

Background Information

1) Child's Name:_____
2) Date of birth:_____
3) Gender : **Male / Female**
4) Place of birth: _____
5) Parents/Guardian's Name: _____
6) What is your child first language? _____
7) What language is mostly spoken at home?: _____
8) Does your child have siblings living in the same home? **Yes /No**
If yes, how many and how old are the siblings? _____

Health Information

9) Was your child born on due date? **Yes / No**
If no, how many days early or late?_____
10) Was there any complication during
the birthing process? **Yes/ No**
If yes, please specify: _____
11) Has you child experienced any important
medical problems or concerns? **Yes/ No**
If yes, please specify:_____

Home Environment Information

12) Do you have puzzles appropriate for your child's age
available in your home? **Yes/ No**
If yes, how many puzzles appropriate for your
child's age are available? **None / 1-2 / 3-6 / More than 7**
13) How many pieces are the puzzles your child
is capable of completing alone? **4 pieces / 6 / 8 / 10 / 12pieces and more**
14) Do you have construction toys appropriate for your child's age
available in your home (e.g. Lego, blocks)? **Yes / No**
15) Are there put-together toys appropriate for your child's age
available in your home (Brio, Playmobil)? **Yes / No**
16) Do you have the "First Puzzle-Animals" (set of 4) by Galt in your home? **Yes/ No**
17) Do you have the "Bob the Builder" character
building sets by Brio in your home? **Yes/ No**

Behavior Information

18) How long does your child play alone with his/her favourite toy?
Less than 2mins / 5mins / 10 mins / More than 10 mins
19) Does your child usually finish his/her play tasks such as nesting cups together, completing puzzles, constructing something? **Yes / No**
20) How often does your child look away from the object he/she is playing with?
Rarely / Sometimes / Often / Very Often
21) Does your child seem bored or uninterested during play? **Yes / No**
22) Do you need to rotate the toys available in order for your child not to seem bored or uninterested? **Yes / No**
23) Does your child play with puzzles? **Yes / No**
24) Does your child play with puzzles if not initiated by someone else? **Yes / No**
25) Does your child seem to enjoy playing with puzzles? **Yes / No**
26) Does your child play with construction toys? **Yes / No**
27) Does your child play with construction toys if not initiated by someone else? **Yes / No**
28) Does your child seem to enjoy playing with construction toys? **Yes / No**
29) Does your child play with put-together toys? **Yes / No**
30) Does your child play with put-together toys if not initiated by someone else? **Yes / No**
31) Does your child seem to enjoy playing with put-together toys? **Yes / No**

"The Relationship between Attention, Toy Type and Temperament in Young Children."

Additional Questions : Parent(s)/Guardian ID# _____

1) How much does your child like puzzles?
Not at all/ A little/ Somewhat / Alot
2) At home, how often does your child **select** puzzles to play with per week?
Never/ Rarely/ Sometimes/ Often/ Very Often
3) At home, how often does your child and an adult (or older peer) play together with puzzles per week?
Never/ Rarely/ Sometimes/ Often/ Very Often
4) How often does your child ask for help in order to complete a puzzle?
Never/ Rarely/ Sometimes/ Often/ Very Often
5) How much does your child like construction toys?
Not at all/ A little/ Somewhat /Very Much
6) At home, how often does your child **select** a construction toy to play with per week? **Never/ Rarely/ Sometimes/ Often/ Very Often**
7) At home, how often does your child and an adult (or older peer) play together with construction toys per week?
Never/ Rarely/ Sometimes/ Often/ Very Often
8) How often does your child ask for help in order to complete a construction toy? **Never/ Rarely/ Sometimes/ Often/ Very Often**
9) How long has your child been in a Child Care setting, part/full-time nursery program, or family daycare (i.e., interacting with 5 or more children on a daily basis)?
6 months-1year/ 1-2 years/ 2-3years

Appendix D

Parent Early Childhood Behavior Questionnaire (ECBQ)

Parent Early Childhood Behavior Questionnaire

ID #: _____
Parent(s) Name:_____
Child's name: _____
Today's date: Month:____ Day:____ Yr:____

INSTRUCTIONS: **Please read carefully before starting.**
As you read each description of your child's behavior below, please indicate how often your child did this during the last two weeks by circling one of the numbers in the right column. These numbers indicate how often you observed the behavior described during the last two weeks.

never	very rarely	less than half the time	about half the time	more than half the time	almost always	always	does not apply
1	2	3	4	5	6	7	NA

The "Does Not Apply" column (NA) is used when you did not see the child in the situation described during the last two weeks. For example, if the situation mentions your child going to the doctor and there was no time during the last two weeks when the child went to the doctor, circle the (NA) column. "Does Not Apply" (NA) is different from "NEVER" (1). "Never" is used when you saw your child in the situation but your child never engaged in the behavior mentioned in the last two weeks. Please be sure to circle a number or NA for every item.

When told that it was time for bed or a nap, how often did your child

1. react with anger? 1 2 3 4 5 6 7 NA
2. get irritable? 1 2 3 4 5 6 7 NA

When approached by an unfamiliar person in a public place (for example, the grocery store), how often did your child

3. remain calm? 1 2 3 4 5 6 7 NA
4. pull back and avoid the person? 1 2 3 4 5 6 7 NA
5. cling to a parent? 1 2 3 4 5 6 7 NA

During everyday activities, how often did your child

6. startle at loud noises (such as a fire engine siren)? 1 2 3 4 5 6 7 NA
7. tap or drum with fingers on tables or other objects? 1 2 3 4 5 6 7 NA
8. get irritated by scratchy sounds? 1 2 3 4 5 6 7 NA
9. become uncomfortable when his/her socks were not aligned properly on his/her feet? 1 2 3 4 5 6 7 NA

After getting a bump or scrape, how often did your child

10. forget about it in a few minutes? 1 2 3 4 5 6 7 NA

While playing outdoors, how often did your child

11. like making lots of noise? 1 2 3 4 5 6 7 NA

12. enjoy sitting quietly in the sunshine? 1 2 3 4 5 6 7 NA

13. want to climb to high places (for example, up a tree or on the jungle gym)? 1 2 3 4 5 6 7 NA

When s/he was carried, how often did your child

14. like to be held? 1 2 3 4 5 6 7 NA

15. push against you until put down? 1 2 3 4 5 6 7 NA

16. squirm? 1 2 3 4 5 6 7 NA

17. struggle to get away? 1 2 3 4 5 6 7 NA

18. snuggle up next to you? 1 2 3 4 5 6 7 N

While having trouble completing a task (e.g., building, drawing, dressing), how often did your child

19. get easily irritated? 1 2 3 4 5 6 7 NA

20. become sad? 1 2 3 4 5 6 7 NA

When a familiar child came to your home, how often did your child

21. engage in an activity with the child? 1 2 3 4 5 6 7 NA

22. seek out the company of the child? 1 2 3 4 5 6 7 NA

When offered a choice of activities, how often did your child

23. stop and think before deciding? 1 2 3 4 5 6 7 NA

24. decide what to do very quickly and go after it? 1 2 3 4 5 6 7 NA

25. seem slow and unhurried about what to do next? 1 2 3 4 5 6 7 NA

When asked NOT to, how often did your child

26. run around your house or apartment anyway? 1 2 3 4 5 6 7 NA

27. touch an attractive item (such as an ornament) anyway? 1 2 3 4 5 6 7 NA

28. play with something anyway? 1 2 3 4 5 6 7 NA

During daily or evening quiet time with you and your child, how often did your child

29. enjoy just being quietly sung to? 1 2 3 4 5 6 7 NA

30. smile at the sound of words, as in nursery rhymes? 1 2 3 4 5 6 7 NA

31. enjoy just being talked to? 1 2 3 4 5 6 7 NA

32. enjoy rhythmic activities, such as rocking or swaying? 1 2 3 4 5 6 7 NA

During everyday activities, how often did your child

33. become distressed when his/her hands were dirty and/or sticky? 1 2 3 4 5 6 7 NA

34. notice that material was very soft (cotton) or rough (wool)? 1 2 3 4 5 6 7 NA

35. notice low-pitched noises such as the air-conditioner, heater, or refrigerator running or starting up? 1 2 3 4 5 6 7 NA

36. blink a lot? 1 2 3 4 5 6 7 NA

37. get very enthusiastic about the things s/he was going to do? 1 2 3 4 5 6 7 NA

While at home, how often did your child

38. show fear at a loud sound (blender, vacuum cleaner, etc.)? 1 2 3 4 5 6 7 NA

39. seem afraid of the dark? 1 2 3 4 5 6 7 NA

When visiting the home of a familiar adult, such as a relative or friend, how often did your child

40. want to interact with the adult? 1 2 3 4 5 6 7 NA

While bathing, how often did your child

41. sit quietly? 1 2 3 4 5 6 7 NA

42. splash, kick, or try to jump? 1 2 3 4 5 6 7 NA

While playing outdoors, how often did your child

43. look immediately when you pointed at something? 1 2 3 4 5 6 7 NA

44. choose to take chances for the fun and excitement of it? 1 2 3 4 5 6 7 NA

45. not like going down high slides at the amusement park or playground? 1 2 3 4 5 6 7 NA

When s/he was upset, how often did your child

46. change to feeling better within a few minutes? 1 2 3 4 5 6 7 NA

47. soothe only with difficulty? 1 2 3 4 5 6 7 N

48. stay upset for 10 minutes or longer? 1 2 3 4 5 6 7 NA

When engaged in play with his/her favorite toy, how often did your child

49. play for 5 minutes or less? 1 2 3 4 5 6 7 NA

50. play for more than 10 minutes? 1 2 3 4 5 6 7 NA

51. continue to play while at the same time responding to your remarks or questions? 1 2 3 4 5 6 7 NA

When approaching unfamiliar children playing, how often did your child

52. watch rather than join? 1 2 3 4 5 6 7 NA

53. approach slowly? 1 2 3 4 5 6 7 N

54. seem uncomfortable? 1 2 3 4 5 6 7 NA

During everyday activities, how often did your child

55. complain about odors on others, such as perfume? 1 2 3 4 5 6 7 NA

56. seem to be bothered by bright light? 1 2 3 4 5 6 7 NA

57. move quickly from one place to another? 1 2 3 4 5 6 7 NA

58. notice the smoothness or roughness of objects s/he touched? 1 2 3 4 5 6 7 NA

59. become sad or blue for no apparent reason? 1 2 3 4 5 6 7 NA

After having been interrupted, how often did your child

60. return to a previous activity? 1 2 3 4 5 6 7 NA

61. have difficulty returning to the previous activity? 1 2 3 4 5 6 7 NA

While watching TV or hearing a story, how often did your child

62. seem frightened by 'monster' characters? 1 2 3 4 5 6 7 NA

When you suggested an outdoor activity that s/he really likes, how often did your child

63. respond immediately? 1 2 3 4 5 6 7 NA

64. run to the door before getting ready? 1 2 3 4 5 6 7 NA

When told that loved adults would visit, how often did your child

65. get very excited? 1 2 3 4 5 6 7 NA

66. become very happy? 1 2 3 4 5 6 7 NA

When taking a quiet, warm bath, how often did your child

67. seem to relax and enjoy him/herself? 1 2 3 4 5 6 7 NA

When s/he couldn't find something to play with, how often did your child

68. get angry? 1 2 3 4 5 6 7 NA

During sleep, how often did your child

69. toss about in the bed? 1 2 3 4 5 6 7 NA

70. sleep in one position only? 1 2 3 4 5 6 7 NA

During quiet activities, such as reading a story, how often did your child

71. swing or tap his/her foot? 1 2 3 4 5 6 7 NA

72. fiddle with his/her hair, clothing, etc.? 1 2 3 4 5 6 7 NA

73. show repeated movements like squinting, hunching up the shoulders, or twitching the facial muscles? 1 2 3 4 5 6 7 NA

While playing indoors, how often did your child

74. like rough and rowdy games? 1 2 3 4 5 6 7 NA

75. enjoy playing boisterous games like 'chase'? 1 2 3 4 5 6 7 NA

76. enjoy vigorously jumping on the couch or bed? 1 2 3 4 5 6 7 NA

In situations where s/he is meeting new people, how often did your child

77. turn away? 1 2 3 4 5 6 7 NA

78. become quiet? 1 2 3 4 5 6 7 NA

79. seem comfortable? 1 2 3 4 5 6 7 NA

When being gently rocked or hugged, how often did your child

80. seem eager to get away? 1 2 3 4 5 6 7 NA

81. make protesting noises? 1 2 3 4 5 6 7 NA

When encountering a new activity, how often did your child

82. sit on the sidelines and observe before joining in? 1 2 3 4 5 6 7 NA

83. get involved immediately? 1 2 3 4 5 6 7 NA

When visiting the home of a familiar child, how often did your child

84. engage in an activity with the child? 1 2 3 4 5 6 7 NA

85. seek out the company of the child? 1 2 3 4 5 6 7 NA

When another child took away his/her favorite toy, how often did your child

86. scream with anger? 1 2 3 4 5 6 7 NA

87. not become angry? 1 2 3 4 5 6 7 NA

88. sadly cry? 1 2 3 4 5 6 7 NA

89. not react with sadness? 1 2 3 4 5 6 7 NA

When engaged in an activity requiring attention, such as building with blocks, how often did your child

90. move quickly to another activity? 1 2 3 4 5 6 7 NA

91. stay involved for 10 minutes or more? 1 2 3 4 5 6 7 NA

92. tire of the activity relatively quickly? 1 2 3 4 5 6 7 N

During everyday activities, how often did your child

93. pay attention to you right away when you called to him/her? 1 2 3 4 5 6 7 NA

94. seem to be disturbed by loud sounds? 1 2 3 4 5 6 7 NA

95. stop going after a forbidden object (such as a VCR) when you used a toy to distract her/him? 1 2 3 4 5 6 7 NA

96. notice small things, such as dirt or a stain, on his/her clothes? 1 2 3 4 5 6 7 NA

While in a public place, how often did your child

97. seem uneasy about approaching an elevator or escalator? 1 2 3 4 5 6 7 NA

98. cry or show distress when approached by an unfamiliar animal? 1 2 3 4 5 6 7 NA

99. seem afraid of large, noisy vehicles? 1 2 3 4 5 6 7 NA

100. show fear when the caregiver stepped out of sight? 1 2 3 4 5 6 7 N

When playing outdoors with other children, how often did your child

101. seem to be one of the most active children? 1 2 3 4 5 6 7 NA

102. sit quietly and watch? 1 2 3 4 5 6 7 NA

During daily or evening quiet time with you and your child, how often did your child

103. want to be cuddled? 1 2 3 4 5 6 7 NA

During everyday activities, how often did your child

104. seem frightened for no apparent reason? 1 2 3 4 5 6 7 NA

105. seem to be irritated by tags in his/her clothes? 1 2 3 4 5 6 7 NA

106. notice when you were wearing new clothing? 1 2 3 4 5 6 7 NA

107. react to beeping sounds (such as when the microwave or oven is done cooking)? 1 2 3 4 5 6 7 NA

108. show repeated movements like squinting, hunching up

the shoulders, or twitching the facial muscles? 1 2 3 4 5 6 7 NA

When being dressed or undressed, how often did your child

109. squirm and try to get away? 1 2 3 4 5 6 7 NA

110. stay still? 1 2 3 4 5 6 7 NA

When told "no", how often did your child

111. stop an activity quickly? 1 2 3 4 5 6 7 NA

112. stop the forbidden activity? 1 2 3 4 5 6 7 NA

113. ignore your warning? 1 2 3 4 5 6 7 NA

114. become sadly tearful? 1 2 3 4 5 6 7 NA

Following an exciting activity or event, how often did your child

115. calm down quickly? 1 2 3 4 5 6 7 NA

116. have a hard time settling down? 1 2 3 4 5 6 7 NA

117. seem to feel down or blue? 1 2 3 4 5 6 7 NA

118. become sadly tearful? 1 2 3 4 5 6 7 NA

When given something to eat that s/he didn't like, how often did your child

119. become angry? 1 2 3 4 5 6 7 NA

During everyday activities, how often did your child seem able to

120. easily shift attention from one activity to another? 1 2 3 4 5 6 7 NA

121. do more than one thing at a time (such as playing with a toy while watching TV)? 1 2 3 4 5 6 7 NA

While playing indoors, how often did your child

122. run through the house? 1 2 3 4 5 6 7 NA

123. climb over furniture? 1 2 3 4 5 6 7 NA

124. not care for rough and rowdy games? 1 2 3 4 5 6 7 NA

125. enjoy activities such as being spun, etc.? 1 2 3 4 5 6 7 NA

When playing alone, how often did your child

126. become easily distracted? 1 2 3 4 5 6 7 NA

127. play with a set of objects for 5 minutes or longer at a time? 1 2 3 4 5 6 7 NA

128. scratch him/herself? 1 2 3 4 5 6 7 NA

129. tear materials close at hand? 1 2 3 4 5 6 7 NA

Before an exciting event (such as receiving a new toy), how often did your child

130. get so worked up that s/he had trouble sitting still? 1 2 3 4 5 6 7 NA

131. get very excited about getting it? 1 2 3 4 5 6 7 NA

132. remain pretty calm? 1 2 3 4 5 6 7 NA

133. seem eager to have it right away? 1 2 3 4 5 6 7 NA

When s/he asked for something and you said "no", how often did your child

134. become frustrated? 1 2 3 4 5 6 7 NA

135. protest with anger? 1 2 3 4 5 6 7 NA

136. have a temper tantrum? 1 2 3 4 5 6 7 NA

137. become sad? 1 2 3 4 5 6 7 NA

While playing or walking outdoors, how often did your child

138. notice sights or sounds (for example, wind chimes or water sprinklers)? 1 2 3 4 5 6 7 NA

139. notice flying or crawling insects? 1 2 3 4 5 6 7 NA

When you gave your child an attractive toy, how often did your child

140. grab the object as soon as it was set down? 1 2 3 4 5 6 7 NA

141. look the object over before touching it? 1 2 3 4 5 6 7 NA

When asked to wait for a desirable item (such as ice cream), how often did your child

142. seem unable to wait for as long as 1 minute? 1 2 3 4 5 6 7 NA

143. go after it anyway? 1 2 3 4 5 6 7 NA

144. wait patiently? 1 2 3 4 5 6 7 NA

145. whimper and cry? 1 2 3 4 5 6 7 NA

When being gently rocked, how often did your child

146. smile? 1 2 3 4 5 6 7 NA

147. make sounds of pleasure? 1 2 3 4 5 6 7 NA

While visiting relatives or adult family friends s/he sees infrequently,

how often did your child

148. stay back and avoid eye contact? 1 2 3 4 5 6 7 NA

149. hide his/her face? 1 2 3 4 5 6 7 NA

150. "warm up" to the person within a few minutes? 1 2 3 4 5 6 7 NA

When you removed something s/he should not have been playin with, how often did your child

151. become sad? 1 2 3 4 5 6 7 NA

During everyday activities, how often did your child

152. become bothered by sounds while in noisy environments? 1 2 3 4 5 6 7 NA

153. become bothered by scratchy materials like wool? 1 2 3 4 5 6 7 NA

154. notice changes in your appearance (such as wet hair, a hat, or jewelry)? 1 2 3 4 5 6 7 NA

155. appear to listen to even very quiet sounds? 1 2 3 4 5 6 7 NA

156. seem full of energy, even in the evening? 1 2 3 4 5 6 7 N

When interrupted during a favorite TV show, how often did your child

157. immediately return to watching the TV program? 1 2 3 4 5 6 7 NA

158. not finish watching the program? 1 2 3 4 5 6 7 NA

While being held on your lap, how often did your child

159. pull away and kick? 1 2 3 4 5 6 7 NA

160. seem to enjoy him/herself? 1 2 3 4 5 6 7 NA

161. mold to your body? 1 2 3 4 5 6 7 NA

162. seek hugs and kisses? 1 2 3 4 5 6 7 NA

While a story was being read to your child, how often did s/he

163. enjoy listening to the story? 1 2 3 4 5 6 7 NA

When hearing about a future family outing (such as a trip to the playground), how often did your child

164. become very enthusiastic? 1 2 3 4 5 6 7 NA

165. look forward to it? 1 2 3 4 5 6 7 NA

166. remain pretty calm? 1 2 3 4 5 6 7 NA

While looking at picture books on his/her own, how often did your child

167. stay interested in the book for 5 minutes or less? 1 2 3 4 5 6 7 NA

168. stay interested in the book for more than 10 minutes at a time? 1 2 3 4 5 6 7 NA

169. become easily distracted? 1 2 3 4 5 6 7 NA

170. enjoy looking at the books? 1 2 3 4 5 6 7 NA

When tired after a long day of activities, how often did your child

171. become easily frustrated? 1 2 3 4 5 6 7 NA

When a familiar adult, such as a relative or friend, visited your home, how often did your child

172. want to interact with the adult? 1 2 3 4 5 6 7 NA

When asked to do so, how often was your child able to

173. stop an ongoing activity? 1 2 3 4 5 6 7 NA

174. lower his or her voice? 1 2 3 4 5 6 7 NA

175. be careful with something breakable? 1 2 3 4 5 6 7 NA

When visiting a new place, how often did your child

176. not want to enter? 1 2 3 4 5 6 7 NA

177. go right in? 1 2 3 4 5 6 7 NA

While you were showing your child how to do something, how often did your child

178. jump into the task before it was fully explained? 1 2 3 4 5 6 7 NA

While you were talking with someone else, how often did your child

179. easily switch attention from speaker to speaker? 1 2 3 4 5 6 7 NA

During everyday activities, how often did your child

180. become irritated when his/her clothes were tight? 1 2 3 4 5 6 7 NA

181. notice smells from cooking? 1 2 3 4 5 6 7 NA

182. rock back and forth while sitting? 1 2 3 4 5 6 7 NA

183. notice sirens from fire trucks or ambulances at a distance? 1 2 3 4 5 6 7 NA

When you mildly criticized or corrected her/his behavior, how often did your child

184. get mad? 1 2 3 4 5 6 7 NA

185. have hurt feelings? 1 2 3 4 5 6 7 NA

When s/he was upset, how often did your child

186. cry for more than 3 minutes, even when being comforted? 1 2 3 4 5 6 7 NA

187. cheer up within a minute or two when being comforted? 1 2 3 4 5 6 7 NA

188. become easily soothed? 1 2 3 4 5 6 7 NA

When you were busy, how often did your child

189. find another activity to do when asked? 1 2 3 4 5 6 7 NA

While playing outdoors, how often did your child

190. want to jump from heights? 1 2 3 4 5 6 7 NA

191. want to go down the slide in unusual ways (for example, head first)? 1 2 3 4 5 6 7 NA

192. enjoy being pushed fast on a wheeled vehicle? 1 2 3 4 5 6 7 NA

193. enjoy sitting down and playing quietly? 1 2 3 4 5 6 7 NA

When playing alone, how often did your child

194. chew his/her lower lip? 1 2 3 4 5 6 7 NA

195. stick out his/her tongue when concentrating? 1 2 3 4 5 6 7 NA

196. move from one task or activity to another without completing any? 1 2 3 4 5 6 7 NA

197. have trouble focusing on a task without guidance? 1 2 3 4 5 6 7 NA

When given a wrapped present, how often did your child

198. become extremely animated? 1 2 3 4 5 6 7 NA

When around large gatherings of familiar adults or children, how often did your child

199. want to be involved in a group activity? 1 2 3 4 5 6 7 NA

200. enjoy playing with a number of different people? 1 2 3 4 5 6 7 NA

When s/he was asked to share his/her toys, how often did your child

201. become sad? 1 2 3 4 5 6 7 NA

Appendix E

Letter to the director of the childcare center

To whom it may concern,

My name is Nathalie Di Francesco and I am a graduate student in the M.A. Child Study program in the Department of Education at Concordia University. As a requirement for the completion of my program, I am conducting a research project under the supervision of Prof. Ellen Jacobs. For my thesis, I have chosen to examine **the relationship between toys and attention to these toys in children with different types of temperament.** The rational for this study is to determine whether certain types of toys are influential in helping children sustain their attention regardless of their specific temperament.

My project has been defended and accepted by my thesis committee as well as Concordia University's ethics board and I am therefore presently seeking participants between the ages of 33 to 39 months. The children's participation will consist of taking part individually in two 20-minute play sessions at the daycare on two separate occasions- one week apart. The child will be asked to play with six different toys of varying difficulty; three closed-ended toys (puzzles) and three closed-ended with playful outcome (construction toys) and a distractor will be presented during the play sessions. During these play sessions; the child's involvement with the toys will be videotaped in order to assess the toys effectiveness in holding the child's attention. These sessions will take place during the child's time at the daycare and will be scheduled while taking into consideration the classroom's routine and schedule. This study is centred on the *focused attention* of young children therefore, would require a separate space or room in your establishment in which to conduct these play sessions.

In addition, the study will also require the parent(s) and educators to complete questionnaires pertaining to the child's temperament, attention and the availability of specific toys in their environment. These questionnaires contain approximately 200 questions for parent(s) and 40 questions for educators with frequency scale responses and should take approximately 45 and 10 minutes respectively to complete. This research will provide a deeper understanding of what can support a young child's level of attention as well as perhaps provide insight as to what type of toy could be provided to increase the level of attention for children of this age and with different temperaments. Parental permission and consent will be requested and every child and parent will be informed of their freedom to discontinue participation at any time during the study without any consequences. All information gathered in this study will be kept strictly confidential and identification numbers will be assigned to the children's information. It is also important to note that the data gathered during this study may be published at a later time.

Therefore, I would like to request your permission to contact the educators and parents of the children within the specified age range in order to recruit participants for my study. Upon receiving your permission I would like to send letters of permission to parents of children who meet the study's requirements. Only findings from entire group in the present study will be available to all participants by contacting me or my thesis advisor. No individual results, observation or data collected will be divulged.

If you have any questions or concerns please do not hesitate to contact me at 514-961-2941 (ln_di@education.concordia.ca) or my thesis advisor Ellen Jacobs in the Department of Education, Concordia University at 514-848-2424 ext: 2016. I would like to thank you for your time and consideration,

Sincerely,
Nathalie Di Francesco
M.A. Candidate Child Study
Concordia University, Montreal

Appendix F

Letter to Educator

Dear Educator,

My name is Nathalie Di Francesco and I am a graduate student in the M.A. Child Study program in the Department of Education at Concordia University. As a requirement for the completion of my program, I am conducting a research project under the supervision of Prof. Ellen Jacobs. For my thesis, I have chosen to examine **the relationship between toys and attention to these toys in children with different types of temperament.** The rational for this study is to determine whether certain types of toys are influential in helping children sustain their attention regardless of their specific temperament.

My project has been defended and accepted by my thesis committee as well as Concordia University's ethics board and I am therefore presently seeking participants between the ages of 33 to 39 months. The children's participation will consist of taking part individually in two 20-minute play sessions at the daycare on two separate occasions- one week apart. The child will be asked to play with six different toys of varying difficulty; three closed-ended toys (puzzles) and three closed-ended with playful outcome (construction toys) and a distractor will be presented during the play sessions. During these play sessions; the child's involvement with the toys will be videotaped in order to assess the toys effectiveness in holding the child's attention. These sessions will take place during the child's time at the daycare and will be scheduled while taking into consideration the classroom's routine and schedule. This study is centred on the *focused attention* of young children therefore, would require a separate space or room in your establishment in which to conduct these play sessions.

In addition, the study will also require you, educator, to complete questionnaires pertaining to the child's temperament, attention and the availability of specific toys in their environment. These questionnaires contain approximately 40 questions with frequency scale responses and should take approximately 10 minutes to complete. This research will provide a deeper understanding of what can support a young child's level of attention as well as perhaps provide insight as to what type of toy could be provided to increase the level of attention for children of this age and with different temperaments.

Your role in this process will be to distribute the letters to the parent(s) of children of the required age (33-39months) as well as complete the questionnaires mentioned above. All information gathered in this study will be kept strictly confidential and identification numbers will be assigned to your and the children's information. Only findings from entire group in the present study will be available to all participants by contacting me or my thesis advisor. No individual results, observation or data collected will be divulged. It is also important to note that the data gathered during this study may be published at a later time.

If you have any questions or concerns please do not hesitate to contact me at 514-961-2941 (ln_di@education.concordia.ca) or my thesis advisor Ellen Jacobs in the Department of Education, Concordia University at 514-848-2424 ext:2016. I would like to thank you for your time and consideration,

Sincerely,
Nathalie Di Francesco
M.A.Candidate Child Study
Concordia University, Montreal

Appendix G

Educator questionnaire

Educator Questionnaire

Background Information

Name of educator: _____

Name of Child: _____

How long have you taught/known this child? **1-3months/ 3-6 / 6m-1year/ More than 1year**

How would you rate how well you know this child? **Not much/ A little / Well / Very well**

Classroom Environment Information

1) Do you have puzzles appropriate for this child's age available in your classroom? **Yes/ No**

If yes, how many puzzles appropriate for this child's age are available? **None / 1-2 / 3-6 / More than 7**

2) How many pieces are the puzzles this child is capable of completing alone? **4 pieces / 6 / 8 / 10 / 12pieces and more**

3) Do you have construction toys appropriate for this child's age available in your classroom (e.g. Lego, blocks)? **Yes / No**

4) Are there put-together toys appropriate for this child's age available in your classroom (Building sets-Brio, Lego Explore)? **Yes / No**

5) Do you have the four-levels animal puzzles by Galt in your classroom? **Yes/No**

6) Do you have the "Bob the Builder" character building sets by Brio in your classroom?

Behavior Information

7) How long does this child play alone with his/her favorite toy? **Less than 2mins / 5mins / 10 mins / More than 10 mins**

8) Does this child usually finish his/her play tasks such as nesting cups together, completing puzzles, constructing something? **Yes / No**

9) How often does this child look away from the object he/she is playing with? **Rarely / Sometimes / Often / Very Often**

10) Does this child seem bored or uninterested during play? **Yes / No**

11) Do you need to rotate the toys available in order for this child not to seem bored or uninterested? **Yes / No**

12) Does this child play with puzzles?

13) Does this child play with puzzles if not initiated by someone else? **Yes / No**

14) Does this child seem to enjoy playing with puzzles? **Yes / No**

15) Does this child play with construction toys? **Yes / No**

16) Does this child play with construction toys if not initiated by someone else? **Yes / No**

17) Does this child seem to enjoy playing with construction toys? **Yes / No**

18) Does this child play with put-together toys? **Yes / No**

19) Does this child play with put-together toys (building sets) if not initiated by someone else? **Yes / No**

20) Does this child seem to enjoy playing with put-together toys? **Yes / No**

"The Relationship between Attention, Toy Type and Temperament in Young Children."

Additional Questions : Educator ID# _____

1) How much does this child like puzzles?
Not at all/ A little/ Somewhat / Alot
2) At the center, how often does this child **select** puzzles to play with per week?
Never/ Rarely/ Sometimes/ Often/ Very Often
3) At the center, how often does this child and an adult (or older peer) play together with puzzles per week?
Never/ Rarely/ Sometimes/ Often/ Very Often
3) How often does this child ask for help in order to complete a puzzle?
Never/ Rarely/ Sometimes/ Often/ Very Often
4) How much does this child like construction toys?
Not at all/ A little/ Somewhat /Very Much
5) At the center , how often does this child **select** a construction toy to play with per week? **Never/ Rarely/ Sometimes/ Often/ Very Often**
6) At the center, how often does this child and an adult (or older peer) play together with construction toys per week?
Never/ Rarely/ Sometimes/ Often/ Very Often
7) How often does this child ask for help in order to complete a construction toy?
Never/ Rarely/ Sometimes/ Often/ Very Often

Appendix H

Teacher Early Childhood Behavior Questionnaire (ECBQ)

Teacher Early Childhood Behavior Questionnaire

ID #: _____
Teacher's name: _____
Child's name: _____
Today's date: Month:____ Day:____ Yr:____
How long have you taught/known this child? **1-3months/ 3-6months/ 6m-1year/ More than 1year**
How would you rate how well you know this child? **Not much/ A little / Well / Very well**

INSTRUCTIONS: **Please read carefully before starting.**
As you read each description of the child's behavior below, please indicate how often the child did this during the last two weeks by circling one of the numbers in the right column. These numbers indicate how often you observed the behavior described during the last two weeks.

never	very rarely	less than half the time	about half the time	more than half the time	almost always	always	does not apply
1	2	3	4	5	6	7	NA

The "Does Not Apply" column (NA) is used when you did not see the child in the situation described during the last two weeks. For example, if the situation mentions the child going to the doctor and there was no time during the last two weeks when the child went to the doctor, circle the (NA) column. "Does Not Apply" (NA) is different from "NEVER" (1). "Never" is used when you saw the child in the situation but the child never engaged in the behavior mentioned in the last two weeks. Please be sure to circle a number or NA for every item.

While playing outdoors, how often did this child

1. look immediately when you pointed at something? 1 2 3 4 5 6 7 NA

When engaged in play with his/her favorite toy, how often did this child

2. play for 5 minutes or less? 1 2 3 4 5 6 7 NA
3. play for more than 10 minutes? 1 2 3 4 5 6 7 NA
4. continue to play while at the same time responding to your remarks or questions? 1 2 3 4 5 6 7 NA

After having been interrupted, how often did this child

5. return to a previous activity? 1 2 3 4 5 6 7 NA
6. have difficulty returning to the previous activity? 1 2 3 4 5 6 7 NA

When engaged in an activity requiring attention, such as building with blocks, how often did this child

7. move quickly to another activity? 1 2 3 4 5 6 7 NA
8. stay involved for 10 minutes or more? 1 2 3 4 5 6 7 NA
9. tire of the activity relatively quickly? 1 2 3 4 5 6 7 NA

During everyday activities, how often did this child

10. pay attention to you right away when you called

to him/her? 1 2 3 4 5 6 7
NA

11. stop going after a forbidden object (such as a VCR) when you used a toy to distract her/him? 1 2 3 4 5 6 7 NA

During everyday activities, how often did this child seem able to

12. easily shift attention from one activity to another? 1 2 3 4 5 6 7
NA

13. do more than one thing at a time (such as playing with a toy while watching TV)? 1 2 3 4 5 6 7 NA

When playing alone, how often did this child

14. become easily distracted? 1 2 3 4 5 6 7
NA

15. play with a set of objects for 5 minutes or longer at a time? 1 2 3 4 5 6 7 NA

When interrupted during a favorite TV show, how often did this child

16. immediately return to watching the TV program? 1 2 3 4 5 6 7
NA

17. not finish watching the program? 1 2 3 4 5 6 7
NA

While looking at picture books on his/her own, how often did this child

18. stay interested in the book for 5 minutes or less? 1 2 3 4 5 6 7 NA

19. stay interested in the book for more than 10 minutes at a time? 1 2 3 4 5 6 7
NA

20. become easily distracted? 1 2 3 4 5 6 7
NA

While you were talking with someone else, how often did this child

21. easily switch attention from speaker to speaker? 1 2 3 4 5 6 7 NA

When you were busy, how often did this child

22. find another activity to do when asked? 1 2 3 4 5 6 7
NA

When playing alone, how often did this child

23. move from one task or activity to another without completing any? 1 2 3 4 5 6 7 NA

24. have trouble focusing on a task without guidance? 1 2 3 4 5 6
7 NA

Appendix I

Scoring procedure for the ECBQ

SCORING PROCEDURE

EARLY CHILDHOOD BEHAVIOR QUESTIONNAIRE

Scale scores for the Early Childhood Behavior Questionnaire represent the mean score of all scale items applicable to the child, as judged by the caregiver. Scales' scores are to be computed by the following method:

1. Sum all numerical item responses for a given scale. Note that:

a) If caregiver omitted an item, that item receives no numerical score;

b) If caregiver checked the "does not apply" response option for an item, that item receives no numerical score;

c) Items indicated with an R are reverse items and must be scored in the following way:

7 becomes 1	3 becomes 5
6 becomes 2	2 becomes 6
5 becomes 3	1 becomes 7
4 remains 4	

2. Divide the total by the number of items receiving a numerical response. Do not include items marked "does not apply (N/A)" or items receiving no response in determining the number of items. For example, given a sum of 47 for a scale of 12 items, with one item receiving no response, two items marked "does not apply," and 9 items receiving a numerical response, the sum of 47 would be divided by 9 to yield a mean of 5.22 for the scale score.

Activity Level/Energy (12 items)
Level (rate and intensity) of gross motor activity, including rate and extent of locomotion.

While bathing, how often did your child
41.R sit quietly?
42. splash, kick, or try to jump?

While participating in daily activities, how often did your child
57. move quickly from one place to another?
156. seem full of energy, even in the evening?

During sleep, how often did your child
69. toss about in the bed?
70.R sleep in one position only?

When playing outdoors with other children, how often did your child
101. seem to be one of the most active children?
102.R sit quietly and watch?

When being dressed or undressed, how often did your child
109. squirm and try to get away?
110.R stay still?

While playing indoors, how often did your child
122. run through the house?
123. climb over furniture?

Attentional Focusing (12 items)
Sustained duration of orienting on an object of attention; resisting distraction.

When engaged in play with his/her favorite toy, how often did your child
49.R play for 5 minutes or less?
50. play for more than 10 minutes?

When engaged in an activity requiring attention, such as building with blocks, how often did your child
90.R move quickly to another activity?
91. stay involved for 10 minutes or more?
92.R tire of the activity relatively quickly?

When playing alone, how often did your child
126.R become easily distracted?
127. play with a set of objects for 5 minutes or longer at a time?
196.R move from one task or activity to another without completing any?
197.R have trouble focusing on a task without guidance?

While looking at picture books on his/her own, how often did your child
167.R stay interested in the book for 5 minutes or less?
168. stay interested in the book for more than 10 minutes at a time?
169.R become easily distracted?

Attentional Shifting (12 items)
The ability to transfer attentional focus from one activity/task to another.

When playing outdoors, how often did your child
43. look immediately when you pointed at something?

When engaged in play with his/her favorite toy, how often did your child
51. continue to play while at the same time responding to your remarks or questions?

After having been interrupted, how often did your child
60. return to a previous activity?
61.R have difficulty returning to the previous activity?

During everyday activities, how often did your child
93. pay attention to you right away when you called to him/her?
95. stop going after a forbidden object (such as a VCR) when you used a toy to distract her/him?

During everyday activities, how often did your child seem able to
120. easily shift attention from one activity to another?
121. do more than one thing at a time (such as playing with a toy while watching TV)?

When interrupted during a favorite TV show, how often did your child
157. immediately return to watching the TV program?
158.R not finish watching the program?

While you were talking with someone else, how often did your child
179. easily switch attention from speaker to speaker?

When you were busy, how often did your child
189. find another activity to do when asked?

Cuddliness (12 items)
Child's expression of enjoyment in and molding of the body to being held by a caregiver.

When your child was carried, how often did s/he
14. like to be held?
15.R push against you until put down?
16.R squirm?
17.R struggle to get away?
18. snuggle up next to you?

When being gently rocked or hugged, how often did your child
80.R seem eager to get away?
81.R make protesting noises?

During daily or evening quiet time with you and your child, how often did your child
103. want to be cuddled?

While being held on your lap, how often did your child
159.R pull away and kick?
160. seem to enjoy him/herself?
161. mold to your body?
162. seek hugs and kisses?

Discomfort (10 items)

Amount of negative affect related to sensory qualities of stimulation, including intensity, rate or complexity of light, sound, texture.

During everyday activities, how often did your child

8. get irritated by scratchy sounds?
9. become uncomfortable when his/her socks were not aligned properly on his/her feet?
33. become distressed when his/her hands were dirty and/or sticky?
55. complain about odors on others, such as perfume?
56. seem to be bothered by bright light?
94. seem to be disturbed by loud sounds?
105. seem to be irritated by tags in his/her clothes?
152. become bothered by sounds while in noisy environments?
153. become bothered by scratchy materials like wool?
180. become irritated when his/her clothes were tight?

Fear (11 items)

Negative affect, including unease, worry, or nervousness related to anticipated pain or distress and/or potentially threatening situations; startle to sudden events.

During everyday activities, how often did your child

6. startle at loud noises (such as a fire engine siren)?
104. seem frightened for no apparent reason?

While at home, how often did your child

38. show fear at a loud sound (blender, vacuum cleaner, etc.)?
39. seem afraid of the dark?

While watching TV or hearing a story, how often did your child

62. seem frightened by 'monster' characters?

While in a public place, how often did your child

97. seem uneasy about approaching an elevator or escalator?
98. cry or show distress when approached by an unfamiliar animal?
99. seem afraid of large, noisy vehicles?
100. show fear when the caregiver stepped out of sight?

When visiting a new place, how often did your child

176. not want to enter?
177.R go right in?

Frustration (12 items)

Negative affect related to interruption of ongoing tasks or goal blocking.

When told that it is time for bed or a nap, how often did your child

1. react with anger?
2. get irritable?

While having trouble completing a task (e.g., building, drawing, dressing), how often did your child

19. get easily irritated?

When s/he couldn't find something to play with, how often did your child

68. get angry?

When another child took away his/her favorite toy, how often did your child

86. scream with anger?
87.R not become angry?

When given something to eat that s/he didn't like, how often did your child

119. become angry?

When s/he asked for something and you said "no", how often did your child

134. become frustrated?
135. protest with anger?
136. have a temper tantrum?

When tired after a long day of activities, how often did your child

171. become easily frustrated?

When you mildly criticized or corrected her/his behavior, how often did your child

184. get mad?

High Intensity Pleasure (12 items)

Pleasure or enjoyment related to situations involving high stimulus intensity, rate, complexity, novelty and incongruity.

While playing outdoors, how often did your child

11. like making lots of noise?
13. want to climb to high places (for example, up a tree or on the jungle gym)?
44. choose to take chances for the fun and excitement of it?
45.R not like going down high slides at the amusement park or playground?
190. want to jump from heights?
191. want to go down the slide in unusual ways (for example, head first)?
192. enjoy being pushed fast on a wheeled vehicle?

While playing indoors, how often did s/he:

74. like rough and rowdy games?
75. enjoy playing boisterous games like 'chase'?
76. enjoy vigorously jumping on the couch or bed?
124.R not care for rough and rowdy games?
125. enjoy activities such as being spun, etc.?

Impulsivity (10 items)

Speed of response initiation.

When offered a choice of activities, how often did your child

23.R stop and think before deciding?
24. decide what to do very quickly and go after it?
25.R seem slow and unhurried about what to do next?

When you suggested an outdoor activity that s/he really likes, how often did your child

63. respond immediately?
64. run to the door before getting ready?

When encountering a new activity, how often did your child

82.R sit on the sidelines and observe before joining in?
83. get involved immediately?

When you gave your child an attractive toy, how often did your child

140. grab the object as soon as it was set down?

141.R look the object over before touching it?

While you were showing your child how to do something, how often did your child
178. jump into the task before it was fully explained?

Inhibitory Control (12 items)
The capacity to stop, moderate, or refrain from a behavior under instruction.

When asked NOT to, how often did your child
26.R run around your house or apartment anyway?
27.R touch an attractive item (such as an ornament) anyway?
28.R play with something anyway?

When told "no", how often did your child
111. stop an activity quickly?
112. stop the forbidden activity?
113.R ignore your warning?

When asked to wait for a desirable item (such as ice cream), how often did your child
142.R seem unable to wait for as long as 1 minute?
143.R go after it anyway?
144. wait patiently?

When asked to do so, how often was your child able to
173. stop an ongoing activity?
174. lower his or her voice?
175. be careful with something breakable?

Low Intensity Pleasure (11 items)
Pleasure or enjoyment related to situations involving low stimulus intensity, rate, complexity, novelty and incongruity.

While playing outdoors, how often did your child
12. enjoy sitting quietly in the sunshine?
193. enjoy sitting down and playing quietly?

During daily or evening quiet time with you and your child, how often did your child
29. enjoy just being quietly sung to?
30. smile at the sound of words, as in nursery rhymes?
31. enjoy just being talked to?
32. enjoy rhythmic activities, such as rocking or swaying?

When taking a quiet, warm bath, how often did your child
67. seem to relax and enjoy him/herself?

When being gently rocked, how often did your child
146. smile?
147. make sounds of pleasure?

While a story was being read to your child, how often did s/he
163. enjoy listening to the story?

While looking at picture books on his/her own, how often did your child

170. enjoy looking at the books?

Motor Activation (11 items)

Definition: Repetitive small-motor movements; fidgeting.

During everyday activities, how often did your child

7. tap or drum with fingers on tables or other objects?
36. blink a lot?
108. show repeated movements like squinting, hunching up the shoulders, or twitching the facial muscles?
182. rock back and forth while sitting?

During quiet activities, such as reading a story, how often did your child

71. swing or tap his/her foot?
72. fiddle with his/her hair, clothing, etc.?
73. show repeated movements like squinting, hunching up the shoulders, or twitching the facial muscles?

When playing alone, how often did your child

128. scratch him/herself?
129. tear materials close at hand?
194. chew his/her lower lip?
195. stick out his/her tongue when concentrating?

Perceptual Sensitivity (12 items)

Detection of slight, low intensity stimuli from the external environment.

During everyday activities, how often did your child

34. notice that material was very soft (cotton) or rough (wool)?
35. notice low-pitched noises such as the air-conditioner, heater, or refrigerator running or starting up?
58. notice the smoothness or roughness of objects s/he touched?
96. notice small things, such as dirt or a stain on his/her clothes?
106. notice when you were wearing new clothing?
107. react to beeping sounds (such as when the microwave or oven is done cooking)?
154. notice changes in your appearance (such as wet hair, a hat, or jewelry)?
155. appear to listen to even very quiet sounds?
181. notice smells from cooking?
183. notice sirens from fire trucks or ambulances at a distance?

While playing or walking outdoors, how often did your child

138. notice sights or sounds (for example, wind chimes or water sprinklers)?
139. notice flying or crawling insects?

Positive Anticipation (11 items)

Excitement about expected pleasurable activities.

During everyday activities, how often did your child

37. get very enthusiastic about the things s/he was going to do?

When told that loved adults would visit, how often did your child

65. get very excited?
66. become very happy?

Before an exciting event (such as receiving a new toy), how often did your child

130. get so worked up that s/he had trouble sitting still?
131. get very excited about getting it?
132.R remain pretty calm?
133. seem eager to have it right away?

When hearing about a future family outing (such as a trip to the playground), how often did your child

164. become very enthusiastic?
165. look forward to it?
166.R remain pretty calm?

When given a wrapped present, how often did your child

198. become extremely animated?

Sadness (12 items)

Tearfulness or lowered mood related to exposure to personal suffering, disappointment, object loss, loss of approval, or response to other's suffering.

While having trouble completing a task (e.g., building, drawing, dressing), how often did your child

20. become sad?

During everyday activities, how often did your child

59. become sad or blue for no apparent reason?

When another child took away his/her favorite toy, how often did your child

88. sadly cry?
89.R not react with sadness?

When told "no", how often did your child

114. become sadly tearful?

Following an exciting activity or event, how often did your child

117. seem to feel down or blue?
118. become sadly tearful?

When s/he asks for something, and you say, "no", how often did your child

137. become sad?

When asked to wait for a desirable item (such as ice cream or a treat), how often did your child:

145. whimper and cry?

When you removed something s/he should not have been playing with, how often did your child

151. become sad?

When you mildly criticized or corrected her/his behavior, how often did your child

185. have hurt feelings?

When your child was asked to share his/her toys, how often did your child

201. become sad?

Shyness (12 items)

Slow or inhibited approach and/or discomfort in social situations involving novelty or uncertainty.

When approached by an unfamiliar person in a public place (for example, the grocery store), how often did your child

3.R remain calm?
4. pull back and avoid the person?
5. cling to a parent?

When approaching unfamiliar children playing, how often did your child

52. watch rather than join in?
53. approach slowly?
54. seem uncomfortable?

In situations where s/he is meeting new people, how often did your child

77. turn away?
78. become quiet?
79.R seem comfortable?

While visiting relatives or adult family friends s/he sees infrequently, how often did your child

148. stay back and avoid eye contact?
149. hide his/her face?
150.R "warm up" to the person within a few minutes?

Sociability (8 items)

Seeking and taking pleasure in interactions with others.

When a familiar child came to your home, how often did your child

21. engage in an activity with the child?
22. seek out the company of the child?

When visiting the home of a familiar adult, such as a relative or friend, how often did your child

40. want to interact with the adult?

When visiting the home of a familiar child, how often did your child

84. engage in an activity with the child?
85. seek out the company of the child?

When a familiar adult, such as a relative or friend, visited your home, how often did your child

172. ..... want to interact with the adult?

When around large gatherings of familiar adults or children, how often did your child

199. want to be involved in a group activity?
200. enjoy playing with a number of different people?

Soothability (9 items)

Rate of recovery from peak distress, excitement, or general arousal.

After getting a bump or scrape, how often did your child

10 forget about it in a few minutes?

When s/he was upset, how often did your child

46. change to feeling better within a few minutes?
47.R soothe only with difficulty?
48.R stay upset for 10 minutes or longer?
186.R cry for more than 3 minutes, even when being comforted?
187. cheer up within a minute or two when being comforted?
188. become easily soothed?

Following an exciting activity or event, how often did your child

115. calm down quickly?
116.R have a hard time settling down?

Appendix J

Coding scheme and operational definition of
Focused Attention

Coding scheme and Operational definition:
Focused Attention

CODE: Focused Attention

An instance of focused attention is defined as concentrated attention that involves an intent facial expression, minimal extraneous bodily activity, a posture that enclosed the object of interest and brought it closer to the eyes, and either no talking or some talking mostly directed to the self.

An instance of focused attention is identified when lasts *for 1 second or more* (≥ 1 second), and timer *started* when:

1) The child exhibits a posture that encloses the toy/pieces (body close to the toy/pieces-maybe hunched over toy/pieces) and there is minimal extraneous bodily activity.

2) The child leans in towards & cast's eyes on the toy/pieces, brings the toy/pieces closer to the eyes (looks actively and intently at toy/pieces, analyzing the toy/pieces)

3) The child's facial expression is one of concentration or interest, intent facial expression (e.g., knitting the brows together, biting or pursing one's lips, tongue out, shoulders raised/hunched, eyes analyzing the toy).

4) The child actively, engages intently in manipulation directly related to the goal of the task (e.g., touching and turning the pieces of puzzle/construction toy, examining and comparing the pieces)

5) The child actively, engages intently in manipulation proactive play with the toy/pieces (e.g., symbolic play with the toy and/or pieces). This includes intentional actions such as bringing toy/pieces closer to body or eyes, reaching for pieces, turning pieces with a purpose, analyzing the place for pieces.

NO CODE: Distraction and Casual and Settled Attention

An instance of *distraction* is defined as when the child looks away from the toy and/or pieces, seems interested in something other in the environment than the toy/pieces, manipulating toy and/or pieces without looking at object, letting go of toy and/or pieces, gets up to walk around or to talk to the researcher. An instance of *casual attention* is defined as looking at the toy but not being engaged. An instance of *settled attention* if defined as a pause in the child's casual attention to look at and manipulate the toy/pieces. In this case, looking is steady but not necessarily intent, extraneous movements tend to diminish but might be present and there might be talking.

An instance of off-task/distraction is identified when lasts *for 1 second or more* (≥ 1 second), recorded and timer *stopped* when:

1) The child looks away from toy/pieces and/or periods in which there is no clear visual orientation towards the relevant objects.

2) The child manipulates toy and/or pieces in a way that is judged to be repetitive and non-focused with/without looking (e.g., when child banged pieces together without looking at them, rolls wheel on table without looking at the wheel).

3) The child stops engaging with the object and looks away (e.g., puts the object down, holds onto it passively without looking at it, steps away from toy, gets up to walk around in the room or gets up to talk to the researcher).

4) The child looks at toy/pieces (in a non analytical way) without touching or engaging with toy/pieces usually accompanied by extraneous body movements such as hands doing something else not related to what child is looking at (e.g., child is look passively at puzzle and plays with his lips).

5) The child looks at and/or manipulates toy/pieces in a manner that is passive and non-intent,

Appendix K

Coding sheet: Focused Attention

Coding sheet: Focused Attention

Child's ID #: _____
Session #: **1** **2**
Toy Type: **Puzzle** **Construction**
Date of play session: _____ 2004
Toy # : **1** **2** **3**
Start time of play session: _____
End time of play session: _____

Instance #	**Focused Attention Start time**	**Focused Attention End time**	**Total duration of instance**
1	: :	: :	:
2	: :	: :	:
3	: :	: :	:
4	: :	: :	:
5	: :	: :	:
6	: :	: :	:
7	: :	: :	:
8	: :	: :	:
9	: :	: :	:
10	: :	: :	:
11	: :	: :	:
12	: :	: :	:
13	: :	: :	:
14	: :	: :	:
15	: :	: :	:
		TOTAL TIME	: **/4:00 Mins.**

Child's ID #: _____
Session #: **1** **2**
Toy Type: **Puzzle** **Construction**
Date of play session: _____ 2004
Toy # : **1** **2** **3**
Start time of play session: _____
End time of play session: _____

Instance #	**Focused Attention Start time**	**Focused Attention End time**	**Total duration of instance**
1	: :	: :	:
2	: :	: :	:
3	: :	: :	:
4	: :	: :	:
5	: :	: :	:
6	: :	: :	:
7	: :	: :	:
8	: :	: :	:
9	: :	: :	:
10	: :	: :	:
11	: :	: :	:
12	: :	: :	:
13	: :	: :	:
14	: :	: :	:
15	: :	: :	:
		TOTAL TIME	: **/4:00 Mins.**