

THE RELATIONSHIP BETWEEN A COSTUME PROP AND
A TODDLER'S TYPE AND INTENSITY OF MOVEMENT AND SOCIAL PARTICIPATION

by

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Abstract

With obesity on the rise in young children, the need to examine interventions to increase activity levels, a factor in obesity, in childhood is apparent. The purpose of this study was to examine the relationship between toddlers wearing a costume prop and their type and intensity of movement as well as their level of social participation. It was hypothesized that intensity of movement and types of movement would increase when the child wore a cape compared to no cape. A total of fifty-four subjects between the ages of 24 and 36 months participated in the study, structured into an intervention group ($n = 27$) and a control group ($n = 27$). Toddlers in the control group were observed for 20 minutes during free play inside the classroom wearing a specifically designed data collection garment (which looked like a “vest”) to record movement and sound. Participants in the intervention group were observed with the same data collection garment and the costume prop “cape” for 20 minutes during morning free-play period inside. The toddlers’ behaviors were coded as outlined by Brown, Pfeiffer, McIver, Dowda, Joao, Almeida, and Pate’s (2006) Observational System for Recording Physical Activity in Children-Preschool (OSRAC-P), modified to capture the unique movements of toddlers for the present study. Analysis of Variance (ANOVA) and a Multivariate Analysis of Variance (MANOVA) were utilized to examine the effect of a costume prop on intensity of activity, types of gross motor movement, and forms of social play. Results revealed the intervention group exhibited significantly greater engagement in onlooker, solitary, and parallel play ($p < .001$) than the control group. No significant differences in the levels of intensity or types of activity exhibited between the two groups. Implications for further research on physical activity and stimulating physical activity in the classroom are discussed

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Chapter 1 – Introduction

Obesity is reaching epidemic proportions with over half of the United States' population classified as overweight or obese (Center for Disease Control: CDC, 2007). The epidemic extends downward into the toddler and preschool years, with National Health and Nutrition Examination Survey (NHANES) reporting 10.4% of two to five-year-olds classified as overweight in 2008 (CDC, 2008). A lack of moderate-to-vigorous physical activity (MVPA) is the most prevalent contributor to the present obesity issue. Other contributing environmental and behavioral factors are increased calorie intake, decreased vegetable and fruit consumption, increased television time, and increased computer or video game engagement (Canvera, Sharma & Murnan, 2010).

Another contributor that has received increased attention in recent years is the amount of time spent in a non-parental care, child care. The United States Department of Health and Human Services reported the percentages of children in different types of child care for 2009. It was reported that 65% of toddlers one-to-three-years-old spend their day in a center based care (Administration for Children & Families:ACF, 2009). A study on preschool age children in child care revealed 80% of time spent was in sedentary activities (Pate, McIver, Dowda, Brown & Addy, 2008). This statistic implies that children in the child care setting are not meeting the minimum recommendations of physical activity suggested by National Association for Sport and Physical Education (NASPE, 2006). With the increased time spent in a child care setting, empirical research has focused on interventions to increase physical activity in this setting (Benjamin, Ammerman, Sommers, Dodds, Neelson & Ward, 2007; Bower, Hales, Tate, Rubin & Benjamin, 2008). The high level of sedentary behaviors reported in the child care setting is a concern that demands further attention by teachers and researchers.

Current research in interventions targeting obesity addresses the three domains of physical activity for successful implementation: frequency, duration, and intensity (Coureya & McAuley, 1994). NASPE established physical activity guidelines in 2006 for children from birth to five-years-old. Toddlers (12 to 36 months) are recommended to accumulate 30 minutes of structured physical activity a day. Additionally, 60 to 180 minutes of unstructured physical activity should be accumulated on a daily basis (NASPE, 2006). In addition to the duration established by NASPE, types of physical activity encouraged in toddlers should target areas of

fine and gross motor skill development. Examining a relationship between motor proficiency and physical activity, researchers found that among children eight to ten-years-old, those with better developed motor skills were more likely to be physically active than those with poor motor skills (Wrotniak, Epstein, Dorn, Jones & Kondilis, 2006). The development of motor skills with toddlers can lead to more involvement in physical activity later in life, reducing potential obesity (Koplan, Liverman, & Kraak, 2005, p. 259).

Interventions to increase physical activity in preschoolers or kindergarteners by intentionally incorporating movement experiences in the curriculum has been explored by multiple researchers (Bundy, Lockett, Tranter, Naughton, Wyver, Ragen & Spies, 2009; Cheung, 2010; Trost, Fees & Dzewaltowski, 2008; Wang, 2004). For example, Wang (2004) compared the implementation of a twice-a-week creative movement program against unstructured free play in three to five-year-olds. The creative movement program instructors guided preschoolers through movements that targeted movement and dance concepts. Gross motor skills and locomotion scores of the creative movement group increased compared to the control group. Trost et al. (2008) took a similar approach to enhance the presence of physical activity in three to five-year-olds, incorporating it into the curriculum rather than setting aside time for the creative movement program. At the end of the eight week intervention, moderate-to-vigorous physical activity (MVPA) was significantly higher than the preschoolers who continued with the normal schedule. Instead of aiming to increase physical activity, Cheung (2010) targeted creative development through movement in a group of kindergarteners. Instructed by a teacher, the child's movement in terms of creative responses rather than increase in intensity or type of activity was recorded. The variety of movement responses did increase as well as the number of creative responses.

Interventions directed at the preschool and kindergarten population often include an incorporation of movement into the existing curriculum. Children are also typically taught or guided by an instructor during the intervention rather than during unguided and unstructured free play. However, no research was located on the use of costume props in normally developing toddlers to increase physical activity and types of movement. A review of the physical activity, early childhood, apparel design, and obesity literature shows there is a gap in the literature on the relationship between clothing and activity in young children, more specifically, garments for pretend play "dress up" and promotion of physical activity.

Toddlerhood is a time in development where children are learning to control and coordinate their bodies. They are acquiring self help skills, one of which is learning to dress themselves. The practice and refinement of fine and gross motor skills is also occurring during this time. From birth to two years, toddlers construct their understanding of the world through movement (Piaget, 1946). Vygotsky (1933/1966) and Piaget (1946) both proposed play as being a primary mode of learning for toddlers. This is an important consideration for the usage of a costume prop, a means to learn through movement while furthering motor skill development as they play. The encouragement of movement during free play is an opportune time for adults to ensure toddlers are learning about how to move their bodies.

The importance of play time and decreased opportunities for play were evident in research conducted by Hofferth and Sandberg (2009). In a time-lapse survey, conducted in 1997 then again in 2003, data showed a three percent increase in time spent in school among children six-to eight-years-old. This increased time in an academic setting may be problematic for engaging in play. Examining Hofferth and Sandberg's article about changes in children's use of time from 1981 to 1997, researchers also found change in availability for free play: a 25% decrease in free play among American children during this time frame (Hofferth & Sandberg, 2001). An increase in "seat" time and a decrease in free play available to American children may contribute to the lack of opportunities available to children to participate in moderate-to-vigorous physical activity. Additionally, concerns about school readiness are emerging downward into the toddler and preschool years exemplified by the federal initiative Good Start and Grow Smart. Although voluntary, the initiative encourages states to align early experiences (particularly in pre-mathematics and literacy) prior to school entry with education standards K-12 (Administration for Children & Families: ACF, 2001). Again, such initiatives for pre-academics tend to encourage more sedentary "seat" time rather than play. If play and physical activity/movement are primary modes of learning between 2-and 3-years-of-age, then this is the population that is most in danger in terms of losing free play availability and being physically active if we view learning as a sedentary, "sit still and listen" experience.

A review of the literature in early education and apparel design to date revealed no research on the relationship between children's activity levels and costume props, although clothing and uniforms enable individuals to embrace a role, whether a sports uniform or an exercise outfit. This observed connection between clothing and a role, as well as a functional

support, leads to the question that does donning play clothes facilitate a potentially greater level of intensity and range of physical movements. Increased movement is one strategy in obesity prevention, which may lead to better developed fine and gross motor skills, and may enhance opportunities for social participation and interaction between peers. Play clothing may be an outlet for children to “transform” into something or someone else as well as provide an opportunity for heightened social participation. To combine free play with pretend clothing could contribute to endured social interaction, allowing toddlers greater opportunities to practice language, cognitive abilities, and physical skills. The purpose of this study was to examine the relationship between a garment designed for imaginative play and toddler’s intensity and types of movement and social participation during free choice activity time in the child care environment.

Chapter 2 - Literature Review

Milestones in Development 24 to 36 Months

Motor

Motor development begins in infancy with reflexes and increases in complexity and combinatorial movements as the child ages (Gallahue & Ozmun, 2006). An infant's level of motor development is initially defined in terms of the presence or absence of primary reflexes, primitive in nature to be used for functional purposes such as feeding and grasping, as well as for less, yet well understood purposes such as the Babinski reflex, and Moro reflex. The first phase of motor development is known as the "reflective" phase and occurs prenatally to one year. Fine motor behaviors that develop during this time include reaching (2-4 months), Palmer grasp (3-5 months), and pincer grasp (8-10 months) (Gallahue & Ozmun, 2006). Gallahue and Ozmun (2006) designate the "rudimentary" phase from 1 to 2 years of age, in which these types of movements are directed toward body stability, object manipulation, and locomotion with the intent to relocate one's body. Toddlers can jump down from an object at 18-24 months, hop up to three times on one foot by 2 to 3-years-old, and can kick at a ball with straight legs and low body movement around 2 to 3-years-old (Gallahue & Ozmun, 2006). This phase of rudimentary movements sets the stage for more complex motor development beginning to emerge in the "fundamental" phase during the preschool years (3 to 5-years-old).

Running, for example, occurs between 2 to 3-years-old while an efficient and refined run occurs between 4-to 5-years-old (Gallahue & Ozmun, 2006). Motor development progresses by establishing basic skills that become more advanced and refined in the older years. Gallahue and Ozmun (2006) recommend individually-based experiences that are developmentally appropriate for increasing motor skills, indicating that not only changes in individual motor development are heavily influenced by the quality of support in the environment, but also the inter-individual differences observed in children (Gallahue & Ozmun, 2006). Gerber, Wilks, and Erdie-Lalena (2010) reviewed gross and fine motor developmental milestones/skills from one month old up to 6-years-old. For 2-year-olds, gross motor skills involve walking down stairs assisted and unassisted, balancing on one foot for three seconds, and pedaling on a tricycle (Gerber, Wilks, & Erdie-Lalena, 2010). For further study of the milestones and sequences in motor development,

see Gallahue and Ozmun's (2006) table of movement patterns and over developmental abilities with onset of age ability from birth to six years.

Another equally important component of motor development is fine motor skills, small muscle development such as hands and fingers for coordination. These skills are important for the toddler to be able to grasp and manipulate objects. Some fine motor abilities for toddlers 24 to 36 months are stringing large beads, turning pages of a book, drawing a circle if outlined for them, and turning the lid on a jar. The ability to feed oneself with a spoon or fingers and build a tower of 3 or 4 blocks is also present by this time. A major proposition in Gesell's (1943) maturational theory was that the child goes through the same progression of development, but the rate of which it occurs varies from child to child.

Language

Along with rapidly advancing motor movements, toddlers are immersed in language development. They depend upon the connection of gestures and fine motor skills with language to express ideas and wishes as they are not yet proficient in expressing ideas verbally. Piaget (1946) viewed language as a source of symbols during the early preoperational (2-to-4-years-old) years, a precursor to organize actions later. The level of receptive speech, that is, what they understand, is far greater than their expressive speech, that is, what they can say. For example, when they express 10 words, they comprehend approximately 100 words (Fenson, Dale, Reznick, Bates, Thal, Pethick, Tomassello, Mervis, & Stiles, 1994). By the third birthday, toddlers can use approximately 543 words in everyday interactions with adults and peers. Fenson et al. (1994) examined the variability in the different aspects of language development in infants and toddlers, such as the use of suffixes. By 30 months, toddlers are able to use the following suffixes accurately: plurality (-s), possessive (-'s), progressive (-ing), and past tense (-ed). Other milestones in language development in children 24 to 36 months of age include saying sentences with 2 to 4 words, able to follow basic instructions, and some possessive words like "we" and "I" (Center for Disease Control: CDC, 2009).

Several researchers have examined fine motor skills in terms of gestures and the impact it has on conveying thoughts in toddlers (Cochet & Vauclair, 2010; Iverson & Thelen, 1999). Gestures are a means of integrating communication with body language, as Iverson and Thelen (1999) discovered with the origin of language and corresponding gesticulation visibility. Cochet

and Vauclair (2010) examined declarative gestures, a way of expressing ideas to another individual or creating joint attention on an object or experience, in 26 toddlers during free play. It was found that declarative gestures, such as pointing gestures, composed of 68.2% of all gestures observed, showing the importance of fine motor development and the ability for toddlers to convey thoughts prior to advanced language abilities.

Cognitive

The cognitive development of the child, according to Piaget's cognitive-developmental theory, comes from the knowledge gained as they manipulate and explore their surroundings (Piaget, 1946). Toddlers, 18 to 36 months, are towards the end of Piaget's sensorimotor period (birth to two years) and entering the preoperational period (2-to 7-years-old). The sensorimotor period focuses on learning through one's senses and motor manipulation. Tactile and kinesthetic learning are two important contributors to cognitive development during this period. An important aspect of a child's cognitive development during this period lies in schemas, the mental representation of a set of ideas or actions (Piaget, 1946). An example of a schema is the recognition of a dog that is small. The child's schema is that all dogs are small. With the encounter of a big dog, the child changes its schema to include the new mental representation of a dog being one of all sizes. Once an experience occurs, the toddler alters their schema in light of the recent event in order to accommodate or assimilate a new one. As the child enters the preoperational period, an increase in the ability to create mental representations of experiences and objects is evident.

Still, this time period is marked by many limitations. For example, the young preoperational thinker is unable to conserve, that is, focuses on only one aspect of a task or event at a time. He or she is also a transductive thinker, tending to make illogical connections by equating events to events rather than thinking deductively. This results in "magical thinking" and conclusions adults find humorous such as that woman is a man because she has short hair, implying that all persons with short hair are men. Children may be able to identify basic shapes and colors and count by rote, but unable to understand 1 to 1 correspondence nor is the toddler able to think in reverse or "take away". However, the ability to represent ideas mentally and to manipulate those ideas emerges with time. This gives the child the ability to pretend a block is a telephone, enabling them to engage in pretend play (Piaget, 1970).

Social and Emotional

Toddlers are often referred to as the “terrible twos” based upon the frequent use of “no” and what adults perceive to be stubbornness when they refuse preferred foods or insist on wanting to “do it myself.” Toddlers are striving for a sense of autonomy and independence (Erikson, 1963). They frequently want to engage in tasks by themselves. This sense of independence eventually develops into their perceived ability to complete a task, coined by Albert Bandura as self-efficacy (Bandura, 1986). Bandura developed a learning theory, Social Cognitive Theory (SCT), which addressed a reciprocal relationship between an individual’s personal, behavioral, and environmental determinants. Applied to health promotion, SCT attempts to promote self-management of healthy behaviors through recognizing health benefits and risks as well as perceived self-efficacy among other factors. Research involving SCT and children has focused largely on disease states, such as increasing personal self-efficacy in managing diabetes through interactive video games (Lieberman & Brown, 1995). It is acknowledged that toddlers have not yet reached the cognitive level of self-efficacy, ability to self-manage, or comprehension of long-term cause and effect. Furthermore, target populations for interventions based upon SCT are typically geared towards school-aged children (Canavera, Sharma & Murnan, 2009). However, the health status of an individual is greatly impacted by jeopardizing lifestyle habits, a majority of which are formed in childhood and adolescence (Bandura, 2004). With a greater understanding of foundations established in childhood, toddlers are gaining increased attention in health preventive approaches and enhancing self-efficacy for later behaviors.

Other social and emotional developmental milestones achieved between 24 and 36 months include the ability to take turns during games, understands possession “mine,” “his,” “hers,” and expresses a wide variety of emotions (CDC, 2009). Learning to interact with peers and adults is a primary developmental task for toddlers, including recognizing and responding to the emotional states of others.

Physical Activity Intensity

Intensity is used as an indicator for how hard one’s cardiorespiratory system is working during physical activity. In adult populations, relative intensity is commonly measured by taking one’s heart rate and comparing it a scale to give the percentage of work exerted by an individual

(Center for Disease Control, 2011). VO_2 consumption is another method of measuring intensity by finding the amount of oxygen consumed by the body as an activity is performed. The greater the intensity, the more oxygen consumed during physical activity. Elevated levels of intensity during physical activity are beneficial for weight loss, increased breathing efficiency for longer durations of physical activity, and increased blood flow through the body (United States Department of Health & Human Services: HHS, 2008).

In the younger populations, more feasible objective observational measures such as Observational System for Recording Activity in Children- Preschool (OSRAC-P) (Brown, Pfeiffer, McIver, Dowda, Joao, Almeida & Pate, 2006) and Children's Activity Rating Scale (CARS) (Puhl, Greaves, Hoyt & Baranowski, 1990) as well as accelerometers are most widely used (Bower, et al., 2008; Cardon & De Bourdeaudhuij, 2008; Finn & Specker, 2000). OSRAC-P, the observational scale used in the present study, integrated the CARS measure into the recording system and measures intensity on a 5-point scale from stationary or motionless to fast movements. Activity may also be measured objectively with the use of an accelerometer. Accelerometers are small devices worn by the participants generally at the waist to record the counts (epochs) of activity over a designated period of time, typically 1 minute long.

Research by Bower et al. (2008) using the OSRAC-P found that only 12 % of activity across all centers was spent in MVPA while 56% of time was spent in sedentary behaviors. Finn and Specker (2000) compared the results of CARS to Actiwatch (accelerometer) in 40 3 to 4-year-olds in a preschool setting. Aside from revealing that 66% of preschoolers spent their day in sedentary behaviors, the authors suggested that accelerometers were more accurate means of measuring intensity in young children due to catching bursts of activity that observational measures do not always capture (Finn & Specker, 2000). Utilizing 15 second epochs instead of the more common 1 minute observation period with accelerometers, Cardon and De Bourdeaudhuij (2008) found only 7% of participants engaged in MVPA for 60 minutes per day with 85% of time spent in sedentary behavior.

The availability of literature on the usage of accelerometers and observational measures for measuring intensity of physical activity in toddlers is limited, mostly due to the perceived sporadic nature of activity levels and difficulty in measuring intensity. Cauwenberghe, Gubbels, De Bourdeaudhuij and Cardon (2011) examined the feasibility of accelerometers by comparing the data to observed physical activity coded with OSRAC-P in 25 boys under the age of three

years. Observed during free play in a child care setting, Cauwenberghe et al. (2011) recorded 50.4% of toddlers engaged in sedentary behavior while 13.3% engaged in MVPA with the accelerometers. This is contrary to the common belief that toddlers are always busy and moving chaotically. When examining activity type with OSRAC-P, it was discovered that toddlers engaged in three predominant activities: sit and squat (24.3%), stand (24.3%) and walk (33.1%) (Cauwenberghe et al., 2011). These percentages of gross motor movements reflect the high levels of sedentary behaviors observed with toddlers, consistent with the findings in preschoolers.

Play

Play! It is often said play is the work of the child. However, many adults do not see the value of play to learning nor socialization, it is “just play.” Play, however, has a primary place in the early childhood programs and child care with extended periods of the day often devoted to free play (Copple & Bredekamp, 2009). Rubin, Fein, and Vandenberg (1983) define play through identification of six characteristics labeled the “dispositions of play.” First, play must be intrinsically motivated and originate from within the child. Spontaneity allows the child to take control of learning as to when and at what pace it occurs in order to achieve a sense of mastery. Secondly, it must be free of rules imposed from an external force, whether that is a teacher or other adult figure. An activity ceases to truly be play if an adult structures or inappropriately interferes with the activity. Third, play must also be performed as if it were a real-life activity. Fourth, play is a process; it is what occurs during play that is the focus rather than the end result. As a process, the child focuses on the present setting and not on the outcome. Fifth, play must also be dominated by the participants and not by on looking individuals, such as adults. Finally, the child must be involved and contributing to the play setting.

Play and its importance in all domains of development are theoretically and empirically integral to child development and researchers have examined the multi-dimensional benefits to a child’s growth (Frost, Wortham, & Reifel, 2008). Theories and ideas about play date back to the 17th century, during the Enlightenment period when philosophers viewed play as a means to eliminate excess energy. Friedrich von Schiller proposed this “surplus energy” theory of play enabled humans to explore creatively (Frost et al., 2008). More concrete ideas about play

developed in the 20th century with researchers recognizing play as an all-encompassing concept that impacts cognitive, emotional, social, and physical realms of development.

The relationship between a child's cognition and play was explored by Vygotsky, Piaget, and Smilansky. Vygotsky (1933, 1966) suggested learning was a socially-mediate process, that is, learning occurs through engagement with others rather than solely alone. Play, therefore, is one of the primary learning processes during early childhood for Vygotsky. Vygotsky (1933, 1966) suggested that, during play with his peers, a child acts more mature than he or she typically does for their age, identifying the child's ability to both self-regulate and the benefit of social engagement. Vygotsky (1935) applied his concept of the zone of proximal development (ZPD) suggesting children gradually become more competent in specific skills with the assistance of more mature individuals who provide consistent guidance just slightly above the child's current level of performance or understanding. He viewed ZPD, as stated in Whitebread, Coltman, Jameson and Lander (2009), as a contributor to the child's understanding and development of control and self-regulation.

Levels of play may be defined by the cognitive abilities of the child. Piaget (Frost et al., 2008) proposed four levels: functional or practice play (birth to 2 years), symbolic play (2-to 7-years-old), dramatic play (2-to 7-years-old) and then games with rules (7-to 12-years-old). "Practice" and "manipulative" play is common among infants and early toddlerhood, exploring materials in the surrounding environment and rehearsing movements with objects. Entrance into toddlerhood signifies the ability to engage in pretense, or pretend play. Piaget (1946) observed symbolic play to begin around 2-years-old when objects can represent something else. During this period of development, cognitive abilities expand and they begin to internalize objects into mental representations. Decontextualization also begins to occur as children distance themselves from an object's characteristics. This allows a deeper engagement in dramatic play as contexts surrounding objects get farther from its original characteristics (Casby, 2003). An example of such play is for a child to themselves transform into a car or a spaceship. Frost et al. (2008) states that "when [toddlers] engage in dramatic play, they are using their imagination to create or replicate a role" (p. 113). Games with rules is the most advanced form of play, requiring the ability to play competitively and cooperatively with others as well as implementing a strategy as to how to win the game. Common games with rules during this age period include board games

such as Chutes and Ladders®, Monopoly®, and Sorry!® as well as organized sports such as soccer or baseball.

Smilansky also considered the child's level of cognitive development when defining forms of play observed in early childhood: functional play, constructive play, symbolic and dramatic play, sociodramatic play, and games with rules (Frost et al., 2008, p.132). The initial level of play is known as "functional" play (birth to 2-years-old) as an outlet to physical activity based on the high frequency of manipulation of materials observed (Smilansky & Shefatya, 1990). "Constructive" play entails the construction of something through sensimotor activity and thinking or planning ahead. Entrance into the second year marks the presence of "dramatic" play, the imitation of human behaviors through constructed representations. This transforms into "sociodramatic" play in the later years once the child can engage in pretense with others. With the incorporation of cognitive development, Smilansky's six criterions of "dramatic" play evolve into "sociodramatic" play as the child gains a better understanding of roles and surroundings. They are: imitative role play, make-believe with regards to objects, verbal make-believe with regard to actions and situations, persistence in role play, interaction, with peers and verbal communication (Smilansky, 1968). The first two criterions address dramatic play and the cognitive levels of toddlers. The first criterion, imitative role play, is when the child adopts a make-believe role and is able to convey that role through movement or language. Incorporating objects in the make-believe schema is the second criteria, when the child is able to substitute one object for another in play. Smilansky focuses on movement during play in the first two criterions, acknowledging that movement is a primary mode of expressing ideas in early toddlerhood (Smilansky & Shefatya, 1990).

Toddlers learn through hands-on manipulation as they engage kinesthetically with materials in their environment. When considering a toddler's developmental stage, Torrance (1981), as stated in Bournelli, Makri, and Mylonas (2009) article, advocates movement as the most suitable expression of thought and learning. Exercise play, defined by Pellegrini and Smith (1998), involves gross locomotor movement in the context of play that includes running, jumping, pushing & pulling, and lifting (Pellegrini & Smith, 1998). Some benefits from engaging in exercise play were spatial awareness, opportunity to engage in social play, and developing muscle fibers and strengths (Pellegrini & Smith, 1998).

An important consideration of play, stated earlier, is the direction of play being dictated by the child. Therefore, an activity will cease to truly be play if an adult structures or inappropriately interferes with the activity (Fein et al., 1983). The rewards that result from mastery through play contribute to the likelihood of continued engagement. External rewards can be detrimental to a child's concept of play, supported by the research of McCullers, Fabes and Moran (1987). Material rewards have been found to transform a person's perceived reason for engaging in the task from an intrinsic to an extrinsic one. Extrinsic rewards provide sufficient motivation to ensure task engagement for a temporary period of time, but performance suffers as a result of reduced interest (McCullers et al., 1987). Subsequently, when rewards are withdrawn, intrinsic motivation to engage in the task also suffers. In order for play to continue in the lives of children, a solid foundation must be formed through the internal motivation to engage in play in order to reap the development rewards that come with it.

The social and emotional benefits of play as a learning process are empirically documented, including self-concept and regulation. Self-concept, how a child views themselves, was found to be positively correlated with play through motor creativity (Bournelli, Makri, & Mylonas, 2009). When a child expresses a creative idea through play and receives positive reinforcement for ideas, their confidence level increases. In the same direction of positive reinforcement, Bandura viewed modeling and praise as a step in self-regulation. Children observe self-evaluative standards and incorporate it within themselves to regulate behaviors (Bandura, 1986). Through scaffolding, mastery of impulses and promoting independence are achieved (Berk, Mann, Ogan, Singer, Golinkoff & Hirsh-Pasek, 2006). Rewards of good behavior are seen in older children, which leads younger children to incorporate it into their schemata of behavior and better learn to regulate impulses. With the positive benefits of play well documented, Ranz-Smith addressed President George W. Bush's „No Child Left Behind' initiative and its negative impact on free play as a curricular approach which is decreasing in classrooms (Ranz-Smith, 2007). As a constructivist process, play provides opportunity for learning that academic-structured classes cannot (Copple & Bredekamp, 2009).

Play is one of the most effective opportunities for young children to engage socially with their peers. It is for this reason that teachers practicing developmentally appropriate practices observed in child care and early education programs provide extended periods of free play each day for children. (Copple & Bredekamp, 2009). Specific forms of play have been discovered to

lead to different developmental benefits, as Lloyd & Howe (2003) found in linking play and creativity together through the engagement of solitary-active play. Toddlerhood is a time of transition from playing alone to playing alongside or together with peers.

Social participation

Mildred B. Parten (1932) laid the groundwork for levels of social engagement among children suggesting six different successive levels of increasing social engagement during early childhood: unoccupied, onlooker, solitary, parallel, associative, and cooperative play. Extensity, the frequency of contact made by an individual upon another as well as intensity, the type of groups engaged in, and the role of the individual in that group were considered when categorizing social play (Parten, 1932). There are several important distinctions to be made between the levels identified, such as unoccupied and onlooker according to Parten.

“Unoccupied” behavior is sitting back to watch others, while being distracted by anything appealing. “Onlooker” is the same behavior, except the point of interest is the group of children playing rather than just anything in the room. “Solitary” play is not simply playing alone; rather, it is playing with a different toy than those around the child and not actively making an effort to be included in the group playing. Furthermore, a distinction between solitary and parallel play is necessary. Solitary play is playing with a toy different than those around the child while “parallel” is playing with similar toys *next* to the group of kids rather than *in* the group. Finally, “associative” play is defined by cohesiveness with the group as they play within the same theme of the activity while “cooperative” play is actively working together to create or facilitate something (Parten 1932).

Further empirical research has supported Parten’s findings for social participation, such as how solitary play has a bidirectional role into other social forms of play (Robinson, Anderson, Porter, Hart, & Wouden-Millder, 2003). Focusing on parallel play, Robinson et al. (2003) examined the child’s awareness of parallel play in preschoolers as a facilitator into the other levels of social participation identified by Parten. The sequence discovered, onlooker to parallel to cooperative-social play, shows the practical significance behind the different levels of social participation. Children often observe their peer’s engagement in surroundings then play beside them before understanding social context and engaging in cooperative play. Moreover, 68% of

preschoolers shifted from onlooker to parallel play skipping solitary play while 54% moved from solitary into parallel play (Robinson et al., 2003).

Several researchers show that more complex levels of social interaction are not reached until preschool or school-age (Lyytinen, 1991; Pellegrini, 1982). Children 2 to 6-years-old were examined in dyadic play interactions to examine developmental trends of social participation over time, revealing consistent results with Parten (Lyytinen, 1991). The more advanced forms of social play did not occur until age three years and older. This is in agreement with Parten's general findings of the forms of social participation increasing with age. Pellegrini (1982) coded 10 preschoolers at ages 2-, 3-, and 4-years based on Parten's social participation scale. Play sophistication increased with age, with the peak development for forms of dramatic play not occurring until three years old.

However, Howes, Unger and Seidner (1989) provide evidence to the contrary with a study on solitary and social play behaviors in toddlers 14 to 38 months. Along with the increasing entrance of complexity into pretend play, it was found that toddlers as young as 24 months can enter socially defined play with a same-aged peer. Of the 21 dyadic interactions observed, 19 of them successfully engaged in social pretend play (Howes, Unger & Seidner, 1989). Howes suggests early entrance into child care settings allow for practice in socially interactive settings which advances the ability for the child to engage in more complex interactions at a younger age (Howes, 1987). These findings are supported in research by Rolfe and Crossley (1991).

Parten published a series of three articles from one observation of children from the nursery school, examining leadership and size of play groups (Parten, 1932; Parten, 1933a; Parten, 1933b). A general trend noted was that the size of groups in which children engaged increased linearly with age, with the exception of dyads being the most frequent group size across all ages. Additionally, 68% of dyadic group formations were composed of same-sex (Parten, 1933a). Peer play has been extensively examined in its importance for developing self-regulation, social competence, and other aspects behavioral development. Stating the importance of peer play in identifying patterns of social competence, Mathieson and Banerjee (2010) examined social competence in 18 to 49 month old toddlers and preschoolers. Researchers found that children rated by teachers and mothers as displaying self-regulation and emotional understanding were also evaluated as demonstrating prosocial behaviors during peer play.

Costume props

As discussed in previous sections, the emerging cognitive abilities of toddlers include the growing representational ability that enables pretend or imaginative play to occur. Costume props are common in the play setting, found in the forms of purses, shoes, hats, and dresses. They are considered a fundamental part of a high quality child care environment (Harms, Clifford & Cryer, 2004). These items enable the child to take on a role, helping support the expanding ability to represent objects and stimulate more physical activity. The use of uniforms for sports and occupations validate the functional nature of the garments. Designed for ease in exercising, the garment design is fundamental to function and to signify a role. While research has been conducted on the use of costumes to enhance story telling (Crowe, Haar & Agne, 2003); Haar & Crowe, 2001), story related play roles (Haar, Crowe, & Tysinger, 2003), and as an aid during therapy sessions (Haar, 1998), to date no empirical research has been found on the relationship between children's costume props and type of physical activity nor types of social engagement. This study addresses that gap by examining these relationships.

In summary, researchers motivated by concerns about health and obesity have demonstrated increasing interest in the intensity and levels of physical activity as early as age two years or toddlerhood. Motor skill development is rapid yet foundational to further motor skill development throughout early childhood and even into adult years and greatly influenced by the quality of the environment stimulation around the child. Additionally, during these early years, children emerging social skills and representational abilities allow for increasing social engagement or play with peers. Thus the focus of this study was to assess the effects of a developmentally appropriate intervention of a costume prop on the intensity of toddler's physical activity, types of physical gross motor movements, and levels of social engagement within the context of the child care environment.

The research hypotheses for the study are:

1. Toddlers who wear a costume prop during free play will engage in more moderate-to-vigorous physical activity (MVPA), of movement compared to toddlers not wearing a costume prop. The null hypothesis is the costume prop will have no effect on a toddler's MVPA.

2. Toddlers who wear a costume prop will engage more frequently in gross motor activity than toddlers who do not wear a costume prop. The null hypothesis is no difference in frequency of gross motor movements between toddlers wearing the costume prop and those who are not.
3. Toddlers who wear the costume prop will engage more frequently in social forms of play, parallel play as defined by Parten (1932), than toddlers who are not wearing a costume prop. The null hypothesis is no difference in frequency in forms of social forms of play between toddlers wearing the costume prop (cape) and those who are not.

Chapter 3 – Methods

Participants

A total of fifty-two toddlers participated in this study. Toddlers were divided into two groups: intervention ($n = 27$) and a matched sample control ($n = 27$). Control children were drawn from an earlier study (data collection 2007 – 2009) of physical activity and language with a uniquely designed data collection garment (Haar, Fees, Trost, Crowe & Murray, 2011). Children participating in the intervention phase wore the same data collection garment with the addition of a costume prop. Children in the intervention group were predominantly Caucasian and ranged in age between 24 to 36 months ($M = 29.15$, $S.D. = 3.56$, $n = 17$ males, $n = 9$ females). The matched control group also consisted of toddlers 24 to 36 months ($M = 29.00$, $S.D. = 3.25$; $n = 14$ males, $n = 12$ females). The control group was drawn from a larger sample through matching based on the age and gender of children in the intervention group. In the instance that this was not feasible, children were matched on age alone. In the two remaining cases where the above was not possible, intervention participants were matched based on gender alone.

Participants in the intervention group attended one of two center-based child care programs with single-aged toddler classrooms in the same Midwest community. A total of four classrooms were utilized in this study, three from one center and one from the other. The two center-based child care programs were the same as the control group from 2007 – 2009. However, one child care program moved into a new facility before data collection in the present study. This resulted in the classrooms for the present study to be twice the size compared to the space available for the control group. Forty-five consent forms were distributed with thirty-nine returned, an 87% rate. Of the 39, 27 children participated for a 69% participation rate. The remaining 13 children were absent on the day of testing or refused to participate. To be included in the final data analysis, children must participate 6 minutes or approximately one-third of the 20 minute observation period. Prior to analysis, one child and respective matched sample from the control group were dropped based upon this protocol thus the final sample included 26 intervention and 26 matched controls.

Measures

Intensity of movement

Intensity of movement was measured using a modified version of the Observational System for Recording Physical Activity in Children-Preschool (OSRAC-P: Brown, Pfeiffer, McIver, Dowda, Joao, Almeida & Pate, 2006) to reflect the unique movements of toddlers. The activity codes, measuring intensity, however, were not modified. Intensity of activity was measured on an ordinal scale from 1 to 5 as follows: 1 = stationary or motionless, 2 = stationary with limb or trunk movement, 3 = slow-easy movements, 4 = moderate movements, and 5 = fast/vigorous movements. Reliability of the scale was reported as $\alpha = .80$ (Brown, et al., 2006). Reliability for this sample was as $\alpha = .83$.

Type of movement

Types of gross motor movement were also identified using a modified version of the OSRAC-P designed for toddlers. (See Table 4.1). The activity type and activity context codes of the scale were modified by two researchers with extensive teaching experience with toddlers and graduate degrees in child development and early childhood education to reflect the unique nature of the developmentally appropriate toddler classroom environment as well as the unique emerging fundamental movement of toddlers. The 27 activity type codes outlined were: bend, bounce, carried/held, climb, crawl, creep, dance, fall down, hanging, hesitation, jump/skip, kicking, lie down, pull/push, rough & tumble, ride, rock, roll, run, scoot, sit/squat, stand, swim, swing, throw, walk, and other. For the purpose of analyses, the activity types were consolidated into 13 modified activity types based upon the criteria of activities that share common gross motor movements. For example, scoot, creep, and crawl were combined due to the actions involving locomotion lower to the ground. Movements not identified in children were not analyzed further. The dependent variable, frequency of movement, was obtained by counting the number of times each movement behavior was observed for each child across 40 coding periods.

Social Participation

Social participation was identified using a modified version of the OSRAC-P drawing from the following sections: “classroom activity context” and “group composition”, representing the first 4 levels of social participation as defined by Parten (1932). These levels of social

participation are addressed in OSRAC-P (revised for toddlers) as: onlooking, solitary, and one-to-one peer (parallel play). Onlooking was operationalized as “watching others engage or interact”. Solitary was operationalized as “engaging in a solitary activity and not in proximity to peers or adult.” Parallel was operationalized as “engaging in an activity with or in proximity to a peer or being in an activity area with a peer”. Finally, associative and cooperative play was operationalized as “engaging in sociodramatic or pretend play activities or being in a sociodramatic play center”, drawn from the “classroom activity context codes” in the modified OSRAC-P. Sociodramatic, the engagement in pretend activities with others or being in a sociodramatic area of the classroom signified the social forms of associative and cooperative play. Unoccupied was not included in the analysis. The dependent variable, type of social participation, was obtained by a frequency count of the number of times each social participatory behavior (e.g. onlooking, solitary, parallel, associative and cooperative) was observed for each child across 40 coding periods.

Costume prop

The cape costume prop (intervention) was designed specifically for this study and age group by a faculty member in Apparel Design. For this study, a costume prop was defined as a material item in which the child can incorporate into their play behaviors to enhance different aspects of play. The costume prop was a cape and shape attachments which attached to a data collection garment. See Figure 1.1. The costume prop served as the intervention treatment. The data collection garment worn by all children was a solid black sleeveless top that opened at the shoulder and both sides. See Figure 1.2. The top was constructed from Veltex® nylon loop fabric which has a thin polyester foam core (.4 cm) and nylon tricot backing. The Veltex® loop fabric allowed for hook tape to be attached at the opening for snug fit, ease of donning and doffing, as well as attaching the costume prop with hook tape. Pockets on the inside of the front and back of the garment housed data collection devices of accelerometers, a microphone, and an audio transmitter (for further description, see manuscript by Haar, et al., manuscript in preparation). During previous research (Haar, et al., manuscript in preparation) with the data collection garment, it was noted that an incentive, in the form of a smiley face attachment, encouraged the children to either wear the garment or wear the garment for a longer period of time. The same smiley face attachments were utilized as an incentive in this study. In addition to

the smiley faces, several shapes to serve as attachments were created as a means to facilitate ideas of how to play with the cape or to assist the child in adopting a role. The four shapes selected, cut from felt material, were: star, lightning bolt, hollow circle, and a circle with thick extensions extending from the middle. These shapes were chosen due the common experience with these symbols in a child's environment. The selection of one shape to attach to the data collection garment during play was encouraged.

A cape was selected as the intervention or independent variable because it was proposed that it would create in a child's mind an association of superheroes and encourage a range of gross motor movements. Superheroes allow the child to insert power and fantasy into play. Additionally, a cape may support developing social skills by giving the young child a chance to take on a role and draw strength from that character in communication (Rubin & Livesay, 2006). To give an idea of the pervasiveness and permanence of superheroes in our media culture, a list of some superheroes that have capes: Superman, Batman, Robin, Wonder Woman, Captain Marvel, Hourman, Dr. Fate, and Powergirl. It is important to note that there are superheroes of both genders, reaching both male and female populations. Capes are also free flowing in structure, allowing more creativity to be generated from them. They can make one fly, be a place to hide under, be a source of entertainment in manipulating the ways it can move, and be a shield. These two dimensions, superheroes and free flowing structure of capes, contribute significance to capes.

The design of the capes was constructed off of popular media capes seen in superhero movies, meant to be free flowing and fall down the child's back. The cape was bell-shaped in nature, with a half-circle cut out at the top to curve around the back neck and extend to attach onto the test garment at the shoulder location with hook tape (Figure 1.1). Two different stretch fabrics (80% nylon/ 20% spandex) were used in the construction of the capes. They both had a solid black background; one had all-over small silver iridescent stars and the other had all-over small iridescent dots (See Figure 1.1). Both fabrics appeared shimmery and reflected light in a rainbow of colors. These materials were seen as gender neutral. The data collection garment slipped over the child's head and secured in place with hook tape on each side of the torso. The cape was then attached onto the child's shoulders.

Procedure

Parents of toddlers between the ages of 24 and 36 months from the two toddler programs were invited to participate in this study by providing informed consent for their child. Informed consent forms were provided to the teachers and distributed to parents and guardians to inform them of the study and procedures and invite their child's participation. Date of birth and gender were requested from parents/guardians on the informed consent form. The order of the four classrooms for data collection was randomly selected. The order of which the toddlers in each classroom would wear the cape was also randomly selected prior to collection in that classroom. Methodology for the study was reviewed and approved by the Kansas State University Institutional Review Board, #5817.

Data collection was determined to occur on Monday and Tuesday of every week during the summer months in the morning free play period. On the Thursday prior to beginning data collection in a new classroom, three data collection garments and three capes were introduced by the researcher or the assistant to the toddlers and teacher. The purpose of this was to desensitize the toddlers to the presence of a new item before video recording as well as the feel of the cape material. Toddlers were allowed to freely play with the capes on the Thursday and Friday prior to data collection. A video camera was also present to allow toddlers to get accustomed to the researcher or assistant recording during data collection. Instructions were left with the teachers to allow the garments and capes to be left out on Thursday and Friday, placed in an area such as the sociodramatic area in order to enhance visibility and encourage the toddlers to play prior to data collection. After data collection ended on Tuesday of every week, the costume props were put away in a closet.

On Monday and Tuesday, the teacher was informed as to which child would wear the cape that day during the morning periods of free play. After telling the toddler that "it was their turn to wear the cape," the teacher assisted the child in putting on the data collection garment. The child was then offered two options of cape designs, a black one with iridescent silver stars or a shimmery silver one. Only the child wearing the cape was recorded for data collection. The 20-minute observation period began once the child was completely outfitted with the data collection garment. The researcher and assistant stood in the room, often in a corner assumed to be out of

the way of the children, to videotape the child using a Panasonic video camera with a microphone attached to the top of the camera.

In the instance that the child refused or attempted to remove the cape after recording began, a stimulus was offered by the teacher to make wearing the cape more appealing. The stimulus choices were: a star, a smiley face, a lightning bolt, and a hollowed out circle. These stimuli had loop tape on the back to allow the child to place it on the data collection garment. If the cape was still refused after the offering of a stimulus, the next toddler on the pre-selected list was told “it is your turn to wear the cape.” It was noted of which toddlers initially refused to wear the cape to ensure they were offered another opportunity at a later time. A toddler was offered three opportunities to wear the cape, spaced out on different days of data collection. Once all participants were given three opportunities to wear the cape, data collection was completed and the process began again in the next classroom.

Coding

All tapes collected during data collection were digitized for coding and placed on a secure server at the university for viewing. Code names were assigned to each child in place of given names to protect the confidentiality of each participant. A graduate student, blind to the purpose of the study, assisted in the coding. Prior to coding, inter-rater reliability was established between two coders (85% agreement). In order to establish reliability, four pilot videos were viewed separately by the researcher and assistant for practice in coding. Behaviors were coded based upon instruction provided by Brown et al. (2006) and the detailed descriptions provided for each behavior. In the instances of continued discrepancy after discussing each pilot video separately, the descriptions provided were further refined to increase agreement. The pilot videos were then recoded until 85% agreement was achieved. The coding protocol entailed five second intervals of observation followed by 25 seconds of coding for 20 minutes, entered into an Excel spreadsheet (see Appendix A). After the completion of coding five videos, one child’s code sheet was randomly selected to ensure inter-rater reliability was satisfied. A 90% agreement was required prior to moving on to the next set of coding. Once the intervention data was coded, it was entered into SPSS 19.0 for analysis.

Analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) were the methods of analysis utilized in the present study. With 40 counts of observation across all 54

participants, these forms of analysis increased the statistical chances of detecting a significant difference in the data.

Chapter 4 – Results

This study was guided by three hypotheses. First, toddlers who wear a costume prop, a cape with attachable chest symbols, during free play will engage in more moderate-to-vigorous physical activity (MVPA), of movement than toddlers not wearing a costume prop. The second was toddlers who wear a costume prop (cape with chest symbols) will engage more frequently in gross motor activity than toddlers who do not wear a costume prop. Finally, toddlers who wear the costume prop will engage more frequently in social forms of play, parallel play as defined by Parten (1932), than toddlers who are not wearing a costume prop.

One-way analysis of variance (ANOVA) and a multivariate analysis of variance (MANOVA) were utilized to examine the relationship between a costume prop and the intensity and type of activity as well as forms of social participation.

Intensity of physical activity

The first hypothesis addressed a toddler's level of intensity, as designated by more periods of MVPA, when wearing the costume prop compared to toddlers not wearing a costume prop. A composite variable, mean intensity was created by finding the average intensity for each child across 40 periods of observation. The dependent variable of intensity was entered with the independent variable, source (control or intervention group), to run a one-way ANOVA to assess mean differences of activity level between the control and intervention. Mean replacement was used for missing data. No significant difference was found between the intervention ($M = 2.13$, $SD = .18$) and the control group ($M = 2.26$, $SD = .42$) on the intensity of activity experienced by toddlers, $F(1, 50) = 2.04$, $p = .16$, $r = -0.19$. The effect size as measured by Cohen's D was -0.19 . The null hypothesis was accepted.

Frequency of gross motor movements

The second hypothesis stated that toddlers who wear a costume prop will exhibit a greater frequency of gross motor movements than toddlers who do not wear a costume prop. From the 17 activity codes, the frequency with which each activity type occurred was counted across all forty observations for each child. Four activity codes displayed a frequency count of less than five between the intervention and control group: Hanging/swinging, rough & tumble/ fall down, hesitation, and roll. The low frequency count of these resulted in the elimination of these from

the data analysis. A MANOVA on the remaining 13 activity codes displayed significant differences between the intervention and the control groups, $F(13, 38) = 2.02, p < .05$. Two activity codes, walks and bounce/jump & skip/kicking, showed significance at the .05 level and pulls/pushes/throws was nearly significant (refer to Table 4.2). A mean comparison was performed for these remaining activity codes to examine where the significance occurred between the two groups. The control group consistently exhibited a higher mean than the intervention group, as displayed in Table 4.3. The hypothesis was partially supported due to mean differences detected but not in the expected direction.

Social participation

The third hypothesis states that toddlers who wear the costume prop will engage more frequently in social forms of play as defined by Parten (1932), than toddlers who are not wearing a costume prop. A frequency count was performed to obtain total number of onlooking, solitary, parallel, and associative/cooperative play across all subjects during the 40 sets of observations. A MANOVA revealed a significant difference between the average counts of the control and intervention groups on each type of play behavior, $F(4, 47) = 16.19, p < .001$. (refer to Table 4.4). The null hypothesis was rejected in favor of the proposed hypothesis of differences. Test of between-subject effects showed a significant difference between all forms of social participation: on looking $F(4, 47) = 40.28, p < .001$, solitary $F(4, 47) = 17.30, p < .001$, parallel $F(4, 47) = 20.26, p < .001$, and associative/cooperative play $F(4, 47) = 6.55, p = .014$. An examination of the means revealed the intervention group scored higher than the control in 3 cases: onlooking, solitary, and parallel play (refer to Table 4.5). Effect sizes as measured by Cohen's D are large (above the 95th percentile), suggesting the results of the intervention are indeed strong and meaningful (<http://www.uccs.edu/~faculty/lbecker/es.htm>)

Table 4.1*Modified Activity Codes for Toddlers*

Activity type codes (OSRAC –T)	Consolidated activity type codes
Bend	Bend & sit/squat
Bounce	Hanging & swing
Carried/held	Stand
Climb	Walk
Crawl	Run
Creep	Scoot & creep & crawl
Dance	Bounce & jump/skip & kick
Fall down	Carried/held
Hanging	Climb
Hesitation	Rock & ride
Jump/skip	Lie down
Kicking	Swim & dance
Lie down	Rough & tumble & fall down
Pull/push	Hesitation
Rough & tumble	Push & pull
Ride	Roll
Rock	Other
Roll	
Run	
Scoot	
Sit/squat	
Stand	
Swim	
Swing	
Throw	
Walk	
Other	

Table 4.2*MANOVA for Activity Type in Intervention Group*

Activity type	df	F	Adjusted R ²	Cohen D	η ²
Bend/sit/squat	1	.07	-.02	.07	.00
Stand	1	.02	-.20	.04	.00
Walk*	1	6.12	.09	-.68	.11
Run	1	.12	-.02	.10	.00
Scoot/creep/crawl	1	.48	-.01	-.19	.01
Bounce/jump/skip/kick*	1	4.92	.09	-.66	.10
Carried/held	1	8.48	.02	-.41	.04
Climb	1	3.25	.01	-.34	.03
Rock/ride	1	2.77	.03	.46	.05
Lie down	1	1.23	-.02	.11	.00
Swim/dance	1	1.56	.02	-.41	.04
Pull/push/throw	1	3.72	.05	-.54	.070
Other	1	.75	-.01	.23	.02

* p < .05

Table 4.3*Mean Comparison between Intervention and Control for Activity Type*

Activity type	Group Type	<i>M</i>	<i>SD</i>
Bend & sit/squat	Intervention	11.96	8.61
	Control	11.31	9.36
Stand	Intervention	15.31	7.70
	Control	15.00	7.80
Walk*	Intervention	4.81	2.00
	Control	7.19	4.49
Run	Intervention	1.31	2.40
	Control	1.04	3.09
Scoot/creep/crawl	Intervention	.35	1.13
	Control	.54	.81
Bounce/jump/skip/kick*	Intervention	.04	.20
	Control	.65	1.29
Carried/held	Intervention	.00	.00
	Control	.81	2.82
Climb	Intervention	.46	.76
	Control	.96	1.91
Rock/ride	Intervention	.46	1.42
	Control	.00	.00
Lie down	Intervention	1.08	3.75
	Control	.77	1.18
Swim/dance	Intervention	.00	.00
	Control	.35	1.20
Pull/push/throw	Intervention	.15	.46
	Control	.54	.91
Other	Intervention	.23	.86
	Control	.08	.27

* $p < .05$

Table 4.4*MANOVA for Intervention and Control for Social Participation*

<i>Social Participation</i>	<i>df</i>	<i>F</i>	<i>Adjusted R²</i>	<i>Cohen D</i>	η^2
Onlooking	1	40.282	.46	1.76	.45
Solitary	1	17.299	.24	1.15	.26
Parallel	1	20.255	.27	1.25	.29
Associative/Cooperative	1	6.550	.10	-0.71	.12

*p < .001

Table 4.5*Mean Comparison between Intervention and Control for Social Participation*

Group type		Onlooking	Solitary	Parallel	Associative/Cooperative
Intervention	<i>M</i>	12.42	6.92	6.12	.08
	<i>SD</i>	6.10	5.56	4.45	.27
Control	<i>M</i>	3.96	2.12	1.58	3.73
	<i>SD</i>	3.17	1.95	2.58	7.28

Chapter 5 – Discussion

There is a substantial amount of literature devoted to increasing physical activity through implementation of creative movement programs, enhancing gross motor development, and levels of social participation in children. Small subsets of these studies are specifically devoted to toddlers, a population in which obesity is becoming an issue. However, no published research to date has been devoted to the use of a costume prop as a means to increase activity levels and types of gross motor movements in this population as well as the potential use of a medium to facilitate further interaction with peers. The present study utilized a costume prop “cape” during free play to examine the impact on a toddler’s intensity and form of movement as well as level of social interaction.

The results of this study indicated a greater level of social participation with the availability of a cape compared to the control group with no cape. This provides support for the utilization of a costume prop as a means to enhance some forms of social participation except for associative/cooperative play in toddlers. The higher mean occurrence of parallel play in the intervention group compared to the control group offers support to Robinson (2003) findings of parallel play being the hub for which most forms of social participation result in. Additionally, one-on-one peer play (parallel play) or dyadic play, was the most frequently engaged form of social participation across all ages in a study done by Parten (1932). The presence of the costume prop may have served as an anchor to facilitate social interaction between two peers. The lack of significance reached for associative/cooperative play indicated that the intervention did not facilitate the more advanced form of social play. Instead, a decrease in associative/cooperative play was displayed in the intervention group when compared to the control group.

One explanation for this lies in the lack of prior experiences toddlers may have had with capes, contributing to an underdeveloped cognitive ability for how to engage in play with it. Piaget conveyed the importance of assimilation in the creation of a schema of an object or idea in a child’s mind (Piaget, 1946). The capes have never been present in these classrooms with this group of children prior to the study, potentially contributing to the difficulty in engaging in play with others using the cape. Another possibility is the cape is not an object of play that children can readily share with peers. Piaget states that the beginning of pretend play begins around two-years-old, when the child can engage with an object as if it is something else (Piaget, 1946). The

ability to engage in pretense with others is often seen as to go hand-in-hand with the more advanced forms of social participation, associative/cooperative play. The cape may not have been perceived as an object in which one can engage in pretense with others, as it is more structured in purpose than other objects available in the classrooms. With language development rapidly increasing in these early years, an object is an important source of facilitating interactions in what cannot be conveyed through verbal expression. The cape being attached to the toddler may be perceived as part of the child rather than an object that is capable of being shared through play. This may restrict a child's perception of being able to engage in play if the child does not have a cape as well. The location of the cape, behind the child instead of in front, may have not made it as readily visible to the child.

The lack of support found for greater engagement in gross motor physical activity suggests the cape is not an effective means to encourage more gross motor movement in toddlers. The control group displayed greater frequency of gross motor movement than the intervention group in almost all categories. This contradicts the results found by Wang (2004) and Cheung (2010) in which an increase in movement and MVPA was respectfully found. It is important to note that the interventions in that study were led by an instructor or teacher. Therefore, a lack of increase displayed in the intervention group for gross motor movement may stem from not being shown the different ways in which a cape can be utilized. Wang (2004) and Cheung (2010) utilized preschoolers and kindergarteners for interventions to increase movement which could limit generalization as the focus of this study was on toddlers. However, toddlers may be even more reliant on modeling by adults because of their likely lack of experience with a breadth of clothing and costumes. Certainly, the different developmental levels must be taken into consideration when comparing results.

Vygotsky (1933/1966) suggested the importance of working within the Zone of Proximal Development in order to bring a child along in development. If the child has never engaged in play with a cape before, and was not shown the means in which it can be used, they do not know how to incorporate it into a play context. Another contributor for the lack of increased gross motor movement could be attributed to the acceptability of those movements in a classroom. In the instance that running or jumping occurs, a child is often reminded of walking or keeping one's feet on the ground. The ability to engage in gross motor play may have been thwarted by the teachers.

Results from Cauwenberghe et al. (2011) indicated the three predominant behaviors engaged in by toddlers are sit and squat, stand, and walk. These three behaviors were also gross motor movements that displayed the highest means in the present study. This is not uncommon, for other gross motor movements coded in OSRAC-P are more complex motor movements that develop later in older toddlers, such as jump and skip. However, the prevalence of these sedentary behaviors in the present study and in Cauwenberghe et al. (2011) indicates an area of focus for future research in increasing non-sedentary gross motor movements.

The hypothesis of a greater intensity displayed in the intervention group was not significant, which suggests the cape does not stimulate higher levels of intense physical activity in toddlers. The low mean intensity in the intervention group for the present study, which is categorized as “sedentary with trunk or limb movement” reflects Cauwenberghe et al. (2011) findings of a high percentage of toddler’s time spent in sedentary behaviors. A proposed reason for this is similar to the one mentioned previously, the acceptability of higher intensity behaviors in a child care setting.

Limitations

There are several limitations that must be noted in the present study. Not all of the participants in the intervention group wore the costume prop for the total 20 minutes during data collection. This resulted in a wide range of data available for coding activity and social participation. An important aspect of play is that it is intrinsically motivated and instigated by the child. While play was not a specific variable examined in the present study, the principles behind play were adhered to in order to reflect the context in which the costume prop was to be used in. If the child expressed the desire to remove the data collection garment and prop, that was a signal to the end of play with these items.

Another limitation to the study was the different teachers in each of the four classrooms. Although each program was nationally accredited by the National Association for the Education of Young Children (NAEYC), a recognition of high quality programming, the lack of consistency in teaching engagement between lead teachers potentially contributed to the increased discomfort with having another strange individual (the researcher) in the classroom and prevented the child from engaging in play with the costume prop. Also, attachment is an important component of a toddler’s security in being able to rely on a consistent caregiver. The

absence of this leads the child to behave differently. This was reflected in that the lowest participation occurred in the classroom that had a different teacher every day during data collection.

A third limitation to the study was the structure of the play area, inhibiting the ability for the toddler to freely engage in gross motor movement. Run was one code activity utilized in observation scale. The area in which morning free play occurred, as well as the rules imposed by the teachers to always walk in the classroom, prevented the toddlers from engaging in MVPA. This limited the ability of the costume prop to allow the child to run and move at a higher level of intensity.

A fourth limitation lies in the design of the study, weak in respect to internal validity threat of selection as is typical of a voluntary sample. Differences that were observed between the two groups may not be attributed to implementation of the cape alone, but to differences in the way that teachers designed and directed the classrooms. The teachers from the control group were different than the teachers in the intervention group, contributing to differences in teaching style and behaviors accepted in the child care room. There was also a two year lapse from the time of data collection in the control group until implementation of the present study. Therefore, the participants from the control group were not the same participants as the intervention group. This may have provided a different group dynamic in which the toddlers responded to the capes.

Implications

This research was truly exploratory in nature and has implications for further research. An area of future research lies in applying an alternate version of a costume prop in a different context. For example, implementing the availability of the cape outside or larger setting to enable movement. The use of accelerometers as an additional measure for intensity and movement of physical activity is also proposed, ensuring the intermittent and sporadic behaviors of toddlers are recorded accurately and as a means to validate direct observation results. The lack of literature suggests this is an area that is in great need of further research. The design of the capes was based upon what was perceived that toddlers would like. To involve children in the designing process for what material and images they would like to see on the cape may stimulate more activity through a greater connection to the capes. Another direction to examine is the impact of the capes with some prior demonstration on the ways to use the cape during free play.

The availability of space may permit the child to engage more freely in MVPA as well as different gross motor activity types. With the lack of impact of the cape on associative/cooperative play, it is important to look further at what contributes to the ability of a toddler to engage in play with peers. Research shows the presence of a concrete object does assist young children in connecting through social engagement due to limited but growing cognitive capacity. It would also be of interest to examine ways in which more advanced forms of social participation can be facilitated and empirically documented to encourage earlier growth in cooperation and sharing among toddlers.

Another area of future research is the effect of a costume prop on gender, as it was not a variable examined in the present study. Research shows there are gender differences in physical activity, with boys generally being more active than girls (Cardon & De Bourdeaudhuij, 2008; Pate et al., 2008). Therefore, the need to increase activity levels in younger girls is implied. One proposed direction with the use of costume props is to provide capes that are gender specific to help girls better identify with the prop. This could be modeled after butterfly wings or a fairy.

This study also has implications for teachers and parents. One is the need for exemplified gross motor movements to assist toddlers in engaging in greater levels of physical activity. Adults need to structure and model different types of movements for children to imitate and practice as suggested in the NASPE standards (2006), there must be time for structured physical activity where adults model movements. The lack of increased intensity and gross motor movements in the present study suggest toddlers need direction in continued learning on the ways to move their bodies with unfamiliar props. The use of the capes and the increase in solitary and parallel play among the intervention group children indicate the importance of utilizing costume props with adult guidance to further social interaction between peers in a classroom setting. Teachers should bring in a variety of costumes for exploration and, in addition, model and visit with the children about the costumes. Suggestions on how they may be worn and what they may be or do in them would be appropriate in furthering play with them. Supportive engagement during play may also be helpful in keeping the child focused on a role.

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Appendix A

OSRAC-P
for
Toddlers

Child ID

Date of coding

Age in months of
taping

Clock (30 Secs)	Activity Level	Activity Type	Location	Classroom Act Context	Group Comp
0:00:00					
0:00:30					
0:01:00					
0:01:30					
0:02:00					
0:02:30					
0:03:00					
0:03:30					
0:04:00					
0:04:30					
0:05:00					
0:05:30					
0:06:00					
0:06:30					
0:07:00					
0:07:30					
0:08:00					
0:08:30					
0:09:00					
0:09:30					
0:10:00					

Appendix A (Con't)

OSRAC-P
for
Toddlers

Child ID _____

Date of coding _____

Age in months of
taping _____

Clock (30 Secs)	Activity Level	Activity Type	Location	Classroom Act Context	Group Comp
10:30					
11:00					
11:30					
12:00					
12:30					
13:00					
13:30					
14:00					
14:30					
15:00					
15:30					
16:00					
16:30					
17:00					
17:30					
18:00					
18:30					
19:00					
19:30					
20:00					

Figure 1.1

Costume Prop of Data Collection Top, Cape, Shape Attachments, and Alternative Fabric for Cape



Photo by Sherry Haar

Figure 1.2

Data Collection Garment Top, Front and Back View



Photo by Sherry Haar