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SPAWNING EXECUTIVE FUNCTIONS IN FIRST GRADERS: EXPLORING SITUATED LEARNING EXPERIENCES WITH THE CLASSROOM PET CONSISTENT WITH CHILDREN'S TEMPERAMENT

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A DISSERTATION APPROVED FOR THE
DEPARTMENT OF INSTRUCTIONAL LEADERSHIP AND ACADEMIC CURRICULUM

BY

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This dissertation is dedicated to my family. I am blessed to have two very resilient, autonomous, and loving children who adapted to the ever-changing demands of my career as a doctoral student. My devoted husband always went above and beyond the duties of father and husband enabling me to reach my dream of earning my PhD. I have a mother and father who always believed in me and set high expectations while providing support each step of my journey in reaching my ultimate goal. And to my sister who always provided comfort and support, not only because of our strong sister bond, but as a student herself she understood the stress of juggling work, school and family.

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Abstract

Rapid growth in all domains of development occurs during the early childhood years. Even so, the pressures of high stakes testing and the push down of curriculum often elicit a focus on cognitive development while neglecting other developmental areas important in school and later life success such as executive functions. All developmental domains including social, emotional, cognitive, and physical development are embodied in executive functions with previous research illustrating gains in executive functions as efficacious in a child's success outside and inside of school.

The purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments. A hermeneutic phenomenology design was implemented for this qualitative study. Methods utilized for data collection included observations, initial and culminating interviews along with ongoing collaborations with the classroom teacher, pre and post temperament scales, pre and post executive function tasks, documentation, and a field notebook to better understand the phenomenon with classroom pets through the lived experience of the participants.

Three levels of data analysis took place: starter codes, with-in case analysis, and cross-case analysis. Major findings included the connection between temperament and executive functions, the classroom pet as provocations for augmenting executive functions, and negotiated meaning. Several implications are provided for ensuring optimal outcomes for children in the classroom, including the

benefits of understanding children's temperament in providing a goodness of fit and integrating situated learning experiences with a classroom pet into the curriculum to enhance executive functions.

*K*eywords: executive functions, temperament, classroom pet, humane education, situated learning experiences, early childhood, hermeneutic phenomenology

Chapter 1: Introduction

"Educating the mind without educating the heart is no education at all." Aristotle's (Nicomachean Ethics, 1955) observation alluded to the importance of educating the whole child and corresponds with the knowledge that the early childhood years embody an era of rapid growth in all domains of development. However, with the pressures of high stakes testing and the push down of curriculum, academic skills become the focal point of many early childhood classrooms (Barksdale-Ladd & Thomas, 2000: Stipek, 2006). Attention to significant developmental areas such as executive functions are neglected in the classroom even though parents, children, and teachers can concurrently benefit from programs and strategies that effectively increase children's overall well-being (Webster, Stratton, & Reid, 2003). Additionally, gains in executive functions are efficacious in a child's success in school (Diamond, 2013; Schultz, Richardson, Barbeer, & Wilcox, 2011).

Early childhood years give rise to tremendous gains in social and emotional development. Universally, children begin to learn not only about themselves, but also their world through play. Through interactions with peers and adults within their environment, children learn culturally relevant roles and standards of their society (Ashiabi, 2007). Sociocultural theory explains how children learn successfully through an interrelated triad among cognition, language, and culture (Vygotsky, 1978). Furthermore, situated cognition entails children learning concepts, skills, and strategies within a relevant situation alongside a more knowledgeable and skilled adult or peer. (Levine & Resnick, 1993; Rogoff, 1990) denoted that in today's complex world, a situation that is purely cognitive and barren of social and cultural

influences is highly unlikely. However, a child's temperament can substantially affect how the child reacts to their social, contextual, and learning environment whether positively or negatively (Stifter, Cipriano, Conway, & Kelleher, 2009). Rothbart and Bates (2006) defined temperament as genetic traits that account for differences in children's reactions and regulations in activity level, distractibility, adaptability, responsiveness, mood, sensory threshold, and self-regulation skills.

Not only are the early childhood years an important era for growth in all developmental domains, but also executive functions (Diamond, 2013; Obradovic, Portilla, & Boyce, 2012; Weibe, Espy, & Sheffield, 2012). Executive functions are defined as being able to ignore irrelevant stimuli or inappropriate automatic responses, consider different perspectives or thinking, and follow controlled, thought out appropriate responses (Shaul & Schwartz, 2014; Weibe et al., 2012). First graders are undergoing developmental advances relevant to executive functions that are plastic and can be improved with training and practice. However, executive functions are affected by lack of social, emotional, and physical health including stress, lack of sleep, loneliness, and lack of exercise (Diamond, 2013). Nevertheless, a possibility for overcoming the barriers for executive function development could entail providing opportunities for children to interact with animals.

Animals have been depicted as a source of companionship, support, and therapy for children throughout history alleviating fear, anger, loneliness, and stress (Esposito, McCune, & Mahomes, 2011). Not to mention, children's interactions with animals provide children with a variety of learning modalities including tactile development through petting an animal, physical development by playing with

animals, and social-emotional development through understanding a animals' needs and emotions even through a pet's nonverbal cues (Pattnaik, 2004). Through humane education children have the opportunity to build on their natural curiosity of animals (Daly & Suggs, 2010). Thomas and Beirne (2002) defined humane education as becoming informed about animal, human, and consumer rights, in addition to gaining knowledge about environmental care. Weil (2004) expanded the definition of humane education to incorporate creativity, responsibility, respect, decision making skills, critical thinking, and problem solving. In summary, humane education is an ideal catalyst for enhancing social and emotional development, and possibly executive functions in young children.

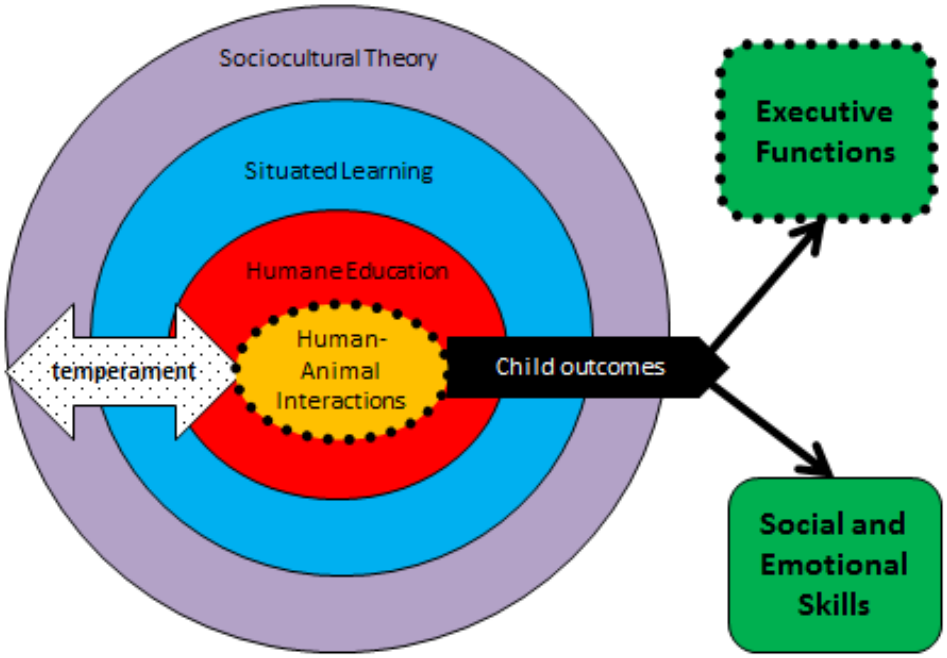
In fact, studies have found benefits in the presence of animals in children's developmental growth during the early childhood years. O'Haire, McKenzie, McCune, and Slaughter (2013) incorporated activities involving a guinea pig into the curriculum of first grade classroom and found growth in the children's social and emotional skills. Studies incorporating the presence of a dog with children ages four to six demonstrated an increase in motivation, focus, calmness, and memory hence decreasing errors on tasks (Gee et al., 2010; Gee et al., 2010; Gee et al., 2007; Gee et al., 2009; Hergovich, Monshi, Semmler, & Zieglmayer, 2002). Given these points, I incorporated humane education into my study and provided children with situated learning experiences involving the classroom pet that were consistent with children's temperament aimed to increase executive functions.

Theoretical Framework

Learning is socially and culturally situated in experiences in which a more knowledgeable adult or peer can provide guidance and support through scaffolding (Vygotsky, 1978). The purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments. Situated learning experiences incorporated humane education to increase first graders' knowledge of the care and rights of animals. Children's play or interactions with a classroom pet also referred to as human-animal interactions had implications for increasing social and emotional skills with a possibility of increasing executive functions. Noteworthy was that a child's temperament influences how the children reacted to the social and cultural aspects of the environment and how they reacted to the demands of the situated learning experiences with the classroom pet (Figure 1).

Figure 1

Map of Theoretical Framework



*The solid line denotes strong evidence based on literature and the dotted line denotes sparse literature in this area.

Sociocultural Theory of Development

Vygotsky (1986) initiated the sociocultural theory of development to justify how children collaboratively build knowledge through interactions with other people (Edwards, Gandini, Forman, 1998). Furthermore, sociocultural theory is different from other cognitive constructivism in that it proposes that learning is not just a product of independent thinking but instead connects the individual in relation to the social and cultural contexts of the child's environment across many systems (Tappan, 2006). Learning occurs in relation to negotiated meaning within a cultural context and social experiences and modifies understandings according to

negotiations between more than one learner, also referred by Rogoff (1990) as an *apprenticeship*.

For Vygotsky (1978), development was not a question of nature or nurture; it was an aggregation of both nature and nurture in that child development is the coaction of biological development with cultural development (Bodrova & Leong, 2010). He (1986) asserted that culture, language, and cognition are a dynamic and integral triad in child development, markedly the social interactions a child's experiences affects his or her cognitive and language development. In brief, children are talking to learn, through negotiated learning with others and progressing from private speech to inner speech to regulate thoughts and understandings and to regulate impulsiveness (Bodrova & Leong, 2010; Gardiner & Kosmitzki, 2011).

Definitions of Terms

Sociocultural Theory: Vygotsky (1978) initiated the sociocultural theory of development to justify how children collaboratively build knowledge through interactions with other people. Learning occurs in relation to negotiated meaning within a cultural context and social experiences and modifies understandings according to negotiations between more than one learner (Fosnot, 1996).

Situated Cognition: Scaffolding provided by a more knowledgeable adult or peer allows children to build new knowledge and understandings of a concept or skill during authentic hands-on experiences. Adults can help children activate previous knowledge and experiences through scaffolding with objects, prompts, questions, or discussions (Resnick, 1985). According to Resnick, situated cognition is based on the constructivist approach to learning and very similar to Vygotsky's zone of proximal

development (ZPD) in which children build their own knowledge through direct interactions with their environment (Brown, Collins, & Duguid, 1989). Lave and Wenger (2011) differentiate between ZPD and situated learning in that situated learning is not an individualized learning experience but instead occurs within a community of learners participating in a shared learning experience.

Humane Education: Thomas and Beirne (2002) defined humane education as becoming informed of animal, human, and consumer rights, in addition to knowledge of environmental conservation. Weil (2004) extended the definition of humane education by identifying four elements of a superior humane education program. First, children should be provided with the skills, knowledge, and strategies to make decisions as citizens and understand the consequences of their choices. Secondly, a quality humane education program should foster curiosity, creativity, and critical thinking to increase children's skills in problem solving. Next, the humane education program should build reverence, respect, and responsibility. Finally, a productive humane education program should provide information for children to make choices that not only benefit themselves, but also other people, the environment, and animals.

Human-Animal Interactions (HAI): An interaction that occurs between human and animal, which facilitates activities, situations, and treatments that influence physical and psychosocial determinants of human health, with the resultant outcome of improved well-being. The interface is characterized by a concrete, structured environment for interaction and a psychological component of positive affect associated with the behavior (Vitztum, 2013).

Temperament: Temperament is relatively stable and biologically based and explains individual differences in children's emotional, motor, attentional reactivity, and self-regulation. Effortful control is the child's ability to regulate reactivity to environmental stimuli and demands (Stifter et al., 2009; Thomas & Chess, 1977). To align with both the purpose of this study and The Carey Temperament Scale, which was incorporated in this study, nine temperament traits will be defined (Anderson, Pellowski, Conture, & Kelly, 2003):

1. Activity level: The extent of physical activity exhibited.
2. Adaptability: The ability to change with the demands of the environment.
3. Approach or withdrawal: The response to a new situation.
4. Quality of mood: The amount of emotion produced by situations.
5. Intensity of reaction: The amount of energy produced when responding to a situation.
6. Distractibility: The degree of diversion due to extraneous stimuli.
7. Attention span/persistence: The length of time focused on an activity and ability to stay focused despite distractions.
8. Sensory threshold: The extent of response induced by stimulants in the environment.
9. Rhythmicity: The inconsistency or consistency of physiological functions.

Executive Functions: The ability to engage in deliberate, goal directed thought and action with inhibitory control, attention shifting or cognitive flexibility, and working memory (Diamond, 2013). The three core executive functions are:

1. Inhibition: the ability to control actions and not be controlled by habitual behaviors or environmental stimuli.
2. Cognitive flexibility: the ability to comprehend a different or new opinion and perspectives in addition to thinking outside the box.
3. Working memory: the ability to remember information and manipulate this information as needed regardless of distractions.

Purpose of Study and Research Questions

The purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments. Play and interactions children had with the classroom pet included care and handling of the pet or observation of the pet. Play or interactions with the pet were *human-animal interactions (HAI)* defined by Vitztum (2012) as:

> An interaction that occurs between human and animal, which facilitates activities, situations, and treatments that influence physical and psychosocial determinants of human health, with the resultant outcome of improved well-being. The interface is characterized by a concrete, structured environment for interaction and a psychological component of positive effect associated with the behavior. The animal can be defined as a pet in the traditional sense of the terms but this is not mandatory, animals in HAI that are characterized as nonpets are capable of providing these interactions as well. (p. 33)

Play with animals and human-animal interactions were utilized interchangeably. The research questions for this study included:

1. What is the nature of the lived experiences for the children during interactions with the classroom pet?
2. How are children's executive function traits being used during interactions with classroom pet?
3. How does children's temperament impact situated learning experiences with the classroom pet?

Overview of the Chapters

The purpose of the study and research questions have been described in chapter one. To summarize, the purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments. Furthermore, this study was implemented and scrutinized through the lens of sociocultural theory coordinating the study with the perception that children collaboratively build knowledge in relation to the social and cultural contexts of their environment (Tappan, 2006; Vygotsky, 1978).

Chapter two begins with a comprehensive narrative of development during the early childhood years and the importance of play as a vital medium for learning in every domain. Next, sociocultural theory is described and aligned with situated cognition as a medium for learning and development. Finally, executive functions, temperament, and moral development are depicted as substantial constructs of early childhood development. Humane education is synthesized with each of the previously mentioned concepts.

The methodology in chapter three describes how this qualitative study was conducted through a hermeneutic phenomenology approach. Qualitative research by

means of a hermeneutic phenomenology design provided a vivid picture of the lived experience of the children bringing to focus every detail while achieving the goal of insights and connotations of the child's experiences with the classroom pet and the outcomes of these experiences (Friesen, Hernriksson, & Saevi, 2012). The participants included 21 first grade children and their teacher. Data was collected and analyzed over a six-month time span beginning in late November and ending in late May. Methods utilized for data collection included observations as a participant observer, initial and culminating interviews and ongoing collaborations with the teacher, a pre and post temperament assessment, pre and post executive function tasks, documentation in the form of children's artwork or writing pertinent to the study, and a field notebook. Three levels of analysis included starter codes, with-in case analysis, and cross-case analysis.

Chapter four presents three major finding that emerged during analysis: temperament as a liaison, the classroom pet as a provocation, and negotiated meaning. Temperament was incorporated into decisions regarding many aspects of the classroom to ensure a goodness of fit including how to structures groups, how to design situated learning experiences, and how to organize classroom space and schedules. As a result, children's executive functions were enhanced and temperaments were slightly modified. The classroom pet served as provocation for many different situated learning experiences in which children not only gained knowledge in humane education but engaged in opportunities to practice executive functions. Negotiated learning occurred through negotiated meaning within a social

experience in which different background knowledge and experiences from peers and adults become merged into a shared understanding.

Chapter five provides conclusions, limitations, implications for future research, and a reflection of the study. The strong interplay between, executive functions, temperament, and situated learning experiences with the classroom pet illustrated the importance of incorporating strategies in an early childhood classroom that could potentially lead to optimal outcomes not only in the present but also across the lifespan. Limitations encompassed a small sample size, complications of being a participant observer, and limited time to incorporate situated learning experiences. Opportunities for future research are discussed including a study with a nonliving pet, a study bringing in outside resources such as animal welfare agencies and visits from service animals, and a study with a class consisting of the majority of children from low socioeconomic backgrounds. The chapter concludes with my reflections on the study.

Chapter 2: Review of the Literature

The primary years encompass ages six through eight, an era for children in which they transition from play based learning environments into more academically rigorous environments (Trawick-Smith, 2010). Transformations in the school culture have occurred not only because of policy, but also due to changes in the way people think and live. For example, parents strive to build a safe and risk free life for their children leading to more structured activities and indoor play. Yet, play is still vital to children's development and the complexity of play increases as children have become more skilled in all areas of development (Frost, Wortham, & Reifel, 212).

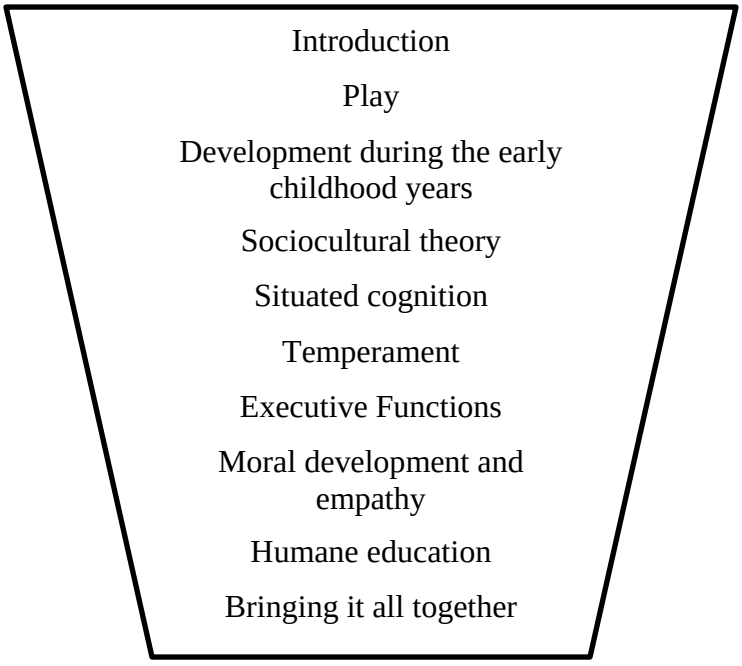
Equally important to mention is the cultural diversity prevalent among primary age classrooms. For this reason, it is imperative that teachers not only become knowledgeable about the diverse cultures represented in their classroom, but also build relationships and communicate with families in a way that is harmonious with families' cultural values and beliefs (Berk, 2010). Children embody an innate curiosity about the world and an intrinsic motivation to learn, therefore teachers and families must cultivate children's development through hands on learning experiences in a socially stimulating environment (Edwards et al.,1998).

This chapter provides a comprehensive narrative of sociocultural theory and situated learning in addition to definitions and a review of the literature for the implications of humane education in enhancing executive functions and social and emotional skills with first graders through situated learning experiences involving the classroom pet. Chapter two begins with a review of development during the early childhood years, while emphasizing the early primary years, and the importance of

play as a vital medium for learning in every domain. Next, a commentary of the two learning domains pertinent to this study is comprehensively explored: social and emotional development and cognitive development. A thorough explanation of sociocultural theory is described and aligned with situated cognition as a medium for learning and development. Then, executive functions, temperament, and moral development are sufficiently canvassed as relevant aspects of early childhood development. Finally, humane education will be discussed and synthesized with each of the previously mentioned concepts. Each section will begin with a definition of the concept then go into a discussion on how the concept affects development and learning during early childhood. A synthesis of the literature pertaining to the concept captures the current research and explains how these concepts are interrelated. This chapter concludes by piecing the concepts together. Figure 2 provides an advance organizer for the literature presented in chapter two.

Figure 2

Advanced Organizer for Chapter 2



Development during the Early Childhood Years

The Influence of Play on Child Development

The alliance between early childhood and play has been ubiquitous for hundreds of years granted that play has distinct differences depending on the situation, context, participants, and purpose (Reed, 2000). From a psychoanalytical perspective, Freud and Erikson both acknowledged the prosperities of play (Frost et al., 2012). Specifically, Freud thought of play as an avenue for biology to coincide with environment including social interactions and cultural influences. Erikson also viewed play as a critical aspect of social development in that children can reflect on past experiences, understand what is happening presently, and plan for future endeavors. Bateson and Garvey developed theories incorporating communication and play. Bateson's *play frame* is an indicator of when a child transitions from reality to fantasy. Social development is cultivated as children take on roles within play. Garvey's *play talk* helps children assimilate into a play scenario and adapt the play as needed.

For Piaget (1951), play creates a means for assimilation and accommodation. Additionally, play is not a catalyst for development but a consequence of development. Children transition from the preoperational stage to the concrete operational stage beginning around first grade. During the preoperational stage, children engage in symbolic play in that play is symbolic of children's thoughts and feelings. The concrete operational stage incorporates more logical and less egocentric views of the world. Yet, abstract thinking may still be a challenge for most in this stage. Vygotsky (1978) entangled play with his ZPD as children are not

tied to concrete experiences for understanding initiating higher levels of thinking. Unlike Piaget who asserted that play with rules did not emerge until after preschool, Vygotsky considered play to be rule based in relation to components allowing children to adhere to the imaginary play scenario. Bruner (1996) regarded play as a channel for development across many learning domains. Markedly, play enables children to rehearse many skills important in adulthood like problem solving, cooperation, cultural competence, language, and creativity. Children are free to make errors without any real consequences.

Frost et al. (2012) brought together the many different perspectives of theorists and play researchers to answer the question: What is play? A consolidated definition based on theories and ideas from Smilansky, Froebel, Piaget, Dewey, Bruner, and Vygotsky concluded that play is an experiential learning process (not product) in which children voluntarily participate in an enjoyable yet challenging, planned or unplanned, activity that involves interactions with the environment including but not limited to peers, adults, animals, structures or manipulatives.

Moreover, much confusion still persists on the benefits for the process and product of play. Endorsed by Smilansky's (1990) research on play and supported by the theories of Erickson, Piaget, and Vygotsky, play aligns with Sutton-Smith's (1997) *progress rhetoric of play*, which emphasized play as a means for learning and development. Educators and researchers should be obligated to take an in-depth glimpse into play as a learning vehicle for children by understanding how children learn, think, and feel during their play experiences, how adults can set up the environmental conducive to meaningful learning experiences, and how adults can

interact with children during play to provide guidance and nurturance (Frost et al., 2012).

Trawick-Smith and Dziurgot (2011) conducted a study on the effectiveness of an adult-child play interaction model, *the good-fit model*, in early childhood classroom. As expected, teachers responded befittingly to child's play with good-fit interactions that evoked prolonged play at a higher level. The good-fit model begins by the teacher's observation and assessment of child's play needs. The teacher then reflects on how much scaffolding is needed to advance children's play. Next, teachers interact with children through modeling and conversations. Finally, teachers withdraw and continue to observe as children play. Conversely, a poor-fit emerges if teachers interact without carefully observing and reflecting on the play.

Social Development

Social and emotional development begins at birth and continues throughout a person's lifespan (Thomas, 2005). Social smiling and laughter begins in infancy including early signs of empathy arising as infants mirror caregiver's tone and expressions (Berk, 2010). Ashiabi (2007) characterizes the social aspect of development in children as how they interact with peers and build friendships, whereas, the emotional side of development is how they respond to peers and situations. Consequently, it is vital to understand the children's social experiences are full of emotions. Yet, children are still learning the strategies to respond to these emotions as children are immersed in many new experiences and begin to build peer relationships (Reifel, 2012).

Subsequent to children building autonomy, Erikson (1982) declared children were equipped to tackle the conflict of industry versus inferiority. With a new ability in perspective taking and increasing moral awareness, children either begin to develop confidence or begin to develop a lack of self-confidence while collaborating with peers and adults on new tasks. Universally children begin to learn not only about themselves, but also their world through play. Through interactions with peers and adults within their environment, children learn culturally relevant roles and standards of their society. Additionally, children gain the intrinsic motivation to master new tasks and skills hence becoming aware of their own strengths and weaknesses. However, when children receive constant criticism for their endeavors, their play and risk taking abilities begin to deteriorate (Berk, 2010).

Cultural values impact how children establish self-concept (Gardiner & Kosmitzki, 2011). For example, Chinese families related children's actions to how it affects other people. Whereas, Irish American families emphasize how children's actions affect themselves. The former culture nurtures a more collective view and the latter culture nurtures a more autonomous view of self-concept. The outcome of self-concept is self-esteem, how children view themselves in terms of capabilities and their feelings as a result of their own perceptions. Still, children cannot discriminate between their actual competencies and desired competencies. For this reason, unless children have been overly critiqued by adults, children tend to have high self-esteems but as children embark on Piaget's concrete operational stage and Erikson's industry versus inferiority stage, children's new awareness of other's perspectives leads children to develop a low self-worth (Berk, 2010).

In respect to an increase in representation, language, and self-concept, children undergo great strides in emotional development during the early primary years. Children can recognize the signs and causes of various emotions (Santrock, 2008). Children are not only grasping recognition of their own emotions, but they begin to acknowledge the emotions of peers and have even begun to engage in sympathetic gestures like hugging an upset friend. Furthermore, children in middle childhood are beginning to understand that more than one emotion can be felt simultaneously (Berk, 2010).

Empathy is a prevalent and essential part of social-emotional development during the early childhood years (Berk, 2010). Sympathy is when a child can relate or understand another's feelings, and *empathy* is defined as the ability to understand others' feelings and viewpoints and identify with that person's feelings and taking actions in response to the feelings of others (Berk, 2010; Frost et al., 2012). Ergo, frustration, aggression, and other problems decrease as empathy develop (Feshbach, 1978). Hoffman (1977) began writing about empathy over thirty years ago and claimed children show signs of empathy from birth. However, not until age six are children able to transform from egocentric to altruist. As children begin to develop empathy, they often begin to show caring gestures towards peers and adults in their environment (Hoffman, 1981).

A synthesized definition of social competence entails children exhibiting positive and caring behaviors towards others and can process social cues and respond in a productive and positive manner ensuring acceptance by peers and adults (Frost et al., 2012). Characteristics of prosocial behavior include perspective taking,

empathy, sympathy, friendships, conflict resolution, self-concept, and self-esteem. By providing rationales for why certain behaviors are inappropriate and harmful to others and scaffolding children through conflict resolution and problem solving, adults can provide support and guidance for children's social and emotional development. Social learning theorists advocate for adult modeling and guidance of social and emotional skills in addition to providing opportunities for children to foster these skills through play. The cognitive developmental theorists view children as active constructors of social emotional development through metacognition and awareness of moral conflicts and resolutions (Berk, 2010).

Although Piaget (1951) did not explicitly designate social development as a product of peer play, he believed children gained perspective taking abilities through peer play, which is essential to prosocial development and behaviors (Berk, 2010). Erikson (1982) asserted that make believe play allows children to gain social and cultural competence through role-playing as a means to understand cultural and societal expectations and norms. Vygotsky's sociocultural theory (1978) associated play as a medium for both social and cognitive development. Understanding social norms and rules, inhibiting impulsivity, and developing emotional and self-regulation blossoms as children practice by negotiating and setting up guidelines for make believe play and adhering to the guidelines throughout the play episode (Frost et al., 2012).

Supported by a multitude of pedagogical theories, children gain many social and emotional skills through play (Frost et al., 2012). Social play progresses through a four step process. Initially, children engage in nonsocial activity or solitary play

and then transition to parallel play as they play next to each other with the same materials, but do not interact. Children then advance to associative play wherein children converse and share materials while involved in separate activities. Finally, children engage in cooperative play or group play while participating in a shared play scheme (Berk, 2010; Frost et al., 2012).

The numerous studies on play and culture deem play as a universal activity, albeit play is carried out in different contexts with different purposes and different types of play throughout the world. Notably, when a variety of cultures become integrated into one setting it is important to keep in mind the influences of culture on play. Culture effects social development in a myriad of ways (Igoa, 1995). Misconceptions are sometimes made by teachers when cultural diversity is not taken into account. For example, Valdez (1996) gave the example of a teacher who tried to no avail to engage one Hispanic child in make believe play. In all actuality, the child found make-believe play to be silly and preferred to help the teacher with real tasks like cleaning. At home, the child helped with household chores and care of the younger siblings, skills nurtured in her culture.

In a collectivist society, group play enhances cooperation and collaboration, whereas an individualistic culture stresses autonomy and social development advances more slowly than in a collectivist society (Gardiner & Kosmitzki, 2011). Children from cultures that encourage more introverted personalities, feel a culture shock in school in the Western society that cultivates extroverted children (Igoa, 1995). Parents in cultures that values independence are less likely to provide toys and materials for pretend play. High quality interactions with adults in a positive

climate can increase children's social and emotional development. By the same token, a positive and supportive classroom environment conducive to enthusiastic and engaged learners can contribute to children's later motivation in school (Copple & Bredekamp, 2009).

Cognitive Development

The brain has increased to 90% of its adult weight by the time children enter first grade enabling children to tackle and master challenges and build knowledge and experiences to be successful cognitively and socially. The advance in brain development facilitates an increase in working memory and inhibitory control enhancing thinking and learning (Berk, 2010). As children in first grade are embarking on Piaget's concrete operational stage, conservation and reversibility in thinking, classification and seriation, and spatial reasoning allow mastery for a new realm of understanding our complex world. An increase in cognitive development launches play into a more complex level with roles assigned and rules being implemented (Santrock, 2008). Adults can augment children's development by incorporating games into the day in a more relaxed format. Play activities are integrated in project learning by providing choices and self-initiated opportunities (Frost et al., 2012).

Vygotsky's (1978) sociocultural theory illustrates how children learn through interactions with peers during play. Specifically, make believe play is a medium in which children can practice difficult tasks or skills and enables children to think at a higher level, increase attention span, and practice self-regulation skills (Copple & Bredekamp, 2009). Similar to Piaget's egocentric speech, Vygotsky's private speech

entails children talking aloud or to themselves as they map their thoughts and actions. Although Piaget believed that egocentric speech decreased with cognitive and language advances, Vygotsky believed private speech increase in function and complexity with age. Private speech enables children to work at a higher level by increasing attention, planning, recall, memorizing, categorizing, and self-reflection. With age and increase in skills, private speech transfers from talking aloud to whispers and eventually to internal thought (Berk, 2010).

Environment plays a critical role in children's cognitive development via thinking, reasoning, and problem solving (Santrock, 2008). Homes with a positive, stimulating environment and enriched educational toys and books, as well as lots of conversations with parents, lead to higher academic success. Inversely, homes lacking in toys and books or conversations lead to lower academic success. Children from low-socioeconomic homes tend to enter school as at-risk for academic failure. Adults can escalate the level of cognitive development through interactions with children during play experiences through scaffolding and prompting thought processes in addition to serving as a secure base for safe exploration (Berk, 2010).

When looking at cognitive and language development through the lens of Vygotsky's sociocultural theory, development appears different across cultures, yet there are still many similarities. Chomsky (as cited in Gardiner & Kosmitzki, 2011) stated that a person is born with an innate set of plans to acquire language that is similar across cultures and evident in the fact that all infants make similar babbling sounds. Sounds not native to their language are dropped, and the needed sounds for

their native language nurtured through family responses and scaffolding remains as they begin to construct words.

The early childhood years bring on an accelerated rate of development in language skills, hence establishing an effective means of scholarship in all areas of children's learning and development. Not only are children learning through negotiation and communication with themselves through private speech, but they also learn through interaction with more experienced and insightful peers and adults. Sociocultural theory views language as a vital tool for learning (Park, 2011). Vygotsky (1986) believed children's private speech persists throughout their lifetime and is an avenue for children to participate in higher level thinking by enabling children to predict, plan, problem solve, and remember. As children progress in development, their private speech becomes inner speech between the ages of three and seven. Furthermore, research has shown that children who utilize private speech have an advantage in gaining cognitive and social skills over children who do not utilize private speech (Santrock, 2008).

In summary, cognition is the course of developing knowledge, including higher level thinking skills such as synthesis, analysis, reflecting, evaluation, and problem solving. Language is the process utilized to communicate thinking and understanding. Noteworthy, culture is cultivated through interactions with other members and passed down from generation to generation, and diversity exists between and within each of the dimensions of the cultural context (Santrock, 2008). Therefore, it is important to be aware of majority and minority influences on learning when working with a diverse classroom of learners. Adults need to facilitate learning

safeguarding against a child who has a different perspective based on background knowledge or experience from merely agreeing with the majority out of peer pressure, whether real or imagined (Levine & Resnick, 1993). With this in mind it is important to remember that learning is situated within culture and social experiences (Gardiner & Kosmitzki, 2011).

Sociocultural Theory

Vygotsky (1978) was a constructivist indoctrinated in the idea that children construct their own understanding and knowledge through active participation in a task with guidance provided by adults or expert peers. All things considered, Vygotsky's theory is a social constructivist approach underscoring the social aspects of learning and development through interactions with peers, adults, and the environment. To better understand the triad in Vygotsky's sociocultural theory, each element is described in detail. Culture is defined as behaviors, beliefs, traditions, and values and can be further influenced by ethnicity, socioeconomic status, and gender. Ethnicity includes cultural heritage, race, religion, and language (Berk, 2010). Diversity exists between and within each of the dimensions of the cultural context.

Sociocultural theory (Vygotsky, 1978) illustrates that one evolves through negotiations with others as ideas are exchanged, thus improving children's ability to organize and communicate thinking and internalize learning. Cognitive development in children is strengthened through interactions within a cultural and through language (Dimitriadis & Kamberelis, 2006). Vygotsky's perspective of development is that it is a dynamic and interrelated process and children progress and regress erratically as they integrate experiences and language to organize and devise new

meanings (Dimitriadis & Kamberelis, 2006). Vygotsky (1987) differentiated between everyday concepts and scientific concepts and encouraged the integration of both for comprehensive learning. Everyday concepts are the infrastructure for learning scientific concepts. For example, an everyday concept would be a child's discovery of how to open and close a door. After a child has mastered this concept, an adult could introduce the scientific concepts of push and pull and scaffold the child to a deeper understanding by placing provocations in the environment that the child can push and pull in addition to a door. Through experimentation and play with materials in the environment, the child will be able to transfer this new everyday knowledge and scientific knowledge to other situations (Fleer, 2009).

Vygotsky (1986) defined zone of proximal development (ZPD) as the point children's background knowledge and experiences, although disorganized, enabled them to meet the adult's logical reasoning of a concept. Specifically, ZPD is the difference between the child's actual level of development and potential development through scaffolding with a more knowledgeable peer or adult. Skills and tasks that fall into a child's zone of proximal development are tasks too difficult for the child to complete alone but easily accomplished with guidance (Santrock, 2008). As adults scaffold children, they provide children strategies by building on children's current knowledge and experiences and providing guidance to help those master tasks by breaking the tasks down into smaller, sequential segments.

The amount of guidance or support provided by a more knowledgeable peer or adult through scaffolding depends on the child's needs and strengths and is alleviated as the child reaches mastery (Berk, 2010; Copple & Bredekamp, 2009).

Children replicate the dialogue in their private speech as they complete the tasks independently. Children's motivation is heightened when adults provide encouragement and positive feedback as children work through the task at hand. Vygotsky (1986) also regarded make-believe play as a tool for social and cognitive development. Through planning and following a predetermined set of criteria, children can safely act out and negotiate meaning and understanding of real life phenomenon independently or with peers (Berk, 2010; Frost et al., , 2012; Santrock, 2008). Make-believe play is a universal type of play among children from modern industrialized societies and cultivates cognitive, social, self-regulation skills, and executive functioning skills. Important to realize is that make-believe play should not be an addition to early childhood curriculum but integrated throughout the day (Bodrova & Leong, 2010).

Variations of sociocultural theory have emerged across many different disciplines. Across all the disciplines, social and cultural influences still have an impact on learning with the sociocultural theory framework. Although Vygotsky's (1978) sociocultural theory has gained much support during the past three decades and accentuates the role of cultural influences in children's learning, it does not account for some differences among cultures. For example, in some cultures children learn through careful observation in lieu of an adult or expert peer talking them through the process of a new skill. In Western cultures, middle socioeconomic families frequently engage in conversations focused on children's initiated activities, whereas children from tribal and village cultures spend their days alongside adults as they witness them working. Essentially, the purpose of the children in tribal and

village cultures tagging alongside adults as they work is to learn tasks through observation, enabling them to take on more adult chores early on (Berk, 2010).

Rogoff (1990), a theorist in the realm of sociocultural theory, built on Vygotsky's ZPD, explaining the lack of communication in some cultures during an apprenticeship in that learning can occur through observation by children of adults modeling tasks. Guided participation was coined by Rogoff to describe the shared learning experience through nonverbal and palpable experiences that enable children to become active participants in a reciprocal learning situation. Therefore, a child's development becomes an apprenticeship and dependent on the context and influence of peers and adults within the classroom and community. Similarly, Feuerstein spawned the term mediated learning experience to amplify sociocultural theory by emphasizing the importance of mediation by an adult or peer to help a child learn from experiences by bringing unconscious thoughts to the child's consciousness so as to become aware of one's metacognition during the whole process of the event or task (Edwards et al, 1998).

Many other theorists align with sociocultural theory and contribute to the sphere of education in relation to cultural and social influences. Dewey (1925) founded a laboratory school at the University of Chicago in an effort to connect research and practice. Gained through interacting with the environment, he (Dewey & Carmichael, 1956) believed knowledge was a tool for solving problems one faces in everyday situations. In his laboratory school, children worked collaboratively in authentic situations, both indoors and outdoors, making connections from the classroom to real life in the community and asserted the importance of social

interactions with experience in cognitive development (Dewey, 1925; Frost et al., 2012). Dewey (Dewey & Carmichael, 1956) stated that the group dynamics would affect the quality of education. In other words, and in congruence with Vygotsky, Dewey asserted that results of learning experiences greatly depend on scaffolding children from their zone of proximal development.

A proponent of project work, Dewey (1925) believed children could assimilate knowledge gained in one situation to help understand future situations and that the teacher's role is to provide guidance and not overshadow children's experiences (Marlowe & Page, 2005). In addition, teachers help children form connections between experiences and reflect on the meaning and purpose of experiences. Dewey's belief in learning as a democracy fostered the relationship between learning through social interactions. Additionally, Dewey's democracy and education connection nurtured all domains of learning, including moral development (Dimitriadis & Kamberelis, 2006).

Similar to Vygotsky and Dewey, Bruner (1996) advocated for the benefits of children's play through interactions with the environment with inquiry, experiments, and problem solving. In addition, Bruner viewed the teacher as a guide to children's learning instead of just dictating knowledge to children out of context (Marlowe & Page, 2005). Bruner (1996) viewed play as a vehicle for development in all domains, including cultural procurement. Correspondingly, his theory can be summarized as knowledge comes from experience. By the same token of constructivist theorists, Bruner was interested in how children learn, moreover how children negotiate and create meaning within a community. A child's culture and social background

provides a lens for how children interpret and understand experiences. Through discovery learning, children successfully gain knowledge through self-initiated activities and revelations (Marlowe & Page, 2005). However, children are reliant on past experiences and background knowledge. For this reason, it is important for teachers to be familiar with children's culture and experiences to inhibit misconceptions or misunderstandings by children (Dimitriadis & Kamberelis, 2006).

Sociocultural theory lends itself to a framework for current trends in studies and practices among educators and researchers in a multitude of disciplines. Sociocultural theory is a springboard for many strategies associated with the implications for the integration of social and cultural influences on child development. One concept closely related to sociocultural theory is situated cognition, or the idea that learning is specific to elements of a situation conducive to children building their own knowledge through direct interactions of their environment alongside others (Levine & Resnick, 1993).

Situated Cognition

Levine and Resnick (1993) strongly believed people did not learn by merely receiving information and that new knowledge was not merely placed into memory. Rather children and adults assimilate and accommodate the new understandings with previous knowledge and experiences. Adults can help children activate previous knowledge and experiences through scaffolding with objects, prompts, questions, or discussions (Resnick, 1985). Situated cognition is based on the constructivist approach to learning in which children build their own knowledge through direct

interactions with their environment (Brown et al., 1989), and children are enthusiastically engaged during the authentic activities (Fleer, 2009).

Resnick (1985) did not view cognitive skills as pre-existing. Rather he thought they developed in relation to a particular circumstance. Specifically, as one shifts to a new circumstance and encounters a new set of people, symbols, thoughts, and environments, one's thinking is reactive to and influenced by that specific situation (Edwards et al., 1998). Lave and Wenger (1991) referred to this process of learning as situated cognition as learning takes place in authentic contexts. Currently, schools are so preoccupied with preparing children for high stakes tests that learning is out of context and primarily a consequence of direct instruction pressuring children to memorize and recall (Mordechai, 2005). In short, America's education system forms a disconnect between learning and hands-on experiences (Brown et al., 1989).

Situated cognition falls under the sociocultural framework as learning is literally situated within an intricate social environment with contrasting background knowledge and experiences that culminate into a shared understanding (Levine & Resnick, 1993). Learning is more effective through hands-on experiences in the context of the situation. As with semantics of language, the meaning of a word is easier to comprehend in context. During a spelling bee, when children are unfamiliar with a word, they can ask the judges to use a word in a sentence. Learning out of context is equivalent to an adult telling a child about a hammer and how it is used without a hammer in sight. Similarly, a child receiving the same information about a hammer and then actually comes in contact with a hammer, he too does not actually

know when or how to utilize it appropriately. To be effective, learning should incorporate concepts into activities that are culturally relevant. The best analogy to describe the importance of incorporating all three elements of concepts, activities, and culture is an apprenticeship. Children learn through hands-on experiences with authentic materials under the guidance of an expert (Brown et al., 1989; Rogoff, 1990).

Rogoff (1990) facilitated a connection for situated cognition to learning in the classroom during interactions with adults and expert peers through the medium of her apprenticeship theory. Teaching skills in authentic situations enables children to generalize these skills to other appropriate contexts. Brown et al. (1989) compared teaching children skills out of context to math word problems. Word problems may contain real world problems, but they are out of context and children have a hard time transferring this information to other similar math problems, thereby often creating a math phobia. The apprenticeship theory allows children to learn skills similar to how people learn trade skills. A carpenter is not given a written set of directions on how to make cabinets and expected to independently complete the task without experience. Most people would agree that a picture of a cabinet in not the same as an actual cabinet. Instead, a carpenter learns how to make cabinets through hands on experiences in real-life situations with an expert cabinetmaker. In the process, the novice cabinet maker may make mistakes, but through scaffolding from the expert the novice learns from these mistakes. By utilizing real wood and tools and building real cabinets, carpenters internalize the skills of cabinetry through

apprenticeship and can transfer these skills to the next cabinet project (Brown et al., 1989).

Immersed in the culture and environment of an activity, problem-solving skills become proficient through trial and error in authentic situations just like the novice cabinet maker working alongside an expert cabinet maker (Rogoff, 1990). Children's background knowledge and experiences become validated as adults build on what children know through scaffolding to help them reach their zone of proximal development, an idea that is characteristic in sociocultural theory (Brown et al, 1989; Serpell, 2002). By allowing children to experiment and discover solutions on their own through trial and error, children create their own explanations for phenomenon. Furthermore, enculturated in authentic situations among relevant cultural and social aspects, children develop and internalize the vocabulary, skills, and confidence in a collective environment through negotiations and discussions. All things considered, situated cognition lends itself to precise knowledge and inherent understanding while hindering surface learning that can lead to misunderstandings (Brown et al., 1989).

Temperament

Temperament is a stable, genetic characteristic of children (Rothbart & Bates, 2006). Even though heredity plays a role in a child's temperament, the environment can influence how children behave depending on their reactions and regulations to environmental stimuli. As Turecki and Tonner (1985) stated, temperament explains the *how* of behavior, not the *why* of behavior. The two domains of temperament include reactivity and self-regulation. Reactivity entails the speed and strength, as well as, the physiological response to the environmental stimuli. It is a child's

arousability or impulsivity. Conversely, self-regulation is the physiological, cognitive, and behavior processes a child implements to manage reactions from environmental stimuli. These regulatory processes of regulation are referred to as effortful control. Therefore, temperament explains the individual differences in children's emotional, sociability, activity level, and attentional reactivity (Rothbart & Bates, 2006; Valiente, Swanson, & Lemery-Chalfant, 2012).

Rothbart and Bates (2006) configured three temperament types that are similar across developmental periods, races, and cultures. The first type, *undercontrolled,* is characterized with outgoing, active, distractibility, and impulsivity. Undercontrolled children have a difficult time participating in teacher directed and whole group activities. The second type, *resilient,* encompasses children who are assertive, self-confident, and social. The third type, *overcontrolled,* consists of children who are anxious, fearful, and withdrawn. Missed opportunities for social learning experiences arise often for overcontrolled children.

Vitiello, Moas, Henderson, Greenfield, and Munis (2012) explored the relationship between children's temperamental characteristics and adult behaviors through the concept of *goodness of fit*. Goodness of fit is defined as a child being able to meet the demands of external stimuli including the peers, adults, and the environment. How teachers interact with children and structure social and learning experiences for children can mesh or clash with a child's temperament leading to success or behavior challenges. Correspondingly, the results of the study illustrated that the type and degree of control an adult places on a child is a large proponent of goodness of fit. Boys deemed as having a difficult temperament had higher success

rates completing tasks when the adults took the permissive approach and allowed the boys to take the lead. Girls with difficult temperaments had far better success completing tasks when the adults took on a more controlling lead. Hence, it is important for teachers to be aware of children's different temperament traits and plan instructional strategies that are favorable for each child for optimal outcomes.

When teachers are aware of the different temperaments in the classrooms and adapt factors that interplay with a child's temperament to create a goodness of fit, children can be more successful in dealing with the demands of the classroom environment. The three factors that can be adapted to ensure a goodness of fit for children include:

1. Teacher-student interactions
2. Organization of space and time
3. Mode of instruction

Lane, Wellman, Olson, Miller, Tardif, and Wang (2013) explored how temperament affects theory of mind with preschoolers from the United States and China. Theory of mind is children's acknowledgement and appreciation of how others, think, feel, and behave. Their results indicated that if a child is aggressive or withdrawn, the child will lack theory of mind. Children with less reactive temperaments and better regulatory skills will fare better in social situations enabling them to learn from others. Rudasill and Rimm-Kaufman (2009) examined how temperament, specifically shyness and effortful control, and gender contributed to the quality of the teacher-child relationship in light of knowing high quality teacher-child relationships increase social and academic outcomes for children. Effortful

control, a child's ability to inhibit a reflexive or habitual response and perform and more appropriate response, was positively associated with quality teacher-child relationships.

Valiente et al. (2012) explored how effortful control, impulsivity, anger, or shyness could predict the type of relationships between the child and peers and adults. Vygotsky's (1978) sociocultural theory illustrates the importance of social engagement and participation with peers and teachers, yet temperament can play a role in the whether or not a child engages in this social experience. Impulsivity, anger, and shyness in high levels decreased engagement in social learning experiences and hindered the teacher-child relationship. In contrast, children with high effortful control exhibited prosocial behaviors, including moral skills, and engaged in learning experiences and formed strong relationships with the teacher. Therefore, effortful control can be a buffer for adverse temperament traits or classroom environments.

Stifter et al. (2009) conducted a study that investigated the moderating effects of effortful control on the relationship between temperament and moral emotions and moral conduct. In this study effortful control was further separated into two types of inhibition: delay inhibition and conflict inhibition. Delay inhibition is the ability to delay an automatic response for a more thought out response. Conflict inhibition is the ability to produce a new response instead of resorting to a familiar or habitual response. Inhibited children were able to internalize rules easier. Additionally, children with low effortful control were more aggressive, whereas, children with high effortful control exhibited more empathetic behaviors. Children who exhibit

little fear may need effortful control to control behaviors. Conversely, children who are fearful may need effortful control to overcome fears to help others.

Executive Functions

Early childhood years are important for the development of executive functions which are more important than IQ for school readiness (Shaul & Schwartz, 2014). Executive functions are defined as behaviors that enable children to successfully execute goal oriented behaviors by focusing on the task at hand and ignoring irrelevant external stimuli and suppressing habitual, impulsive, or inappropriate behaviors and actions (Garon, Bryson, & Smith, 2008). Diamond (2013) identified executive functions as being cognitively adaptable, flexible, and perseverant to complete tasks. However, executive functions are highly sensitive to mental and health illnesses and deficits including lack of sleep, loneliness, and lack of exercise. Knowing executive functions can be augmented with training and practice is significant for the field of early childhood.

The backbone of executive functions is attention as it is interrelated to all three components: inhibitory control, working memory, and cognitive flexibility (also known as set shifting) (Diamond, 2013). Beginning in the early childhood years, children can remain focused for longer time spans. In fact, children not only can focus during free play, but they have the ability to focus longer during structured task (Garon, Bryson, & Smith, 2008).

The first executive function component is inhibitory control, which enables a child to curb a behaviors, thoughts, or emotions. In other words, the child is able to delay gratification or suppress an inappropriate response for a more appropriate

response. Inhibitory control can constitute simple tasks like stopping when asked or more complex tasks like holding information in your mind and responding accordingly. Additionally, inhibitory control can involve hot tasks, those that are emotionally driven, or cool tasks that are void of emotion. Games like Simon Says, where a child can only do the action if it is preceded by "Simon Says" is a complex task. Children younger than four have a difficult time with complex tasks as many of them contain abstract rules. Engaging in games that involve simple and complex tasks builds executive functions in children (Diamond, 2013; Garon et al., 2008; Obradovic et al., 2012).

Working memory operates in conjunction with inhibitory control and is related to attention (Diamond, 2013). Beginning in the early childhood years, children are able to hold more items in memory and can store information passively or more complexly by updating or manipulating the information. Working memory enables a child to sequence events, follow instructions, think mathematically, reason, and make plans and decisions. Engaging in self-talk and parallel talk, teachers can model working memory and inhibitory control. Additionally, visual schedules, cues, and reminders are helpful in building children's executive functions (Diamond, 2013; Garon et al., 2008).

The final component of executive functions is cognitive flexibility, also commonly referred to as set shifting or attention shifting. Cognitive flexibility develops later during early childhood building on working memory and inhibitory control and entails being able to think outside the box and come up with alternative solutions to solve problems. Teachers can guide children's cognitive flexibility skills

through schedules, routines, and efficient transitions, in addition to providing children with specific feedback and avoiding abstract rules (Diamond, 2013: Garon et al., 2008).

Obradovic et al. (2012) noted that executive functions increase social and emotional well-being. Low socioeconomic status is associated with poor executive functions, yet can be mediated by more proximal processes including, parenting styles and home environment (Weibe et al., 2012). Executive functions can increase through training and practice (Diamond, 2013). Contextual influences that enhance executive functions are secure attachments, positive guidance, autonomy, school and family support system, creativity, physical exercise, mindfulness, and emotional understanding. Additionally, Obrodavic et al. (2012) found that Tools of the Mind (Bodrova & Leong, 1996) strategies (ie. visual aids, private speech, dramatic play, advanced planning and goal setting) benefit children's development of executive functions.

Shaul and Schwartz (2014) conducted a study to explore the impact of executive functions on school readiness over other variables. School readiness is comprised of child's competencies important for success at the time of kindergarten entry including language, comprehension, pre-reading and math, cognitive, and social and emotional skills (Liew, 2012). The results indicated that executive functions are significantly associated with an increase in pre reading and pre math knowledge. The impact of executive functions increases as a child's pre-academic skills increase.

Nature Versus Nurture

Temperament is an innate trait and executive functions are impacted by environmental stimulants or hindrances (Diamond, 2013; Thomas & Chess, 1977). A major detriment to stage theories is the assumption that development progresses in a universal manner. In reality, people come from various environments coupled with distinctive biological backgrounds. Thus, emerges the debate on nature versus nurture. Does hereditary (nature) effect development more than the environment (nurture) or vice versa? On the other hand, do nature and nurture work harmoniously in development? Some theorists believe that development is more strongly correlated to heredity, thus environmental factors will not change or influence development, whether positively or negatively. Theorists with more visionary beliefs feel that development is more fluid and plastic and can be enhanced with the appropriate environmental influences and experiences (Berk, 2010). Do executive functions impact temperament or do executive functions change temperament permanently?

Executive Functions and Temperament

Bridgett, Oddi, Lake, Murdock, and Machmann (2013) analyzed three studies to differentiate between executive functions and effortful control. Effortful control is associated with behaviors and temperament. Executive functions have been associated with more cognitive and neural processes. Whereas effortful control is quicker and automatic, executive functions are slower and more deliberate. Executive functions and effortful control overlap conceptually with attention and inhibitory control, in addition to self-regulation being essential for both constructs. Temperament and effortful control are hereditary and appear early in life yet they are

influenced by environmental stimuli and maturation (Bridgett et al., 2013:Conway & Stifter, 2012; Liew, 2012). Wolfe and Bell (2007) conducted a study to investigate age related differences in working memory and inhibitory control (WMIC), also referred to as effortful control. Associations were found between cognition and temperament, which were moderated by age. Executive functions appear later during the early childhood years and can be enhance in later years through training. Both effortful control and executive functions have been linked to academic success including achievement, regulation of emotion, inhibition, and less negative effect (Bridgett et al., 2013; Conway & Stifter, 2012; Liew, 2012).

Moral Development and Empathy

Moral development first becomes evident as toddlers and preschoolers begin to engage in conversations during social interactions alluding to their perceptions of right and wrong (Thomas, 2005). Across many cultures, children develop reasoning skills, understanding of rules and expectations, as well as a sense of justice. In the early years, morality is shaped by external factors such as adult control or societal expectations, but eventually children develop an intrinsic motivation for morality (Berk, 2010). Literature often place Gilligan and Kohlberg as opposing forces, however, the two moral theorists are not that different (Jorgensen, 2006). Socialization is an important element in moral development in that it enables children to conform to the norms of their culture and society and internalize by morphing their own values and beliefs into these expectations. A child's morality can be gauged based on three aspects: observed behavior, emotion of guilt, and tracing a child's judgment. Kohlberg (1981) devised his stages of moral development based

on a research study in which he introduced dilemmas to children and aimed to understand how each of the three aspects is utilized when a child chooses a solution for the dilemma.

Kohlberg (1981) believed that moral judgment was universal and applies to all situations based on values. His theory has been criticized for not being culturally sensitive. In the 1950s, Kohlberg did a study with adolescents around the world and found that his theory of stages was culturally diverse, but the rate at which children moved through the stages varied across cultures. He found his stages to be universal or true to all societies and did not vary from culture to culture as the ethical relativist believed. Kohlberg's moral development consists of three levels and six stages, and he developed 30 aspects in life that people have in which to make moral decisions (i.e., telling the truth or lying depending on the situation). Stage one, the pre-conventional level, deals with rules in relation to rewards and punishment. Stage two, the conventional level, deals with social conformity. Stage three entails universal morals, including institutional morals as contained in the Constitution and obligations like love and respect.

In congruence with sociocultural theory, Kohlberg (1981) believed nature and nurture interact to foster moral development. For the most part, Kohlberg's stages of moral development correlate with Piaget's stages of cognitive development (Thomas, 2005). Lags may appear between cognitive and moral development because Kohlberg's (1983) stages are interrelated in that children may use more than one stage to make a decision, as well as, invariant, in that people must go through the stages in sequence. Even though some children may be able to reason at the highest

level, moral decisions are usually based on the lower stages. Although one may have the ability, he or she does not have the will. For example, a child may lie even though he knows it is not the right thing to do, but he just does not have the will to tell the truth (Thomas, 2005).

Kohlberg's (1981) concept of just community is a means for socialization, allowing children to see others' perspectives and gain sympathy through conflict resolution and role-playing. In the classroom, when a child is upset by another child's actions, conflict resolution can be implemented by going through a process wherein the upset child tells her version of the story then the other child tells her version and collaboratively the two children discuss solutions. If a problem situation keeps arising, adults and/or children can role play the situation and discuss feelings and solutions to the problem. Similar to Piaget's thoughts about equilibrium and Vygotsky's (1986) idea about scaffolding, group discussion can help children grow socially and emotionally. Kohlberg's just community provides a framework for creating a democratic classroom in which children are not told what is right or wrong but can debate through role playing and discussions, making the experience more relative and intrinsic (Devries & Zan, 1994; Thomas, 2005; Yuksel, 2005).

Gilligan (1982) introduced her theory on moral development and, although it conflicted with Kohlberg's view, his theory was the catalyst for her theory. As part of Kohlberg's staff, Gilligan interviewed 144 participants by pairs (one female and one male) on moral decisions. She found that females were not subordinate to males based on Kohlberg's stages. Instead, males and females had different moral thinking: males focused on justice and equality, whereas females focused more on compassion

and social issues. Therefore, Gilligan concluded that Kohlberg's stages are gender biased. Yet, she was in accordance with the congruence of Kohlberg's stages of moral development and Piaget's stages of cognitive development. As they move through the stages, they begin to balance their own needs with concern for others' (Jorgensen, 2006).

Gilligan (1982) studied the moral development of girls and boys from infancy through adolescence. In the early childhood years of a child's life, a parent's perception of gender affects gender differences in development. In middle childhood, the focus of justice in boys and caring in girls becomes evident during a child's play and games. Boys are very attentive to rules and do not change rules during play, whereas girls are more accommodating to others' needs and will change the rules to meet their needs. In adulthood, women continue to focus on caring and boys on justice. However, boys have the ability to empathize and girls have the ability to see situations from a justice perspective when needed. Although she has yet to find biological and cultural differences in the justice voice or care voice through research, Gilligan found both of them equally important. Her model is appropriate to the real world in its implication for constructive child-rearing practices. Gilligan brought this aspect into the realm of moral development opening the door to many future studies on the relevance of not only gender differences, but of cultural differences as well (Jorgenson, 2006, Thomas, 2005). In hindsight, it appears that Kohlberg and Gilligan did have a love/hate relationship. Still, the only major difference in the two was a man's less emotional stance and a women's more emotional stance. Altogether, they saw eye to eye in moral development not just being a stage theory, but aligned more

with sociocultural theory in light of the social and cultural context of moral development (Jorgensen, 2006).

Moral development during the early childhood years usually falls under the domain of social and emotional development. Creative Curriculum (Teaching Strategies, 2013), a widely implemented program in many early childhood settings, includes aspects of moral development in the social-emotional objectives. More specifically, objective one emphasizes a child being able to regulate own emotions and behaviors, objective two entails a child being able to establish and sustains positive relationships and respond to emotional cues of others, and objective three strives for children being able to participate cooperatively and constructively in group situations and balance own needs and rights with others' needs and rights (Teaching Strategies, 2013). The National Education Goals Panel (Kagan et al., 1995) framework labeled social/emotional development as an essential learning domain for school readiness. Inhibitory control is included as a variable in the social/emotional domain in conjunction with externalizing and internalizing behaviors.

An important aspect of social and emotional development during early childhood is empathy development (Frost et al., 2012). Hoffman (as cited in Kristjansson, 2004) stated that children show signs of empathy from birth. However, not until age 6 are children able to show empathy without any egocentricism. Empathy is defined as the ability to not only understanding the feelings and viewpoints of others, but also to be able to respond through language or gestures to calm or help the other child (Frost et al., 2012). Embodied within moral

development, empathy decreases frustration, aggression, or problems as a result of the children understanding perspectives of others (Feshbach, 1978).

Humane Education

Ghandi stated (People for the Ethical Treatment of Animals, n.d., para. 3), "The greatness of a nation and its moral progress can be judged by the way that its animals are treated." An individual's empathy towards animals is believed to be reflective of an individual's empathy toward people. Research exploring the relationship between human and animals has become increasingly prevalent over the past 40 years (Thomas & Bierne, 2002). Theorists have been communicating the importance of children interacting with more than just peers, adults, and the environment. Froebel (1902) and Gardner (1999) extended the classroom environment to include animals and the outdoors and advocated for play with animals and plants. Froebel felt that nothing was more special than children being able to interact and study animals, plants, and the outdoors (Frost et al., 2012). Gardner (1999) added an eighth intelligence to his multiple intelligences: the naturalistic intelligence. Gardner's eighth intelligence encompasses knowledge and appreciation of animals, plants, and other elements of the outdoor world. He noted how universally all cultures value one's ability to not only recognize but also classify species of his or her environment whether it is a beneficial species or a harmful species to humans or the environment.

During the last three decades, research exploring interactions between human and animals has become increasingly ubiquitous beginning with Vockell and Hodal's (1980) investigation of the effects of humane education on children's attitudes

towards animals. Thomas and Beirne (2002) defined *humane education* as gaining knowledge about human, animal, and consumer rights, in addition to environmental care. Weil (2004) extended the definition of humane education by identifying four elements of a superior humane education program. First and foremost, children should be provided with the skills, knowledge, and strategies to make decisions as citizens and understand the consequences of their choices. Second, a quality humane education program should foster curiosity, creativity, and critical thinking to increase children's skills in problem solving. Next, the humane education program should build reverence, respect, and responsibility. Finally, a productive humane education program should provide information for children to make choices that not only benefit themselves, but also other people, the environment, and animals. Vockell and Hodel (1980) explored the effects of humane education on children's attitudes towards animals. Many people who exhibit violent behaviors toward other people have shown a history of violent behaviors toward animals. Some studies even show that empathy and positive attitudes toward animals cannot only be taught, but are also generalized towards people (Ascione, 1992; Daly & Suggs, 2010).

Throughout history, animals have played many roles in the lives of humans with predominate roles including teachers, healers, and companions (Esposito et al., 2011; Kurdek, 2008; Melson & Fine, 2006). As teachers, animals have been used in many stories, fables, and proverbs that teach moral lessons. Animals are becoming recurrent visitors in hospitals, schools, and nursing homes as a means of pet therapy, which affirms their roles as healers. Further, dogs are trained to assist and comfort

people who are blind, have post-traumatic stress syndrome, and other health risks or disabilities, including learning disabilities.

The benefits that emerge from the human-animal bond are becoming an increasingly hot topic in many fields, especially education and medicine. In 2009, the National Institute of Health (NIH) hosted a multitude of meetings to bring together many leading experts and researchers in the field of human-animal bonds in an effort to increase and improve research in this area. The NIH stated that research on human-animal bond has shown many benefits across a variety of areas of development and treatments. One interesting finding reported by NIH was that walking a dog leads to more conversations and social encounters, reasoning it is hard to walk a dog without someone wanting to pet the dog or ask questions. NIH (2013) also discussed the importance of pets for children as a means of comfort and empathy development.

Humane Education and Social and Emotional Development

Humane education is a phenomenal resource in social and emotional development for children and research including humane education has shown a high success rate for substantial improvements in children's social and emotional development skills (Aguirre & Orihuela, 2010; Anthony & Beck, 2000; Ascione, 1992; Ascione & Weber, 1996; Daly & Suggs, 2010; Tsai & Kaufman, 2009). Humane education not only encompasses the humane treatment of animals, but has grown to include social responsibility, informed choice, environmental care and protection, and human rights. Fundamentally, the goal of humane education is to foster moral values in children and adults (Daly & Suggs, 2010). In an effort to

understand the importance of humane education in schools, Thomas and Bierne (2002) addressed the need to understand the social and emotional dimensions of animal abuse. Inappropriate role models, victims of abuse, peer pressure, trauma, anger, and suicidal tendencies are a few triggers for animal abuse. Empathy can be taught, and humane education is a great resource for empathy and moral development.

It is well established that people who exhibit violent behaviors towards others have shown a history of violent behaviors towards animals (Ascione, 1992; Daly & Suggs, 2010). Nevertheless, previous studies show that empathy and positive attitudes towards animals can not only be taught, but are also generalized towards people illustrating the capacity of humane instruction in breaking the cycle of aggressive and abusive behaviors in both children and adults (Thomas & Bierne, 2002). Moreover, many studies validate the transferability of teaching children empathy and compassion for animals towards humans (Ascione, 1992). The few studies that explore the benefits of humane education on children's attitudes, empathy, and relationships to animals have been promising. Thus, the findings from these studies have prompted organizations such as NIH to call for further research exploring the contributions of human-animal interactions on development, therapy, and health (NIH, n.d.; NIH, 2009).

Humane Education and Executive Functions

Melson (2003) investigated the importance of a child's interaction with animals on perceptual, cognitive, and social and emotional development. Observations of children interacting with animals in their natural environment are

not common in research even though a child's relationship with animals can be so beneficial. To emphasize, the American Veterinary Medical Association (1997) reported that 70% of households with children younger than six years old have pets. Moreover, Humane Society (2014) stated pets are present in 62% of American households. Melson (2006) found evidence that companion animals sustain attention and motivate children's curiosity. Because animals are so unpredictable, they are significant catalysts for cognitive disequilibrium, which provides learning opportunities for children. When children are emotionally attached to what they are learning about, they are more intrinsically motivated, thus leading to optimal learning experiences. Animals provide social support when children are sad, angry, or happy, therefore providing knowledge of nurturance as children are given the experience of learning about caring for another being (Melson, 2003).

Gee, Church, and Altobelli (2010) examined both typically developing and developmentally delayed preschoolers while completing a cognitive task in the presence of a dog, stuffed dog, or a human. The group that performed the task in the presence of a real dog completed the task with fewer errors and with a quicker completion rate than in the presence of a stuffed dog or human. This could be because the presence of a dog during stressful situations has led to a lowered arousal of children (Havener, Gentes, Thaler, Megel, Baun, Driscoli, & Agrawal, 2001). Children's interactions with dogs are both beneficial and therapeutic (Sprinkle, 2008).

A dog present in the classroom setting has shown improved social competence and empathy, as well as increased social interactions between peers.

Additionally, children were able to focus more on directions when a dog was present to serve as a model. Studies have associated an increase with attention, speed, and motivation when a dog is present (Gee et al., 2009). Gee et al. (2010) investigated how children completed memory tasks in the presence of a dog and found that children were able to follow instructions, focus more, relax, and complete tasks with fewer errors than children not in the presence of a dog. In other words, the presence of the dog was associated with an increase in working memory. Building on children's natural curiosity with animals, studies need to explore how children's interactions with live pets can increase executive functions and empathy, as none of the mentioned research integrated pets as part of the study.

Synthesizing the Literature

In a NIH conference held in 1987, researchers and educators from a variety of disciplines concluded that children's interactions with pets could lead to development in all domains and should be further researched. Many child development theories could be utilized as a framework for understanding the implications on development of a child's interaction with pets. Esposito et al. (2011) listed theories of cognitive development, theory of mind, ecological systems theory, attachment theory, and sociocultural theory of development as possible frameworks for research on the effects of children's interactions with animals. Through curiosity and engagement with pets, children's cognitive and emotional development can be enhanced. Pets are usually embedded within the social and cultural context of an environment, thereby supporting sociocultural theories including Bronfenbrenner's ecological framework (Esposito et al., 2011).

An untapped resource in social and emotional development for children is humane education. Although humane education shows a high success rate for substantial improvements in children's social and development skills, the research is scant. A noteworthy finding in research conducted previously is that empathy toward animals can be transferred to empathy toward humans (Ascione, 1992; Daly & Suggs, 2010). As Gandhi (PETA, n.d.) stated, one can deduct how great a nation is in terms of morality by determining how well it treats its animals. Gandhi's prophetic statement is quite insightful, alluding to a common finding emerging in research of humane education: an individual's empathy toward animals is transferrable to an individual's empathy toward people. Even with the small amount of research on the effect of humane education, studies show the potential of implementing humane instruction in breaking the cycle of aggressive and abusive behaviors in children and adults (Thomas & Bierne 2002). In addition, many findings demonstrate that teaching children empathy and compassion for animals can be transferred to empathy toward humans (Ascione, 1992).

In an endeavor to analyze the ramifications of humane education on children's attitudes, empathy, and relationships to animals, Ascione (1992) conducted an extensive year-long research project with first, second, fourth, and fifth grade children. He designed a study that included an experimental group and a control group for each grade level and appended gender and experience with animals as additional variables in the results. The experimental group engaged in 40 hours of humane instruction integrated into the existing curriculum over a year. The control group received little or no humane education. Significant gains in the experimental

group's empathy and positive attitudes toward animals emerged compared to that of the control group. In a one-year follow up, 80% of the original participants were reevaluated in terms of empathy and positive attitudes towards animal. The experimental group continued to exhibit greater amounts in each area compared to the control group (Ascione & Weber, 1996).

Aguirre and Orihuela (2010) conducted a quantitative study with 276 first graders in a rural school district in Mexico. The study spanned a one-week period with one hour a day devoted to instruction in animal welfare topics, covering the humane treatment of animals and optimal living conditions for them. The children's knowledge of animal welfare increased 78%. Although gains in empathy were evident, the preceding studies incorporated humane education outside of authentic experiences, therefore lacking situated cognition. However, through discussions, children were able to interact in a social and cultural context. Because not all teachers have access to real pets, it is difficult to provide hands-on situated conditions for children to gain empathy through human-animal interactions. Tsai and Kaufman (2009) tested the benefits of a computer-simulated animal via a hand-held virtual pet video game on children's empathy and attitudes toward animals. The study showed a significant increase in empathy and humane attitudes toward pets. Children formed a close bond with the computer-simulated animal and considered it a real pet.

Some teachers utilize inanimate objects that resemble pets such as stuffed animal as their classroom pets. Likewise, one research study focused on children's relationship with a robotic pet. Kahn, Perez-Granados, and Freier (2006) found a

robotic dog could be used as a tool for developing children's empathy. Children even referred to the robotic dog as a real dog and treated it with care and empathy. Even with a stuffed or robotic animal as a class pet, measures could be taken to connect the experience to home and school. The stuffed animal could be sent home each weekend with a child. The families could journal about the pet's visit and include drawings or pictures of the experience for the child to share with classmates the following week. Pictures and children's quotes could be included in a weekly newsletter to inform families of the social emotional skills that have emerged in relation to the pet enabling parents to have discussions with children at home.

Similar to the sociocultural theory and Vygotsky's (1978) concepts of scaffolding in a child's zone of proximal development, explicit instruction in conjunction with hands-on experience, in depth discussions, and reflection increases children's understanding of how to care for animals, while enhancing children's development of empathy and compassion (Aguirre & Orihuela, 2010; Ascione & Weber, 1996; Meadan & Jegatheesan, 2010; Melson, 2003; Nicoll & Samuels, 2008; Tsai & Kaufman, 2009). Humane education should evolve as an everyday experience and mimic an apprenticeship in order to be successful. In addition, children need guidance in understanding that animals, like people, have emotions and feel pain, suffering, and deprivation (Thomas & Beirne, 2002).

Meadan and Jegatheesan (2010) referred to children's intrinsic motivation and fascination with animals. Rud, Anthony, and Beck (2000) concurred with the notion of children's natural appeal for animals by pointing out that *dog* and *cat* are two of the most looked up words by children in the encyclopedia. Children's social

and emotional development can prosper as parents and teachers build on children's interest and background knowledge of animal care and treatment. For instance, an investigation with a classroom pet or helping with the care and responsibility of a home pet would allow children to internalize concepts through child-centered, hands-on learning experiences. The variety of modalities that emerge during experiences with classroom pets enables children to transfer these skills to interactions with other adults and children, decreasing challenging behaviors (Meadan & Jegatheesan 2010). Henceforth, coupling children's natural enthusiasm for pets with situated learning is a high quality process of implementing humane education. Adults can observe and listen to children as they interact with classroom pets or even discuss stories about animals to determine their current level of understanding or misunderstandings and their zone of proximal development of humane education.

Building on the need for children to enhance their social emotional skills and children's innate captivation with animals, Meadan and Jegatheesan (2010) introduced a *Pyramid Model* to promote social development in a child-centered way. Level one focuses on building positive relationships with children and families through exploration and experiences with the classroom pet. Classroom pets become a vehicle for building a community by involving children in discussions on the responsibilities and care of the classroom pets. Teachers and children can keep families informed on what the children are learning about the classroom pet in terms of responsibilities, care, as well as nonverbal and verbal cues of the classroom pet. Newsletters and documentation containing pictures and quotes from children can

paint a clear picture for parents about the learning taking place and the relationships children are developing.

Level two entails prevention and supportive environments and teaches children the importance of routines in relations to animals (Meadan and Jegatheesan 2010). Discussion on the importance of responsibilities, rules, and routines for pets can infiltrate to the importance of responsibilities, rules, and routines for children. Working collaboratively to ensure proper interactions with pets can transfer to the benefits of cooperative interactions with each other.

Level three includes social and emotional strategies to build children's social skills, specifically in making friends, recognizing feelings, and solving problems (Meadan & Jegatheesan, 2010). Teachers and parents can foster children's social emotional development by modeling skills and allowing children to practice how to be caring and compassionate toward the animals. The skills children learn through interactions with the pet will transfer to their interactions with peers. Empathy will emerge as parents and teachers talk about the differences between humans and animals, including the discussion of how animals have feelings too. Other skills that emerge through interactions with a classroom pet include problem solving, communications, and friendship.

Despite its simplicity, a powerful tool for increasing children's development in empathy is through stories that include animals (Karniol, 2012). Building on children's natural fascination with animals, stories can be utilized to cultivate in depth and reflective discussions around the character's moral dilemmas and relate them to their own lives. In one study, Karniol (2012) explored how children respond

to stories with characters that are animals. Children would listen to a story about an animal. The reader would stop reading either before the problem arose or after the problem was resolved. Discussions to elicit children's empathic understanding took place, and children were asked how they would respond or how they thought another child would respond to the problem. Results showed that children do in fact become aroused more when hearing a story about animal versus a human and were able to emphasize with the animal. Merely incorporating children's books with animals as characters and engaging children in discussions on moral dilemmas can enhance children's empathy and caring in both home and school. Through discussion, children can express what they would do in the character's position and further brainstorm how they can implement the moral element in theory own lives can help children connect the story to real life situations (Lake, 2001).

Even though sociocultural theory is usually not applied to moral development, Tappan (2006) believed sociocultural theory could explain the dynamic process of moral development. Based on the work of three theorists, Wertsch, Gilligan, and Kohlberg, Tappan (2006) identified sociocultural theory to describe moral development in terms of mediated action, or agents within a situation, using culturally relevant tools or means to carry out moral actions. Tappan described how both Kohlberg's and Gilligan's perspectives on moral development align with sociocultural theory in that through real-world experiences, children can master moral dilemmas within their zone of proximal development with scaffolding from adults or even peers.

Conclusions

A multitude of theorists including Vygotsky, Piaget, Dewey, Froebel, Gardner, and Bruner are well known for their beliefs in the benefits of children's experiential, real-world learning experienced within their natural environment as the basis for all learning and development. Humane education is becoming informed with animal rights, but also environmental conservation, consumer rights, and human rights. In and of itself, humane education lends itself to a variety of learning domains. Even with the small amount of research on the effect of humane education, many studies show the potential of implementing humane instruction in breaking the cycle of aggressive and abusive behaviors in children and adults and building social and emotional skills (Thomas & Bierne, 2002). Children have an innate curiosity about their environment, nature, and animals. Henceforth, humane education is a valuable mechanism for fostering enthusiasm and engagement and consequently knowledge (Louv, 2005; Sobel, 2008).

Children's interactions with a pet in a classroom setting corresponds with Vygotsky's (1978) sociocultural theory in that learning is embedded in the social and cultural context of the child's environment along with negotiated learning experiences with peers and adults in relation to the care for the animal. Furthermore, humane education aligns with Levine and Resnick's (1991) situated cognition as children build their own knowledge through direct interactions with their environment (Brown et al., 1989). Therefore, hand- on experiences interacting with a classroom pet amongst peers and a more knowledgeable adult could enhance social and emotional development and possibly executive functions.

In a time when the focus of education is turning to preparation for high stakes testing, approaches to learning are influenced by standards and not wise practices that are developmentally appropriate or productive for children (Flannery, Quinn, & Ethridge, 2006). Vital skills pertinent to life-long success including executive functions and social emotional development is being put on the back burner although moral development needs to play a more dominant role in curriculums. Sociocultural theory provides a vehicle for appropriate and relative learning opportunities for children within their social and cultural environment across home, school, and the community (Resnick, 1985). Likewise, situated cognition recognizes children need hands-on active learning experiences in which they learn through discovery and experimentation while adults provide the right amount of scaffolding.

A child's temperament not only can affect cognitive achievement but also social and emotional achievement depending on whether or not the classroom environment provides a goodness of fit between the child and the environment (Vitiello et al., 2012). Executive functions go hand- in-hand with temperament in relation to effortful control (Bridgett et al., 2013; Conway & Stifter, 2012; Liew, 2012). Additionally, executive functions have been linked to school readiness and later success in overall well-being (Diamond, 2013). Humane education aligns with sociocultural theory in that it combines cognitive processes, social interactions, and cultural practices (Weil, 2004). Opportunities for situated cognition designed to meet the needs of the diverse temperaments represented in the classroom to occur as children interact with classroom pets and learn care and handling procedures with adult and peer guidance. Humane education can be integrated throughout the day and

form a bridge between home and school providing a comprehensive and effective means for the development of executive functions and social and emotional skills.

Chapter 3: Methodology

Following Vockell and Hodal's (1980) call for more research on human-animal interactions, the NIH (1987) hosted a conference portraying the health benefits of pets. In spite of the increasing awareness of the implications of human-animal interactions for developmental impetus and therapeutic intervention, research on this topic remains sparse. Correspondingly, the National Institute of Child Health and Human Development (NICHD) entered into a public-private partnership with a corporation to provide funding for a competitive research grant program. The goal of the research grant program was to establish a more solid research base on how animals impact the lives of children ranging from children's attitudes towards animals and relationships with animals and what this entails for social development, emotional development, health, and therapeutic treatments (NIH, 2012). The development of this research grant program emphasizes the growing need for more research in the realm of humane education, especially involving HAI.

The majority of research studies examining the effect of animals on children's development constitute quantitative studies implementing humane education elements into the existing curriculum of children beginning in first grade but concentrating on middle childhood and later years (Aguirre & Orihuela, 2010; Ascione, 1992; Ascione & Weber; Nicoll & Samuels, 2008; Tsai & Kaufman, 2009). Moreover, limited studies have integrated live animals into investigations involving the development of children (Beetz et al., 2011; Gee et al., 2007; Gee et al., 2010; Kahn et al., 2006; Karniol, 2012; O'Haire, McKenzie, McCune, & Slaughter, 2013).

Interestingly, two studies surveyed teachers in an effort to understand the prevalence of pets in the classroom, how these pets were utilized in the classroom, and the teacher's attitudes to having pets in the classroom (Daly & Suggs, 2010; Rud et al., 2000). Responses predominantly alluded to the benefits of pets whether or not teachers had classroom pets. Of the classrooms comprised of classroom pets, teachers stated pets not only increased empathy, social, and language skills, but also enhanced a multitude of other learning domains including writing, language, and science.

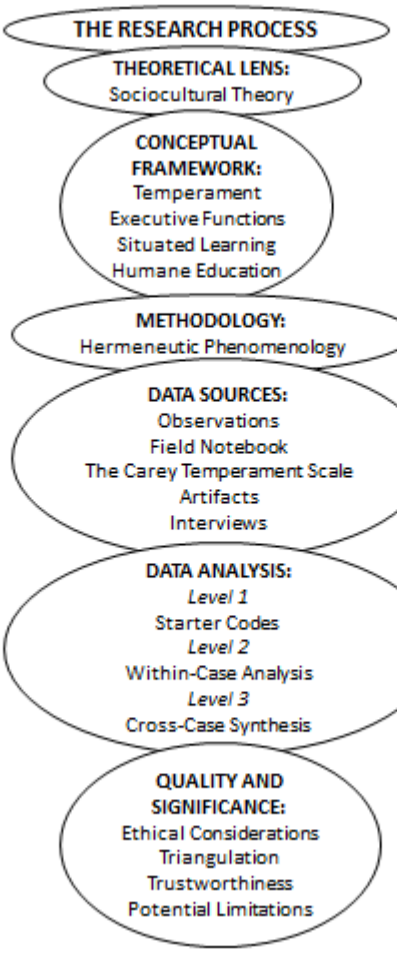
The early childhood years are vital in relation to development in all learning domains, including social, emotional, and cognitive (Diamond, 2013; Obradovic et al., 2012; Weibe et al., 2012). An increase in attention and working memory beginning at age three brings on many opportunities to enhance executive functions during early childhood (Shaul & Schwartz, 2014; Weibe et al., 2012). In contrast, executive functions are negatively affected by lack of social, emotional, and physical health including stress, lack of sleep, loneliness, and lack of exercise (Diamond, 2013). A barrier to stressors in a child's life and a support in building executive functions could be the presence of a dog. During cognitive tasks, the presence of a dog has been associated with an increase in children's motivation, focus, calmness, and memory (Gee et al., 2010).

Across multiple disciplines (e.g. medical, psychology, education) a call for a more complete understanding of the benefits of HAI on children's development amalgamated with a more recent understanding of the significance of executive functions and social and emotional skills in school readiness (Diamond, 2013; NIH,

2012). For those reasons, justification was provided for my study exploring and describing the integration of situational learning experiences on children's learning outcomes specifically executive functions in relation to children's play with animals in the classroom (Diamond, 2013). The purpose of this chapter is to describe the research process that was utilized in this study (Figure 3). First, the motivation for culling a qualitative methodology is examined followed by related studies to support this approach. Next, a deliberation will depict the appropriateness of hermeneutic phenomenology as the research design for this study. Finally, specific methods for data collection and analysis will be chronicled, as well as potential limitations. Each phase of this chapter will reflect the theoretical lens of sociocultural theory and align to the conceptual framework and research questions.

Figure 3

Advanced Organizer of the Research Process



Qualitative Methodology

The vast majority of previous research exploring the effects of humane education programs constituted quantitative research and established a cause and effect relationship between humane education and empathy, as well as positive attitudes towards pets (Aguirre & Orihuela, 2010; Ascione, 1992; Ascione & Weber, 1996; Nicoll & Samuels, 2008; Tsai & Kaufman, 2009). Similarly, research emerging in more recent years examining the presence of a dog on children's cognitive and emotional skills involved quantitative methodologies (Beetz et al.,

2011; Gee et al., 2010; Gee et al., 2007). I implemented a qualitative study to obtain an in-depth understanding of the social and cultural environment of the classroom in relation to the phenomenon of children's play with classroom pets via situated learning situations.

Richards and Morse (2013) highlighted the gravity of the interrelationship between the research questions, methods, and results. The current study aimed to understand the lived experience of the participants and comprehend the phenomenon of situated learning experiences involving classroom pets in a more in depth and exhaustive manner, aligning with qualitative methods. Additionally, Klehr (2012) noted focusing on the authenticity, yet complexity, of the classroom environment elicits an intuitive, integrated, and adaptable path characteristic of qualitative research. Wasser and Bressler (1996) eloquently tied the social nature of qualitative research to sociocultural theory through the *interpretive zone.* The interpretive zone of qualitative research refers to the co-construction of knowledge. Working closely with Christie, the classroom teacher, through weekly collaborations reflecting on past experiences and developing future situated learning experiences that align with the individual needs of the children coordinate with the social nature of qualitative research.

Eisner (1998) described six features of a qualitative study. The current study aligned with Eisner's six features in numerous ways. First and foremost, qualitative research is naturalistic, occurring in the child's natural environment allowing researchers to obtain a realistic picture of everyday occurrences. In this context, children are actively constructing knowledge through hands on experience with the

classroom pet while interacting with peers, adults, and the environment. The second feature of qualitative research is the idea that the researcher is a pivotal instrument in the data collection and analysis process through first-hand experience and cognizance of the situation as a participant observer and co-collaborator in planning. The third element is the interpretive character of qualitative research in trying to explain why something occurs and making meaning from this situation. The fourth feature is the researcher's voice in the study and analysis versus a neutral standpoint characteristic of quantitative research. The fifth feature of qualitative research is attention to details, and the sixth feature is qualitative research's continuity and perceptiveness. Therefore, qualitative research is fundamental in gaining a deeper understanding of children's behaviors during interaction with an animal in the natural setting of their classroom.

Bazely (2013) emphasized the importance of a conceptual framework to organize research endeavors. Therefore, the conceptual framework for this study embraces the idea that all learning is influenced by social and cultural experiences which promote learning mirroring an apprenticeship in which a more knowledgeable adult or peer works collaboratively within the child's zone of proximal development. Hence, scaffolding the child during situated learning experiences involving humane education incorporating classroom pets correlated with children's temperaments with the intention of enhancing executive functions (Resnick, 1985; Rogoff, 1990). Furthermore, to navigate the research study along criteria of the conceptual framework, the following research questions were utilized:

1. What is the nature of the lived experiences for the children during interactions with the classroom pet?
2. How are children's executive function traits being used during interactions with classroom pet?
3. How does children's temperament impact situated learning experiences with the classroom pet?

Related Studies

The purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments while describing the teacher and children's lived experience through a sociocultural lens. Despite the past majority of research examining children's interactions with pets consisting of quantitative research methods, literature exists on qualitative research delving deep into the lived experiences of children in the classroom during play and social interactions. Two qualitative studies explored children's play through a sociocultural theory. Park (2011) analyzed children's perspective of racial and ethnical differences through a sociocultural lens. The second study not only utilized a sociocultural theory lens, but only integrated situated learning experiences. Fleer (2009) investigated the differences between free play and purposeful play designed with situated learning experiences incorporating scientific concepts. O'Haire et al. (2013) utilized a quantitative methodology that focused on situated learning experiences with a guinea pig, and they found associations between the learning experiences and social development. Specifically, the group participating in the animal-assisted activities with the guinea pig

demonstrated a significant increase in social skills and a decrease in problem behaviors. The control group did not show significant changes with social skills or problem behaviors. Although this study is not a qualitative study, it relates in that it contains situational learning experiences with a classroom pet and aligns with my conceptual framework.

Other qualitative studies examined the social interactions of children in the natural setting of the classroom. Hsu and Geist (2012) explored children's social interactions during collaborative computer games through observations and found that even without adult guidance, children naturally interact with each other. Erwin, Alimaras, and Price (1999) examined a preschool classroom of fourteen children while focusing on a focal child with visual impairments. In this study, the researchers utilized observations and semi-structured interviews with children in order to gain a deeper understanding of their lived experiences, in addition to their perspectives. Kahn et al. (2006) also implemented semi-structured interviews and observations to probe the experiences and perspectives of the children to understand the influence of the robotic pet on the children's social and moral development.

The previously mentioned studies illustrate the importance of qualitative research methodology to gain an in depth understanding of children's development in their natural environment while taking into account the social and cultural influences of the classroom setting among peers and other adults (Table 1). Furthermore, these related studies depict the importance of investigating the lived experience through data sources that are conducive to gaining the child's perspective together with the researcher's perspective. The studies span anywhere from eight

weeks to ten weeks of data collection (Erwin et al, 1999; Fleer, 2009; O'Haire et al., 2013). Implementing a qualitative study that examines the lived experience of Christie and the children in her class through a sociocultural lens incorporating situational learning experiences aligns with the previous literature. My study contributed to the literature by incorporating situational learning experiences with a classroom pet in an effort to increase executive functions.

Table 1

Related Studies

Title/Year	Author	Participants	Methods	Findings	How it relates
A qualitative examination of social interaction during cooperative computer activities (2012)	Hsu, I.C. & Geist, E.A.	52 children Ages: 3-5	Parent Survey Observations	Children interact socially even without adult guidance	Social interactions, natural environment qualitative preschool
Under-standing the dialectical relations between everyday concepts and scientific concepts within play-based programs (2009)	Fleer, M.	24 children Ages: 4-5	Semi-structured Interview Observations: 10 weeks	Children's play more focused on conceptual connections when purposeful materials and guidance are provided	Socio-cultural Theory Play Nature of concept formation in situated playful contexts
A qualitative study of social dynamics in an inclusive preschool (1999)	Erwin et al.	14 children One focal child Ages: 3-4	Semi-Structured Interview Participant-Observer 10 sessions	The focal child interacted with peers Adult mediation	events, experiences, and perspectives Natural setting of classroom
Robotic pets in the lives of preschool children (2006)	Kahn et al.	80 children Ages: 3-6	Card Sort Task Semi-Structured Interview Observation	Robotic pets can impact children's social and moral development	Play interactions Social relation-ships Theory of Mind
Young children making sense of racial and ethnic differences: A sociocultural approach (2011)	Park, C.C.	20 children Ages: 3-5	Participant-Observer: 12 weeks Classroom artifacts Interviews	Young children were able to construct ideas about differences and formed peer groups	Language and social interactions in context Socio-cultural approach
Effects of animal-assisted activities with guinea pigs in the primary classroom (2013)	O'Haire et al.	128 children Ages: 4-12	Social Skills rating system 8 week time span 20 min sessions	Programs integrating animals in the classroom enhanced social functioning	Classroom pets Situated learning experiences

Research Design

The hermeneutic phenomenology design most closely aligned with the purpose of this study in its capacity to illuminate the meaning of the children's and Christie's lived experiences with a classroom pet. The lived experience denoted that our experiences were interwoven and influenced by the world around us (Nielsen, 2012). Hermeneutical phenomenology encompasses the understanding that knowledge emerges via language and understanding during a lived experience of a phenomenon and is influenced by culture and context coupled with background experiences and knowledge (Laverty, 2003; Richard & Morse, 2013). Hermeneutic phenomenology is a qualitative research design with the aim of delving further into experiences taken for granted by most in an effort to divulge new insights within a situation (Laverty, 2003).

Interpretation of data in hermeneutic phenomenology is a cyclical process in which data is examined as a whole and then broken down into parts with the two previously mentioned steps repeated numerous times (Laverty, 2003). Hence, this design increased the degree of understanding allowing me to see past the horizon or the obvious. Hermeneutic phenomenology falls under the interpretivist paradigm of research coordinating with sociocultural theory in that knowledge is socially constructed in a dynamic and complex world. Therefore, this research design involved interacting with participants in their natural settings and gained their insights and perspectives of a phenomenon. For this study, the phenomenon was the children's lived experience of interactions with a classroom pet.

Participants and Location

For my study, I was interested in first grade children's interactions with classroom pets. Miles and Huberman (1994) acknowledge that in qualitative research, purposive sampling is preferred over random sampling. Not only are qualitative researchers studying smaller sample sizes than quantitative researchers, but usually these samples are part of a particular circumstance within a specific environment lending itself to a deeper understanding of a phenomenon. I utilized *criterion sampling* to describe a case that specifically meets the criteria for the purpose of my study (Miles & Huberman, 1994). The participants of my study were members of one classroom that accommodated a classroom pet, a guinea pig. Participants were enrolled in first grade in a public school located in an urban area in a Midwestern city. The class was part of an elementary school consisting of 399 children in prekindergarten through fifth grade. The children ranged from age six to seven years old and came from various ethnic and socioeconomic backgrounds. Although the school only had 36% of students on free and reduced lunch, the district had 80% of students on free and reduced lunch.

Out of the 21 students, nine were male and 12 were female. Fifteen of the children were Caucasian, four of the children were African American, one child was American Indian , and one child was multiracial. The teacher was a Caucasian female with 18 years of teaching experience in the early childhood classroom. Steps were followed to fully inform and protect the participants. I assigned the pseudonym "Christie" to the teacher and each child was assigned a pseudonym.

The classroom incorporated the Reggio approach and utilized learning objectives from the district that covered the following areas: social-emotional, physical, cognitive, language, literacy, and mathematics. Sociocultural theory is a principle aspect of the Reggio approach aligning with the theoretical lens of this study. Specifically, the Reggio approach fosters children's social and emotional development via a community learning environment in which knowledge is constructed through social learning experiences as children engage in meaningful hands-on experiences while working independently or collaboratively in long-term projects (Goffin & Wilson, 2001). The Reggio Approach views children not only as capable but also as efficacious and influential forces in their own learning experiences. Consequently, it is vital for educators to intently listen to children as they communicate through their various forms of expression. In addition, educators fathom the importance of the environment in the cultivation of children's development (Goffin & Wilson, 2001; Nutbrown, 2006).

Timeline of Our Story

Although the focus of my study concentrated on 10 weeks inclusive of situational learning experiences aligning with children's temperament, my actual presence in the classroom spanned 24 weeks. The initial eight weeks in the classroom facilitated a strong rapport between the children, Woody, Christie, and me in addition to allowing ample time for Christie and the parents of the children to complete the temperament surveys. Week nine encompassed sifting through the temperament survey results and planning how to incorporate these results into the ensuing ten weeks of situated learning experiences. Finally, weeks 20 through 24

comprised a time of closure for our ongoing projects and summarizing our new understandings of executive functions, temperament, and humane education (Table 2).

Table 2

A Synopsis of the Situated Learning Experiences

Weeks	Topics
Weeks 1-8	**HAI** Getting to know each other and the guinea pig Caregiving and handling Learning about guinea pigs **Executive Functions** Introduction of executive functions
Weeks 9-14	**HAI** Comparing Woody to Us **Humane Education** Introduce 5 freedoms of animal and human rights **Executive Functions** Inhibitory Control **Temperament** Introduce Temperament trait: I like to talk vs I like to listen **Charlotte's Web (EF and HE)** Injustice
Weeks 15-19	**HAI** Designing and make a plan for habitat Creating habitats for our clay Woody **Humane Education** The right to express normal behavior The right to be free from hunger and thirst The right to be free from discomfort The right to be free from fear and distress The right to be free from pain, injury, or illness **Executive Functions** Working Memory **Temperament** Loud vs quiet Curious vs focused In charge vs leader **Charlotte's Web (EF and HE)** Making informed choices Friendship

	Charlotte's Plan
Week 20-24	**HAI** 2D sketches of our 3D habitats Naming habitats Presenting habitats to our peers **Executive Functions** Cognitive Flexibility **Charlotte's Web (EF and HE)** Humble Templeton's transition Compare/Contrast movie to book

Data Sources

Current measures in the realm of social-emotional development and executive functions include observations, structured measures, tasks, and teacher/parent ratings. Observations are the best tool to assess a child's social-emotional development in that it assesses the child in their natural context (Iannotti, 1985). Tasks to assess the different attributes of children's executive functions have thus far been utilized (Diamond, 2013). In terms of social and emotional development and humane education, Kahn et al. (2006) evaluated the effects of robotic pets on children's social emotional development through the utilization of interviews and observations. Furthermore, Karniol (2012) utilized children's drawings and responses to vignettes, or short descriptions of events containing events relevant to children's lives.

By examining other studies that explored social and emotional development during early childhood, I concluded that two hours of observation for a period of ten weeks would be sufficient to carry out the purpose of my study. Erwin et al. (1999) conducted their data collection in a preschool classroom from September to June,

once a month for three-hour time spans, totalling 30 hours. Lee and Recchia (2008) observed children once a week for three hours during a six-week period. Fleer (2009) observed two different groups of children for four weeks. One group was observed for eight hours and the other group was observed for 11 hours totaling 19 hours of observation. Additionally, I conducted a pre and post interview, collaborated with the teacher, collected artifacts of children's work, utilized a field notebook to record thoughts, reflections, and memos, and completed pre and post temperament surveys.

Observations

Observations can paint an accurate picture of young children. Because of the variation in young children's development, attention, and verbal skills, documenting children's behaviors and conversations while they engage and interact in their natural environment by observing, listening, and questioning can provide strong evidence of children's empathy development (National Research Council, 2008; Wait-Stupiansky, 1997). More importantly, observations can enable the researcher to look through the lens of sociocultural theory to determine why a strategy or intervention was productive or unproductive and how the social and cultural context attributed to the situation (Hendricks, 2009).

Initially, before temperament surveys were completed, observations took place three to five times a week to ensure a strong foundation for the study and implement productive data collection practices. Supplemental observations in the beginning of the study bolstered Christie's knowledge of the procedures of the study including a more comprehensive understanding of the aspects under investigation. Through a scaffolding process, Christie gained a more in depth understanding of the

study and the aspects of the study including temperament, executive functions, and humane education enabling her to take a more active role in planning situational learning experiences and recording observations of child behaviors pertinent to the study that occur in my absence. During the second half of the study, observations took place three times a week during situated learning experiences or other activities involving Woody.

As the researcher, I acted as a participant observer and remained in close proximity and participated in guiding the situated learning experiences. The primary goal of conducting observations as a participant observer was to obtain a comprehensive account of the setting, participants, and behaviors (Glesne, 2011). I took running records that included children's verbal and nonverbal behaviors and reflected on the observations in a field notebook. Throughout the observations, I continually analyzed my observations through memos in my field notebook to account for bias and ensure accurate interpretation.

Interviews/Collaborations with Christie, the Classroom Teacher

The purpose of the interviews and collaborations was to gain a perspective other than my own of the lived experience of the children's interactions with the classroom pet and how those experiences contributed to children's outcomes (Lindseth & Norberg, 2004). During interviews, researchers ask questions with the goal of gathering information about specific topics, and participants answer the questions in relation to their own background knowledge, experiences, and beliefs (Glesne, 2011). I utilized a semi-structured interview consisting of prepared open ended questions in addition to ideas for provocations to illicit more ideas from the

interviewee (Laverty, 2013: Richards & Morse, 2013). The open-ended nature of semi-structured interviews enabled Christie's voice to emerge as she was given the opportunity to convey her lived experience. The transcription of the interview provided a rich text enabling me to gain an in-depth understanding of the lived experience (Lindseth & Norberg, 2004). I conducted a pre and post interview with Christie. Some of my questions included:

1. What are you hoping to learn (post: what have you learned) from this study?
2. How do you feel about children interacting with animals?
3. What do you know (post: what did you learn) about temperament?
4. How could (or did) the social and cultural aspects of the classroom including the temperaments of the children interplay with the classroom pet?
5. How do children associate feelings and emotions to classroom pet?
6. What skills can children gain if any when interacting with classroom pet?
7. What opportunities could (or have) arisen for teachable moments when children were interacting with the classroom pet?
8. How can these skills learned through interactions with classroom pet enhance (or did enhance) their interactions with their peers?

Additionally, weekly collaborations or shorter daily collaborations between Christie and I elicited a time of reflection on observations and served as a time for planning situated learning experiences. These collaborations provided a text resulting from an interaction between Christie and me in which both of us were able to

contribute our perspectives on the situation (Lindseth & Norberg, 2004). Both interviews were audio recorded, transcribed, and given to Christie for member checking purposes (Bazely, 2013).

Artifacts

Artifacts were objects that portrayed the social and cultural aspect of the participants and their context. By examining artifacts such as children's drawing, a child's thought processes and experiences were captured through the child's perspective (Glesne, 2011; Nielson, 2012). Most notably, scholars have communicated the possibilities even in children's scribbles as powerful indicators of children's comprehension or perspectives of an event, idea, or object. Drawings allowed children's voices to be heard and understood by Christie and me in addition to enabling children to become part of the research process (Nielson, 2012). In accordance with sociocultural theory, drawings can be utilized to co-construct meaning in situated learning experiences through negotiated understandings between the adult and the child. Therefore making connections and providing affirmation between child's thoughts, the drawings and writings, and the situated learning experience (Tay-Lim & Lim, 2013).

Artifacts created by the children ranged from three-dimensional objects such as clay or collage pieces to two-dimensional objects including words and pictures with a variety of art mediums and stories or journal entries. I collected the artifacts by taking pictures and recording the children's narratives of their artifacts so the children could retain their creations. If a child's art or writing product pertained to the situated learning experience significant to the classroom pet, or showed evidence

of executive functions or temperament, those artifacts were collected. Artifacts were generated during my observations or completed at other times and brought to the collaborations by Christie.

Field Notebook

The field notebook was utilized to record detailed descriptions of the observations including the situated learning experiences and participant behaviors and responses for each visit to the classroom (Hendricks, 2004). Bracketing, or eradicating opinions, beliefs, and values are oftentimes difficult for researchers (Friesen et al., 2012). Therefore, I incorporated reflexive memo writing as a tool to record and analyze my involvement in the research in an endeavor to promote rigor by not only evoking self-awareness but also convey to others how my involvement influenced outcomes and my perspective contributed to findings (Glesne, 2011; Kennedy-Lewis, 2014). Later, I included additional thoughts, ideas, and possible patterns I noticed from my observations (Glesne, 2011). My field notebook was divided into several sections: fieldwork plans, interview questions, artifact notes, participant-observation notes, interview and weekly collaboration notes, reflexive journal, and analysis.

Temperament Survey

The Carey Temperament Scale was included as a data source measuring the nine categories of temperament of each child participating in the study, therefore enabling teachers to adapt the environment or situations to align with the child's temperamental needs (Carey, 2000). Christie completed these scales during the first few months after IRB and district approval had been granted and before data

collection, and again after the end of the ten weeks of situated learning experiences. Parents completed a paper copy of the scale for triangulation purposes. The Carey Temperament Scale measured the child's activity level, regularity, adaptability, initial approach-withdrawal, intensity, mood, persistence, sensory threshold, and distractibility. Temperament determines how a child reacts to certain situations or demands of the environment and the Carey Temperament Scale was an active measurement of the interactions between the child, teacher, and context (Vitello et al., 2012).

The scale contained up to a 100 items rated on a six-point scale ranging from almost never to almost always. Scoring could be conducted manually or by a computer. Each participating child took twenty to thirty minutes to assess using the Carey Temperament Scale (Ringwalt, 2008). Validity of the Carey Temperament Scale was moderate in that the limitation of the scale coincides with the possibility of human error. Reliability scores of the Carey Temperament Scale range from .64 to .94 increasing with the age of the child, henceforth more valuable for children between the ages of three and 12 (Carey, McDevitt, Medoff-Cooper, Fullard, & Hegvik, 1996). Table 3 provides sample items from the Carey Temperament Scale.

Table 3

Item Samples from Carey Temperament Scale

Carey Temperament Scales	Item Samples
Item samples from the BSQ for 3-7 year old children	50. The child holds back until sure of himself. APPROACH 56. The child will avoid misbehavior if punished firmly once or twice. ADAPTABILITY 84. The child spontaneously wakes up at the usual time on weekends and holidays. RHYTHMICITY 88. The child becomes upset or cries over minor falls or bumps. THRESHOLD 95. The child speaks so quickly that it is sometimes difficult to understand him/her. ACTIVITY
CTS Questionnaire Characteristics	Ratings of the frequency of each behavior are tabulated and averaged across the items in each category. Each category has 7-12 of these items for each of the nine categories. Some items are reversed (scored in the opposite direction). Items are randomly placed to avoid response set. The questionnaires are normed and each infant or child assessed can be compared to others of the same age.

Note. Adapted from Behavioral-Developmental Initiatives (1998). *Carey Temperament Survey.* Retrieved from www.b-di.com.

Additionally, Christie and I completed the adult version of the Carey Temperament Scale, the ATQ2. The ATQ2 is a self-report instrument consisting of 54 questions aligning with the same nine categories in the child version. Completion of the ATQ2 took approximately 20 minutes (Behavioral-Developmental Initiatives, 1998). During parent-teacher conferences, I conducted a brief workshop for parents whose children were participating in the study in an endeavor to thoroughly describe what was meant by the temperament profiles generated from the assessments. Additionally, I explained why this information was important for children's success in responding to environmental demands in the classroom and at home.

Executive Function Tasks

Garon, Bryson, and Smith (2008) reviewed published literature on executive functions in early childhood and identified task appropriate to assess executive functions at various ages. The tasks were divided by executive function components that include working memory, inhibition, and shifting (also referred to as cognitive flexibility). Each component included a list of tasks separated by age appropriateness and level of complexity. From this information one task was chosen from each component and administered to the children participating in the study at two different time points: once before the study began and again at the end of the study. Not only did this information compliment the triangulation of the data, but it also served as a point of reference when situated learning experiences were planned. Table 4 provides an explanation for each task that was administered during my study. Each child was given the same number of trials for each task and the number of correct responses was recorded.

Table 4

Executive function tasks

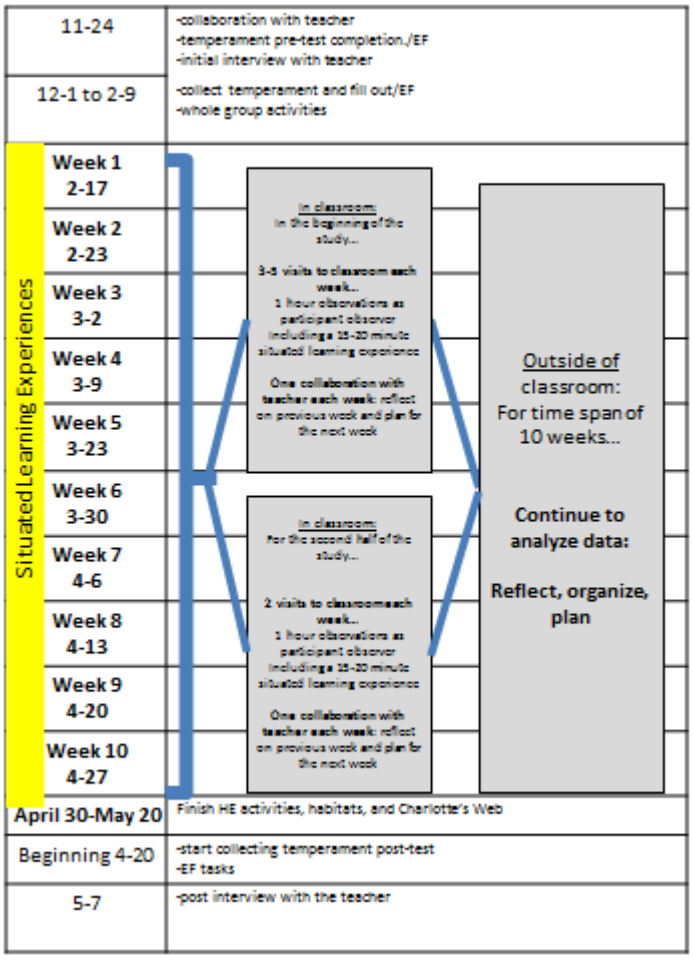
EF component	Task	Description
Working Memory	Digit/Word Span	Child repeats a list of digits or words (simple). Child repeats words or digits backwards (complex).
Inhibitory Control	Bear and Dragon	Child follows directions given by the bear and ignores the directions given by the dragon.
	The Pencil Tap	Child taps pencil once when assessor taps pencil twice. Child taps pencil twice when assessor taps pencil once.
Cognitive Flexibility	DCCS	Child sorts cards with colored shape by one dimensions and then must shift two second dimension.

Data Collection Timeline

Data collection commenced after my advisory committee and Institutional Review Board (IRB) approval mid-October. One classroom with a classroom pet participated in the study in an effort to gain insight into the benefits of situated learning experiences with a classroom pet on children's development and learning. Once the teacher agreed to participate in the study, the parents received consent forms providing a thorough explanation of the study and decided if they wanted their children to participate in the study. Ensuing participant approval, data collection began. Figure 4 provides a visual time line for data collection.

Figure 4

Data Collection Timeline



Reflexive entries and memos were entered into a field notebook beginning right after the classroom was selected and the relationships between Christie and I began immediately following IRB and the local school board approval. An interview conducted with Christie in the beginning of the study probed her thoughts and feelings about incorporating classroom pets into the classroom learning environment. A final interview at the end of the study explored Christie's lived experience and perspective of the situated learning experiences. Temperament scales were completed on each child and adult prior to the ten weeks of situated learning

experiences and post temperament scales were completed on children at the conclusion of the study. I informally assessed participating children's executive functions with simple tasks such as the digit span, the rabbit and ladybug task, the pencil tap, and sorting. I also carried out these tasks at the end of the study for triangulation purposes.

Christie and I met each week and planned situated learning experiences that incorporated the classroom pet. Over the time span of ten weeks, a situated learning experience was integrated into the morning time or right after the children returned from recess three to five times during the week. Observations were made during these situated learning experiences in addition to other times the children were interacting with the classroom pet. Following the ten weeks of observations and situated learning experiences, final interview, and collection of post temperament surveys, data collections ceased although data analysis continued.

Data Analysis

Data analysis began with an entry in the field notebook referred to as bracketing in an endeavor to become cognizant of my bias, values, beliefs, and assumptions not necessarily to separate them from my reflection and analysis but bury and integrate them (Bazely, 2013). In hermeneutic phenomenology, researcher's personal reflections are as important as observations of participants' behaviors and records of participants' reflections and perspectives on the lived experience (Freissen et al., 2012; Laverty, 2003). In terms of analyzing the interview and other transcribed conversations, it was important to remember to not only look at nonverbal and verbal occurrences, but also read between the lines including paying

attention to silence. Data collection continued until the point of saturation as continuation past saturation would not produce a clearer understanding (Laverty, 2003).

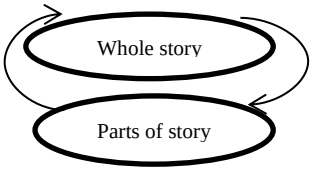
Three Levels of Data Analysis

Lindseth and Norberg (2004) stated the most fundamental route to understanding our own reality is to chronicle our experiences and listen to other's as they chronicle their experiences. Christie and I become co-authors in the interpretation of a situation. When recorded observations, transcribed interviews, or artifacts are utilized as data sources, a sovereign text is spawned that communicates a story that can be deciphered through thorough analysis. Transforming experiences into stories permits readers to see their experiences in a variety of ways.

A story is made up of segments of events that give meaning to the whole story. Likewise, the whole story gives meaning to the segments of events. This reciprocal reaction is reflected in the cyclic process of analyzing data in hermeneutic phenomenology research studies by beginning with the whole story, breaking the story up into parts, and then reexamining the whole story and repeating this process until saturation is reached (Laverty, 2003). Qualitative research encompasses a repeated series of analysis in order to construct rich descriptions and in-depth understandings of the phenomenon being studied (Table 5)

Table 5

Three Levels of Analysis

Question	**Source**	**Procedure**	**Three Levels of Analysis**
1. What is the nature of the lived experiences for the children during interactions with the classroom pet? 2. How are children's executive function traits being used during interactions with classroom pet?	Observations Interview/Collaboration Artifacts Field Notebook	Observations: detailed descriptions will be recorded during the interactions with the classroom pet. Interview/Collab-oration: The pre and post interview with the teacher will capture the teacher's beliefs and knowledge about the study. The weekly collaborations will allow the teacher and researcher to discuss their observations and plan for situated learning experiences. Artifacts or art pertaining to the classroom pet will be photographed and explanation by child will be recorded. Field Notebook: Thoughts and reflections will be recorded as memos in the field notebook.	<u>Cyclic process of hermeneutic phenomenology:</u>  <u>Level 1: Coding</u> -identify essential elements or meaningful chunks of data -code, look for patterns, sort and sift data, reduce or collapse codes, summarize findings <u>Level 2: Within-Case Analysis</u> -read between the lines (inferences) -comparing behaviors or events from different viewpoints or circumstances to gain insight <u>Level 3: Cross-Case Synthesis</u> --synthesize finding across cases -relate to findings from level one and level two -relate to literature
3. How does children's temperament impact situated learning experiences with the classroom pet?	Temperament Survey Observations Field Notebook Interview/Collaboration with the teacher	Results of the pre temperament survey will be incorporated into planning situated learning experiences. Observations: detailed descriptions will be recorded during the interactions with the classroom pet. Field Notebook: Thoughts and reflections will be recorded as memos in the field notebook. Interviews/Collaborations: Discussions with the classroom teacher will validate and augment the observations. Pre and Post Interview will provide opportunities for the teacher to give her perspective of the experience.	

Level 1: The Literal Level of Comprehension, Coding with Starter Codes

This study included data collected from interviews and collaborations with Christie , observations and artifacts collected from the children, and the field notebook. Calibrating with the cyclic process of hermeneutic phenomenology, level one analysis began by looking at the whole story. This phase of the analysis was analogous to finding a completed 1,000 piece puzzle depicting a beautiful landscape and being drawn to closely examine the picture. Next, the analysis continued by breaking the data into smaller elements to code in an effort to gain higher level comprehension of the whole story similar to breaking apart the pieces of a completed puzzle in order to put them back together more efficiently (Lindseth & Norberg, 2004). I began coding the data utilizing a set of starter codes as suggested by Miles and Huberman (1994), based on the attributes of sociocultural theory, situated cognition, temperament, humane education, executive functions, social and emotional skills found in the literature and framed by my research questions. As the data was coded, I searched for patterns, sorted and sifted through my data, reduced or collapsed codes, summarized and displayed, reflected, and repeated the process (Bazely, 2013). Also, I sought for high-quality analysis by utilizing all of my data and examining for outliers or possible alterative explanations (Yin, 2009).

Finally, the details were related back to the whole story. Surveying the complete story after examining each puzzle piece enabled me to understand how social and cultural aspects of the environment contributing to child and animal interactions and in what ways opportunities for situated cognition arose in relation to the caring and handling of the classroom pet (Bazely, 2013; Lindseth & Norberg

2004). I engaged in the emerging understanding of the story capturing meaning of the lived experience of the participants (Richards & Morse, 2013).

Observations and field notebook: Reading the story from the researcher's perspective. Initially, I read through notes from the observations from the entire ten week time span several times and recorded new understandings of the experiences through my perspective. When evaluating impact and outcomes, it was imperative to not only note what was happening, but also identify the response to what was happening during the situated learning experience (Bazely, 2013). I explored children's responses to the situated learning experiences while interacting with the classroom pet through coding meaningful segments based on the starter codes and looking for patterns that arose. With the coded data and emerging patterns in mind, I reread the observations again as a complete story.

Interview, Collaboration, and Artifacts: Reading the story from the participants' perspective. Through weekly collaborations and interviews, Christie contributed her perspective as the story unfolded. Artifacts in the form of children's drawings and recorded explanations of their drawing, along with journal entries gave the children a voice and opportunity to contribute their perspectives of the lived experience of interacting with the classroom pet. This data was analyzed as a whole and then broken up into segments for coding purposes.

Level 2: Within-Case Analysis, The Interpretive Level of Comprehension

During level two analysis, a more in-depth understanding of the story emerged by reading between the lines of the transcribed texts of observations, artifacts, interviews, and collaborations of each case. The term *case* in the present

study referred to situated learning experiences in which children were interacting with the classroom pet or activities that related to the classroom pet. Bazeley (2013) explained that within-case analysis involves comparing behaviors or events from different viewpoints or from different circumstances with the purpose of increasing awareness and insight into features of the case leading into relational analysis. For this reason, each situational learning experience and observations of interactions with the classroom pet during play was examined through data sources that portrayed my perspective and data sources that portrayed the participants' perspective. During this process, understanding was gained in how children's temperament interplayed with their social and learning experiences while interacting with the classroom pet and in what ways opportunities for situated cognition arose in relation to the caring and handling of the classroom pet.

Deciphering the story from the researcher's perspective and from the participants' perspective. First, observations, artifacts, collaborations, and field notebook entries for each case were read thoroughly. Next, the data was read line by line while searching for existing patterns from the coded segments during level one analysis and any new patterns that emerged were noted. Finally, these units of meaning were placed into a chart for comparison purposes and to see how the units of meaning pertained to the research questions. The coded units of meaning from my perspective were compared and contrasted to units of meaning from Christie and the children's perspective. Finally, all coded data was analyzed in relation to the related research questions.

Level 3: Cross-Case Synthesis, The Applied Level of Comprehension

Cross-case synthesis was implemented to create a narrative sanctioning the relationships between the lived experiences of the participants while synthesizing findings. In other words, the puzzle pieces were glued together (Bazely, 2013).

Summarizing the story from the researcher's and the participants' perspective. Specifically, the patterns that arose during level 1 and level 2 analysis were summarized and transitioned back into reflecting on the whole story in order to modify and expand awareness and understanding of the research questions (Lindseth & Norberg, 2004). I reread through the observations and field notebook while reflecting on previous insights and understandings that arose during level 1 and level 2 analyses. The transcription of the interview, notes from collaborations, and artifacts were reread and children's behaviors were related to the temperament surveys. The following questions were answered:

1. What was the nature of the lived experiences for the children during interactions with the classroom pet?
2. How were children's executive function traits used during interactions with classroom pet?
3. How did children's temperament impact the situated learning experiences with the classroom pet?

Ethical Considerations

In an endeavor to ensure high ethical standards, many steps were taken. The study was submitted to the University of Oklahoma's International Review Board and the administration of the participating school district. Moreover, this study

adhered to protocols and procedures. Participation in the study was voluntary and the identity of all participants was kept confidential. Participants were fully informed of all aspects of the study enabling them to make the decision of whether or not to participate. In addition, the participants were informed of their right to withdraw from the study at any point without repercussions. I built a relationship with the participants and respected their time and commitment. Their right to privacy was honored and Christie viewed the transcribed conversations, disclosed findings, and will be informed of any future publications (Glesne, 2011).

Triangulation

Triangulation occurred through a variety of methods: Implementing and comparing different data sources, including observations, artifacts, interviews, collaborations, and my field notebook. Further triangulation included the Carey Temperament Scale completed by the parents, the informal executive function tasks that were conducted with the participating children, member checking of transcriptions, and peer debriefing of data by a fellow doctoral student (Lincoln & Guba, 1985).

Trustworthiness

Lincoln and Guba (1985) stated that in order for a researcher to convince readers that the findings were trustworthy, the researcher needed to prove *credibility*, *transferability*, *dependability,* and *confirmability*. These four criteria for trustworthiness in qualitative research correspond to validity and reliability in quantitative research. Each criterion is further explained and aligned with this hermeneutic phenomenology study.

Credibility

First, assurance that my findings were credible was conducted through prolonged engagement in the field beginning with weeks of pre study task completion, ten weeks of situated learning experiences, and ending with two weeks of post study task completion (Lincoln & Guba, 1985). By the time the actual study began, a relationship with Christie had developed through regular visits to the classroom to collect the consent forms and temperament surveys, as well as through our collaborations and interviews. Through persistent observation, I collected enough data to reach saturation and distinguish the elements or data that were most pertinent to the purpose and research questions of the study. During weekly collaborations, observations and descriptions of the children's artifacts were discussed in an endeavor to capture any missed opportunities, misperceptions, or additional insights. The analysis of the various data sources was verified by colleagues who were proficient in analysis to confirm the researcher's findings. In qualitative research, outliers play an essential role in the understanding of data. Therefore, in this study, outliers were examined in a thorough manner to increase understanding of the lived experience of the participants when interacting with the classroom pet (Bazely, 2013).

Transferability

Transferability is the second step in trustworthiness and was established through rich and thick descriptions of the data in findings enabling a reader to make similar conclusions as reported in my findings (Lincoln & Guba, 1985). Rich and thick descriptions of events that can be conveyed to the reader in a comprehensive

and clear manner contribute to transferability. Descriptions from a variety of situations captured through a variety of data sources ensured transferability. This study covered a six month time span that allowed for substantial amounts of data to be collected through a variety of methods including observations, artifacts, field notebook, interviews, and collaborations. When reporting the findings, rich and thick descriptions of a variety of instances were provided to illustrate evidence supporting each research question.

Dependability

Dependability is the third step in building trustworthiness and was achieved by overlapping methods, or comparing findings across different types of data, and an inquiry audit, which entailed giving a sample of data to a peer to analyze and compare findings (Lincoln & Guba, 1985). For this hermeneutic phenomenology study, data was collected in numerous approaches enabling the researcher to compare and contrast findings establishing dependability. For example, findings from observations were discussed during weekly collaborations enabling both the researcher and participant to share perspectives from the same lived experience.

Observations, interviews, collaborations, and children's artifacts were compared and contrasted for each case in addition to the field notebook being utilized to analyze the researcher's perspectives from the time the event occurred to any new insights that may arise during repeated readings of notes and transcriptions. Finally, an inquiry audit was conducted through peer debriefs with colleagues. Codes provided to peers allowed data to be analyzed independently followed by a

discussion between peer and researcher to compare findings. If the findings of the researcher and peer were similar, therefore, the audit was deemed efficacious.

Confirmability

The final step in trustworthiness is confirmability, which was accomplished through an audit trail, triangulation, and a reflexive journal (Lincoln & Guba, 1985). The audit trail was achieved through an inquiry audit of a peer and included raw data, data that has been coded, reduced, or collapsed in addition to findings that emerged during level 2 within-case analysis and level 3 cross-case synthesis. Before the study began, a consenting peer was familiarized with the research design, purpose, and research questions of this study, as well as the data sources.

Data was shared with the peer, a plan for auditing was devised, and auditing occurred throughout the study. Findings from the researcher and peer were compared and contrasted and any additional techniques to analyze data were discussed. Rich and thick descriptions helped validate trustworthiness for this study. Prolonged time in the natural environment in which the lived experience of participants interacting with a classroom pet was observed and documented provided grounds for credible and reliable research. Although the findings from this study will not be easily generalized to all classrooms with classroom pets, the findings provide a comprehensive and detailed account of the lived experience of the participants and the outcomes of their interactions with the classroom pet on many skills including executive functions and social and emotional skills vital for later school success (Diamond, 2013).

Conclusion

Eisner (1998) stated that although qualitative research is different than quantitative research in that it is not generalizable, qualitative research is treasured in its ability to help others *learn life lessons.* Researchers can learn from experiences that entail careful observations and reflections. Additionally, by accumulating a comprehensive understanding of different phenomena, researchers can assemble the different qualitative pieces into a complete picture.

The significance of my qualitative hermeneutic phenomenological study is the comprehensive picture of how humane education through interactions with a classroom pet can impact children's development. Early childhood is a time of rapid growth in the realm of all areas of development, still high stakes testing and the pushing down of the curriculum puts many areas, such as executive functions and social and emotional development in the background of the classroom.

It is vital to properly aggregate and disseminate the data in a respectful and understandable manner (Gus, Norris, Horm, & Monroe, 2013). Research should be conducted effectively utilizing appropriate assessments and data should be accurately analyzed allowing for correct results to be published for the effects of humane education to become more widely accepted and implemented in early childhood programs.

The findings of this study show the benefits of children constructing executive functions social and emotional skills through hands-on situated learning experiences involving interactions of the classroom pet within the cultural and social context of their classroom environment. Furthermore, the study showed how

interactions with the classroom pet provided opportunities for teachers to scaffold children in their zone of proximal development and enhance the opportunity for children to successfully gain skills crucial for future school success.

CHAPTER 4: Findings

This chapter portrays the story of 21 first grade children and their teacher, Christie, as they experienced the phenomenon of sharing their classroom with a guinea pig named Woody. Data were collected and analyzed over a six-month time span beginning in late November and ending in late May. The purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments. Situated learning experiences included humane education in an endeavor to increase children's knowledge of animal and human rights, in addition to fostering responsibility, respect, empathy, problem solving, critical thinking, and increased curiosity (Thomas & Bierne, 2002; Wiel, 2004). Growth in social and emotional skills and enhanced executive function skills, as well as modified temperament traits were ensued by the situated learning experiences integrated with children's temperaments (Ascione & Weber, 1996; Beetz et al., 2011; Daly & Suggs, 2010; Diamond, 2013; Esposito et al., 2011; Gee, Crist, & Carr, 2010; Gee, Church, & Altobelli, 2010; Gee et al., 2007; Gee et al., 2009; Hergovich, 2002; NIH, 2012; O'Haire et al, 2013; Saudino, 2005; Saudino & Cherny, 2001; Sprinkle, 2008; Tsai & Kaufman, 2009).

The Emergence of Three Prominent Themes

The findings are organized into the three major themes that emerged during analysis: temperament as a liaison, the classroom pet as a provocation, and negotiated learning. A discussion of each theme will provide an explanation for each of the three research questions. More specifically, the theme of temperament as a

liaison will clarify how children's temperament impacted situated learning experiences with the classroom pet. Respectively, children's temperament influenced how children reacted to the social and cultural aspects of the environment, and how they reacted to the demands of the situated learning experiences with the classroom pet. Therefore, a discourse on the findings commence with the theme of temperament, since temperament was a crucial component in planning the situated learning experiences (BDI, 1998; Carey et al.. 1996; Havener et al., 2001; Kahn et al., 2006; Keogh, 2003; Liew, 2012; Rudasil & Rimm-Kaufman, 2009; Stifter et al., 2009; Valiente et al., 2012; Vitiello et al., 2012).

The different ways children exhibited executive functions during interactions with Woody will become clear as the second theme is discussed. The second theme encompasses the classroom pet as a provocation. This theme is subsequent to the first theme in that temperament was a compulsory aspect of planning the children's interactions with the classroom pet.

Direct and indirect experiences involving Woody transpired during the study. For example, direct experiences included the care and handling of Woody and evoked social and emotional skills, as well as executive functions as children exhibited inhibitory control, working memory, and cognitive flexibility (Day & Suggs, 2010; Esposito et al., 2011; Melson, 2003; O'Haire, 2013; Rud, 2000; Sprinkly 2008: Thomas & Bierne, 2002). Conversely, the mere presence of Woody in the classroom induced a sense of calmness in the classroom as reported by Christie during the post interview (Beetz et al., 2011; Havener et al., 2001: NIH, 2012;). Likewise, other experiences indirectly involving Woody including humane

education topics, reading *Charlotte's Web,* and building habitats for clay guinea pigs augmented social and emotional skills and executive functions (Aguirre & Orihuela, 2010; Ascione, 1992; Ascione & Weber, 1996; Gee, Crist, & Carr, 2010; Gee, Church, & Altobelli, 2010, Gee et al., 2007; Gee et al., 2009; Hergovich, 2002; Nicoll, 2008: Pattnaik, 2004; Thomas & Bierne, 2002).

Finally, the theme of negotiated learning will answer the question of what was the nature of the lived experiences for the children during interactions with Woody. Explicitly, children were the central figures in their own learning that transpired during social experiences in which new understandings arose through negotiated meaning with peers and guidance from adults (Brown et al., 1989; Edwards et al., 1998; Fleer, 2009; Fosnot, 1996; Lave & Wenger, 1991; Mordechai, 2005; Resnick, 1985; Resenick et al., 1991; Rogoff, 1990; Schultz et al., 2011; Vygotskly, 1978). Opportunities for negotiated meaning arose during indirect and direct experiences with Woody in addition to experiences designed to scaffold children in understanding temperaments and executive function games. Therefore, negotiated learning will be the final theme discussed as a consequential function of the aforementioned themes involving situated learning experiences with the classroom pet aligned with temperament.

Temperament as a Liaison

A significant theme that arose during data analysis comprised temperament as a liaison between situational learning experiences and optimal outcomes in social, emotional, and executive function development (Bridgett et al., 2013; Conway & Stifter, 2012; Liew, 2012; Vitiello et al., 2012; Wolf & Bell, 2007). The goal of the

present study was to incorporate situated learning experiences that aligned with children's temperament, hence leading to a goodness of fit (Vitiello et al., 2012). Goodness of fit encompasses the harmonious relationship between a child and her environment by successfully meeting the demands of external stimuli. However, a poor fit can lead to unfavorable outcomes including behavior and academic challenges. Keogh (2003) emphasized that knowledge and understanding of each child's temperament enables a teacher to plan appropriate learning experiences, engage in favorable interactions, organize the classroom space, and manage schedules.

Temperament as a liaison between executive functions and situated learning experiences will answer the question: How does children's temperament impact situated learning experiences with the classroom pet? First, a picture will be drawn of the different temperaments represented in this class followed by a discussion of how this information was interwoven into the planning of situated learning experiences. Next, an interpretation of the executive functions tasks conducted at the beginning of the study leads into a justification of how this information was utilized based on children's needs. Then, a discourse on goodness of fit details the interplay of temperament and executive functions. Finally, an inquiry into the changes exhibited in both the post temperament scales and the post executive function tasks prompts a discussion on the nature versus nurture aspect of temperament.

Temperament

To align with both the purpose of this study and the Carey Temperament Scale completed before and after the study, nine temperament traits will be discussed

in relation to how the class rated for each trait. Analysis of the results from the temperament scale completed during the beginning of the study began with an in-depth examination of each child's computer generated temperament profile (BDI, 1998). Next, an investigation across the different cases depicted the whole story of the temperament traits of this first grade class. Tables six through 14 illustrate the story of the whole class for each temperament category including the adults participating in the study. Table 15 only includes temperament information on the children (Anderson, et al., 2003; Bazely, 2013).

Table *6*

Adaptability

	Non-adaptable	Somewhat Non-adaptable	Somewhat Adaptable	Adaptable	General Impression
Lauren	5.67				6
Tiffany	5.50				3
Kemp	4.67				4
Nathan	3.75				3
Tori	3.42				2
Caroline	3.42				3
Kremer	3.33				2
Wesley	3.25				2
Kinsly		3.17			5
David			2.92		3
Luke			2.75		2
Sophie			2.58		2
Jake			2.50		2
Brynlee			2.50		1
Lila			2.33		2
Connor			2.25		1
Tara				1.50	1
Savannah				1.42	3
Jasmine				1.33	2
Janiya				1.25	2
Nicholas				1.25	1
Rachel				1.00	1
Christie				1.00	1

Slow to adapt

Slowness to change behavior in meeting the expectations of others

Difficulty altering usual reactions and may need extended period to adjust

Needs gradual change…no sink or swim

Somewhat non adaptable

Gradual acceptance of change

Sometimes need an extended period to adjust

Somewhat adaptable

Typical adaptability for age

Sometimes may need a period to adjust but often not

Quick to adapt

General adaptability to most situations

Can change behavior in socially desired direction

Table 7

Approach/Withdrawal

	High With-drawal	Somewhat With-drawal	Midrange	Somewhat Approach	Low Approach	General Impression
Tiffany	6.17					3
Kinsly	5.18					5
Kemp	4.27					3
Lila		3.73				4
Christie		3.67				2
Luke		3.63				3
Lauren			3.45			4
Savannah			3.36			4
Jake			3.18			3
Caroline			3.09			3
Kremer			2.82			3
Janiya			2.73			3
Jasmine			2.55			2
Connor				2.36		1
Nathan				2.27		2
Rachel				2.18		2
Sophie					2.00	3
Wesley					2.00	2
David					1.91	1
Nicholas					1.82	3
Brynlee					1.55	1
Tori					1.55	1
Tara					1.36	1

High withdrawal

A tendency toward initial withdrawal or reluctance from new or unfamiliar situations or circumstances

Gradual introduction in small increments and explain in advance

Somewhat withdrawal

Moderate tendency toward initial withdrawal or reluctance in accepting new things or people or situations

Midrange

A balance to move towards and away from new people or situation or things

Somewhat Approach

Moves right into meeting new people or engaging in new experiences

Low approach

Moves right into new situations or meeting new people, things, and situations

Table 8

Sensitivity

	Highly Sensitive	Somewhat Sensitive	Somewhat Nonreactive	Nonsensitive	General Impression
Tiffany	5.17				4
Lauren	4.64				6
Caroline	4.55				5
Wesley		4.36			3
Tori		4.27			4
Anna		4.00			4
Savannah			3.55		2
Luke			3.55		3
Kemp			3.55		2
Kinsly				3.36	4
Brynlee				3.18	4
David				3.18	2
Jake				3.18	4
Tryon				3.00	4
Tara				2.91	2
Rachel				2.91	2
Lila				2.64	2
Janiya				2.64	2
Jasmine				2.64	2
Nathan				2.55	2
Connor				2.27	3
Nicholas				2.27	2
Christie				2.17	2

Highly Sensitive

More sensitive to sensory stimulation reacting to light, sound, and touch with changes in behavior.

The temperature of food, tight or scratchy clothing, lights may be irritants

More likely to be more empathetic towards others

Midrange

Balance of sensitivity and lack of reaction to light, tough, temperature, etc

Mix of strong reaction to lack of reaction (may be specific stimulants or situations that go either way)

Somewhat nonreactive

May be unaffected or not notice sensory stimulation

May need higher levels of input before changes in his/her behavior seen

Repetition may be needed

Low/Nonreactive

Unaffected by and does not notice sensory stimulation

May miss cues or implied meanings and repetition for learning is needed

Table 9

Activity Level

	Active	Midrange	Inactive	General Impression
Christie	5.67			2
Brynlee	5.38			6
Jake	4.77			5
Connor	4.46			5
Wesley	4.31			6
Nathan		4.00		5
Lauren		3.69		4
Kremer		3.62		6
Tori		3.54		1
David		3.23		6
Luke		3.08		4
Nicholas			2.77	5
Kemp			2.77	4
Tara			2.46	5
Sophie			2.38	4
Rachel			2.31	5
Savannah			2.23	4
Lila			2.15	4
Janiya			2.08	4
Caroline			1.92	4
Jasmine			1.92	4
Kinsly			1.85	4
Tiffany			1.00	4

High/Active

Difficulty sitting still or engaging in quiet pursuits
Opportunities for active activities should be provided
Quiet behaviors can be expected but only for short times spans

Midrange

Normal activity level for this developmental age
The child will rarely have difficulty adjusting to active or inactive situations

Low/Inactive

Inactive with little overt behavioral movement
Easy for him to sit quietly and do quiet activities
Enough time should be allowed for activities to avoid rushing
Achievements should be complimented even if not finished
Child should not be rushed or have another child finish or help

Table 10

Rythmicity

	Not Regular	Somewhat Not Regular	Somewhat Regular	Regular	General Impression
Brynlee	4.67				5
Lauren	4.44				5
Kinsly	4.33				3
Nathan	4.11				2
Caroline	3.44				3
Janiya		3.33			4
Gavin			3.00		3
Kemp			2.89		3
Savannah			2.78		5
David			2.78		4
Luke			2.78		2
Connor			2.78		6
Lila			2.78		3
Sophie			2.78		3
Tori			2.67		3
Christie			2.67		3
Kremer			2.44		3
Tara			2.33		2
Nicholas			2.33		2
Jake				2.22	4
Jasmine				2.22	1
Rachel				2.00	5
Tiffany				1.00	3

Not Regular

- Irregularity in patterns of eating sleeping and elimination
- Needs are usually unscheduled or unanticipated by adults because unpredictable
- Hungry in-between meals or may not want to eat at meals

Somewhat Not Regular

- Irregularity in patterns of eating sleeping and elimination
- At times needs are unscheduled or unanticipated by adults bc unpredictable
- Hungry in-between meals or may not want to eat at meals

Somewhat Regular

- Mixed patterns of routines
- Sometimes consistent and sometimes not regular
- Consistency
- May become upset if routine changes

Regular

- Consistency
- May become upset if routine changes

Table 11

Persistence

	Rarely Persistent	Somewhat Non-persistent	Somewhat persistent	Persistent	General Impression
Lauren	4.00				6
Jake	3.80				4
Tiffany		3.67			1
Luke		3.60			3
Connor		3.40			4
Brynlee		3.30			6
Kremer		2.90			3
Savannah		2.90			3
Caroline		2.80			2
Kemp		2.70			2
Nathan			2.40		2
Lila			2.40		3
Kinsly			2.30		4
Tori				2.20	2
Janiya				1.90	3
Sophie				1.90	3
Rachel				1.90	1
Christie				1.83	1
Nicholas				1.80	1
David				1.70	1
Jasmine				1.50	1
Gavin				1.40	1
Tara				1.10	1

Rarely persistent

Very low persistence, giving up or interrupting tasks before completing them

Most comfortable with brief periods of involvement and may need to be watched to ensure that tasks are completed

Somewhat Non-persistent

Child may focus on tasks for only brief periods but also capable of longer periods of sustained activity

Somewhat persistent

Moderate level of persistence and tendency to continue with tasks for longer periods

Needs warnings in advance of being interrupted

Highly persistent

Tendency to continue with tasks or activities for long period of time compared with others

May need warnings in advance of being interrupted

Table 12

Quality of Mood

	Negative	Somewhat Negative	Somewhat Positive	Positive	General Impression
Lauren	5.08				5
Kemp	4.58				4
Nathan	4.58				4
Caroline	4.58				2
Tori	4.17				2
Kremer		3.58			3
Kinsly		3.50			1
Wesley		3.50			2
Sophie		3.50			3
Connor		3.25			2
David		3.25			2
Lila		3.17			3
Luke		3.00			2
Christie		3.00			3
Tiffany			2.83		4
Janiya			2.83		1
Jasmine				2.42	1
Jake				2.25	2
Tara				2.17	1
Savannah				2.08	2
Rachel				1.75	1
Brynlee				1.67	2
Nicholas				1.33	1

Negative

Tends to be negative in quality of mood with reactions more often tending towards distress or discomfort

Somewhat Negative

Balance of positive and negative expression of emotion

Child may react in a placid and positive manner or appear moody and cranky

Somewhat Positive

Fairly positive in his or her quality of mood

Tends to express happy and contented feelings, which make him/her pleasant to be around

Positive

Positive in his/her quality of mood

Generally expresses happy and contented feelings making him/her pleasant to be around

Table 13

Intensity

	Intensive	Somewhat Intensive	Midrange	Somewhat Mild	Mild	General Impression
Tori	5.33					5
Lauren	5.17					6
Kemp		5.00				6
Nathan			4.75			6
Lila			4.42			5
Connor			4.17			4
Kremer				4.08		4
Wesley				4.00		5
David				4.00		2
Luke				3.83		3
Tiffany				3.83		2
Jasmine					3.58	3
Brynlee					3.42	4
Caroline					3.17	4
Rachel					3.08	1
Jake					3.00	3
Tara					3,00	1
Sophie					2.92	3
Nicholas					2.83	1
Savannah					2.58	2
Kinsly					2.42	2
Janiya					2.33	1
Christie					2.00	4

High Intensity

Emotional reactions even for minor things may be loud and dramatic

Can be overwhelming to adults but need to avoid reacting with equal intensity and use calm and quiet responses

Somewhat Intensive/High

Somewhat high emotional expression

Can be loud and dramatic

Midrange

Reactions matches concern felt by child

Somewhat Intensive/low

Low level of emotional expression but not necessarily aligns with inside

Low/mild

Mild level of emotional expression

Responds meekly or quietly

Table 14

Distractibility

	Often distracted	Somewhat Distracted	Somewhat Non-Distractible	Rarely distracted	General Impression
Tiffany	5.17				3
Kemp	4.80				4
Caroline		4.40			4
Kremer		4.10			4
Brynlee		4.00			5
Jake		4.00			2
Luke		3.80			4
Lauren		3.80			4
Sophie		3.80			3
Tori		3.70			3
Connor		3.40			4
Kinsly		3.40			3
Tara			3.20		2
Christie			3.17		2
Rachel				3.10	1
Lila				3.00	2
Jasmine				2.90	1
Janiya				2.80	2
Nicholas				2.80	1
Savannah				2.70	2
Wesley				2.70	2
Nathan				2.50	2
David				2.00	3

High/often distracted

Behavior is easily interrupted by irrelevant sights, sounds, or movements

May change activities to what distracted them

Midrange

Mixture of responding to or ignoring distractions

Somewhat Distractible

Somewhat less likely than others to be distracted by sights, sounds or irrelevant events

The child's focus may cause him to continue working even though it is time to stop

Low/Rarely distracted

The score indicates a child less like to be distracted while working on something

Child may continue activity even though time to stop, so insist quietly

Table 15

Manageability

	Very Difficult	Difficult	Somewhat Difficult	Somewhat Easy	Easy	Very Easy
Lauren	6					
Brynlee		5				
Kemp			4			
Nathan			4			
Tryon			4			
Wesley				3		
Connor				3		
Tori				3		
Luke					2	
David					2	
Caroline					2	
Jake					2	
Jasmine						1
Janiya						1
Kinsly						1
Lila						1
Rachel						1
Tara						1
Sophie						1
Nicholas						1
Savannah						1

Activity level (Table 9) includes the extent of physical activity exhibited, which in turn determines whether or not children are able to sit still and engage in quite activities. Four children fell into the highly active range and were unable to sit still or engage in quiet activities, the remaining 18 children fell in the midrange and inactive range indicating those children could sit still and engage in quiet activities for periods appropriate for their age.

Rhythmicity (Table 10) depicted 18 out of the 21 children falling into the irregular range of rhythmicity, which is the inconsistency of physiological functions, and exhibited irregular patterns of eating, sleeping, and restroom needs. *Adaptability* (Table 6) is the ability to change with the demands of the environment. Eight

children fell into the slow to adapt or somewhat non-adaptable range meaning these children had a difficult time with change and needed more time to adjust. The remaining 14 children were adaptable to most situations and could change to meet the social demands of any situation.

Five children scored in the *withdrawal* (Table 7) range and exhibited reluctance to new or unfamiliar situations, yet with time these children could tolerate change or the novelty of a situation. Eight children scored in the *sensitive* (Table 8) range which entailed an increase in sensitivity to light, sound, touch, and an acute awareness of activity in the room. In addition, highly sensitive children were more in tune with others feelings. Conversely, the 15 children who were non-sensitive were less aware of others' feelings and activities or changes in the room. These children needed higher levels of stimuli before changes were made and repetition was needed for learning to occur.

Persistence (Table 11) demonstrated that 12 children scored in the rarely persistent range and were more apt to give up on tasks before completing them and only engaged in brief periods of involvement in activities. The remaining 10 children engaged in activities for longer periods of time and even some times had a difficult time stopping a task before completing it. As far as *distractibility* (Table 14), 13 children scored in the highly distractible range and were easily distracted by environmental stimuli often needing redirection or reminders.

Quality of mood (Table 12) depicted 14 children in the negative range, which meant these children tended to be negative in quality of mood. Eight children fell into the positive quality of mood and often expressed happy and content feelings.

Seven children fell into the highly *intensive* (Table 13) range on the intensity of reaction trait meaning their reactions were loud and dramatic, whereas 15 children responded to situations with mild levels of emotional expression. In terms of general *manageability* (Table 15) as rated by the teacher, five children fell under the difficult to manage range, three children were somewhat easy to manage, and 13 children fell in the easy to manage range.

Utilizing knowledge of children's temperament. Once Christie and I had the temperament scale results, the information became a strong influence on planning during collaborations. Our goal was to achieve a goodness of fit for each child during every situational learning experience. Three factors were taken into consideration in order to ensure goodness of fit: teacher-student interactions, organization of space and time, and mode of instruction (Vitiello et al., 2012).

Teacher-student interactions. Understanding children's temperaments, especially quality of mood and intensity of children's reactions, enabled Christie and me to engage in positive and sensitive interactions with children regardless of their mood or emotional reactions (BDI, 1998; Keogh, 2003). Based on the temperament profiles, four children scored negative in quality of mood. Out of those four children, three scored in the high intensity range exhibiting strong emotional reactions even for minor things and they were often loud and dramatic. With this in mind, Christie and I could predict certain ways the children would respond to situations and find ways to help them prepare for a new situation in a positive way. For example, during transitions, Tori and Lauren did not want to stop the activity, and if told to do so, would immediately get angry and loud. Therefore, we provided a visual timer

enabling these children to monitor the time, and we also delivered verbal reminders closer to transition times (Yeager & Yeager, 2013).

Similarly, children who scored in the low sensory threshold range or children who scored in the non-adaptable range needed more stimuli or support for transitions. Therefore, these children were also provided with extra support or reminders. For example, Nicholas scored in the low sensory threshold range. When a quiet bell was rung as a cue to clean up and come to the rug, Nicholas would continue to work. Christie or I would walk up to Nicholas and put our hand on his back in conjunction with a verbal cue to denote it was time to clean up. For the children who scored in the withdrawal range, any changes, new situations, or routines were introduced ahead of time giving them time to adjust. As half the class fell into this category, a morning meeting served as a great vehicle for Christie to prepare the children for any changes in the daily routine (Keough, 2003; Rudasill, 2009; Turecki & Tonner, 1985).

With half of the class falling into the distractible range and almost half of the class falling into the non-persistent range, it was a necessity to incorporate strategies to help children focus and stay on task (Liew, 2012: Yeager & Yeager, 2013). Verbal reminders like *flashlight focus,* created by the children during discussions involving inhibitory control, were incorporated to help these children refocus. One day the children were rolling around on the rug and talking when they should have been preparing to hear *Charlotte's Web.* I sat down, held up the book, and said flashlight focus. Children quickly got ready to listen, thus emphasizing those visual cues and reminders were essential in scaffolding inhibitory control.

Organization of space and time. Knowledge of children's temperament was fundamental in the room arrangement and schedules (Keogh, 2003). During collaboration, Christie and I initially decided to arrange the desks in groups according to similar temperaments. After a long Sunday afternoon of arranging desks, we were eager to find out how the children worked together in their new seating arrangement. The only issues that arose were with the high sensory threshold and high distractibility group, which we later discovered also included the children who scored in the negative quality of mood and intense range of reaction. After dispersing the children who fell in the extreme ends of negative quality of mood and intense range of reaction into other groups, the seating arrangement became efficacious.

Children with high sensitivity or distractibility were placed furthest from busy parts of the classroom. Likewise, children with a heightened sensitivity were placed in more quiet areas to increase their ability to focus on tasks. Tori, who fell in the sensitive range and somewhat distractible range, would look up anytime another child got up out of her desk and then mimic the child's actions. If a child went to sharpen her pencil, Tori would go sharpen her pencil. Hence, Christie and I decided to move her desk towards the back of the room away from the door and pencil sharpener in a quiet and secluded area by the library center. Her back faced the pencil sharpener and door enabling Tori to become more focused on her work or activity and engaging with her group members providing her with a goodness of fit (Keogh, 2013). Four children who scored in the active range were allowed more

freedom to move around as needed on the rug or by their seats, which were placed next to open areas allowing for this movement.

Measures were put into place to support the needs of the children who had difficulty adapting to change (Keogh, 2003; Rothbart & Bates, 2006). For example, I tried to be consistent with the time of day that I arrived and how I implemented situated learning experiences. When I first incorporated some transitional time games to provide extra support for their executive function growth (Yeager & Yeager, 2013), Kemp explained, "That's not Woody Time….that has nothing to do with Woody…why are we doing them." He kept repeating this phrase until I was able to explain the connection. Due to a scheduling conflict, my arrival time was later in the day on one occasion. Wesley, who also fell in the non-adaptable range exclaimed, "You're late! What happened?" During collaboration the following week, we discussed the children's need for routine and schedule and set a time for my arrival each morning that worked with her schedule. Christie and I agreed I should begin early in the morning before the class began morning work centers, and we came up with a schedule for the flow of the activities involving Woody, humane education, executive functions, or temperament.

The majority of the children fell into the irregular range of rhythmicity meaning their physiological functions did not follow a pattern (BDI, 1998; Keough, 2003: Rothbart & Bates, 2006). Christie adapted to inconsistencies in routines of their physiological functioning by not having set restroom breaks and allowing children to leave the classroom and go to the restroom individually. The only limit she set was that children were not to leave the classroom when she or I were going

over directions. Christie also integrated a longer time span for snack instead of passing out the snack and having children clean up after 15 minutes, thereby meeting the needs of the children who were non-persistent or non-adaptable, which meant they were slower to finish.

Mode of instruction. With over half of the class falling into the category of rarely persistent, situated learning experiences were broken up into several brief periods of activities with many movement opportunities (Keogh, 2003; Rothbart & Bates, 2006). We would start with a hands-on game for executive function development, read a story, and then engage in a group activity. When the stories or chapters in *Charlotte's Web* were lengthy, we would employ an abridged version of the chapter by reading sections or summarizing sections of the chapter and engaging the children in predicting what was missing or what was happening next.

Group activities often resulted in conflict and chaos. Using the children's temperament profiles, Christie and I formed groups for the children that worked successfully. However, the children wanted to be able to choose their own groups. Christie and I reached an epiphany as we decided the children were more successful in situations in which they were the protagonist in their own learning (Edwards et al., 1998). Therefore, we concluded that we could teach them about their different temperament traits. If they understood the concept of temperament, then they could analyze their traits and potentially use this information to successfully choose their own groups. Our initial discussion with the children began with what makes a group not work out. Lauren stated, "We fought a lot and didn't work

together." Janiya said, "Too many people in my group." Next, we discussed what makes a group work. Rachel stated, "You have to listen to each other." Tara said, "You have to help." We made a list of traits that described a good group. From this discussion, Christie and I decided on four traits to introduce to the children: curious versus focus, talk versus listen, in charge versus helper, quiet versus loud. As a class, we completed the chart for one trait at a time.

The first trait we talked about was adpatability, which is how we react in new situations. Nathan, who was moving at the end of the week, exclaimed, "I'm ok with new places…I'm ok." I had created a T-chart, so children had to choose either *I like to talk* or *I like to listen.* After the third child placed their name on the chart the children began to discuss a predicament on the rug. Tori stated, "but…I like to talk and listen." Nicholas replied, "Me too…can I put my name on the middle line." We continued to discuss whether *I like to talk* or *I like to listen* and surprisingly, the children grouped themselves pretty accurately in comparison to their actual temperament profiles. I compared this trait to intensity of mood as some children are more quiet and reserved and other children are more loud and dramatic, in addition to activity level as some children like to sit quietly and other children are more active.

We continued with the three other traits including curious versus focused, loud versus quiet, in charge versus helper. During our discussion on *curious* or *focus,* the children desribed the terms in detail. Lauren said when you are curious, "you are interested in a lot of stuff." Jake followed

up with, “You want to know about somethings.” Curious versus focus coincides with the tempermant traits of sensitivity in whether children are very cognizant of external stimuli or unaffected by their surroundings and approach/withdrawal to new situations, people, or things. Loud versus quiet aligned with intensity of mood and quality of mood. In charge versus helper coordinates with persistance, approach/withdrawal, and adaptability in the child’s ability to quickly become emersed in the activity or the chid’s ability to stay focused and engaged in the activity. The children demonstrated their understanding when they contributed examples that supported the various temperaments and used the information discussed to group themselves.

We then discussed how they could use these temperament charts to choose groups. On the first day, Christie and I were very apprehensive as we laid out the temperament charts and dismissed the children to form groups. The transition from whole group to choosing groups for the small group activity went smoothly. The children gazed at the charts and had discussions with their friends and then began to form groups. The groups of children dispersed to different areas of the rooms and engaged in the activity. Harmony filled the room as children worked productively in their groups and the children shared responsibilities (Keogh, 2003). For example, when it was time to share their project to the whole group, children had assigned parts to each other. Jasmine said, “We each took a circle in the [Venn] diagram.” Kremer said, “We picked one thing to talk about.”

Towards the end of the school year the posters disappeared as the school was undergoing a mass spring cleaning in preparation for summer renovations. Nicholas

said, “I need the charts to help me choose the right people for my group.” We first tried to choose groups without the posters by relying on our memory. The first day went as smoothly as the days with the posters. However, over the next few days conflict and chaos overcame group activities. I had taken pictures of the posters, so I printed the pictures off and the children used the pictures of the posters to successfully choose groups.

Executive Functions

The purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments. During collaboration, Christie and I decided our intentions were to build these skills through interactions with Woody, games, and other projects that emerged during the study (Diamond, 2013; Yeager & Yeager, 2013). We did not plan on explicitly teaching executive functions until the children started utilizing the vocabulary. Of course, this group of children desired to be central figures in their learning (Edwards et al., 1998) so it made complete sense to scaffold their understanding of executive functions by providing them the knowledge of the concepts (Vygotsky, 1978).

To scaffold their understanding, a reference board for executive functions was constructed illustrating the four steps for goal oriented behaviors: setting a goal, making a plan, modifying the plan, and reflecting. Additionally, the components of executive functions, inhibitory control, working memory, and cognitive flexibility were displayed on the board (Diamond, 2013). The children were constantly setting goals anywhere from short term goals as Kremer stated, “My goal today is to be a

good listener today," to more long term and complex goals as Rachel exclaimed, "My goal is to raise enough money to go to Lego Land." We compared the components of executive functions listed on the board to learning how to ride a bike. Just like riding a bike in which you need to acquire certain skills to be successful in staying upright on your bike and peddling, with executive functions, you need the three components to be successful in carrying out your goals.

Three tasks were administered to children in the beginning of the study to evaluate their strengths and needs in terms of executive functions. The tasks included a picture sort, digit span (forward and backward), and the ladybug and rabbit task (Diamond, 2013). During the picture sort task, children were asked to perform simple to complex sorts to evaluate cognitive flexibility. The digit span task asked children to repeat numbers forward and then backwards which primarily assessed working memory, but also cognitive flexibility and inhibitory control. The final task was the ladybug and rabbit task. If the ladybug said to do something, the children would follow the directions. However, if the rabbit said to do something, children would ignore the directions. This task is similar to the game, *Simon Says*, and assessed children's inhibitory control.

Initially, I looked at each child's individual performance on the tasks. Then, I completed a chart for each task with all of the children's performances for that task on one chart enabling me to look at the whole picture of executive functions in this first grade classroom. Finally, to gain an even deeper understanding of each child's executive functions, I carefully analyzed each child's performance one task at a time. This cyclic process enabled me to gain an in-depth understanding of the children's

executive functions and utilize this information during collaborations with Christie so we could plan based on the children's needs (Friessen et al., 2012). The children in this classroom were strong in cognitive flexibility, yet lacking in working memory and inhibitory control. Therefore, Christie and I decided to begin with inhibitory control and then move to working memory.

From the time I first interacted with the children and throughout the first four months, they displayed their need to make decisions about their learning experiences, but many of them lacked the inhibitory control needed to be successful. Consequently, Christie and I began playing many games as transitional activities that were designed to increase inhibitory control. We began by explicitly stating the rules of the game and then modeling the game with another child or group of children. Modeling the game allowed us to engage in self-talk and parallel talk, subsequently modeling working memory and inhibitory control. Additionally, we incorporated visual cues and reminders that were helpful in building their executive function skills (Diamond, 2013; Garon et al., 2008). These games allowed the children to be successful during complex tasks and build their executive functions (Diamond, 2013; Garon et al, 2008; Obradovic et al., 2012).

The Center for the Developing Child at Harvard University (n.d.) stated that the time span between ages five and seven creates a window of opportunity for enhancing executive functions through games. Although children in first grade have gained interest and skills to successfully engage in games with rules, scaffolding by adults are needed in problem solving and conflict resolution. Games should be

challenging yet not too difficult and could include card games, board games, physical activities/games, quiet games, and songs and movments.

After each game was modeled and before the children were dismissed, we would review each step of the game with children holding up a finger for each step and repaeating the step with me. This process boosted their working memory skills (Diamond, 2013; Yeager & Yeager, 2013). Children were then told that after each person had a turn, they could change up the rules any way they wanted, thus augmenting cognitive flexibility skills. For a different game children were to build the same shape their partner built but covered. I asked children what strategies were utilized in order to help them remember the covered shape. Tara, "You flashlight focus on them when they lay them out." I also provided feedback on their strategies, "I noticed Jake and his partner used their cognitive flexibility when they realized four shapes was too easy and changed to six shapes."

A few children, including Connor and Luke, would roam around the room and join multiple groups for short time spans instead of choosing one group. Guidance, such as reviewing the temperament trait data posters and helping them transition into an already formed group by asking, "Can I join your group?" provided a smooth transition for Connor and Luke to finally join a group (Edwards et al., 1998; Vygotsky, 1978). However, even with guidance, Kemp preferred to work alone, which was congruent with his temperament profile in which he fell into the categories of nonadaptable, high withdrawal, intense, negative mood, and high distractability portraying

group work as a poor fit for him and working independently a good fit (Keogh, 2003).

Kemp did not work independently all the time. If the game required a partner he would find a group utilizing the temperament trait data charts and worked very well with the other members of his group. One activity that necessitated more than one person was the Marshmallow Tower activity. This activity was initially designed to introduce the idea of executive functions. Children worked in groups of three to five and were given toothpicks and marshmallows. The goal was to build the tallest tower. In order to build a successful tower, the children would need to utilize executive functions by making a plan and modifying the plan as needed. Inhibitory control was crucial in not only eating all of the marshmallows before the tower could be built, but also in controling habitual actions and engageing in more thoughtful actions according to the plan (Diamond, 2013).

The first attempt at Marshmallow towers occurred before the implementation of the temperament trait charts and was a catastrphe as the groups did not work collaboratively and were not able to build the towers vertically. Afterwards we debriefed and discussed why the towers were not tall. The children were quick to blame peers. Nicholas said, “Brynlee just ate all the marshmallows.” David said, “No one helped me.” Even with a room full of frustrated children, Kemp said, “Can we do it again tomorrow?”

The second time occurred after the creation of the temperamant trait data posters, therefore children were more efficient at choosing groups. Children incorporated working memory by remembering what worked and didn't work during the first attempt. Cognitive flexibility was evident as children would only get upset for a short period if their tower collapsed before trying to build the tower again (Diamond, 2013). Lila said, "We built our own and then put them together." We decided that a third attempt at Marshmallow Towers would occur the last week of school.

Both direct situated learning experiences and indirect situated learning experiences enhanced executive functions in the children. Direct situated learning experiences designed to enhance executive functions included games like *Simon Says*, *Mother/Father May I, and Red Light Green Light* to build inhibitory control, and card games to build working memory (Yeager & Yeager, 2013). Situated learning experiences that indirectly supported executive function development included care and handling of Woody, humane education group activities revolving around the five freedoms of animal and children's rights, designing and creating habitats for clay guinea pigs, and discussions and journal entries relating to *Charlotte's Web's* by E.B. White (Table.2).

The Interplay between Temperament and Executive Functions

An advantageous interplay between temperament and executive functions can support a goodness of fit for a child in any environment (Bridgett et al., 2013; Liew, 2012; Wolf & Bell, 2007). As an illustration, a component of executive functions was inhibitory control enabling children to carry out the appropriate behaviors

regardless of habitual or reactive tendencies. During transition time from large group to small group activities, we played *Mother/Father May I.* Kremer wanted to be Father May I and repeated this with a high level of excitement, "I want to be the father," but it was another child's turn. He looked down at his lap for a few seconds then glanced up and said, "Oh well….maybe next time." Kremer's comment is an example of inhibitory control. Even though he scored in the highly non-adaptable range on the Carey Temperament Scale, he was able to adapt to the idea of another child having a turn first, demonstrating the interplay between temperament and inhibitory control (Stifter et al., 2009; Thomas & Chess, 1977).

In addition to inhibitory control, working memory and cognitive flexibility can ensure a goodness of fit even if a child's temperament would normally lead to a poor fit in a situation. In order to carry out the appropriate behaviors, children tap into their working memory to recall directions or the appropriate way to behave in similar situations and apply this information to the current situation. Children may even incorporate cognitive flexibility to help problem solve if the situation entails conflict or road blocks. An example of both working memory and cognitive flexibility alleviating a potential poor fit emanated often with the care and handling of Woody.

One day it was Lila's turn to hold Woody, yet Tori and Sophie were finished with their morning work and wanted to hold Woody also. On the Carey Temperament Scale, Tori and Sophie scored in the non-adaptable range in addition to being negative in mood and highly intensive. Consequently, Sophie and Tori easily became upset when things did not go their way. Tori said, "I am never going

to get to hold him." All three children were sitting on a rug in the library center. Sophie grabbed a book and said, "We can take turns reading a book and holding him." They all agreed to this plan. Interestingly, the children have reading buddies in the preschool class and read a story to their buddy once a week. Sophie used her working memory by applying her knowledge of another event and made it work in the current situation. Reading a story to Woody diminished the problem of wait time to hold him (Bridgett et al., 2013; Melson, 2003; O'Haire et al., 2013).

Changes in Temperament and Executive Function Skills

Analysis of the post temperament and post executive functions tasks generated the question: Does hereditary (nature) effect development more than the environment (nurture) or vice versa? On the other hand, do nature and nurture work harmoniously in development? For Vygotsky (1978), development was not a question of nature or nurture; child development was a consensus of both nature and nurture or a coaction of biological development with cultural development (Bodrova & Leong, 2010). However, the literature paints a different picture for temperament and executive functions. Temperament is considered an innate trait while executive functions are impacted by environmental stimulants or hindrances (Diamond, 2013; Thomas & Chess, 1977).

With this in mind, the growth in executive functions, outlined in Table 17, aligned with the literature. The small but evident changes in children's temperament, illustrated in Table 16, painted a different picture. The findings show that the changes in temperament could be explained by the growth in executive functions. However, it is still unclear if executive functions impact temperament or if executive

functions change temperament permanently. Development is fluid and plastic and can be enhanced with the appropriate environmental influences and experiences (Berk, 2010). Temperament is an innate trait yet can be influenced by environment and maturation, whereas executive functions are not innate but are impacted by environmental stimulants or hindrances (Bridgett et al., 2013; Conway & Stifter, 2012; Diamond, 2013; Liew, 2012Thomas & Chess, 1977).

Table 16

Changes in Children's Temperament

	Activity	Regularity	Approach	Adaptability	Intensity	Mood	Persistence	Distractibility	Sensitivity	Manageability
	I-----A	I-----R	W-----A	N-----A	I-----M	N---P	N-----P	D-----ND	NS--S	
Lauren				√	√*		√			
Kemp	√TI						√			
Nathan										
Tori	√√TI			√	√					
Caroline						√TI		√		
Wesley			√	√*	√*	√		√		
Kinsly										
David					√*				√	
Sophie	√		√TI			√				
Jake	√			√			√	√		2 to 1
Brynlee	√	√		√	√	√	√TI	√	√	5 to 4
Lila				√	√	√			√	
Tara		√*								
Savannah	√	√TI	√*	√√TI			√	√	√*	
Jasmine		√	√√TI	√	√	√	√		√	
Janiya						√*			√	
Nicholas	√*		√					√		
Rachel	√	√	√*	√TI		√	√		√	
Kremer	√TI	√TI	√	√*		√	√			
Connor	√*	√TI		√	√*	√	√TI	√√TI		
Luke				√						

*=changed category within trait
√=a change occurred
TI=change on teacher impression section

Table 17

Growth in Executive Function Skills

	Sort		Digit Span		Ladybug/Rabbit	Pencil Tap
	PRE	POST	PRE	POST	PRE	POST
Lauren	√	√	F	Both	X	√
Kemp	√	√	F	Both	√	√
Nathan	√		F		X	
Tori	√	√	F	Both	X	√
Caroline	√	√	F	Both	√	√ 1 mistake
Wesley	√	√	F	F (close on B)	√	√
Kinsly	X		F		X	
David	√	√	F	Both	√	√
Sophie	√	√	F	F (close on B)	√	√
Jake	√	√	F	F	√	√
Brynlee	√	√	F	Both	X	√ 1 mistake
Lila	√	√	X	Both	X	√ 2 mistakes
Tara	√	√	F	Both	√	√
Savannah	√	√	F	Both	X	√
Jasmine	X	√	F	F	X	√ 1 mistake
Janiya	√	√	F	Both	√	√
Nicholas	√	√	F	Both	√	√
Rachel	√	√	F	Both	√	√
Kremer	X	√	F	F	X	√
Connor	X	√	F	F	√	√
Luke	√	√	F	F	X	√ 1 mistake

X=did not master task
√=mastered task
F=forward only
Both=mastered digit span forward and backward

Children showed growth in all components of executive functions as illustrated in Table 17. During the tasks, many children incorporated strategies learned during the executive functions games like when Savannah was looking up as she tried to recall digits for the digit span. I asked her how she remembered and she said, “I made a picture of them.” As Rogoff (1990) and Brown et al. (1989) denoted, children learn through hands-on experiences with authentic materials under the

guidance of an expert. Savannahwas able to transfer skills learned in other activities to the executive function tasks. Children also replicated dialogue or strategies learned in their private speech as they completed the tasks independently (Berk, 2010; Copple & Bredekamp, 2009).

During the card sort post test, the children were very attentive to the details in the pictures. When asked to sort the pictures into either soft or hard, Jasmine said as she held up a picture of a chair, "Well some of it is hard and some of it's not." Working on designing and creating their habitats brought children's attention towards the fine details by purposely choosing fabrics and other materials. Luke needed the perfect object to make a door for Woody. He went through each box of materials and examined the object, then tried it on his habitat. Immersed in hands-on activities, problem-solving skills become proficient through trial and error in authentic situations just like the novice cabinetmaker working alongside an expert cabinet-maker (Rogoff, 1990).

Many of the temperament traits aligned with executive functions traits. For example, executive functions include inhibitory control, which aligned with effortful control that is associated with temperament. Effortful control includes reactivity and regulation. Hence, inhibitory control and effortful control encompassed six out of the nine traits: activity, intensity, mood, persistence, sensitivity and distractibility. Gains in inhibitory control could be why many children had differences in these areas of their post temperament scales. Inhibitory control allowed the children to avoid their habitual or natural responses or behaviors and perform the more appropriate behavior or response for the situation (BDI , 1998; Keogh, 2003; Yeager & Yeager, 2013).

Gains in cognitive flexibility on the post executive functions tasks could explain the changes in approachability and adaptability, as cognitive flexibility enabled the children to problem solve and think outside the box and not get frustrated by brick walls (Diamond, 2013).

Classroom Pet as a Provocation

Humane education fosters development in many domains of learning and development (Aquirre et al.. 2010; Daly & Suggs, 2010; Esposito et al., 2011; Kahn et al., 2006; Meadan & Jegatheesan, 2010; Melson, 2003; Melson, 2006; Rud et al., 2000; Thomas & Bierne, 2002). To review the connections between humane education and executive functions, definitions of humane education and executive functions will be compared. Weil (2004) defined humane education as including decision-making skills, curiosity, creativity, critical thinking, problem solving, respect, and responsibility. Diamond (2013) stated executive functions include the ability to set goals and incorporate problem solving and critical thinking skills to reach those goals. Cognitive flexibility encompasses creativity and problem solving, whereas inhibitory control includes responsibility. Working memory benefits the ability to make informed choices by recalling past information and merging with current information in decision-making.

A comparison of these definitions brings forth many similarities supporting Diamond's (2013) call for research on the impact of pets on executive functions. This study incorporated situated learning experiences with first graders involving Woody. Whether these situated learning experiences indirectly or directly involved Woody, they were planned in alignment with children's temperaments eliciting a

goodness of fit in order to enhance executive functions (Keogh, 2003; Vitiello et al., 2012). This section is divided by situated learning experience topics beginning with activities directly involving Woody to activities that indirectly related to Woody. Each section will illustrate connections between the situated learning experiences, temperament, and executive functions.

Care and Handling of Woody

During the first visit to the classroom, I introduced myself and the idea of a guinea pig joining the classroom. The children were exuberant and, as a result of their exuberance, my apprehension alleviated until one child stormed off from the group. After finishing the introduction, I asked Christie what had upset Kemp so much. She replied, "He doesn't want a classroom pet. It just takes him a while to process change but he will be fine with it." Christie took Kemp into the hallway and they came to an agreement that the Woody would be placed on the opposite end of his desk. After a few days of Woody being in the classroom, Kemp drew a picture of him during the parent meeting that occurred after Woody's arrival with a caption proclaiming, "I love Woody!" Since Kemp fell into the low adaptability and low approach ranges on the temperament scale, he needed advanced warning and time to process the new addition to the classroom (BDI, 1998).

This initial conversation about Woody was very enlightening as it depicted a picture of the children's thoughts and feelings about having a classroom pet and also served as a strong foundation for planning the emersion of Woody. When the children were asked if they had ever owned a pet, they disclosed a series of unfortunate pet occurrences. In particular, one child announced, "I had a guinea pig,

but my dog bit it and it died." Therefore, Christie and I determined we would begin with the basics, such as how to care for and handle Woody. The first week served as a time of observing Woody in his cage and the children recorded their thoughts and observations in *Guinea Pig* journals. The process of observation and recording notes enabled the children to become aware and familiar with Woody's habits and preferences, and as a result see things from Woody's perspective leading to empathy development (Daly & Suggs, 2010). Perspective taking and empathy development are aspects of cognitive flexibility (Orbradovic et al., 2012). For example, instead of assuming Woody preferred oranges, because it is her favorite food, Tara wrote, "He likes cilantro because he eats it fast." Notably, Thomas and Bierne (2002) noted that empathy towards animals can be transferred to empathy towards other people.

The following weeks entailed thorough explanations and discussions on how to hold Woody, "like a baby" (Lilly M). Subsequent to the discussions of handling Woody were lessons on feeding him. The children were engrossed and excited about the feeding process so *Watering Plants* on the job chart was replaced with *Feeding Woody.* This change provided the children with a visual feeding schedule and alleviated the anxiety of "*when is it my turn to feed Woody*" (Yeager & Yeager, 2013). Not only was responsibility evident in children's interactions with Woody, during the interview, Christie noted a change in the overall atmosphere of the classroom with children becoming more harmonious and responsible, which confirms Fleer's (2009) findings that when intrinsically motivated, children would be able to transfer new knowledge to other situations. Thus, learning how to care and handle Woody appeared to not only increase a sense of responsibility and caring for

Woody, but children seemed to transfer this knowledge to peers. For example, Tori fell into the highly sensitive range and noticed every movement or occurrence in the classroom. As the study progressed, Tori seemed less interested in who was going to the bathroom or sharpening pencils and more interested in who was in need of help or comforting. For example, if a child was sick or hurt, she was the first to say, "I'll take them to the nurse." When we were working on the habitats, she would come out in the hallway to get a drink and immediately step in and help a child find materials or glue materials on their habitat.

The executive function tasks in the beginning of the study indicated the first graders were stronger in cognitive flexibility. An example of this strength happened one day when we ran out of time to hold Woody during one of our situated learning experiences. Wesley went to his seat and made a sign that said, "Petting Station" and cut out paper guinea pigs for children to pet. Cognitive flexibility consists of problem solving skills or creative thinking. Since time ran out to actually hold Woody, instead of getting upset Wesley made a make-believe petting station.

Situated learning experiences that emphasized working memory included remembering the care and handling procedures. Children recorded observations in their journals to use as references during our care and handling discussions. We discussed what fruits and vegetables I needed to bring in the following week for Woody and Kinsly said, "Wait, I need to get my journal. I want to show you some of my observations." She had a picture with four foods drawn, each placed meticulously in distinct areas of his cage and assigned to different meals. Additionally, Woody proved to be a valuable tool for Caroline to brainstorm ideas.

Caroline would tell Woody her story before she would write it down in her journal. Telling Woody her story verbally before putting her story on paper become the planning stage necessary for successful goal setting behaviors of executive functions (Diamond, 2013).

Opportunities to build inhibitory control also arose during situated learning experiences involving Woody. Children noticed that Woody went into his small home that was shaped like a castle when he was scared or mad, so the children wrote a journal entry comparing where they went to calm down. Lauren wrote, "Woody and I hide under our beds." Nicholas depicted creativity by drawing a picture split into two halves. On the left side he drew a picture of a staircase and an arrow pointing to a figure under the stairs. On the right side he drew Woody inside his castle. Nicholas wrote, "Shhhhh….don't tell anybody….Please…that me and Woody both have hiding places."

The children showed more inhibitory control when they held Woody in a community circle versus them signing up on the board and holding him during morning work. When the circle was formed, we came to a consensus on how long each child would hold Woody, usually 30 seconds. Gee et al. (2009) demonstrated in their study that, in the presence of animals, children were able to exhibit components of executive functions including working memory and inhibirory control. Christie witnessed the children exhibiting executive functions as they passed around Woody in their circle and she stated that, "The community circle worked because they could see him on their peer's lap and know when he is coming around."

We also played games during transition times to support executive functions. The children always requested to play Father/Mother May I. One person at a time had a turn, so other children had to wait long periods of time in order to get a turn. Our solution was to let the children sit at the edge of the rug and pass around Woody, enabling them to remain in the game and eventually get a turn. However, Woody periodically made noises or random movements when the children were holding him during the game. When he made these noises, we would discuss what he was trying to communicate. Jasmine said, "He wants us to be quiet." Brynlee stated, "No, he is hungry…he is saying he is hungry." Children were incorporating their inhibitory control by focusing on Woody's noises and their working memory by recalling past information in order to decipher what Woody was trying to communicate. Thus, in addition to the game Woody was also a stimulant for executive functions.

Diamond (2013) defined inhibitory control as the ability to execute the appropriate behaviors or actions despite environmental stimuli. Evidence throughout the study illustrates growth in inhibitory control through interactions with Woody. Christie said:

> So what I saw is one big huge teachable moment with the children waiting their turn to feed Woody and the (decrease in) anxiety in contrast to the anxiety in the beginning. (In the beginning) They would say, "Is it my turn?" and there was fighting and bickering. When they finally settled in to it, they knew that they were going to get a turn no matter what happened. They trusted that it will happen and I don't see them fighting over a turn to feed Woody anymore. Wait time was essential and allowing their peers to talk and listening to each other. Even Lauren will now stop and let us talk and before she wouldn't. It's incredible. In terms of bringing unity to this class I think we have taken it to their potential because of Woody.

Children transitioned from not being able to wait for their turn to feed Woody to incorporating strategies such as looking at the job board or standing by the children

who were feeding Woody to watch and not trying to intervene or take over. Similar results of improved inhibitory control emerged in a study in which Gee et al. (2009) found that children were able to focus more on directions when a dog was present. Children in the study were able to utilize inhibitory skills and focus more on the appropriate responses as the children in Christie's class were able to control habitual responses of grabbing Woody and instead waiting their turn.

In terms of assignments and directions in the classroom, Brynlee had a difficult time following more than one step directions. However, she was the first one to successfully follow all of the steps of feeding Woody including writing the foods on the menu, getting the cutting board and knives out of the box, cutting the food, putting the food in Woody's cage, and after observing Woody, recording his favorite foods on the menu chart. She even remembered to put the supplies away when she was finished. Gee et al. (2010) stated that when children completed memory tasks in the presence of a dog, children were able to follow instructions, focus more, relax, and complete tasks with fewer errors than children not in the presence of a dog. Brynlee was able to complete multi-step directions in the care of Woody when she normally was unable to follow more than one step directions.

Lauren fell into the non-adaptable range of temperament. The day it was her turn to feed Woody, vegetables or fruits were not available. When the refrigerator was restocked the next day, it was Kremer and Brynlee's turn to feed Woody and Lauren asked them if she could help feed Woody since she missed her turn. With some prompting from Christie, Brynlee and Kremer agreed to let Lauren help. Some conflict and raising of voices occurred, but they worked it out and completed the task

of feeding Woody. Even though these three children have temperaments that would make it difficult to work together, they persevered for Woody. Thus, confirming findings by Gee et al. (2009) that showed improved social competence and empathy, as well as increased social interactions between peers in the presence of a dog.

During the post interview Christie stated, "Woody brought back the community. They were unified. They would all sit down and partake in passing him and sharing him and watch over Woody together. I think he was honestly the saving grace of the classroom." The mere presence of Woody led to optimal outcomes, yet situated learning experiences yielded optimal conditions for children to foster executive functions, especially working memory in remembering care procedures and inhibitory control in handling Woody.

Designing Habitats for Woody

During our collaboration, Christie and I conceded that the children were captivated by Woody's home as evident in their Guinea Pig Journals. Additionally, children would engage in frequent disagreements on which of his plastic homes shaped like a castle, blue or green, should go in his cage and where Woody prefers it to be placed. The children decided Woody needed the green castle in his cage as it was more transparent and they could see him better. Caroline declared, "He doesn't like that one." I asked, "Why do you think that?" She replied, "He keeps lifting it up with his head." Therefore, we decided to channel this obsession regarding Woody's home preferences into a project in which the children created clay guinea pigs and designed habitats for them.

During the process of creating their habitats, the children were exposed to executive functions by following the four step process they had become familiar with through the discussions and activities. The first step entailed setting a goal, which was to create a habitat for their clay guinea pigs. Making a plan constituted the second step and was carried out by drawing the plans for their habitats on engineering paper. During the process of actually building their habitats, the children modified their plans based on needs and new interests, exemplifying following the step three of executive functions involving modifications if needed. The final step of executive functions was to reflect on the process of reaching the goal. Children engaged in this reflection process by sketching their final habitats and comparing it to their initial plans. They also shared the stories of their habitats with peers who then asked them questions that lead them to reflect on the *hows* and *whys* of their final product.

We began with a pre-plan. David said, "Plan- its like making a blue print. You have to first draw out your design." The children worked on their habitat pre-plan drawings independently, but conversed with peers while designing. Some children even taped their papers together and created a shared habitat design. By talking with a peer, the children talked out their plans, caught details that might not have worked out, or got ideas for additional details to add. A conversation between Savannah and Kemp had them discussing ladders and how Woody could get high, but not fall.

After many discussions on the care and handling of Woody, the children were transfering this information to their habitat designs. Savannah

and Kemp engaged in a conversation that enhanced their ability to assimilate knowledge gained in one situation to other situations. What was this conversation. As a strong advocate of project work, Dewey (1925) believed projects were a way for children to synthesize and internalize new information and the teacher's role was to provide guidance and not overshadow children's experiences.

Many children included necessities in their habitats like a bathroom, bed, and kitchen, whereas others like Nicholas, David, and Wesley added traps, tubes, and slides. Creating the actual habitats turned out to be a very time consuming activity, because the children became so attentive to the details and thought through every piece they added. Nicholas stated, "I glued this on to this but now there is a hole so Woody could fall out. I need to find something that will fit into here to keep him from falling." Tara was very purposeful about the fabric she chose for Woody's bed. She would pull out a piece a fabric and say, "This is not soft enough" and put it back into the box and try another fabric.

As the children constructed their habitats, their ability to problem solve became more evident, demonstrating cognitive flexibility (Diamond, 2013). For example, Kemp had been absent so he was unable to paint his habitat the week before so he painted on the day that the other children in his group were adding objects to their habitats. Kemp wanted to glue things on his habitat instead of waiting for the paint to dry. I told Kemp that we could try gluing objects on while the paint was wet. Kemp said, "I will just go get the one in the classroom." So he got the

sample diorama box and began to create his habitat. Kemp was very non-adaptable and this setback would have upset him, but he utilized his cognitive flexibility and came up with an alternative plan.

The children collaborated very well together during the process of creating the habitat designs and engaged in cognitive flexibility skills through perspective taking and problem solving. For example, Lila and Sophie both wanted the same egg carton, Lila said, "We can both share it. I'll cut it in half." Isabella and Kemp, who are not strong collaborators, worked out in the hallway together for two hours without any discord. Kemp, who always prefers to work alone, helped Isabella with her habitat.

The Five Freedoms of Animal and Human Rights.

Christie and the children were completing a project on great leaders in history including Martin Luther King Jr. and Mother Teresa right before the ten weeks of situational learning experiences aligned with children's temperaments were to begin. We reviewed some of the leaders they studied and I placed a quote on the board by Ghandi, "You can tell a greatness of a nation by the way it treats its animals" (People for the Ethical Treatment of Animals, n.d., para 3). I asked the children what this quote meant. They first dissected the quote into segments and then reflected on the quote as a whole. Rachel exclaimed, "Treat others how you want to be treated." Caroline followed up with "Words, not violence." Connor stated, "be fair," and following the discussion during journal time he wrote in his journal, "I love Woody. I would take care of Woody. XOXO. "Connor made a connection between our

discussion of treating others with kindness and fairness to his relationship with Woody (Ascione & Weber, 1996; Nicoll & Samuels 2008; Tsai & Kaufman, 2009).

Christie and I realized that the children were using people and animals interchangeably and decided to merge animal and human rights. We agreed that comparing their rights to animal rights would make the experience more concrete and enable them to internalize the information. Therefore, we adapted "The Five Freedoms of Animal Rights" (WOAW, n.d.), a universal concept for animal welfare, to the "Five Freedoms of Animal and Children's Rights." The five freedoms encompassed the right to: express normal behavior; be free from hunger and thirst; free from discomfort; free from fear and distress; and free from pain, injury, or illness. For each freedom I read a book (Appendix C) to the children, followed by a discussion of how the freedom related to the book, and concluded with a group activity in which the children utilized the temperament charts to choose their groups. This connection to humane education became an exemplar tool in order to build social and emotional development for the children (Anthony & Beck, 2000; Aguirre & Orihuela, 2010; Ascione, 1992; Ascione & Weber, 1996; Daly & Suggs, 2010; Tsai & Kaufman, 2009).

Working memory is the ability to remember and manipulate information as needed, regardless of distractions (Diamond, 2013). Children's working memory was evident during discussions about humane education. I asked the children, "Why is it not good to chain up a dog?" Rachel replied, "Because it is too small of a space to play." Additionally,

children demonstrated inhibitory control during discussions around humane education by listening to others and waiting their turn to speak.

They also used cognitive flexibility during group activities associated with humane education. After reading a story and having a discussion, children would work in groups to complete a graphic organizer that displayed what they had learned about humane education that day. When comparing the normal behavior of elephants to children on a Venn diagram, Savannah and Janiya said, "We both like to swim. Elephants…be in mud. We…the hot tub. We both talk. Elphants like to roar. I like to sing." Children were thinking creativitly or outside of the box by comparing elephants' interests to their interests. Furthermore, children used creativity when displaying their information on the posters. Even though the initial poster had a Venn Diagram on it, children drew diagrams and other designs and pictures outside of the Venn Diagram to illustrate their main talking points when presenting to peers.

A Book Study on Charlotte's Web

Initially Christie and I chose Charlotte's Web as a method for augmenting children's understanding of the five freedoms of animal and children's rights through discussions and journal writing. However, the book evolved into much more than our original goal as discussions on the animal's executive functions arose. During the chapter in which Charlotte decided to spin words into her webs, Rachel noted that she was making a plan and Sophie ran to the closet to get our Executive Functions information board capturing the attention of all of the children. Consequently, every

child became engaged in the discourse of how Charlotte had exceptional executive function skills. I was just as elated as the children when we realized this connection. Children's temperaments were apparent in their actions during the readings and their reactions to story events. For example, some children wanted to sit on the rug and just listen to the story, whereas others would wander around the room or sit at their desks and draw. Yet all of the children engaged in the discussions regardless of their behaviors during the reading.

The book lent itself as a vehicle for children in this class to engage in moral reasoning at a higher level (Kohlberg, 1981; Thomas, 2005). They were able to recall information from the humane education books and apply it to the discussions during read-a-louds of *Charlottes' Web*. When I asked, "Should Avery put the frog in his pocket?" Jake replied, "They need to hop around." Tara said, "He could suffocate in the box." The dilemma was that Avery wanted to put the frog in his pocket so he could keep it. After discussing this, we decided that wasn't humane for the frog. Was Avery's actions right or wrong? This discussion allowed children to share their perceptions of right and wrong (Thomas, 2005).

Four types of situational learning experiences have been discussed in relation to executive functions and connected to temperament: care and handling, habitats, the five freedoms, and *Charlotte's Web.* Melson (2003) investigated the significance of a child's interaction with animals on a multitude of dimensions including perceptual, cognitive, and social and emotional development. He found that children maintain their attention spans and increase their curiosity in the presence of a pet. For each type of situated learning experience planned and implemented as part of

this study, the children demonstrated executive functions including empathy and responsibility whether indirectly or directly interacting with Woody.

Negotiated Learning

Levine and Resnick (1993) stated that learning was more effective through hands-on experiences within authentic contexts leading to better understanding and increased knowledge. Furthermore, learning occurs as a negotiated meaning within a social experience in which different background knowledge and experiences from peers and adults become merged into a shared understanding. Negotiated learning occurs in schools in which a reciprical relationship arises between children, teachers, and parents who play out the role of teacher and learner simulataneously. A chronicle of the data that supports the theme of negotiated learning answers the question of what is the nature of the lived experiences for the children during interactions with the classroom pet.

Children being able to hold Woody is an example of a hands-on activity in which their executive functions were enhanced through negotiated learning. In the beginning of the study almost every child wanted to hold Woody, but the sign-up board did not provide enough times in the day to accomodate every child. In an endeavor to remedy the lack of time slots, the children would sit around the edge of the rug and take turns holding Woody, and then pass him to the next person. Negotiated learning occurred as both the adult and peers guided children in proper handling and passing of Woody (Rogoff, 1990). For example the following conversation

took place as children were independently holding and passing Woody to each other. Lauren stated, “We hold him like a baby.” Savannah said, “Don’t throw him up in the air.” Sophie followed up with, “We cannot squeeze him.”

Holding Woody also provided a means for negotiating the meaning of Woody’s communication through noises and movement. Kremer was holding Woody and Kemp stated, “When you started talking he put his head up.” Kremer replied, “He recognizes my voice.” Kemp said, “No, he wants you to stop.” Kremer did not get upset; he kept holding Woody. Kemp was transferring previous knowledge to the current situation. I was holding Woody one day and rubbed his head. When Woody threw his head up I told the children that, “I read in one book that when guinea pigs throw their heads back they are telling you that they do not want to be rubbed.” Woody provided the children with a variety of learning modalities including tactile development through petting, physical development by playing, and social-emotional development through understanding his needs and emotions even through Woody’s were nonverbal (Pattnaik, 2004).

Opportunties for negotiated learning not only emerged during the handling of Woody, but also during his care. The first day I brought vegetables and fruit for the children to feed Woody was complete mayhem. All of the children wanted to feed him at the same time. Since it was the first time, I wanted each child to have a turn so they each received a piece of spinach or cilantro. After the children were finished, they began plucking

leaves off of Christie's plants and walking towards Woody, leading to a discussion about Woody's food.

Following this discussion, the children journaled on the topic "I predict Woody's favorite food will be…" Journaling served as a medium for many opportunites for negotiated learning. For example, Nathan had drawn a picture and written a journal entry on a plain piece of paper instead of the lined paper provided in the journal. Several of the children in his group reprimanded him for not using the right paper. However, when they observed the extra space he had for his picture, many children in his group used plain white paper for their next journal entry. Understanding the children's need to make decisions in their learning experiences stopped me from interrupting Allii's creative moment (Edwards et al., 1998). Another child, Wesley, went above and beyond the journal topic by comparing what he liked to eat to what he thought Woody liked to eat, "I like to eat pizza and Woody likes to eat cilantro."

In Simon Says, Nicholas would get frustrated that children were changing the rules of the game and return to his seat and Kemp would say, "I am not playing anymore." After the game, the children and I engaged in a discussion about what they enjoyed about the game and what they could do differently. The children then recorded a new way to play the game in their journal. The next time we played the game, we incorporated some of the suggestions. For example, Nicholas said, "I think after five turns we should change Simon's." Kemp suggested, "A boy should call on a girl and a girl

should call on a boy so it's not all girls all the time." The new ideas for rules were transferred to other games that we played. For the game Mother May I, Addyson suggested that a boy should call on a girl and a girl should call on a boy while swiching roles of participant and Mother or Father. Rachel said, "We can change turns after each person answers one Mother May I."

The games became a medium not only for negotiated meaning but also as a way in which they could practice difficult tasks or skills like inhibitory control, working memory, and cognitve flexibility while simultaneously thinking at a higher level, increasing their attention span, and practicing self-regulation skills (Brown et al., 1989; Copple & Bredekamp, 2009; Park, 2011; Rogoff, 1990; Vygotsky, 1978). Engaging in games and other activities, the children were given many opportunities to develop and internalize the vocabulary, skills, and confidence in a collective environment through negotiations and discussions (Brown et al., 1989).

When groups shared their projects with the class, it became evident that they had reached a higher level of understanding during the activity through communication. They were not only learning through negotiation and communication with themselves through private speech, but they also learned through interactions with more experienced and insightful peers and adults. Language became a valuable tool for learning (Park, 2011). After group activities were completed, they would share their final products with the class. Children would listen intently to their peers share their final

products. The next time we shared, groups would use strategies implemented by previous groups. For example, one group assigned one section of the diagram to each group member. Many groups followed this format for sharing.

Sociocultural theory emphasizes the importance of negotiation as ideas are exchanged, leading to children's ability to organize and communicate thinking, thus internalizing learning (Vygotsky, 1978). Temperament was a critical aspect of planning situated learning experiences that would provide children with a goodness of fit. Through the goodness of fit between the child and the situated learning experiences, negotiated meaning became possible through discussions and collaborations. Executive functions were fostered during negotiated meaning as children used cognitive flexibility through perspective taking and problem solving. Edwards et al. (1998) described the learning child as seeking autonomy and contentment through discussions, engagement, and agreement with peers and adults. Working memory was utilized by children by following with multi-step directions and applying past and current knowledge to complete activities, and inhibitory control by listening to peers and staying engaged in tasks.

Furthermore, the data from the group activities support Levine and Resnick's (1993) belief that people cannot learn through passively receiving information and that new knowledge cannot merely be placed into memory. In every situated learning experience, the children were engaged in hands-on learning activities with other children as they constructed their knowledge through the interactions with their environment (Brown et al., 1989).

Summary of Findings

The purpose of this study was to explore how children apply executive functions during situated learning experiences with a classroom pet that align with their temperaments. Not only did the post executive function tasks show growth, our class discussion after our final run of the marshmallow towers also showed an increase in children's executive functioning. During the debriefing period after the trial run and second run of the marshmallow towers during the beginning of the study, the children seemed frustrated and blamed each other for their unsuccessful towers. The discussion after the final Marshmallow trial illustrated growth as the children truly reflected on their experiences and used executive functions and temperament vocabulary. Wesley said, "We worked together." Rachel said, "We made a plan and if it didn't work we made a new plan." When Christie and I reflected on this during our collaboration, she exclaimed, "That really shows their growth since the beginning of the year!"

Weil (2004) designed a definition for humane education that correlates with the components of executive function by including the rights of humans and animals, respect and reverence, and critical thinking. Melson (2003) investigated the importance of a child's interaction with animals on perceptual, cognitive, and social and emotional development. More recently, Gee et al. (2010) investigated how preschool children completed memory tasks in the presence of a dog and found that children were able to follow instructions, focus more, relax, and complete tasks with fewer errors than children not in the presence of a dog. Therefore, humane education and executive function development are quite harmonious as illustrated in the

findings of this current study. Woody's presence in the classroom not only brought a sense of calm as noted by Christie, but he also played a leading role in the story enhancing executive functions in first graders.

Temperament is a stable, genetic characteristic of children (Rothbart & Bates, 2006). Even so, the environment plays a strong role on how children behave and react to environmental stimuli. Therefore, the individual differences in children's emotional, sociability, activity level, and attentional reactivity can be explained by temperament (Rothbart & Bates, 2006; Valiente et al., 2012).

For children to experience a goodness of fit, it is necessary to be familiar with their temperament traits and provide situational learning experience that meets these needs (Vitiello et al., 2012). During the post interview Christie disclosed how passionately she now feels about teachers gaining understanding of each child's temperament in the classroom,

> It kind of alleviated my guilt for the climate of the children's behaviors. They are such an interesting composite of temperaments that I now better understand them. Before there was a part of me that thought I was failing, so there was so much upheaval upset or reactionary happenings with different children. I was constantly trying to manage it and I felt exhausted from it. When we got the temperaments back I could go "oh I am not God and I did not create this temperament and they are who they are and I know that cognitively.

In this study, temperament was addressed in a myriad of ways including the seating arrangement, groups, situated learning experiences, and how Christie and I reacted to children's behaviors and actions. Altogether the children were protagonists in their own learning and became both teachers and learners by speaking from their own perspectives, yet they learned through negotiation in shared activities. During these shared activities or situated learning experiences, the classroom pet served as

provocation to elicit executive function development. Moreover, temperament served as a liaison between the situated learning experiences enabling each experience to be a goodness of fit and productive.

The nature of the lived experiences of the teacher and children during the six months of Woody's presence became evident during the last few weeks of the study. After we finished a situated learning experience with the children on one of the five freedoms of animal and children's rights, Christie exclaimed:

> I really love what you are adding to the class. Because of what the district wants me to focus on (reading and math) the children do not get a lot of social studies and science and I feel like since this is my first year teaching first grade, I don't know how to incorporate it into the other disciplines yet. I really enjoy it and know the kids are enjoying it too.

The children wrote letters to Woody on his last day at school. These letters depicted the fondness they had towards him. Kremer wrote, "Dear Woody, You are cool. You are fun. You bring so much joy to me." Kemp, who initially did not want a class pet, wrote, "Dear Woody, Goodbye. I'll always miss you. Your step dad, Kemp." The parents expressed during the last week of school how attached their children had become to Woody. One parent asked, "Was today Woody's last day?" When I said yes, the parent responded, "Sophie came home and cried and cried." She continued, "Well you know Sophie is not adaptable and doesn't like change, so this is extra hard on her." I then realized that it was not just the children who gained a stronger understanding of temperament and executive functions, but their parents did too. Additionally, Christie began implementing executive functions into activities outside of the study. She shared,

> The other first grade teachers were going to give just a simple direction sheet, but I made this booklet to help them design a plan first and then build the

simple machine. Then, they have a page to reflect on their journey building the simple machine and final product.

In the post interview Christie summed up the impact that Woody had on the children's growth during the six month time span, "I really can't imagine what this class would have been like without the Woody study. I think we have so many engaged moments now."

Chapter Five

Conclusions and Implications

This study looked at the impact of situated learning experiences aligned with temperament involving a classroom pet on executive functions. The themes that emerged during data collection were the strong interplay between executive functions, temperament, and situated learning experiences with the classroom pet. The significance of the study is emphasized in the research reporting that early childhood years are important for the development of executive functions, which are more important than IQ or reading and math skills for school readiness (Bridgett et al., 2013; Diamond, 2013; Shaul & Schwartz, 2014; Yeager & Yeager, 2013). They also lead to favorable outcomes later in life including marital harmony, job success, physical health, and mental health.

Executive functions are not present at birth, although these skills begin to develop shortly after birth and develop throughout the lifespan. Interactions with the environment including but not limited to imaginative play, games, conversations, storytelling, modeling, role playing, and sorting activities enhance executive functions (Center for the Developing Child, n.d.; Diamond, 2013; Yeager & Yeager, 213).

Why are executive functions not a significant aspect of learning objectives and or standards in our schools? Executive functions are neglected even knowing the importance of educating the whole child and knowing that the early childhood years embody an era of rapid growth in all domains of development. Yet, parents, children,

and teachers can concurrently benefit from programs and strategies that effectively increase children's overall well-being (Webster-Stratton & Reid, 2003).

With the pressures of high stakes testing and the push down of curriculum, academic skills become the focal point of many early childhood classrooms (Barksdale-Ladd & Thomas, 2000: Stipek, 2006). This is quite evident with the first grade classroom participating in this study. Christie's background knowledge and experiences in constructivist approaches to teaching including Reggio, Waldorf, and Montessori enable her to implement learning strategies like long term in-depth investigations into topics that align with children's interests. The process of inquiry and collaboration naturally builds many components of executive functions including inhibitory control, working memory, and cognitive flexibility through hands-on, authentic experiences (Bodrova & Leong, 1996; Brown et al., 1989; Fleer, 2009; Lave & Wenger, 1991; Resnick, 1985; Rogoff, 1990).

During my time in the classroom I observed frequent visits by instructional coaches who monitored Christie's practices. They wanted to see the children on the computer with "I Read" or at their desks doing designated worksheets and textbook activities. The moment I realized Christie had gained an understanding of executive functions, temperament, and humane education was during one of these visits. I was in the hallway working with a small group of children on their habitats. When the instructional coach inquired what we were doing, the children replied, "making habitats for our guinea pigs." Christie interjected with a thorough explanation of what executive functions were, how they were important, and how habitats enhanced executive functions. If the instructional coach was not pleased with what she saw

occurring in the classroom, she reported to the principal who then talked to the teacher. Christie believed that not hearing from the principal that afternoon meant the instructional coach was content with her response. Therefore, having a thorough understanding of executive functions and being able to communicate the benefits might allow a teacher to supersede pressures from outside the classroom.

Executive functions lead to short term and long term success and are teachable, whereas temperament can lead to a goodness or poor fit in the classroom environment and are considered genetic and relatively stable (Diamond, 2013; Keogh, 2003). Teachers sometimes wonder why one of their students fared better in their classroom, but the following year is very challenging. Goodness of fit provides an explanation for the discrepancies in how children adapt from year to year. A child's temperament influences how he or she reacts to the environmental demands of the classroom including teacher-child interactions, organization of space and time, and instructional modes. Therefore, becoming familiar with each child's temperament allows the teacher to adapt the environment to meet the child's needs, leading to a goodness of fit or success in the classroom (Keogh 2003; Vitiello et al., 2012).

The only dilemma that arises is that most temperament scales are time consuming for the teachers to complete and score. One solution to this problem is to become familiar with Thomas and Chess' (1977) nine temperament traits and use them in a more informal way. Many of the temperament traits can be answered through observations. For example, many websites such as The Child Development Institute (n.d.) offers questions to ask about the child for each trait. When

considering persistence, a question to ask could be, “Does the child continue to work on a task even if it becomes too hard or does the child move on to a new task?” For adaptability, a question to ask would be, “Does the child have a difficult time transitioning from one activity to another?”

More important than deciphering children’s temperament is knowing how to adapt the environment to meet the individual needs of the children. For the most part, this is a trial and error process, but many valuable resources are available on the internet and through journal articles and books. For example, Keogh’s (2003) temperament in the classroom gives a thorough background understanding of temperament and how to adapt the classroom to meet the needs of different temperaments. With seatwork becoming a more common practice in the primary grades, child with a high activity level are exhibiting challenging behaviors. If a child is very active, opportunities for gross motor movement should be available and quiet tasks that involve sitting should be designed to be completed in shorter time span.

A difference arose between children’s pre and post temperament scale profiles. Does hereditary (nature) effect development more than the environment (nurture) or vice versa? On the other hand, do nature and nurture work harmoniously in development? The findings of this study align with Vygotsky (1978) theory that development was not a question of nature or nurture; but an interplay between both nature and nurture (Bodrova & Leong, 2010). To emphasize, temperament is present at birth, however we are not born with executive functions which develop throughout the lifespan (Diamond, 2013; Thomas & Chess, 1977). With contemporary research

supporting the idea that temperament is biologically based and relatively stable, children's growth in executive functions enable them to meet environmental demands regardless of their temperaments. Therefore, temperament is not only impacted by genetics, but influenced by maturation and the environment (Kandler, Riemann, & Angleitner, 2013; Kiff, Lengua, & Zalewski, 2011; Komsi, Raikkonen, Pesonen, Heinonen, Keskivaara, Jarvenpaa, & Strandberg, 2005). Hence, this signifies the importance of providing children with tools such as executive functions to overcome temperamental barriers and adapt to environmental demands for optimal outcomes.

Humane education encompasses social, emotional, and cognitive areas of development aligning with the components of executive functions. Situated learning experiences incorporating humane education can be easily aligned to meet the diverse temperaments in a classroom through a variety of instructional modes, flexibility in organization, and adaptability to different types of interactions. Specifically, humane education can be interwoven throughout the different academic disciplines and taught through many different methods including projects, literacy, activities, whole group, small group, or individually (Thomas & Bierne, 2002; Weil, 2004). Humane education not only fosters social and emotional skills, but also creativity, curiosity, respect, responsibility, decision making skills, problem solving skills, and critical thinking skills. Similar to executive functions, skills learned in early childhood through humane education provides a vehicle for success across the life span.

More importantly, humane education can be integrated into the curriculum with or without live pets (Daly & Suggs, 2010; Karniel, 2012; Meadan & Jegatheesan, 2010; Tsai & Kaufman, 2009). Many classrooms incorporate classroom pets into the environment. However, from my observations these pets are not being utilized to their full potential. Often times the pets remain in the cages and are only taken out on "Fun Friday" for children to look at or hold for short period of times. By adding simple routines and procedures into the classroom such as feeding the classroom pet can build empathy and responsibility. Taking opportunities with the classroom pet to a higher level can foster development in many ways including physical, cognitive, social, emotional, and even math, literacy, social studies, and science (Aguirre & Orihuela, 2010; Beetz et al., 2011; Daly & Suggs, 2010; Esposito et al., 2011; Gee, Crist, & Carr, 2010; Gee, Church, & Altobelli, 2010; Gee et al., 2010; Hergovich et al., 2002; Meadan & Jegatheesan, 2010; Melson, 2003; Melson & Fine, 2006; Nicoll & Samuels, 2008; O'Haire et al., 2013; Rud & Beck, 2000; Thomas & Bierne, 2002).

Optimal learning outcomes emerge when children are enthusiastically engaged in the experience by creating an environment based on the needs and interests of the children (Edwards et al., 1998). Through humane education children have the opportunity to build on their natural curiosity of animals (Daly & Suggs, 2010). Early childhood classrooms incorporating humane education as a vehicle to build executive functions with situated learning experiences aligned with temperament will ensure success in school for all children.

Limitations

Hermeneutic phenomenology describes and explores the lived experience through the intuition of the investigator, hence providing comprehension of the situation through the perspective of the investigator and the participants. Furthermore, the goal of hermeneutic phenomenology is not to locate one essential epiphany, but pursue potential insights through an ongoing cyclical process (Lindseth & Norberg, 2004). Although I spent three to five mornings a week in the classroom over a six month time span, opportunities were probably still missed in my absence. Christie had twenty three children in her first grade classroom and pressures from administrators to implement certain tasks and perform at a certain level on "I Read" and MAP assessments. Therefore, in my absence, time with Woody was not easy to incorporate into the prescribed curriculum. Christie attempted several times to get Woody out for the children to hold when I was not there, but she found it difficult to watch the children and do her required teaching activities. So, Woody time only occurred when I was able to come and conduct activities or projects and allow the children to hold Woody. However, it was more convenient for Christie to report observations of children interacting with Woody while he was in the cage or show me stories or pictures the children created involving Woody.

In light of the small sample size of one classroom, the results will not be generalizable to the general population of early childhood children. This study focuses on one specific classroom and the influences of situated learning experiences with a classroom pet providing a detailed and exhaustive description of the lived

experiences of the participants supporting the gap in the literature related to children's interactions with a classroom pet as a catalyst for executive functions. Bias potentially could be a threat to reliability, nonetheless detailed observations with rich descriptions and weekly collaborations with the classroom teacher will counteract this threat. Another obstacle in the generalizability of the results is factors other than the classroom pet that could have contributed to children's growth in executive functions including maturation, parental influences, and activities or strategies the teacher incorporated outside of the study.

Another limitation was that, as a participant observer, it was hard to record important quotes or observations while simultaneously interacting with the children. I tried various strategies to overcome this limitation that were not successful or efficient. Christie would often sit down with a clipboard to record quotes or observation during situated learning experiences I was conducting. Yet, a conflict or challenge with a child would arise that she would attend to and not be able to record notes. At one point, I decided to run a recorder during the situated learning experiences to record outside of my time in the classroom. These recordings were either stopped by a curious child playing with the recorder or we would move to another part of the classroom and I would forget to take the recorder with me. Pictures with the camera became a valuable data collection resource in assisting in later recollection of events that occurred during the day.

Further Research

Although I am quite partial to live pets, it would be interesting to see if the same findings would arise in a qualitative study with either a nonliving classroom pet

such as a stuffed animal. Additionally, the school in which I conducted my research included children mostly from higher socioeconomic backgrounds. It would be very interesting to see if the same level of growth in executive functions and changes from pre to post temperament profiles would occur in a classroom with the majority of children from low socioeconomic backgrounds and to gain insights into the lived experience of these children with a classroom pet. Further research could also include situated experiences with the classroom pet and also bringing in outside resources to help children connect their experiences in the classroom with experiences outside the classroom. At the last moment, I had thought of bringing in a therapy dog to visit and share their responsibilities. Also, working with organizations that enhance the welfare of animals and people to see how that impacts children learning and development through hands on, authentic experiences in helping others.

During the present study, a great amount of time was dedicated to inhibitory control. Inhibitory control is a component of both executive functions and temperament. Opportunities for children to implement inhibitory control arise continuously throughout the day whether it is delaying gratification to carry out the appropriate response or actions or conflict resolution or problem solving. Therefore, another possible future research idea would be to look specifically at the development of inhibitory control through situated learning experiences with a classroom pet that aligned with children's temperaments.

Reflection

I wish I knew then what I know now about temperament. Even though I did not explicitly understand the individual differences in children's temperaments in my

classroom, I understood that certain children did not fare well in certain situations. For example, I often had children who would be so engaged in an activity or project they did not want to clean up when it was time to clean up. I would allow them extra time instead of upsetting them by making them stop right then and there, and oftentimes these children would eventually disengage and join in clean up just because the other children were cleaning. Many times an adult who was temporarily in the classroom would push these children to clean up ending up in an unnecessary conflict. With this in mind, it would have been helpful to be able to articulate that this child is highly persistent and non-adaptable, so I am not going to interrupt his play at this point. Christie repeatedly mentioned how eye opening it was to know the temperament of the children in her classroom and use this information for planning.

Christie was very appreciative of the situated learning experiences with Woody in that they integrated many of the disciplines and enhanced executive functions which enabled the children to build inhibitory control, working memory, and cognitive flexibility, skills essential for success in the classroom setting. During collaboration, Christie and I often talked about skills that could be incorporated into the situated learning experiences in an endeavor to build off the children's natural motivation during these activities. For example, the children loved writing in the Guinea Pig journals. We took this opportunity to help children learn the writing process of planning, writing, and revising with their journals congruent with the goal oriented behaviors of executive functions.

Watching the children engage with Woody and exhibit such respect and pride, not only for Woody, but also any projects involving him or humane education,

brought a sense of happiness and excitement to me. Children were very meticulous and thoughtful in designing and creating their habitats. They communicated concerns that reflected the care and handling of Woody such as making sure the objects they added were safe and purposeful. Christie often stated, “Woody has saved this class,” and “Woody has brought such a sense of community to the class,” or even “You are such a savior and I love what you are doing with the kids.” I truly enjoyed being in the classroom as a participant observer, thus having the opportunity to actually engage with the children. As I walked the long halls of the school on my way to the classroom, my smile would grow bigger and bigger as I got closer to the first grade classroom and my heart would fill with absolute love and happiness as the children’s excitement showed when I walked through the door. Not just because I had built a strong rapport with the children, but because they were so excited about “Woody Time,” making it evident that my study was making a positive impact on them.

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Appendix A: Interview Protocol

Interview Protocol

Facilitator: |__|__|__|

Participant:_____Audio: |__|__|__|

Date: |__|__|/|__|__|/|__|__| **Time** start ___:___ end ___:___

Meeting place description: *detail and description, e.g. size and accessibility, and how this could affect the discussion; interruptions during the discussion*

1. What are you hoping to learn (post: what have you learned) from this study?

2. How do you feel about children interacting with animals?

3. What do you know (post: what did you learn) about temperament?

4. How could (or did) the social and cultural aspects of the classroom including the temperaments of the children interplay with the classroom pet?

5. Do children associate feelings and emotions to classroom pet?

6. What skills can children gain if any when interacting with classroom pet?

7. What opportunities could (or have) arisen for teachable moments when children are interacting with the classroom pet?
8. How can these skills learned through interactions with classroom pet enhance (or did enhance) their interactions with their peers?

Impressions and observations:

Running notes

Appendix B: Observation Protocol

Observation Protocol

(Participant-Observer…classroom teacher and researcher will take turns facilitating situated learning experiences and taking notes)

Facilitator Initials: |__|__|__| **Note-taker Initials**: |__|__|__|

Date: |__|__|/|__|__|/|__|__| **Time** start ___:___ end ___:___

Student behaviors being observed:

Executive function skills:
setting goals or planning and carrying out plans
inhibition
cognitive flexibility
working memory
problem solving
reasoning
cause and effect
delay of gratification
social and emotional skills:
emotions
empathy
caring

Situated Learning Plan: *detail and description*

Participants: (how many?)

Location:

Group dynamics: *(temperament etc.)*

Impressions and observations:

Running notes (detailed notes following collaboration with teacher about this observation)

Appendix C: List of Children's Books

Charlotte's Web by E.B. White

When Anju Loved being an Elephant by Wendy Henrichs

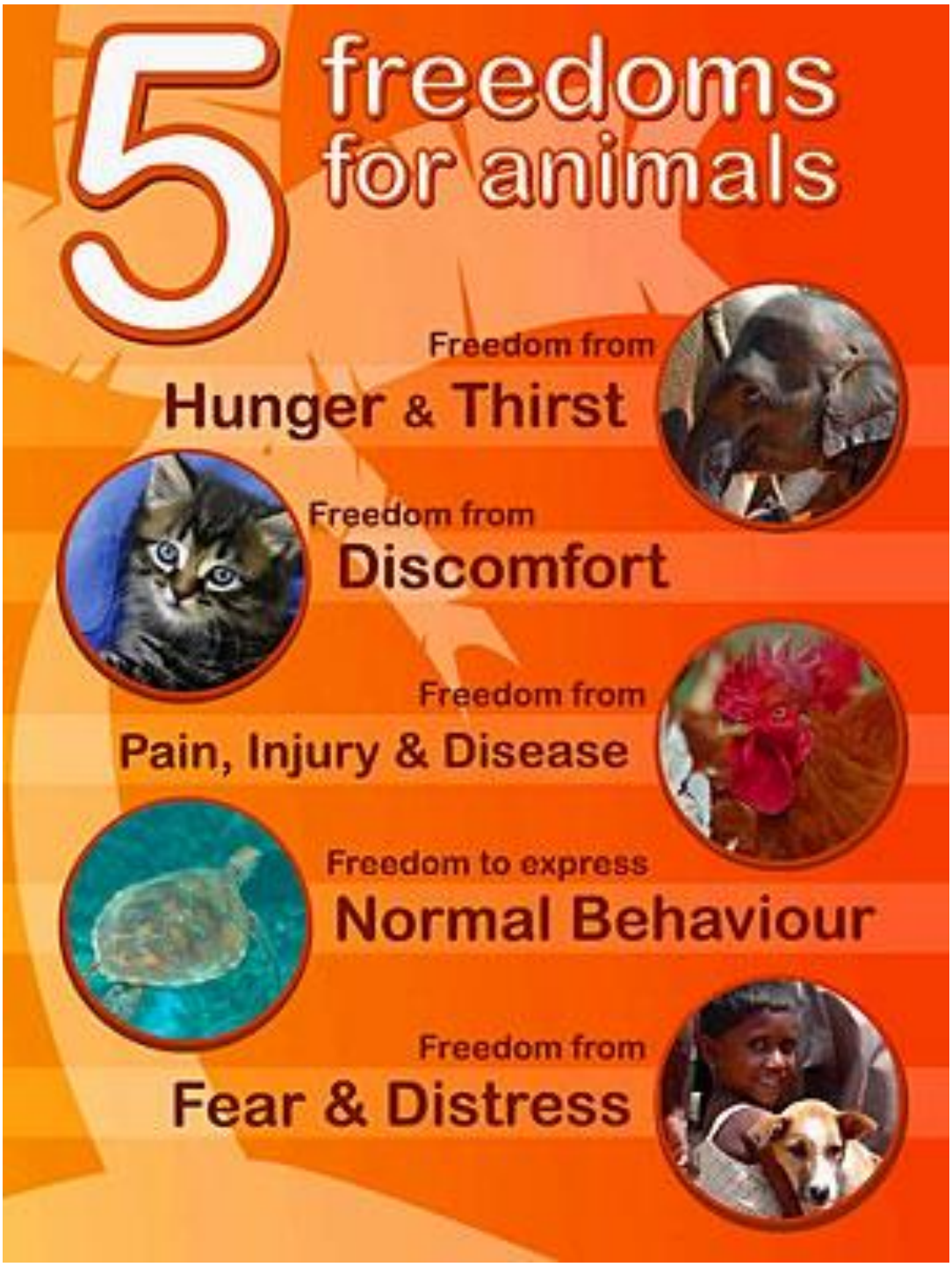
Carolina's Story by Donna German

Buddy Unchained by Daisy Bix

The Forgotten Rabbit by Nancy Furstinger

Adopting Ginger by Linda Grffin

Appendix D: The Five Freedoms



The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Final Report – Inactivation

Date: July 17, 2015 **IRB#:** 4848

To: Kristan Nicole Pearce **Inactivation Date:** 07/16/2015

Study Title: Spawning Executive Functions in First Graders: Exploring Situated Learning Experiences With The Classroom Pet Consistent with Children's Temperament

On behalf of the Institutional Review Board (IRB), I have reviewed the Final Report for the above-referenced research study. You have indicated that this study has been completed and should be inactivated. This letter is to confirm that the IRB has inactivated this research study as of the date indicated above.

Note that this action completely terminates all aspects and arms of this research study. Should you wish to reactivate this study, you will need to submit a new IRB application.

If you have questions about this notification or using iRIS, contact the IRB at (405) 325-8110 or irb@ou.edu.

Cordially,

E. Laurette Taylor, Ph.D.
Chair, Institutional Review Board