PHENOMENOLOGICAL STUDY OF THE SIGNIFICANCE OF RECESS AND BRAIN BREAKS DURING THE INSTRUCTIONAL DAY FROM THE PERSPECTIVE OF ELEMENTARY TEACHERS

by

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Liberty University

A Dissertation Presented in Partial Fulfillment Of the Requirements for the Degree Doctor of Education

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ABSTRACT

The purpose of this phenomenological qualitative study was to collect the perceptions of elementary teachers on the influence of recess and brain breaks on students within the instructional day capturing the essence of their voice through analysis. Participants included 10 teachers at Smith School District (pseudonym used) in the southeastern United States of America. One of the theories guiding this study was Maslow’s Hierarchy of Needs (Maslow, 1954) as it was in question whether elementary teachers perceive that students must have their need for physical movement met in order for optimal learning to occur. Another theory guiding this study was Bandura’s Theory of Social Cognition. Bandura’s theory asserts that people learn through social interactions and by watching others (Bandura, 2004). This concept relates to this study in that physical activity in the school setting is a social event that produces observable benefits. Data were collected via one-on-one interviews, a focus group, and open-ended anonymous questionnaires. Data analysis was conducted utilizing Moustakas’ Seven Steps. The essence of the voice of elementary teachers’ perceptions of the benefits of recess and brain breaks occurring during the instructional day included academic benefits of improved focus and stamina, health benefits of decreased obesity and increase in overall health, improved social skill development and therefore classroom behavior, and overall wellness.

Keywords: Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD), brain breaks, cognition, elementary school, recess
Dedication

I dedicate this dissertation to my amazing husband that has stuck by me through thick and thin, supported me every step of the way, and has been a constant source of unconditional love throughout the process. Your love and support is something I will never be able to express my full appreciation for in words, but please know that I love you beyond words and appreciate you beyond measure. You are the most patient, kind, and compassionate man I have ever known. I am blessed to call you my husband and share this life with you. I thank my Lord for sending me a wonderful life partner.
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Many people, sent into my life by my Lord, helped me with this journey in writing this dissertation.

I would like to thank the participants of this study. You took your valuable time to participate in this study and did so with fidelity and enthusiasm. Your dedication to your students and to the education field are noticed and appreciated.

I would like to express appreciation to Dr. Michael Patrick for serving on my committee, reviewing my work, and making suggestions for improvement throughout this journey.

I would like to express gratitude to Dr. Teresa Ferguson for your long friendship, and for your support throughout this process. Your intellectual input has been much appreciated. More critical to my process, you believed in me, and that has been invaluable and appreciated more than you will ever know.

Dr. Leldon Nichols, my committee Chair, has been invaluable in facilitating my progress throughout this journey. You prompted me, guided me, and believed in me; for this I will be eternally grateful. You are a kind and generous man. I will carry your insight with me as I step into my next life adventure. I don’t know what the future holds for me, but I know that I am better for having known you.
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List of Abbreviations

Attention Deficit Disorder (ADD)

Attention Deficit Hyperactivity Disorder (ADHD)

Beck Depression Inventory-11 (BDI)

Brain-derived neurotrophic factor (BDNF)

California Verbal Learning Test Second Edition (CVLT-II)

Center for Disease Control and Prevention (CDC)

Cerebral Blood Flow (CBF)

Delis-Kaplan Executive Function System – Color Word Interference subtest (DKEFS-color word)

Dual energy x-ray (DXA)

Electroencephalography (EEG)

English Students of Other Languages (ESOL)

Groninger Intelligence Test (GIT)

Magnetic Resonance Imaging (MRI)

Magnetization prepared Rapid Gradient Echo Imaging (MPRAGE)

Montreal Cognitive Assessment (MoCa)

Phase Lag Index (PLI)

Weschler Abbreviated Scale of Intelligence (WASI)

Wisconsin Card Sorting Task (WCST)

Zone of Proximal Development (ZPD)
CHAPTER ONE: INTRODUCTION

Overview

Current pressure placed on states and districts by the media has created a situation whereby politicians and school leaders who do not work directly with students are making decisions about recess and brain breaks for elementary students (Pica, 2010). The updates to the Elementary and Secondary Education Act (ESEA) bill also add to the pressures placed upon schools to ensure a high quality education for all students evidenced by high stakes tests. Decreasing or eliminating recess and/or physical brain breaks actually decreases efficiency, student efficacy, and ultimately student achievement. Teachers who work directly with students every day have not been thoroughly interviewed for input into these decisions.

Background

Quantitative research, summarized in Chapter Two of this study, clearly indicates that cognition improves with physical activity. Previous research studies on this particular topic have been conducted primarily outside of the instructional school day for students. The gap in the research lies with the absence of qualitative studies examining the perception of elementary teachers on the significance of a connection between physical activity during the school day and optimal cognitive function. This qualitative study informs decision makers and stakeholders of teachers’ perceived value of physical brain breaks within the instructional day in the elementary school setting.

Situation to Self

My motivation for conducting this study is to inform educational policy makers, particularly in the United States, to consider adjustments to the limiting or eliminating of recess and/or brain breaks in an attempt to gain instructional time within the school day for elementary
students. The existing quantitative research summarized within this document supports the
collection between optimal cognition and physical activity and the need for frequent acute bouts
of physical activity in order to maintain optimal cognitive function. Based on the fact that
qualitative research examining the perceptions of elementary teachers actually teaching these
students has not been done and that Maslow’s (1943) Hierarchy of Needs addresses how needs
must be met before concentration can be fully attained for other matters, I believe strongly that
this research was necessary. I believe that young children need to move frequently in order to
maintain active attention on tasks at hand; denying that need, could create behavior problems,
foster an inability to concentrate, and ultimately deny an optimal learning environment for
children.

**Problem Statement**

The problem was that elementary teachers’ insights of the phenomenon have not been
analyzed for the essence of their perceptions of the benefits and drawbacks of recess and brain
breaks within the instructional day. Elementary teachers had not been interviewed for their
perceptions. Brain breaks were described by Gonchar (2014) as physical activity that shifts brain
activity from cognition to a cardiovascular activity and/or a strength focus. Recess was
explicated by Pica (2010) as time spent outside of the classroom taking a break that allows for
physical activity that may be teacher organized or free play. Cognition was defined by Drollette,
Scudder, Raine, Moore, Saliba, Pontifex, and Hillman (2014) as the method of attaining or
understanding knowledge of a topic. Politicians and policy makers are making decisions about
physical education programs, recess, and brain breaks without being fully informed (Pica, 2010).
Quantitative research studies done by Smith, Blumenthal, Hoffman, Cooper, Strauman, Welsh-
Bohmer, Browndyke, and Sherwood (2010), Raine, Lee, Saliba, Chaddock-Heyman, Hillman,
and Kramer (2014), Kamijo, Pontifex, Khan, Raine, Scudder, Drollette, Evans, Castelli, and Hillman (2012), Davis, Tomporowski, McDowell, Austin, Miller, Yanasak, Allison, and Naglieri (2011), Knaepen, Goekint, Heyman, and Meeusen (2010), and Schaefer, Lovden, Wieckhorst, and Lindenberger (2010) have all decisively concluded that exercise increases cognition. Therefore the problem under investigation was the perception of elementary teachers on the significance of physical activity in the form of both brain breaks and recess for elementary students during the instructional day.

**Purpose Statement**

The purpose of this phenomenological study was to collect the perceptions of 10 teachers in regards to recess and brain breaks in a public school district in a southeastern state in the United States, capturing the essence of those perceptions through analysis. Brain breaks in this study are understood as physical activity breaks where children are asked to do a short series of physical activities in order to activate their physical bodies and reenergize them for further school work. The process of capturing the essence of teachers’ perceptions was guided by Bandura’s Theory of Social Cognition (2004), which asserts that people learn through social interactions which includes observing the behaviors of others, and by Maslow’s Hierarchy of Needs (Maslow, 1943). Both the social learning and physical need fulfillment are involved in producing a phenomenal experience. Therefore this study was phenomenological whereby the phenomenon under investigation was the perception of elementary teachers on the significance of recess and brain breaks for elementary students within the instructional day.

**Significance of the Study**

The significance of the study is that policy makers who are not currently teaching elementary children are making decisions about recess and brain breaks without being fully
informed (Gonchar, 2014). While quantitative research exists to support the connection between cognition and/or brain activity and physical activity and/or fitness, the qualitative research does not exist at this time. The research done within the elementary school setting is very limited. It is important for teachers, school leaders, school boards, parents, policy makers, and the community to be aware of both the quantitative research and the perceptions of teachers currently in the field, so that well informed decisions can be made to best serve the students of our nation. It is also important for researchers to have access to the collective essence of the perception of elementary teachers in order to guide possible future studies that have the potential to further illuminate the phenomenon at hand. Bandura asserted in his 2004 article that people learn from watching others and through social interaction.

Children learn healthy habits from those around them. It is imperative that children learn healthy physical activity practices in school in order to improve the health situation in the United States today (Gonchar, 2014). Jerome (2013) asserted that people perform optimally when their needs are met. The need for recess and outdoor play is asserted repeatedly in studies and articles including those written by Rich (2010) and Pica (2010). Kamijo et al. (2012) collaborated on a study supporting the connection between childhood obesity and behavioral challenges. The study explicated within this document has the potential to qualitatively validate the fact that students need physical activity during the instructional day as well as to inform and improve physical fitness program policy, ultimately improving academic achievement and self-efficacy for students who need it most.

**Research Question**

Foundational to the purpose of this phenomenological study was the investigation of the perceptions of elementary teachers in regards to the significance of brain breaks and recess for
elementary students. Behaviors originate from both the conscious and unconscious levels (Freud, 1935). Elementary aged students have a basic need for movement that is innate (Pica, 2010). This study is based on the supposition that brain breaks and recess are imperative for elementary aged students’ health and well-being (Gonchar, 2014) and that the outcomes are perceivable by their teachers. As such, this study uncovered the essence of the perceptions of elementary teachers and bridges the gap in the current research in order to inform decision makers and to guide future research. The following research questions were developed from the related literature in order to frame the investigation:

RQ1: What is the essence of the perception of elementary teachers in regards to the benefits of recess and brain breaks for elementary students occurring during the instructional day?

RQ2: What is the essence of the perception of elementary teachers in regards to the long term benefits of recess and brain breaks for elementary students occurring during the instructional day impacting them as lifelong learners?

**Research Plan**

The qualitative phenomenological approach aims to capture the essence of a shared experience (Moustakas, 1994). Creswell (2007) asserted the basic goal of phenomenology is to reduce individual experiences with a particular phenomenon into a description of universal essence of that phenomenon. This study captures the essence of elementary teachers’ perceptions on the significance of brain breaks and recess during the instructional day on elementary students. This qualitative phenomenological study was conducted through data collection triangulation of: (a) one-on-one interviews with 10 teachers, (b) two focus group of 10 teachers, and (c) an anonymous electronic questionnaire of open-ended questions. Open-ended prompts for the questionnaire were peer reviewed by three colleagues to determine whether the
requisite data would be elicited from participants based on the research questions, one-on-one interview questions, and focus group questions. A professional external auditor was utilized throughout the data collection process. Transcriptions of all interviews, focus groups, and questionnaires were typed verbatim and read multiple times in order to ascertain the essence of the shared experience for elementary teachers. These methods of data collection were ideal for this study because they allowed for candid sharing of thoughts and feelings with regard to recess and brain breaks in elementary classrooms. Data analysis utilized Moustakas’ Seven Steps. Moustakas (1994) modified VanKaam’s steps and listed his own as:

1. Listing and preliminary grouping,
2. Reduction and elimination,
3. Clustering and thematizing,
4. Final identification of the invariant constituents and themes
5. Using the relevant, validated invariant constituents and themes constructed for each co-researcher an individual textural description of the experience,
6. Construct for each co-researcher an individual structural description,
7. Construction for each co-research participant a textural structural description of the experience that includes the researcher (pp. 120-121)

**Delimitations and Limitations**

Participants were purposefully delimited to those teaching elementary school within a single metropolitan school district in the southeastern United States. This limits the generalizability of the study. These participants were purposefully selected based on the geographical location where I, as the researcher, currently reside for the convenience of the research process. Another delimitation of the study was the small sample size, which also limits
the generalizability of the study. The size of the participant poll was small in order to maintain a reasonable time frame for completion of the study and yet to be thorough in capturing the essence of elementary teachers’ perceptions. A limitation of the study is that it was possible that the majority of the participants would be female, as the percentage of female elementary teachers is far greater than the male elementary teacher population in the area where this research was being conducted. A further limitation of this study was geographical location, as teacher participants in this study were currently living in the southeastern United States. This also limits the generalizability of this study because teachers from other geographical areas may have differing perceptions.

Definitions

1. *Attention Deficit Disorder/Attention Activity Hyperactivity Disorder (ADD/ADHD)* – condition that creates challenges in maintaining focus and or still attention to activities. (Drollette et al., 2014).

2. *Brain Breaks* – physical activity that shifts brain activity from cognition to cardiovascular and/or strength focus (Gonchar, 2014)

3. *Cognition* – Method of getting knowledge or understanding of a topic (Drollette et al., 2014)

4. *Recess* – Time spent outside of the classroom taking a break that allows for physical activity that may be teacher organized or free play (Pica, 2010).

Summary

This chapter introduces the topic of elementary teachers’ perceptions of the significance of recess and brain breaks in elementary school. I am a human research instrument, who conducted semi-structured one-on-one interviews, semi-structured focus groups, and
administered electronic questionnaires to participants. In order to analyze the data, all interviews and focus groups were transcribed verbatim, read repeatedly, and open coded. Transcriptions that had been open coded were then two tier coded in order to uncover sub-themes that may have emerged. I am an elementary teacher, and needed to set aside personal perceptions in order to collect data with an unbiased approach. An external auditor was utilized in order to further increase the credibility of the study findings. This study is significant in that politicians and policy makers are making decisions in regards to limiting or eliminating physical education, recess, and brain breaks in an effort to increase instructional time (Pica, 2010). The study utilized researcher reflection through memos, member checks, peer reviews, and external auditor reviews in order to increase trustworthiness and credibility to the analysis of the data collected. The quantitative studies reported in Chapter Two of this study support the connection between cognition/brain activity and physical activity/fitness for people of all ages outside of formal educational settings. Qualitative studies collecting and analyzing elementary teachers’ perceptions of the phenomenon, in order to capture the essence of their voice, were absent.
CHAPTER TWO: LITERATURE REVIEW

Overview

The collected literature on this topic is quantitative and supports the assertion that cognition and brain activity are increased with physical activity for participants of all ages outside of school settings. Academic Search Complete, Academic OneFile, JSTOR, LexisNexis Academic, Literati by Credo, ProQuest, Central, ScienceDirect, Education Research Complete, ERIC (Ebsco), and Education Research Guide were utilized to find related literature on this topic. While the quantitative research connecting optimal cognition to physical activity is well established outside of the educational setting, the qualitative research including those within the elementary educational setting is absent. This deficiency leads to the identified gap in the literature and the need for qualitative research to describe elementary teachers’ perceptions on this topic in order to inform next steps for both qualitative and quantitative research within the elementary education setting, as well as to inform current policy makers on the topic of the significance of recess and brain breaks during the instructional day in elementary school settings.

Theoretical Framework

This research study stems from the methodological philosophical assumption that the researcher is hoping to gather information about students through the teachers who actually teach them and to learn how best to teach them. Asking elementary education teachers to share their perceptions in order to capture the essence of the phenomenon is central to this study. Davidson, a U.S. philosopher from the early 1900s once said in an article titled *Inquiries Into Truth and Interpretation*:

The methodological advice to interpret in a way that optimizes agreement should not be conceived as resting on a charitable assumption about human intelligence that might turn
out to be false. If we cannot find a way to interpret the utterances and other behavior of a creature as revealing a set of beliefs largely consistent and true by our standards, we have no reason to count that creature as rational, as having beliefs, or as saying anything. (p 324)

As an educator, instructional methodology must be active and dynamic as opposed to passive (Knight, 2006). Knight (2006) defined instructional methodology as the process by which teaching takes place. The teachers who are actually teaching elementary students every day must have a voice in regards to the circumstances under which those students must learn. If one wanted to know how to improve a situation in a home, one might ask everyone who lived in that home about the situation. If one wanted to know how to improve a situation at a doctor’s office, one might talk with everyone who worked there. It is logical that improving education by eliciting the experiences of teachers is a credible place to start if one wishes to know what is going on with a particular phenomenon in classrooms within our nation’s schools. This study aims to give a voice to those teachers and capture the essence of their perceptions on the topic of the significance of recess and brain breaks for students during the instructional day.

Bandura’s works contribute to this study in multiple ways. Bandura (1989) asserted that humans are social creatures and that we learn through social interactions. Bandura (1993) further asserted that self-efficacy plays a role in cognitive development and functioning. Current quantitative research has provided conclusively that cognition and self-efficacy are directly linked to physical activity outside of the educational setting, which falls directly in line with Bandura’s theories. Bandura’s (2001, 2004) discussion of social cognitive theory further asserted that humans make choices within their world to meet their needs, which is interestingly similar to Maslow’s writings. Collectively, Bandura’s theories frame this research in that
teachers observe the social learning dynamic and therefore have a unique perspective on the behaviors of elementary students. Maslow’s Hierarchy of Needs (1943) asserted that basic needs must be met before full attention can be paid to higher order needs and tasks at hand. Children have a need for movement (Pica, 2010). It is essential that educators help them meet their basic needs during the instructional day (Pica, 2010).

Vygotsky’s concept of zone of proximal development (ZPD) relates to this study in that it illuminates the situation under question whether elementary students achieve more with or without recess and physical brain breaks from the perception of the elementary teachers who teach them. Zone of proximal development is defined by Zaretski (2009) as the difference between what an individual is able to do independently and what that individual can do with support. Vygotsky (1978) defined zone of proximal development in Mind in Society: Development of Higher Psychological Processes as:

The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers. For example, two 8 yr. old children may be able to complete a task that an average 8 yr. old cannot do. Next, more difficult tasks are presented with very little assistance from an adult. In the end, both children were able to complete the task. However, the styles and methods they chose depended on how far they were willing to stretch their thinking process. (p. 86)

Collectively, Bandura’s theories frame this research in that teachers observe and make decisions daily about the social learning dynamic and therefore have a unique perspective on the behaviors of elementary students. Vygotsky and Knight also contribute with their theories of the zone of proximal development and instructional methodology. Maslow’s Hierarchy of needs is
also pivotal in that it is elementary children’s needs and their behaviors in reaction to those needs that is observable to their teachers. The inquiry as to whether physically fit students are also more independent and academically successful learners was in question. Elementary teachers’ captured essence of perception was collected and is presented in this document.

Related Literature

Effects of Physical Exercise on Cognition of Overweight and Obese Children

Infants and toddlers are suffering from negative symptoms of obesity in growing numbers (Centers for Disease Control, 2010, 2014). The Centers for Disease Control (CDC) are one of the major components of the National Department of Health and Human Services, and one of the pivotal missions of the CDC is to increase awareness and security for the health of the people of our nation (Centers for Disease Control, 2014). Overweight and obese are terms used to define ranges of weights for particular heights that are considered above the normal range for optimal health according to the CDC (2014). The CDC (2014) warn of the growing number of overweight and obese children in our nation.

Overweight and obese children are growing in numbers, and not enough is being done to rectify the situation (Rich, 2010). According to the CDC (2014), the number of overweight and obese children in our nation continues to climb and efforts to reduce the dilemma are not doing enough. Possible consequences of being overweight or obese for a child include, but are not limited to high blood pressure, glucose intolerance, diabetes, sleep apnea, asthma, joint problems, fatty liver, gallstones, and a variety of emotional and psychological problems (Centers for Disease Control, 2014).

Obesity is a growing problem in the United States among people of all ages (Centers for Disease Control, 2014). A study completed by Davis et al. (2011), titled “Exercise Improves
Executive Function and Achievement and Alters Brain Activation in Overweight Children”, contained imposing results in regards to cognition and physical activity. Davis et al. (2011) utilized a protocol including 7-11 year old children randomized into exercise and control groups for comparison of brain activity. The independent variable was daily aerobic training for 20 minutes per day or for 40 minutes per day (Davis et al., 2011). The dependent variable was executive function (Davis et. al, 2011). Students were randomized into a control, low dose (20 minutes per day), or high dose (40 minutes per day) group (Davis et al, 2012). Participants in this particular study were given blind standardized psychological evaluations, including the Cognitive Assessment System and the Woodcock-Johnson Tests of Achievement 111, in order to assess cognition and academic achievement (Davis et al, 2012). Functional Magnetic Resonance Imaging was utilized in order to measure brain activity during executive function tasks for all participants. Functional Magnetic Resonance Imaging (MRI) is defined as a technique that uses radio waves and magnetic fields to create images of particular parts of the body (Davis, et al, 2012). In this study, MRIs were used to create images of the brain. The researchers in the Davis et al., (2011) study noted that the results obtained in their study matched results conducted on older study participants. Executive function and brain activation were improved with physical exercise (Davis et al., 2011). Students were recruited from school as volunteers for this study, but the study did not occur within the school nor did it directly correlate academic achievement within the schools to the study results (Davis et al., 2011). This is significant in that it points to the gap in the research where elementary teachers’ perceptions on this phenomenon have not been collected and analyzed. The research question inferred in the Davis study was: what is the effect of approximately three months of regular physical exercise on executive function for sedentary and overweight children (Davis et. al, 2011)? The implied hypothesis was that
exercise will improve brain activity for overweight children (Davis et al., 2011). In the concluding remarks of this article, the authors “hypothesize that regular vigorous physical activity promotes children’s development via effects on brain systems that underlie cognition and behavior” (Davis et al., 2011, p 8).

A Cognitive Assessment System was utilized to measure mental abilities of participants in the areas of planning, attention, simultaneous, and successive (Davis et al., 2011). Academic achievement was measured repeatedly over time using the Woodcock-Johnson Tests of Achievement III (Davis et al., 2011). These assessments were counterbalanced (Davis et al., 2011). Functional imaging data and image analysis were utilized to determine brain activity (Davis et al., 2011). GE Signa Exite HDx3 Tesla Magnetic Imaging Resonance (MRI) system was utilized (Davis et al., 2011).

Participants were randomly assigned by the statistician in the Davis study to low dose (20 minutes per day), high dose (40 minutes per day) of aerobic exercise, or the control group of no added exercise (Davis et al., 2011). Randomization was stratified by gender and race (Davis et al., 2011). Participants were provided transportation after school to the site where the exercise program took place each school day (Davis et al., 2011). The groups were small, and the instructor to student ratio was 9:1 (Davis et al., 2011). There were five cohorts over three years that participated in this study (Davis et al., 2011). Physical activity increased executive function and mathematics achievement for participants in the experimental group (Davis et al., 2011). Bilateral prefrontal cortex activity after exercise was observed (Davis et al., 2011).

Davis et al. (2011) also asserted within their study that while this study was not done directly within an educational study, it does contain results that could be informative to educators.
Implementing vigorous physical activity into public educational programs was strongly recommended by the researchers within this study (Davis et al., 2011).

Similar studies were completed with similar results by Raine et al., (2014) and Kamijo et al., (2013). Raine et al., (2014) found in their study, titled “The Influence of Childhood Aerobic Fitness on Learning and Memory”, that fitness boosted both learning and memory for children and that the association was most prominent when the initial learning was more challenging. The implied research question was: What is the relationship between aerobic fitness, learning, and memory (Raine et al., 2014)? The implied hypothesis was that participants with better aerobic fitness will have increased learning capabilities and better memory (Raine et al., 2014). Participants included 48 children between the ages of nine and ten, of those, 24 were in the “high fit” group and 24 in the “low fit” group (Raine et al., 2014). The high fit group had 14 females and 10 males (Raine et al., 2014). The low fit group had 12 females and 12 males (Raine et al., 2014). Instrumentation for the Raine study included Legal Consent of participant and guardian, Pre-Participation Health Screening, Attention Deficit Hyperactivity Disorder (ADHD) Scale IV, Health History, Kaufman Brief Intelligence Test II (KBIT II), Maximum Oxygen Uptake (VO2 max), and a Map Assessment (Raine et al., 2014).

The Raine study took place over three days for participants (Raine et al., 2014). Day one included the legal consent of participant and guardian, pre-participant health screening, ADHD Scale IV, Health History, and KBIT II (Raine et al., 2014). Day two included instruction of names and locations of regions on a map using the study only (SO) strategy and a test and study (TS) strategy (Raine et al., 2014). Participants were randomly assigned to the strategy order and counterbalancing occurred within each fitness group to ensure the orders were equal across groups (Raine et al., 2014). Day three was a recall day where participants returned the next day
after the learning day to complete the recall portion of the assessment with a free recall test or a
cued recall test (Raine et al., 2014). Again participants were counterbalanced for order, such that
half of the participants were first tested the day prior with the SO condition and half first tested
on the TS condition (Raine et al., 2014). Analysis for the Raine study included Omnibus
analysis, ANOVA, Bonferroni Correction, and Post-Hoc Analysis (Raine et al., 2014). Overall
data in the Raine study indicated that interspersed testing and study as well as higher levels of
fitness produced improved learning and performance on memory tasks (Raine et al., 2014).
Fitness differences did not produce statistically different findings on the learning day (day two)
but did on the recall day (day three) (Raine et al., 2014). When looking at only the SO condition,
fit participants outperformed their low fit peers on day two (Raine et al., 2014).

Kamijo et al., (2013) asserted in their study, titled “The Association of Childhood
Obesity to Neuroelectric Indices of Inhibition”, that overweight and obese children in their study
exhibited lower response accuracy under testing conditions. It was also asserted that overweight
and obese children struggle to control their impulsive behaviors (Kamijo et al., 2012). While
both of these findings within the Kamijo et al (2012) study are significant to educators, it is
interesting to note that not only cognition but also the basic ability to control poor impulsive
behaviors was inhibited in overweight and obese participants (Kamijo et al, 2013). The
independent variable was childhood obesity and the dependent variable was neuroelectric indices
of inhibition (Kamijo et al., 2012). The implied research question was: What is the relationship
of childhood obesity and inhibitory control (Kamijo et al., 2012)? The implied hypothesis is that
obese children will show less inhibitory control than their target weight peers (Kamijo et al.,
2012). Participants included 74 total participants; 37 obese and 37 fit children with similar
demographic measures between groups (Kamijo et al., 2012). Participants and legal guardians provided written consent for participation and were paid $10 per hour (Kamijo et al., 2012).

Instrumentation and data collection utilized in the Kamijo study included the Kaufmann Brief Intelligence Test (IQ test), Height and Weight measurements, Health History, Attention Deficit Hyperactivity Disorder (ADHD) Rating Scale IV, Physical Activity Readiness Questionnaire, Graded Treadmill Fitness Assessment, V02 Max, Electroencephalography (EEG), 64 Channel Quik Cap Compumedics Neuroscan Go/NoGo task, and Dual energy x-ray (DXA) measurement to assess body composition (Kamijo et al, 2012). This study took place over two separate days for each participant (Kamijo et al., 2012). Participants were instructed to fast (food and liquids including caffeine) prior to the experiment (Kamijo et al., 2012). Participants completed the Kaufman Brief Intelligence Test (Kamijo et al., 2012). Height and Weight were measured, Health History was taken, and the demographics survey was completed (Kamijo et al., 2012). ADHD Rating Scale IV was completed, the Physical Activity Readiness Questionnaire was completed, and a graded exercise test was performed on a treadmill to assess physical fitness (Kamijo et al., 2012). On the second visit day, participants were fitted with a 64 Channel Quik Cap and completed a Compumedics Neuroscan Go/NoGo task (Kamijo et al., 2012). Dual energy x-ray (DXA) measurements were taken in order to assess body composition (Kamijo et al., 2012). Overall data provided evidence that gender was not related to differences in performance or neuroelectric measures, so all further analysis were collapsed across both sexes (Kamijo et al., 2012). Obese participants had lower response accuracy than healthy weight peers (Kamijo et al., 2012).

All three of these studies were able to decisively determine that exercise improves both brain function and cognition for overweight and/or obese children. Three studies with similar
results were significant in this search in that all three found mild to moderate exercise improved brain function for children. It is important for educators and education policy makers to be made aware of this trend in the research. These studies are pivotal to the research proposed in this document, which will examine the essence of the perception of elementary teachers on the significance of recess and/or brain breaks during the instructional day on elementary students within their classes.

Self-efficacy is important for children, particularly those struggling with body image and weight issues (Raine et al., 2013). If self-efficacy is defined as one’s belief in one’s ability to complete a task with success, it is then imperative that self-efficacy be considered in educational decisions (Rich, 2010). If a child believes he/she can or cannot complete a task or achieve a goal, that belief will have essential impact on their completion of the task or achievement of the goal. If mind, body, and spirit are indeed inseparably connected, it is of vital concern that the education of children as whole beings be imperative instead of attempting to isolate their brains.

Prolonged periods of seated attention are unreasonable for adults and even more unreasonable for children (Raine et al., 2013). Elementary teachers have not been utilized as qualitative research participants in order to collect and analyze the essence of their perceptions on this phenomenon. This clearly outlines the gap in the literature being defined within this literature review.

Self-efficacy is defined by Bandura (1993) as an individual’s belief and confidence in their own ability to control their motivation and behaviors in order to attain specific desired results. Children with poor self-efficacy could be prone to academic underachievement. Academic underachievement then leads to further self-confidence issues that could potentially become a vicious cycle for a child. First lady, Michelle Obama, asserted in her interview with
WebMD writer Shaw (2014) that parents and schools in our nation must take a more active role in helping their families eat healthier and become more active. If self-efficacy is clearly and directly related to physical activity, the evidence for the need for physical activity for children is imperious. Michelle Obama’s call to action further illuminates the gap in the literature, whereby elementary teachers have not been utilized as qualitative research participants. Gathering and analyzing the essence of their perceptions of this situation within our nation’s schools in order to guide further qualitative and quantitative research within the elementary school setting is essential. The collection of research thus far provides conclusive evidence that overweight children benefit cognitively from increased physical activity.

**Effects of Physical Exercise on Cognition of Children with ADD/ADHD**

Many children, as well as adults, struggle with prolonged periods of seated listening time (Gonchar, 2014). Children with Attention Deficit Disorder (ADD) and/or Attention Deficit Hyperactivity Disorder (ADHD) are particularly vulnerable to experiencing challenges with expectations of sustained periods of silent and still attention (Byrnes, 2013). While ADD and ADHD can be described in children as inattentiveness or fidgeting, it is much more (Byrnes, 2013). An inability to concentrate has the potential to have profound impacts on academic achievement for children. ADD and ADHD are defined by Drollette, et al. (2014) as conditions that create challenges in maintaining focus and/or still attention to activities.

Physical activity is crucial in order to keep our bodies healthy. Kotulak (1996) asserted that the brain works in symphony and is not in fact disconnected with the body. Douw et al. (2014) asserted that a healthy lifestyle is critical in society today and that physical fitness is associated with improved cognitive performance in their study, titled “A Healthy Brain in a Healthy Body: Brain Network Correlates of Physical and Mental Fitness”. The independent
variable was the VO2 Maximum and the dependent variable was the Intelligence Quotient (IQ) (Douw et al., 2014). The protocol utilized for the Douw study was a within-subjects design, in which all participants completed resting state, eyes closed, magneto-encephalography (MEG), a maximum oxygen uptake measurement, and a Dutch intelligence test (Douw et al., 2014). Magneto-encephalography is utilized to record the electrical activities within the brain (Douw et al., 2014). The maximum oxygen uptake measurement determines the maximum rate of oxygen ingestion during exercise (Douw et al., 2014). Both intermodular connectivity and cognition were particularly amplified with physical activity in this research by Douw et al. (2014). Intermodular connectivity refers to connections within the brain (Douw et al., 2014).

Participants included 219 adults with an average age of 42, ranging from 41-44 (Douw et al., 2014). One hundred thirteen of the participants were female while 106 were male (Douw et al., 2014). Physical fitness was assessed utilizing a running test on a treadmill; cognitive performance was assessed utilizing a cognitive test battery, including the Groninger Intelligence Test (GIT) (Douw et al., 2014). Magnetoencephalography was administered to assess brain activity, and Phase Lag Index (PLI) was utilized to measure functional connectivity of the brain (Douw et al., 2014).

All assessments were administered to all participants and data were collected (Douw et al., 2014). Gender differences were calculated utilizing t-tests, the association between intelligence and VO2 Maximums were analyzed using a linear regression model, and mediation analysis was utilized to determine third parameter relationships (Douw et al., 2014). ANOVAs were utilized to confirm associations between the independent and dependent variables; physical fitness, intelligence, and brain modularity were associated (Douw et al., 2014). VO2 Max was a predictor of IQ, and physical fitness and cognitive functioning were clearly related (Douw et al.,
In the end, there was in fact, a statistically significant positive association between physical fitness and intelligence/cognitive activity (Douw et al., 2014).

Reading and reflecting on the study by Douw et al. increased my interest in the topic. Modest aerobic activity was directly correlated with an increase in cognitive functioning in a Drollette et al. (2014) study, where 40 pre-adolescent participants were evaluated for cognitive functioning immediately after 20 minutes of treadmill walking or 20 minutes of resting in a seat. This study was titled “Acute Exercise Facilitates Brain Function and Cognition in Children Who Need it Most”. The independent variable was the physical exercise while the dependent variable was the cognitive assessments (Drollette et al., 2014). The research question was: what is the relationship between physical exercise and cognition (Drollette et al., 2014)? The hypothesis was: physical exercise will increase cognition (Drollette et al., 2014). All participants completed a modified version of the Eriksen flanker test, to assess aspects of cognitive control including inhibition (Drollette et al., 2014). Electroencephalographic activity was recorded from 64 electrode sites arranged according to the international 10-10 system (Drollette et al., 2014). Maximum oxygen consumption was collected by a computerized indirect calorimetry system measuring heart rate, average respiratory exchange ratio, and oxygen uptake (Drollette et al., 2014).

Repeated measures Analysis of Variances (ANOVAs) were conducted with lower and higher performers as the between subjects factor in the Drollette study (Drollette et al., 2014). Greenhouse-Geisser correction statistic was utilized to detect violations of sphericity (Drollette et al., 2014). Mean reaction times and Flanker accuracy percentages were analyzed separately (Drollette et al., 2014). Bonferroni corrected t-tests were utilized for post-hoc comparisons (Drollette et al., 2014). Overall data provided evidence that single acute bouts of moderate
physical exercise increased cognitive performance with more pervasive positive effects observed for lower performing students (Drollette et al., 2014). Lowest performing students demonstrated the greatest improvements in response accuracy and interference measures to a level comparable to higher performers after cessation of exercise (Drollette et al., 2014). It could be said that seated rest might involve more brain activity than listening to lecture, in that rest often involves active engagement of the imagination while lecture does not (Drollette et al., 2014). If this is the case, conceivably these discoveries are even more dramatic than they first appear.

At this point, a review of the literature has established that studies have shown a marked cognitive improvement for students with weight and/or ADD/ADHD challenges. The search for contradictory studies utilizing Academic Search Complete, Academic OneFile, JSTOR, LexisNexis Academic, Literati by Credo, ProQuest, Central, ScienceDirect, Education Research Complete, ERIC (Ebsco), and Education Research Guide was not productive. I was unable to find studies that contradicted the findings that acute bouts of physical activity had a positive cognitive impact on students challenged by ADD/ADHD and/or weight challenges.

**The Relationship Between Physical Activity and Cognition for All Children**

Children need the support of everyone around them in order to learn to be healthy and active, according to Michelle Obama, in her interview with Shaw (2014) for WebMD. Studies supporting the positive correlation between physical activity and cognition for healthy children without challenges were present in the literature. Japan was the setting for one study that was completed where both cognition and reasoning were analyzed after walking (Drollette, Shishido, Pontifex, & Hillman, 2012). This study was titled “Maintenance of Cognitive Control During and After Walking in Preadolescent Children” (Drollette et al., 2012). The research question was: what are the effects of an acute bout of moderate intensity treadmill walking on aspects of
cognitive control participants (Drollette et al., 2012)? The hypothesis was: physical exercise will increase cognition (Drollette et al., 2012). The independent variable was the physical exercise while the dependent variables included the inhibitory control and working memory of participants (Drollette et al., 2012). Participants included 36 pre-adolescent children between the ages of 9 and 11 with a mean age of 9.9 (Drollette et al., 2012). Participants included 20 females and 16 males (Drollette et al., 2012). Instrumentation and data collection included screening for absence of neurological disorders, normal vision, Attention Deficit Hyperactivity Disorder (ADHD) Rating Scale IV, K-Bit, Maximal oxygen consumption assessments by a computerized calorimetry system, behavior recordings and stimulus presentation were controlled with Neuroscan Stim software, Modified Eriksen flanker task, Spatial n-back assessment, and repeated cognitive assessments under different conditions including before, after, and during moderately intense treadmill aerobic walking.

Prior to the beginning of the Drollette et al. 2012 research, all participants were screened for absence of neurological disorders, normal vision (could be corrected with glasses or contacts if already in place), and a score below the 90th percentile on the Attention Deficit Hyperactivity Disorder (ADHD) Rating Scale IV (Drollette et al., 2012). Participants were also given the K-Bit in order to determine that all participants had average or above average intelligence (Drollette et al., 2012). During the research, all participants were given the Maximal Oxygen Consumption assessments by a computerized calorimetry system, behavior recordings and stimulus presentation were controlled with Neuroscan Stim software, and inhibitory control was assessed using a modified Eriksen flanker task (Drollette et al., 2012). Working memory was assessed throughout using a spatial n-back assessment (Drollette et al., 2012). Each participant participated in three separate sessions of assessments with repeated cognitive assessments under
different conditions including before, after, and during moderately intense treadmill aerobic walking (Drollette et al., 2012). Omnibus analysis was performed, which indicated a main effect of congruency and Flanker Accuracy and Reaction time were analyzed (Drollette et al., 2012). Findings were reported utilizing Greenhouse-Geiser statistic with a significance level of P= 0.05 and findings were decomposed using Bonferroni corrected t-tests for post-hoc comparisons in order to maintain accuracy (Drollette et al., 2012). Overall data provided evidence that aerobic exercise increased cognition (Drollette et al., 2012). The authors found evidence that moderately intense aerobic exercise provided increased attentional aspects of cognitive control and that participants were able to maintain accurate memory and cognitive tasks even during moderately intense aerobic exercise, while adults in other studies were not (Drollette et al., 2012). The greatest cognitive benefit was found after the moderately intense aerobic exercise for participants (Drollette et al., 2012). Drollette et al. (2012) asserted that “No Child Left Behind” has steered many districts to a decrease in physical education and recess within the United States and that this detrimental trend is triggering health problems as well as decreased cognition capabilities in children.

Further analyzing the Drollette et al. (2012) study, it is noteworthy that cardiovascular fitness assessments and cognitive task assessments were correlated, extenuating increased cognitive functioning within the physical activity group. Prior to the research, all participants were screened for absence of neurological disorders, normal vision (could be corrected with glasses or contacts if already in place), a score below the 90th percentile on the Attention Deficit Hyperactivity Disorder (ADHD) Rating Scale IV, and the K-Bit in order to determine that all participants had average or above average intelligence (Drollette et al., 2012). These were healthy children, and they were benefiting cognitively from increased physical activity. These
study results point directly to the correlation between cognitive benefits and an increase in physical activity. Even though this study was not conducted within a school setting and results were not directly correlated to academic achievement in school, the results remain noteworthy to the current study.

In another study by Drollette, Scudder, Raine, Moore, Saliba, Pontifex, and Hillman (2014), a within subjects design was utilized in which all participants completed two separate cognitive testing sessions in the lab at approximately the same time on separate days following 20 minutes of either moderate intensity walking on a treadmill or seated and quiet rest. Electroencephalographic activity was recorded from 64 electrode sites arranged according to the international 10-10 system (Drollette et al., 2014). Maximum oxygen uptake consumption was also collected by a computerized indirect calorimetry system, which measured heart rate, average respiratory exchange ratios, and overall oxygen uptake (Drollette et al., 2014). All data provided evidence that single acute bouts of moderate physical exercise created an increase in cognitive performance with more pervasive positive effects observed for lower performing students (Drollette et al., 2014). All data from both of these studies showed an increase in cognitive activity with physical activity. These studies continue to point to the gap in the literature in that qualitative studies collecting the perceptions of elementary teachers could guide future qualitative and quantitative studies within the elementary education setting, correlating the possibility of a direct relationship between physical activity within the instructional day and academic achievement for students.

“Examining the Impact of Integrating Physical Activity on Fluid Intelligence and Academic Performance in an Elementary School Setting: A Preliminary
Investigation” completed by Reed, Einstein, Hahn, Hooker, Gross, and Kravitz (2010), asserted the completed research to date necessitated research done within the realm of the elementary education setting. This study took place within the elementary school setting. This study utilized a random sampling of third grade teachers willing to incorporate 30 minutes of physical activity per day. The results were mixed, in that students in the experimental group scored higher in some areas than those in the control group on achievement tests and cognitive function but not statistically significantly higher in some areas. The experimental group scored statistically significantly higher on the fluid intelligence test after treatment.

A study by Erickson, Voss, Prakash, Basak, Szabo, Chaddock, Kim, Heo, Alves, White, Wojcicki, Mailey, Viera, Martin, Pence, Woods, McAuley, and Kramer (2011), examined the effect that modest exercise had on both the anterior hippocampus and the spatial memory of participants. This study conducted by Erickson et al. (2011), titled “Exercise Training Increases Size of Hippocampus and Improves Memory”, utilized a randomized control trial. The research question was: how does exercise affect the anterior hippocampus and spatial memory (Erickson et al., 2011)? The implied hypotheses were that hippocampal volume loss would be decreased with physical exercise and that spatial memory would be improved with exercise (Erickson et al., 2011). The independent variable was the physical exercise while the dependent variable was spatial memory (Erickson et al., 2011). ANOVA with repeated measures was utilized within the Statistical Package for the Social Sciences (SPSS) with repeated measures as a between subjects factor and time as a within subject factor, correlations were calculated, and scatterplots were utilized to display data evidencing an increase in hippocampal volume in the aerobic training group (Erickson et al., 2011). All dependent variables were assessed and met criteria for skew and normality before Pearson and general linear model correlations were conducted; repeated
calculations and assessment results were identical (Erickson et al., 2011). For all correlations and analysis, a partial correlation approach was utilized in order to control for the confounding effects of gender and age (Erickson et al., 2011).

Participants completed fitness assessments or aerobic fitness and heart health (Erickson et al., 2011). All participants, including the control group, were also given Magnetic Resonance Imaging (MRI) assessments within one month of the start of the intervention (Erickson et al., 2011). The experimental group trained with a certified exercise leader during all sessions, starting out walking slowly for 10 minutes per day and increasing duration by five minutes each week until a duration of 40 minutes was reached (Erickson et al., 2011). All participants were also given a spatial memory computerized test as a baseline before intervention, after intervention, and after six months (Erickson et al., 2011). Overall, data from this study demonstrated that aerobic exercise increased both the anterior hippocampus and spatial memory (Erickson et al., 2011). Cardiorespiratory fitness and cognition were directly related and positively correlated according to Voss, Erickson, Prakash, Chaddock, Malkowski, Alves, Kim, Morris, White, Wojcicki, Hu, Szabo, Klamm, McAuley, and Kramer (2010). This study showed similar results to the studies analyzed thus far.

Two quantitative works supporting the case for the connection between physical exercise and cognition for children include the work of Knaepen, Goekint, Heyman, and Meeusen (2010) and the work of Schaefer, Lovden, Wieckhorst, and Lindenberger (2010). Acute aerobic exercise impacts cognition in a positive manner, according to Knaepen, Goekint, Heyman, and Meeusen in their 2010 study review, titled “Neuroplasticity – Exercise Induced Response of Peripheral Brain – Derived Neurotrophic Factor.” Brain-derived neurotrophic factor (BDNF) is a crucial neurotrophin involved with homeostasis in humans (Knaepen et al., 2010). Six studies
implemented an aerobic training program ranging from five to 24 weeks, two to seven sessions a week, of different loads, mode, and duration (Knaepen et al., 2010). Acute aerobic exercise induced an increase in peripheral BDNF concentration, in healthy subjects, as well as in persons with a chronic disease or disability. (Knaepen et al., 2010).

Schaefer et al. (2010) likewise asserted improved cognition and brain function both during and after physical exercise. In the Schaefer et al. (2010) study titled “Cognitive Performance is Improved while Walking: Differences in Cognitive-sensorimotor couplings Between Children and Young Adults,” cognitive functioning was improved when walking compared to when sitting. The implied research question was: What is the relationship between walking and cognitive performance (Schaefer et al., 2010)? The implied hypothesis was that participants would perform poorly when asked to walk and perform cognitive tasks at the same time (Schaefer et al., 2010). The independent variable was walking and the dependent variable was cognitive performance (Schaefer et al., 2010). Instrumentation and data collection included the Weschler Digit Symbol Substitution test, a vocabulary test, written consent, Vicon motion capture system, and a treadmill test (Schaefer et al., 2010). Mixed ANOVAs were utilized for data analysis (Schaefer et al., 2010). Overall data indicated that younger adults preferred a faster walking speed than 9 year old children (Schaefer et al., 2010). Overall cognitive performance improved when walking at preferred speed (Schaefer et al., 2010). These works provide further definitive research supporting the connection between increased physical exercise and improved cognition. These studies also bring about the question whether physical activity during learning, and not just as a break, could be beneficial to cognition as the researchers in the Schaefer study found increased cognitive function in participants not only after physical activity but also during.
Physical exercise is necessary for all children to live healthy lives according to Michelle Obama, current first lady, in her interview with Shaw for WebMD (2014). The search for quantitative research disproving the connection between physical exercise and healthy children utilizing Academic Search Complete, Academic OneFile, JSTOR, LexisNexis Academic, Literati by Credo, ProQuest, Central, ScienceDirect, Education Research Complete, ERIC (Ebsco), and Education Research Guide was not fruitful; I was unable to find research studies with contradictory results. Larson (2010) asserted that children must be met where they are and that learning must be fun and create happiness for education to be successful. If children are not happy sitting for prolonged periods, and the study evidence substantiates the direct correlation between acute bouts of physical activity and cognition, why have elementary teachers not been asked for input on their perceptions of this phenomenon?

Hale (2014) completed a doctoral dissertation titled *The Relationship between Body Mass Index, Fitness, Self-Efficacy and Their Prediction on Criterion Referenced Competency Test Scores for Eighth Grade Students*. This study was able to link self-efficacy to standardized test scores as well as fitness to standardized test scores for eighth grade students. This study provides further evidence that the possibility exists that increased physical activity including recess and brain breaks may increase academic achievement for elementary students.

**Significance of Physical Exercise for Adults and the Elderly**

The research asserting the value of exercise in treating the elderly for brain function challenges is well established. Ploughman (2008) defined exercise as physical activity that requires effort. Ploughman (2008) asserted in her book titled *Exercise is Brain Food: The Effects of Physical Activity on Cognitive Function* that exercise is quite literally brain food. Exercise has been suggested by the medical profession as treatment for Alzheimer’s and other
cognitive challenge issues for the elderly (Ploughman, 2008). The elderly can be especially vulnerable to brain function challenges. This is an emotional issue for many and one that touches the hearts of almost all Americans. While it was once believed to be fact that the brain of an adult was unable to yield new neurons, it is now well established within the medical community that new neurons can be created within the hippocampus throughout life (Ploughman, 2008). This is significant in that it establishes the ability of the human body to regenerate and improve itself, specifically including the brain and its cognitive functioning.

Ploughman (2008) asserted that rats subjected to one week of exercise showed significant spatial memory improvements. The exercise benefit to spatial memory and cognition is established in adults, particularly young adults (Ploughman, 2008). Ploughman (2008) also raised the question of how much exercise is ideal for particular human age groups, which leads to the specific gap in the literature addressed in the current study.

A study integral to this literature review was written by Chapman, Aslan, Spence, DeFina, Keebler, Didehbani, and Lu (2013) titled, “Shorter Term Aerobic Exercise Improves Brain, Cognition, and Cardiovascular Fitness in Aging”, where the researchers utilized a randomized control trial where all participants were screened employing the Telephone Interview Cognitive Status-Modified (TICS-M) to screen for dementia. Dementia is defined as a persistent disorder of the mental processes (Chapman et al., 2013). Dementia affects the relationships of the patient with their family and friends with often devastating effects. The Beck Depression Inventory-11 (BDI) was administered to screen for symptoms of depression (Chapman et al., 2013). Depression is defined as feelings of severe and prolonged dejection (Chapman et al., 2013). Depression has a direct impact on the ability to experience happiness in life. The Montreal Cognitive Assessment (MoCa) was administered to identify early cognitive
impairment (Chapman et al., 2013). Cognitive impairments range from mild to severe and can affect the ability to remember things, learn new things, make decisions, and concentrate on tasks at hand. The Weschler Abbreviated Scale of Intelligence (WASI) was administered in order to assess estimated intelligence quotient (IQ) (Chapman et al., 2013). This significant battery of assessments was administered in order to clearly define the particular situations of all participants and add validity to the study results.

The measures utilized within the Chapman study included physiological, neurocognitive, and magnetic resonance imaging (MRI) (Chapman et al., 2013). Physiological measures were taken as a baseline, during Week 6, and at the end of the training in Week 12 (Chapman et al., 2013). Neurocognitive measures were also taken as a baseline, during Week 6, and at the end of the training (Chapman et al., 2013). Neurocognitive measures included assessments of executive function, memory, and complex attention; “Trials B-Trials A” was used to measure executive function; The California Verbal Learning Test Second Edition (CVLT-II) was administered to determine verbal ability; immediate and delayed memory was assessed with Delis-Kaplan Executive Function System – Color Word Interference subtest (DKEFS-color word) and Backward Digit Span (Chapman et al., 2013). Participants were randomly placed into two groups for the Chapman study, a physical training group, which exercised for three 60 minute sessions per week for 12 weeks alternating between a workout, stationary bike, and a treadmill (Chapman et al., 2013). Physiological and neurocognitive measures were taken on participants as a baseline, during Week 6, and at the end of the training in Week 12 (Chapman et. al, 2013). Study results indicated that physical exercise improves cognitive and brain health and that exercise particularly stimulates cognitive and brain health in aging adults (Chapman et. al, 2013). Participants in this study showed improvements in cognition and brain health as early as six
weeks into the program, indicating the expediency of possible cognitive and mental improvements with physical exercise (Chapman et al., 2013).

Evidence was provided in the “Shorter Term Aerobic Exercise Improves Brain, Cognition, and Cardiovascular Fitness in Aging” study that showed participants from the physical exercise group had increased cerebral blood flow (CBF) and improvement in both immediate and delayed memory (Chapman et al., 2013). Both immediate and delayed memory are integral to learning new things and making connections between what has been previously learned to new knowledge. The evidence that cognition and physical fitness were related is linked, and yet so many in the United States continue to make decisions ignoring this evidence, leading to the need for further and more specific research (Drollette, Shishido, Pontifex, and Hillman, 2012).

Cognitive function decline, due to aging, can occur as early as the third decade of life, even in healthy adults (Chapman et al., 2013). Cognitive challenges can affect people of all ages. Current research shows that aerobic exercise can improve cognition and brain health (Chapman et al., 2013). The question remains whether frequent bouts of physical activity within the instructional day for elementary students will lead to improved cognition and overall academic achievement, which is the gap in the research currently at hand. The brain indeed heals itself and does so better if steps are taken to support it (Kotulak, 1996). Kotulak asserted in his 1996 book titled Inside the Brain: Revolutionary Discoveries of How the Mind Works that physical exercise, meditation, and brain exercise all help support optimal brain healing.

Parallel results to the Chapman et al. (2013) study were found by Erickson et al. (2011) in their study where exercise was shown to increase hippocampus volume in older adults with dementia. The study by Erickson et al. (2011) was titled “Exercise Training Increases the Size of
Hippocampus and Improves Memory”. The hippocampus is an essential portion of the brain, therefore hippocampus volume is integral to optimal brain function (Ericson et al., 2011). Adults struggling with memory challenges experienced increased memory skills in this study directly correlated to increased physical activity (Erickson et al., 2010).

All participants in the Erikson study completed fitness assessments, including assessment of aerobic fitness and heart health (Erikson et al, 2011). All participants, including the control group, were also given Magnetic Resonance Imaging (MRI) within one month of the start of the intervention (Erikson et al., 2011). The experimental group trained with a certified exercise leader during all sessions (Erikson et al., 2011). Experimental group participants started out walking slowly for 10 minutes and increased the duration by five minutes each week until a duration of 40 minutes was reached in Week 7 (Erikson et al., 2011). All participants were also given a Spatial Memory computerized test as a baseline before intervention, after the intervention, and after six months (Erikson et al., 2011).

Overall data in the Erikson study provided evidence that aerobic exercise increased the anterior hippocampus and spatial memory; exercise improved hippocampus volume by 2%, which would be the equivalent of age reversal of 1-2 years in the participants effected (Erikson et al., 2011). Spatial memory improved for the aerobic exercise group and all dependent variables in the Erikson study were assessed and met criteria for skew and normality before Pearson and general linear model correlations were conducted (Erikson et al., 2011). Repeated calculations and assessment results were identical, and for all correlations and analysis, a partial correlation approach was utilized in order to control for the confounding effects of gender and age (Erikson et al., 2011).
Analysis of variance (ANOVA) with repeated measures was utilized within the Statistical Package for the Social Sciences (SPSS) with repeated measures as a between-subjects factor, and time as a within-subject factor within the Erikson study (Erikson et al., 2011). Correlations were calculated, and scatterplots were utilized to display data evidencing an increase in hippocampal volume in the aerobic training group (Erikson et al., 2011). All dependent variables were assessed and met criteria for skew and normality before Pearson and general linear model correlations were conducted (Erikson et al., 2011). Repeated calculations and assessment results were identical (Erikson et al., 2011). For all correlations and analysis, a partial correlation approach was utilized, in order to control for the confounding effects of gender and age (Erikson et al., 2011).

The evidence was abundant in support of physical exercise being a significant factor in improving cognition for elderly participants in published research studies. Continuing to focus on research connecting physical exercise and brain activity led to a study that was written by Voss, Erickson, Prakash, Chaddock, Malkowski, Alves, Kim, Morris, White, Wojcicki, Hu, Szabo, Klamm, McAuley, and Kramer (2010) and a meta-analytic review was written by Smith, Blumenthal, Browndyke, and Sherwood (2010). Analogous evidence to the studies thus far could be found in the study by Voss et al. (2010), which provided similar findings to those previously discussed where healthy elderly adults displayed both increased functional connectivity and cognition with an increase in physical exercise. “Functional Connectivity: A Source of Variance in the Association Between Cardiorespiratory Fitness and Cognition” is the title of the study completed by Voss et al in 2010. Functional connectivity is fundamental to optimal brain function and therefore significant to this study (Voss et al., 2010). Voss et al. (2010) also specifically examined the connection between aerobic fitness and cognitive
performance within their study. As aerobic fitness increased, so did cognitive performance (Voss et al., 2010). The question remains, if an increase in aerobic fitness increased cognitive performance for participants in this study, how often and how much physical activity would be optimal for elementary aged students to achieve optimal cognitive results? Voss et al. (2010) asserted that her study was the first of its kind to examine functional connectivity differences within the brain in relation to aerobic fitness differences. This study was significant and pivotal to the current study, in that Voss honed in on the lifestyle factors of participants and their pivotal role in mental and physical health. The health and lifestyle of elementary aged students could be pivotal in improving academic achievement in schools within the United States.

The independent variable in the Voss et al. (2010) study was cardiovascular fitness and the dependent variable was cognition. The implied research question was: Is there a source of variance association between cardiovascular fitness and cognition (Voss et al., 2010)? The hypothesis was that “functional connectivity would serve as a significant source of variance in the association between aerobic fitness and cognition” (Voss et al., 2010, p 1401). Participants included 32 young adults with a mean age of 24.1, of which 85% were female, and 120 elderly adults with a mean age of 66.5, of which 71% were female (Voss et al., 2010). Eligible participants were right handed, scored at or above 51 on the modified Mini-Mental Status Exam, completed a mock Magnetic Resonance Imaging (MRI) session, and passed a visual acuity exam with vision of 20/40 or better with corrective lenses (Voss et al., 2010). Instruments utilized in the Voss study included MRI, Vision screening, Task Switching, Wisconsin Card Sorting Task (WCST), Spatial Memory, Aerobic Fitness Assessment (VO2max), and Magnetization Prepared Rapid Gradient Echo Imaging (MPRAGE). Overall data indicated that functional connectivity supported improved executive function; fitness and the switch task were closely related as
participants with better fitness showed better switch task scores (Voss et al., 2010). Analysis in the Voss study included Regression based analysis, Linear Model Analysis, and Mediator Analysis (Voss et al., 2010).

A meta-analytic review by Smith, Blumenthal, Hoffman, Cooper, Stauman, Welsh-Bohmer, Browndyke, and Sherwood (2010) of studies conducted between 1966 and 2009 similarly found that aerobic exercise training had a positive impact on neurocognitive routine in adults, including adults already categorized as healthy adults. This meta-analytic review was titled “Aerobic Exercise and Neurocognitive Performance: A Meta-Analytic Review of Randomized Controlled Trials.” Studies included were examined carefully to ensure that participants were adults, that treatment lasted longer than one month, and that a non-aerobic exercise control group was present for direct comparability (Smith et al., 2010). Participants were from all walks of life and included over 2,049 people (Smith et al., 2010). This collective group of studies is relevant to the current study because of the clearly defined history of research. Improvements in processing speed and attention were most widely noted in the studies within this meta-analysis (Smith et al., 2010). Smith et al. (2010) pointed to public health implications derived from this collection of studies closely aligning with the theories of Bandura (1989 & 1993) in that we learn from one another and that self-efficacy plays a significant role in both cognitive development and functioning. Studies dating back to 1966 were examined within the Smith et al. (2010) analysis and the pattern of a clear, positive connection for adults between improved and/or increased physical fitness and cognition was established as not being new to the field of research.

In the 2010 study by Voss et al. the assertion was made that the increase in physical exercise provided marked improvement in brain connectivity and cognition. These two works by
Voss et al. and Smith et al. (2010) provide further support that cognition improves for all adults with increased physical activity outside of public education settings. That both adults with and without brain challenges showed increased brain function with an increase in physical activity in previous studies is pivotal to the research at hand. The positive impact of physical activity on cognition has been made clear for adults with and without brain challenges with both dated and current study findings. It seems logical that if mind, body, and spirit were definitively connected for adults, that they could also be conclusively connected for children. This indication further spurred interest in regards to the effect of physical exercise on study participants of all ages.

Humans have a need for healthy bodies, minds, and spirits (Rich, 2010). People are whole beings. In Rich’s (2010) article, titled Whole Child, Developing Mind, Body, and Spirit Through Outdoor Play, he asserted that our minds, bodies, and spirits are interconnected inseparably. Kotulak (1996) also asserted the connection between mind, body, and spirit in his book, titled Inside the Brain: Revolutionary Discoveries of How the Mind Works. The noteworthy collection of research thus far relating to adults and the elderly in this chapter has supplied justification for examination of the established research for other ages and conditions.

Summary

Studies included within the Review of Literature substantiate that cognitive functioning is improved with an increase in physical activity and yet in the United States, many continue to push for less physical activity, and the elimination of recess and brain breaks in our schools. The push for a reduction in recess and physical activity within our nations’ schools is detrimental to student success in school (Pica, 2010). The theoretical framework for this study is based on the methodological philosophical assumption in that I hoped to gather information about how best to
structure recess and brain breaks for elementary students by collecting the perceptions of the teachers who actually teach them.

The work of Bandura (1989), asserting that humans are social creatures and that we learn through social interactions, also influenced this research. Bandura (1993) also emphasized that self-efficacy plays a role in cognitive development and functioning. Self-efficacy and physical fitness are linked (Hale, 2014). Bandura’s 2001 and 2004 discussions of social cognitive theory also helped to guide this study in that the assertion was made that humans make decisions in order to meet their needs. This connects both of these studies to Maslow’s Hierarchy of Needs (1943), where Maslow asserted that humans will strive to meet basic needs before full attention is paid to other tasks at hand.

In reviewing the literature concerning minors with obesity and or ADD/ADHD challenges, studies showed a statistically significant positive correlation between physical activity and cognitive function. Research studies involving minors without weight or cognitive challenges also showed strong evidence of a positive correlation between physical activity and cognition. While the studies completed within the public school setting are limited, they do begin to show evidence of a positive connection between physical fitness and academic success. An extensive search utilizing Academic Search Complete, Academic OneFile, JSTOR, LexisNexis Academic, Literati by Credo, ProQuest, Central, ScienceDirect, Education Research Complete, ERIC (Ebsco), and Education Research Guide did not provide studies that refuted this positive connection for minors.

Studies including elderly participants that showed a positive connection between cognition and physical activity were also included in the Review of Literature. Elderly patients with and without cognitive challenges benefited from physical activity in regards to cognition in
these studies. Studies refuting the positive connection between increased physical activity and improved cognition for elderly adults were not found in a search utilizing Academic Search Complete, Academic OneFile, JSTOR, LexisNexis Academic, Literati by Credo, ProQuest, Central, ScienceDirect, Education Research Complete, ERIC (Ebsco), and Education Research Guide.

Adult Participants in the research studies reviewed within this chapter also showed that increased physical activity showed increased cognitive abilities. Adults with and without challenges exhibited statistically significant positive benefits for cognition and brain activity from increased physical activity. An extensive search utilizing Academic Search Complete, Academic OneFile, JSTOR, LexisNexis Academic, Literati by Credo, ProQuest, Central, ScienceDirect, Education Research Complete, ERIC (Ebsco), and Education Research Guide did not provide studies that refuted this positive connection.

While an accumulation of research summarized here provides clear justification for physical activity and its positive impact on cognitive functioning and brain activity, research is clearly necessary in order to collect and capture the essence of the perceptions of elementary teachers in regards to this phenomenon in order to guide further and more specific qualitative and quantitative research, particularly within the elementary education setting. Elementary schools build the foundation for future academic endeavors.

As the preceding collection of literature shows, there are quantitative studies linking improved cognition with physical activity for participants ranging from minors to the elderly. Qualitative research is needed in order to collect the essence of the perceptions of elementary teachers on this topic in order to inform policy makers and in order to guide further qualitative and quantitative research within the elementary school setting. An exhaustive search utilizing
Academic Search Complete, Academic OneFile, JSTOR, LexisNexis Academic, Literati by Credo, ProQuest, Central, ScienceDirect, Education Research Complete, ERIC (Ebsco), and Education Research Guide did not provide studies that utilized a qualitative phenomenological approach to investigate the perceptions of elementary teachers on this topic.
CHAPTER THREE: METHODS

Overview

As the preceding literature review showed, there are several quantitative studies associating improved cognition with physical activity. Qualitative research was necessary in order to collect perceptions of elementary teachers on this topic. After an exhaustive research of the literature, I did not find studies that utilized a phenomenological approach to investigate teachers’ perceptions of the significance of recess and brain breaks within the instructional day in an elementary classroom. No qualitative studies were found. Descriptions of the research design, the study participants, the researcher, the data collection and analysis process, and the ethical considerations are included in this section.

Design

Creswell (2007) asserted that qualitative research is best suited for research problems that are technically not yet determined and that require further exploration. Husserl (1913) asserted that individuals understand their experiences through their own lens of sensory perceptions, which therefore bring conscious awareness to our lives. Phenomenology focuses on a shared experience of the same phenomenon and how understanding that phenomenon provides meaning and interpretation (Creswell, 2007; Giorgi, 1985; Moustakas, 1994; Husserl 1901). Husserl (1901 and 1973) described phenomenology as an approach that focuses on the study of consciousness and perception of a direct experience.

After reflecting on all of this, I chose to utilize a phenomenological approach for this study. I selected this approach for this particular study because of my desire for the voice of teachers to be heard. School leaders, politicians, and other stakeholders that do not currently teach elementary students have an opinion about the topic of recess and physical brain breaks in
This research study was designed to give a voice to the teachers who actually teach elementary school daily.

Voice is imperative in phenomenological studies in that it is the voice of the individuals who shared the common phenomenon that is captured and described (Creswell, 2013; Moustakas, 1994). This study was written from the viewpoint of elementary teachers and gives their perceptions a voice. This study captures the essence of the experience in regards to the elementary teachers’ perceptions of the physical activity needs of their students.

**Research Questions**

**RQ1:** What is the essence of the perception of elementary teachers in regards to the benefits of recess and brain breaks for students occurring during the instructional day?

**RQ2:** What is the essence of the perception of elementary teachers in regards to the long term benefits of recess and brain breaks for elementary students occurring during the instructional day impacting them as lifelong learners?

**Setting**

This study took place at Smith School District (pseudonym used). Smith is a large suburban school district in Georgia serving Pk-12. The district where this study took place has over 100 schools, over 100,000 students and over 7,000 teachers (Smith School District, 2015). The district student population is made up of approximately 40% Caucasian, 32% African American, 20% Hispanic and 8% Other (Smith School District, 2015). Approximately 45% of the student population qualifies for free/reduced lunch (Smith School District, 2015). Over 60% of the district’s teachers have advanced degrees (Smith School District, 2015). Interviews and focus groups took place in teachers’ classrooms or at a local restaurant of the participants’ choice.
at a time most convenient for the participants. Participants’ comfort and convenience are important and were deliberately and purposefully addressed (Creswell, 2013; Moustakas, 1994).

Participants

There were 10 participants in this study. Creswell (2013) asserted purposeful sampling in phenomenological studies is important since it is critical that each participant has experienced the same phenomenon under examination. My study included a purposeful sampling of elementary teachers because they were chosen for particular specifications. Creswell (2013) asserted that 10 participants usually allows for saturation of the data in a phenomenological study. Ten participants allowed me to reach saturation of the data for this study. Participants were elementary teachers that had taught for at least three years. This allowed the participant voice to be from a position of experience, excluding teachers who have taught for less than three years. This study also purposefully excluded administrators who are not currently working directly with students daily in the classroom in an instructional format. Participation in this study was voluntary. Using pseudonyms protects the confidentiality of the participants (Creswell, 2013, Moustakas, 1994). Pseudonyms were utilized for participants and their current work locations to protect their confidentiality within the study.

Procedures

A list of possible participants was selected from the district database and 10 teachers were chosen based on study criteria. Institutional Review Board (IRB) approval was procured from Liberty University and Smith School District prior to the beginning of the study (Appendix A). Consent forms were explained, signed, and collected before data collection began (Appendix C). One-on-one semi-structured interviews were conducted first, followed by follow-up one-on-one interviews if necessary (Appendix D). At the conclusion of all interviews, the focus group
was scheduled at the convenience of the participants and was conducted at a location and time most convenient to the participants (Appendix E). Following the conclusion of the focus groups, the last data collection method, the anonymous electronic questionnaires, were hand-delivered to all 10 participants and collected (Appendix F). Moustakas’ seven steps were utilized for data analysis. By following this systematic procedure, themes were identified and elucidated.

**The Researcher’s Role**

My name is Laura Beth Knight. At the time of the study, I was teaching second grade and I was my team’s lead teacher in the district where the study took place. I had been an educator for 22 years and held a Bachelor of Science, Master of Science, and Educational Specialist degree in Education. I currently hold endorsements in the following areas, (a) English Students of Other Languages (ESOL), (b) Gifted, (c) Reading Specialist, (d) Academic Coaching, (e) Middle School Mathematics, (f) Middle School Social Science, (g) Middle School Science, and (h) Pre-Kindergarten through Fifth Grade Generalist. While I retain my own personal opinion of the impact of physical brain breaks and recess in elementary school, I placed my own opinions aside as I openly solicited the viewpoints of elementary teachers through semi-structured one-on-one interviews, focus groups, and questionnaires. Bracketing was essential (Creswell, 2013; Moustakas, 1994) in this phenomenological research. Elementary teachers are the ones experiencing the common phenomenon of attempting to teach students who are struggling to sit still for long periods of time. It is the essence of the voice of the elementary teacher participants that I captured in this study.

**Data Collection**

Data triangulation is a powerful strategy that involves collecting data in at least three ways in order to improve reliability, credibility, and validity (Creswell, 2013). Thus, data
triangulation was utilized within this study. One-on-one interviews were the first method of data collection in order to build the relationship between the participants and me within the bounds of the study. Ten teachers were interviewed individually with the possibility of follow-up interviews. All interviews were transcribed verbatim for analysis. A Focus Group was the second method of data collection in order to dig deeper into the participants’ beliefs about the phenomenon under investigation in light of the opinions of their peers. There was one focus group of 10 teachers in order to allow for maximum sharing of perceptions for all participants. Sessions were audio recorded by two different electronic devices and transcribed verbatim for analysis. The third data collection method was an anonymous questionnaire. Participants were asked for a preferred method for accessing the anonymous questionnaire in order to protect their anonymity. The questionnaires were then hand-delivered. The questionnaire included open-ended prompts in order to give participants another chance to elucidate their position on the topic in light of participating in the interview and focus group sessions. This triangulation of data collection helped to ensure reliability, credibility, and validity of the data and the data collection process.

**Interviews**

Phenomenological qualitative research often uses interviews as the principal means of data collection (Creswell, 2007; Englander, 2012). One-on-one, semi-structured interviews allow for questioning to diverge from the script if the answers given by a participant lead to further inquiry in a particular direction (Cohen, 2006). Moustakas (1994) asserted that quality phenomenological interviews are best described as informal interactions articulated through open-ended questions. This type of interview was utilized as the first data collection method for this study and began to allow participants to answer the research questions. After consulting
with a professional auditor, it was decided that interview questions would be peer reviewed and piloted before use. Interview questions were peer reviewed by three colleagues and then piloted with two teachers for face and content validity. Pilot interviews took no longer than 15 minutes each. Questions were then adjusted as necessary to elicit the desired information from participants.

As the researcher in this study, I interviewed each of the participants in their own classroom or at a location of their choosing at a time convenient to them (before school, after school, or at another time). These interviews were designed to take no longer than 20 minutes. I utilized the audio recording application on my personal cell phone to record these interviews, which were later transcribed verbatim (Creswell, 2013). I utilized a recording device borrowed from my school as a back-up recording device. I also took notes as I recorded. This form of data collection was appropriate for my research because it allowed me to collect honest perceptions in a comfortable and relaxed atmosphere. In consultation with a professional auditor, it was suggested that interview questions be peer reviewed and piloted as well. Interview questions were peer reviewed by three colleagues and piloted with two teachers who were not participants, but that fit participant criteria, in order to determine if the data collected matched the research questions before utilizing the interview questions with study participants.

**Open-Ended Interview Questions for Semi-Structured Interviews**

1) Ice Breaker Question:
   a. What is your favorite thing to do outside of work for leisure or fun?

2) Background questions:
   a. What grade do you currently teach?
   b. How long have you been teaching elementary school?
c. What is your current age?

d. What is your gender?

e. Are you comfortable sharing information about your ethnicity? Do you consider yourself African American, Caucasian, Hispanic, Asian, or other?

3) Perception questions:

a. What do you observe about your students in regards to recess being part of your daily schedule?

b. What do you observe in your students regarding physical brain breaks within your daily schedule?

c. What is your opinion about politicians and school leaders making decisions about how much or how little recess and or brain breaks you should incorporate into your daily class schedule?

d. What are some of the benefits of recess and brain breaks in an elementary school day?

e. What are some of the drawbacks of recess and brain breaks in an elementary school day?

f. Do you observe differences in your students’ ability to concentrate on academics after Physical Education (PE), recess, or a physical brain break as opposed to other times in your instructional day?

g. How do you perceive physical activity affecting students as lifelong learners?

h. Is there anything else that you haven’t mentioned that you would like to tell me that I haven’t asked?
The purpose of the ice breaker question was to increase comfort for the participant and allow for trust to begin to develop, in that this was a friendly exchange (Creswell, 2013; Moustakas, 1994). The purpose of the background questions was to collect and report general information about the participants within the study in order to begin to understand the human factor within the inquiry (Creswell, 2013; Husserl, 1913; Moustakas, 1994; Sartre, 1958; Van Manen, 1990). The perception questions were asked because they are foundational to the purpose of this phenomenological study (Creswell, 2013; Moustakas, 1994). In order to capture the essence of the perception of the shared experience, open-ended questions were asked (Creswell, 2013; Moustakas, 1994). Teachers who were actually currently teaching elementary school and had been for at least three years were included in the study. These delimitations had been selected purposefully in order to gain the perspective of only the teachers who had three years or more years of teaching experience with elementary students and who were currently teaching elementary students. This data collection strategy helped me to begin to collect data in reference to both research questions.

Focus Group

Including a focus group in phenomenological research allows for the drawing out of more memories and emotions of participants who share the same experience (Moustakas, 1994). Joining with others who have a shared experience often enhances discussions on the topic at hand (Ary, Jacobs, Razavieh, & Sorensen, 2012). The focus group provided an opportunity for data collection of the interactions of participants with other participants at the same time. This was especially helpful in collecting data about perceptions of the significance of recess and brain breaks when in the presence of colleagues in similar work situations. Focus group prompts were peer reviewed by three colleagues before use. One focus group of 10 participants was conducted
at the convenience of the participants and took place in an undisclosed location for their convenience and comfort.

Caution was taken so that no participant dominated the discussion and no participant remained silent or contributed little. As the researcher, I ensured that no individual dominated the conversation but that all participants felt free to have their voice heard and acknowledged. Active facilitation was vital. Questions were created after the interviews in order to take the data collected during the one-on-one semi-structured interview and expound upon the interview during the focus group. The research questions were further addressed by this data collection strategy.

**Questionnaires**

Questionnaires are a form of interview done on paper or electronically (Creswell, 2013). Anonymous electronic or paper questionnaires are useful in phenomenological studies in collecting data that may not have been provided previously by participants but has come forth in their mind after the one-on-one semi-structured interviews and focus groups. Anonymous electronic questionnaires are also useful in phenomenological studies because they allow participants to add or expound on their perceptions anonymously without anyone knowing who shared the particular comments, even me, as the researcher. The electronic questionnaire (Appendix F) was created based on data collected through interviews and the focus group and supported participants in having the opportunity to synthesize, summarize, and allow for an additional opportunity for feedback. The questionnaire was peer reviewed by three colleagues, prior to hand-delivery to the participants, in order to ensure that it prompted sharing of perceptions addressing the research questions. Three colleagues peer reviewed the prompts of the questionnaire before its use. This feedback was collected with complete anonymity. This
data collection strategy was especially useful as the final step in triangulating data collection in that participants had already expressed their opinions both in one-on-one interviews and in a focus group setting. They had the opportunity to reflect on their position and have this final chance to elucidate their position.

**Data Analysis**

Data analysis utilized Moustakas’ Seven Steps. Moustakas (1994) modified VanKaam’s steps and listed his own as:

1. Listing and preliminary grouping,
2. Reduction and elimination,
3. Clustering and thematizing,
4. Final identification of the invariant constituents and themes
5. Using the relevant, validated invariant constituents and themes constructed for each co-researcher an individual textural description of the experience,
6. Construct for each co-researcher an individual structural description,
7. Construction for each co-research participant a textural structural description of the experience that includes the researcher (pp. 120-121)

I transcribed all notes and read them repetitively, looking for commonalities in themes and phrases (Creswell, 2013). All notes from interviews, the focus group, and questionnaires were transcribed verbatim. According to Moustakas (1994), reduction and elimination occur by testing each expression within the notes for two requirements, determine whether it comprises a moment of the shared experience that is necessary for understanding and whether it is possible to abstract and label it. After elimination of what doesn’t meet these criteria, what remains are the invariant constituents (Moustakas, 1994). All transcribed notes from my study were read
repeatedly in order to begin to notice preliminary categories or themes. This allowed me, as the researcher, to begin to internalize all of the information and begin to discover the commonalities that began to surface. I also utilized open coding where data were organized into categories or themes that emerged (Creswell, 2013; Moustakas, 1994). I highlighted with the same color all phrases that pertained to a particular theme or category. This process allowed me to delve deeply into the transcription notes of all participant perspectives and clearly delineate commonalities. These became the core themes for my study.

Clustering and thematizing of the invariant constituents (Moustakas, 1994) allowed me to group common themes together and begin to develop an even deeper understanding of the essence of the shared experience. Two-tiered coding allowed me to extrapolate each theme discovered through open coding and type each into a single document in order to look for another possible tier of themes within each. I then highlighted in new colors the similarities and differences within each theme in order to find the possible existence of another tier of themes within each theme in the first set (Creswell, 2013; Moustakas, 1994). Double-checking the invariant constituents and the accompanying themes with all notes on a particular participant allowed for final identification of the themes by application (Moustakas, 1994). This allowed me to make final identification of the themes for my study.

Moustakas (1994) emphasized that it is critical at this point in the process to construct an individual textural structural description of the essences of the experience synthesizing the invariant constituents and themes. Each participant’s perceptions within my study were synthesized into a structural description before the final step, which allowed for the construction of a complete textural description from the point of view of each participant. This entire process allowed me to delve deeply into the transcription notes of all participants’ perspectives and
clearly analyze for all categorization possibilities (Creswell, 2013; Moustakas, 1994). Finally, the individual textural and structural descriptions from my analysis were utilized to develop the composite description of the essence of the experience for the group as a whole.

**Trustworthiness**

Lincoln and Guba (1985) asserted the goal of trustworthiness is to support the argument that the research findings are worthy of notice. Lincoln and Guba (1985) defined transferability as the application in other situations and frameworks and confirmability as the degree of neutrality imposed upon the study. Lincoln and Guba (1985) defined credibility and dependability as how much one can trust the findings of the study and the consistency of the findings where the study could be repeated with similar results respectively. Trustworthiness includes strategies, but it is much more than that; it is the pervasive attitude of respecting the authenticity of the participant perceptions clearly and honestly (Bloomberg & Volpe, 2012). Trustworthiness, transferability, confirmability, credibility, and dependability were addressed through a number of strategies, but most importantly by my pervasive attitude, as a researcher, to respect the authenticity of participant perceptions.

**Transferability.** Transferability is defined by Lincoln and Guba (1985) as the application in other situations. It is my intent that my research will be able to be applied in other contexts as future researchers utilize my study in their own work. I hope that future qualitative and quantitative research ideas can be extrapolated from my study and its findings in order to better inform educational policy makers and decision makers.

**Confirmability.** Confirmability is defined as the degree of neutrality imposed upon the study (Lincoln & Guba, 1985). Confirmability was addressed in this study by reflexivity recorded in a memo instrument. This allowed me to utilize a T-chart in order to list facts and
running thoughts for each interview and focus group. This is important because it reduced bias as it separated facts from the opinion/s of the researcher. Researcher bias was possible because of my own bias as an elementary teacher who struggles with the phenomenon explored in this study. I needed to set aside my bias in order to collect data as impartially as possible. This was important because it elucidates my position honestly and acknowledges that I am aware that it may have impacted the inquiry; therefore, every possible precaution was made to remain impartial throughout.

**Credibility.** Credibility, as defined by Lincoln and Guba (1985) is how much one can trust the findings of the study. Member checks were conducted where participants were given the transcript of their one-on-one interview in order to review, clarify, and respond to inaccuracies in the transcript. I also utilized peer review by asking colleagues, not involved in the study, to review the transcripts and peer review the conclusions and interpretations. An external auditor was also utilized in order to increase the credibility of the findings. My audit trail (Appendix G), chronologically listing in a Microsoft Word document the steps taken within the study, allows for transparency within the study.

**Dependability.** Dependability is defined as how much one can trust the findings of the study and the consistency of the findings where the study could be repeated with similar results respectively (Lincoln & Guba, 1985). I utilized an audit trail where I created a table in a Microsoft Word document in order to chronologically list steps taken while collecting data. This increases dependability and credibility as it makes the process transparent and makes it easy for the study to be replicated.
Ethical Considerations

Institutional Review Board (IRB) approval was attained from Liberty University and Smith School District before data collection began. All participants signed a consent form and were volunteers. Participants were made aware of their right to withdraw from participation in the study at any time without penalty. Participants are addressed using pseudonyms within anything written about the study in order to protect their confidentiality. All participants heard the confidentiality agreement read aloud at the beginning of the focus group in order to protect the anonymity of the conversations and opinions shared within that group. All opinions and conversations that happened within the focus group were to remain within the focus group. Names and specific opinions were not mentioned outside of the focus group in order to protect the confidentiality of the participants and to avoid possible repercussions by administrators, or anyone that might agree or disagree with opinions given. All study information was kept at my personal home to ensure study participants’ anonymity. At the conclusion of the study, all notes and records will be kept in a locked filing cabinet or password protected jump drive for a period of at least five years before being destroyed in order to protect participant confidentiality permanently. All electronic data has been saved on my personal computer or on a password protected jump drive and not on a cloud to avoid possible breaches in security of data.

Summary

Quantitative studies coupling improved cognition with physical activity are available for review and described fully in Chapter Two of this document. Qualitative research was necessary in order to collect perceptions of elementary teachers on this topic. A comprehensive review of the literature did not return studies that utilized a phenomenological approach or any qualitative approach to investigate teachers’ perceptions of the significance of recess and brain breaks.
within the instructional day in an elementary classroom. The design for this study was qualitative and phenomenological. Participants were from Smith School District in the southeastern United States and fit the criteria of in-service elementary school teachers who had taught for at least three or more years. As a researcher, I am also an elementary teacher, so I needed to bracket my own experiences as best as possible in order to allow the study to capture the essence of the participants’ perceptions and to give their perceptions a voice. One-on-one interviews took place in the teachers’ classrooms or in a local restaurant at a time convenient to them. The focus group was conducted after the conclusion of the interviews in order to interview multiple participants simultaneously and allow the effect of their peers to color their lens as they shared experiences. Anonymous questionnaires were the final form of data collection. All interviews and focus groups were transcribed verbatim. Open coding was utilized. Two-tiered coding was then utilized. Member checks and peer reviews helped increase reliability and credibility of the data collection and analysis. Moustakas’ Seven Steps were utilized in data analysis. Ethical considerations included IRB approval that was obtained from Liberty University as well as Smith School District before data collection began. Consent forms were read to the volunteer participants and signed before beginning the study. Anonymity was protected using pseudonyms for both the participants and the name of the district.
CHAPTER FOUR: FINDINGS

Overview

The purpose of this phenomenological study was to describe the perceptions of 10 elementary school teachers in regards to recess and brain breaks in a public school district in a southeastern state in the United States, capturing the essence of those perceptions through analysis. Data were collected via one-on-one interviews, a focus group, and an open-ended questionnaire. An external auditor oversaw the entire data collection process. All questions were peer reviewed by three colleagues and piloted with two teachers meeting study criteria prior to use in the study, as suggested by the professional auditor. The 10 participants utilized for this study were purposefully chosen based on having taught for at least three years, with their current teaching assignment in the elementary school setting, and instructing students as their primary job function during the data collection for this study. Two research questions were addressed by this study:

RQ1: What is the essence of the perception of elementary teachers in regards to the benefits of recess and brain breaks for students occurring during the instructional day?

RQ2: What is the essence of the perception of elementary teachers in regards to the long term benefits of recess and brain breaks for elementary students occurring during the instructional day impacting them as lifelong learners?

Themes that emerged from data analysis include (a) academic benefits (focus and stamina), (b) social behavioral benefits (classroom behavior and social skills), (c) personal health and lifelong habit building for positive results (health, academic, and personal) and (d) empowerment.

Participants

Ten participants were included in this study. Participants utilized for this study were
purposefully selected based on having taught for at least three years, and for having taught in the elementary school setting, with a primary job function of instructing students during the data collection phase of the study. Three participants were male and seven were female. Participants had been teaching elementary school for between three and 26 years prior to participation in the study. Participants were between the age of 26 and 52 at the time of data collection during the study. Four participants were African American, five were Caucasian, and one categorized herself as other. Quotes were typed verbatim into this document, ignoring grammar errors to maintain the integrity of the actual statement made by the participant. Table 1 displays the demographics of the 10 participants.

Table 1.

Demographics of Teacher Participants

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Years of Elementary Experience</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amelia</td>
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<td>28</td>
</tr>
<tr>
<td>Betty</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>Carl</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td>Don</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>Evelyn</td>
<td>17</td>
<td>48</td>
</tr>
<tr>
<td>Fern</td>
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<td>36</td>
</tr>
<tr>
<td>Gertrude</td>
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<td>26</td>
</tr>
<tr>
<td>Harry</td>
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<td>47</td>
</tr>
<tr>
<td>Ingrid</td>
<td>25</td>
<td>47</td>
</tr>
<tr>
<td>Jennifer</td>
<td>9</td>
<td>49</td>
</tr>
</tbody>
</table>

*Note:* Data was taken from teacher interviews.
Amelia

Amelia is a 28 year old elementary teacher with three years of elementary teaching experience. She is a Caucasian female. Amelia teaches in an inclusion classroom where special education and regular education students sit, side by side, as peers, to share their learning. Amelia believes this setting has positive impacts for all students and enjoys her current work situation. She enjoys shopping in her spare time and considers herself active and healthy.

Amelia noted that her students become fidgety if they do not have the opportunity to expel energy by going outside or having a brain break. Amelia said “Well, I definitely notice that if we do not get to go outside and have recess that they are a lot more active and fidgety during work times.” (personal communication with interviewee, December 10, 2015). Amelia also noted that elementary students have the “wiggles” at times. According to Amelia, “They definitely have a lot more focus after they come in from recess. They have gotten all their wiggles out. They are quicker to respond to questions. It also helps wake them up. For our kids that get sleepy during the day, it helps perk them right back up.” (personal communication with interviewee, December 10, 2015). Amelia wants her students to be successful regardless of their personal challenges. Amelia saw recess and brain breaks as a positive for students when considering their lifelong learning habits. Amelia noted:

I mean even as adults, we need exercise; this is a benefit for them to learn this through elementary school and up till high school and then beyond. As adults, me personally, I can focus better after I have done something physical or exercised. I can go clean my house and focus on what I need to get done. A day of non-activity like laying around the house or just watching TV, I’m not as focused or motivated. I think learning the importance of physical activity and learning this habit will help motivate our students to
be better lifelong learners and to be more active adults. (personal communication with interviewee, December 10, 2015).

Betty

Betty is a 52 year old elementary teacher with 26 years of elementary teaching experience. Betty categorized herself as “Other” to describe her ethnicity. Betty loves to travel all over the world when she is not teaching. Betty is married to a military veteran and has lived in several different countries. Betty has been teaching a long time and has watched many initiatives come and go in education. Her perspective on current legislation comes from a wiser and more experienced voice than many of her peers and yet she respects and values their opinions. Betty sees recess and brain breaks as necessary components in an instructional day. According to Betty, “Anything done for a long time can be monotonous . . . So . . . it is just a good break so that you can go back into the classroom refreshed and you’d be surprised how much more learning happens when you get a break from it.” (personal communication with interviewee, December 10, 2015). Betty also said, “Recess is done every day, daily, so kids get used to that routine, they know that when they come back that they need to get their mind back into academics. They are ready to learn after a break.” (personal communication with interviewee, December 10, 2015). Betty considers her students as “whole beings” with needs beyond the obvious academic ones. Betty noted that recess and brain breaks do affect elementary students as lifelong learners. When asked directly about this, Betty said, “It does affect them. They really need to have some sort of physical activity every day.” (personal communication with interviewee, December 10, 2015).

Carl

Carl is a 31 year old, African American male. He has been teaching for five years. Carl
likes to go bowling and enjoys playing ping-pong. Carl has a pregnant wife at home and is busy balancing home and work as he looks forward to becoming a dad for the first time. He is anxious and excited about the upcoming birth of his child. Carl sees recess and brain breaks as an essential part of the elementary school instructional day. Carl said, “I know some say it is needed and some say it is not needed. So . . . I feel that it is needed. I think it is important to give students a break from the academic stress that is put on them throughout the course of the day.” (personal communication with interviewee, December 10, 2015). Carl also stated:

Brain breaks are good outlets. You can’t always make it outside because of your schedule. Even if you do go out to recess, you might need a brain break to break things up. If you are limited in time, it is nice to step away from academics and let off some energy. If you only have 7 minutes, you might want to brain break in the classroom even if you can’t go outside to let off some energy. Press the reset button and get them started again. (personal communication with interviewee, December 10, 2015).

Carl considers his students’ needs, not only in the short term, but also in the long term as they will one day grow to be adults in society. In regards to seeing elementary students as lifelong learners incorporating recess and brain breaks now, Carl mentioned “It is healthy. It is healthier.” (personal communication with interviewee, December 10, 2015).

Don

Don is 33 years old and is a Caucasian male. Don has been teaching elementary school for six years. He enjoys doing anything involving sports outside of work for leisure and fun. Don is married, with a baby girl at home, which challenges his ability to stay well rested for work. Don loves teaching even though he makes more money in his part-time work as a coach and referee than in his work at has school. Don sees recess and brain breaks as a positive
component of the elementary instructional day. Don expressed how he feels recess impacts students’ academics when he said, “I think that after recess, students come back more focused.” (personal communication with interviewee, December 16, 2015). Don also said:

“It [brain breaks/recess] breaks up the monotony of the day. Kids need that when they come from academic learning, they need breaks. Students are more focused after. I think it is good for the mind to have breaks. Also physical activity leads to the kids being more focused and more attentive to lessons.” (personal communication with interviewee, December 16, 2015).

Don stated that he does think about the future of his students and hopes that he is a positive influence on them holistically as they grow and develop into adults. Don sees physical activity, particularly in the form of recess and brain breaks as a positive for elementary students when thinking of them as lifelong learners. Don said, “I think it affects them in the long run. They need to learn to be healthy, active adults someday.” (personal communication with interviewee, December 16, 2015).

Evelyn

Evelyn is a Caucasian female. She is 48 years old. She has been teaching elementary students for 17 years. Evelyn enjoys working outside, playing with her animals, swimming, and reading. Evelyn has two horses, a dog, and two cats, so to say she is an animal lover would be an understatement. Evelyn believes strongly in animal rights and is an advocate for both animals and children in need. Evelyn expressed seeing recess and brain breaks as important in elementary school. According to Evelyn:

Recess to me is very, very important because I feel that they need to, well, they spend so long in the classroom and I have them on a tight schedule and you know I always think to
myself as an adult, can I sit this long without moving and running? So what I do, is I make sure that we go out every day. I try to go outside for at least 15 minutes with them. I’ve done research with the American Health Department where it said that kids from the age of 6 to 17 need at least 60 minutes a day of exercise. When we go out, I really feel that when we come back in, that they can pull it back together and focus better. (personal communication with interviewee, December 11, 2015).

Evelyn also spoke of physical breaks helping specific student groups or students with particular challenges when she said:

Well, it is kind of, we have to do that, I have a lot of children in here that are very impulsive. I have some ADHD children, and you know, when I take a brain break, it seems to help all of them calm down. I think that we really, well, it is just really healthy for them to stop, do a little dancing, or cardiovascular exercise, and get their heart rates going to get their bodies moving. (personal communication with interviewee, December 11, 2015).

Evelyn reported that she often thinks of the future of her students and how the world will be for them. Evelyn noted her perception of physical activity at the elementary level positively impacting students as lifelong learners when she said:

First of all, I think that children have more, well, the more they exercise, the better their self-esteem. You know, they feel better about themselves, especially if there are obesity issues. I think that they value the time that they have to exercise, and I think that you know, when they get older, they need to respect. I think that is something that is important. People that say that “you don’t have to have recess”, they should go back to their childhood and think about how important it was to have a break and exercise. They
are kids. We forget that they need to have some fun too. Physically. (personal communication with interviewee, December 11, 2015).

Evelyn also mentioned, “They [students] just need to be more active. Adults need to be more active too. We [teachers] teach them those habits now.” (personal communication with interviewee, December 11, 2015).

**Fern**

Fern is a 36 year old female. She is Caucasian and has been teaching elementary school for six years. Fern likes to read or jog for fun. Fern has three children, two boys and a girl. The oldest of her children, the boy, is active in competitive sports and Fern feels strongly that this is a positive and valuable experience for him. Family outings to parks and to do physical activities are commonplace for Fern and her family. Fern was specific in her references to recess and brain breaks being an important component of an elementary school instructional day when she said:

I believe that recess is very important. Usually the children that end up sitting out of recess in many classes are the ones that need it most, so I try not to keep that from them. I try to find other ways to motivate them rather than loss of recess. I also do brain breaks. We are in the classroom so long before we leave for anything like lunch or specials, that it is important for them to have those few moments to decompress. Sometimes they don’t even participate in the brain break, they just talk to each other and move around, but they have that free moment to move around and relax. It helps a lot. It helps them focus more on the academics and make the time more efficient. (personal communication with interviewee, December 14, 2015).

Fern also reflects on the learning of her students and the processing of information. According
to Fern:

I would say it [physical activity in the form of recess or a brain break] gives students an opportunity to think about what they’ve done, and process their learning. It gives them a chance to think about what is upcoming. It is a good transition period. They can get that movement out, or the talking out, so that they can fully focus when it is time to focus.

(personal communication with interviewee, December 14, 2015).

Fern is a teacher who considers the long lasting impact of what and how she teaches. When asked directly about whether recess and brain breaks impact students as lifelong learners, Fern said, “I think they don’t get enough physical activity during the day, so any time we can work that in and stress the importance of healthy physical activity, it is good for your body and brain. I think it will benefit them, just hearing it every day will help them throughout their life.”

(personal communication with interviewee, December 14, 2015).

**Gertrude**

Gertrude is a Caucasian female who has been teaching for three years. She is 26 years old. Gertrude likes to run, ride horses, walk her dog, hike, and spend time outside. Gertrude has close family connections to her parents and siblings and keeps in daily contact with them. Gertrude’s parents live close to her geographically. Gertrude often eats dinner at the home of her parents, even during the work week. Gertrude sees recess and brain breaks as a positive part of the elementary instructional day and stated that when she said:

The motivational factor is definitely important, especially for recess to encourage focus and work completion and then for brain breaks, it is a good transition between subjects. Both are also really important for socialization that just doesn’t happen under the more structured environment that happens in the academic classroom sessions. The brain
needs a break before starting something new or to refocus during difficult tasks.

(personal communication with interviewee, December 10, 2015).

Gertrude considers students as whole beings that will one day be the adults who make positive changes to our world. Gertrude also sees recess and brain breaks as important to students as lifelong learners. She stated this when she said:

Effecting it as in . . . It is good for anyone’s mind to be physically active and fit. I can’t think . . . What am I trying to say . . . Healthy . . . It keeps your body generally healthy. Students need to learn that from us. Having physical motions and kinesthetic learning is very helpful for students also. It can really help them remember things. Kinesthetic learners really need to move. Learners need to move. Students need to be physically active. (personal communication with interviewee, December 10, 2015).

**Harry**

Harry is a Caucasian male. He is 47 years old. Harry has been teaching elementary school for 18 years. Harry enjoys going to the movies with his wife for fun outside of work. Harry has a pet hedgehog and has recently added a dog to his family. Harry’s wife is also a teacher, but in a different school. Harry and his wife often carpool to work in an effort to be kinder to the environment. Harry sees recess and brain breaks as significant and necessary for students. Harry said, “I think it is an important part of the schedule for the children. We need those recess times and brain break times.” (personal communication with interviewee, December 10, 2015). Harry also noted, “I think they both serve an important sort of a relief for students, they need, you know, more time for that, because they are very intense with what they do academically.” Harry added:

They [brain breaks] allow students to recharge. Children need that physical activity
because many don’t get it at home. They need the social interactions with their peers also. They need the non-academic social interactions with peers. These allow them to basically get exercise and have a little free play as being part of a child. (personal communication with interviewee, December 10, 2015).

Harry mentioned teaching healthy habits and social skills as important benefits to students as lifelong learners. Harry said, “I think it is very important. We are teaching them good healthy habits as well as being able to play with others and get along with others in a group or team activity setting that they may not always be getting in the classroom. It’s different.” (personal communication with interviewee, December 10, 2015).

**Ingrid**

Ingrid is an African American female. She has been teaching elementary school for 25 years and is 47 years old. Ingrid enjoys teaching dance outside of school for fun and to supplement her income. Ingrid is married with four sons. Her sons are active in competitive sports. Ingrid values the physical health benefits of being involved in competitive sports teams and enjoys watching her sons compete on her free evenings and weekends. Ingrid sees recess as a positive component of the instructional day in an elementary setting for students. Ingrid said of her perception “They look forward to it. It gives them a chance to regroup. I tend to think of the day in terms of before and after recess because it is a starting over point in their minds.” (personal communication with interviewee, December 14, 2015). Ingrid also said:

Definitely that they get to regroup is a positive. It is definitely a time to regroup. It is a brain break. It is a break from doing something settled and serious and just get to work out physical energy and get the wiggles out, stretch a little. There is research that says that it helps you refocus. If there is research that shows that we should have recess and
brain breaks, then everyone should do it, because we want kids to be successful. (personal communication with interviewee, December 14, 2015).

Ingrid thinks about the future of her students and how she can help support them in becoming healthy adults that respect their minds, bodies and souls. When discussing lifelong learning, Ingrid mentioned:

Well, we know there is an obesity epidemic in America. If we teach children physical activity is fun and is an everyday thing, and a good thing to do and something to look forward to. It isn’t a punishment. It is something fun. If we can get students to see exercise in a positive light, then it benefits students. “Oh we get to run, fun!” It is a good thing to get them seeing it this way when they are younger. Learning a healthy lifestyle later, at say 21, maybe the weight has settled in, bad habits are hard to break. Those healthy habits need to be formed when they are children. It is much easier to learn healthy habits as children. (personal communication with interviewee, December 14, 2015).

**Jennifer**

Jennifer is an African American female. She has been teaching elementary school for nine years. Jennifer is 49 years old. She enjoys shopping for leisure. Jennifer works with special education students in a small group setting because of their specific and particular needs. Jennifer’s job requires a special kind of patience that few possess. When Jennifer speaks of her students, her eyes light up with pride. Jennifer sees recess and brain breaks as important and expressed this when she said, “I think that the kids benefit from recess. The population that I teach, in teaching special education students, they take frequent breaks, it is part of a regiment that we have in place and they definitely benefit from it.” (personal communication with
Jennifer also said, “much needed, the kids benefit from that small break, and for my kids especially, they need frequent small breaks allowing them to get their thoughts together, to get excess energy out… they are more focused. Again, it is much needed.” (personal communication with interviewee, December 15, 2015).

When discussing elementary students as developing lifelong learners, Jennifer said, “It is very important. It is life changing. It teaches them good habits mentally and physically and definitely emotionally.” (personal communication with interviewee, December 15, 2015).

**Results**

Themes that emerged from data analysis include (a) academic benefits (focus and stamina), (b) social behavioral benefits (classroom behavior and social skills), (c) personal health and lifelong habit building for positive results (health, academic, and personal) and (d) empowerment. Commonalities in concerns for students perceived benefits were evident throughout the data collected. Quotes are typed verbatim into this document, ignoring grammar errors to maintain the integrity of the actual statement made by the participant.
Table 2 displays the frequency of horizons of open-codes across all data collection methods within this study.

Table 2.

*Frequency of Horizons of Open Codes Across Data Sets*

<table>
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**Academic Benefits**

Focus and stamina benefits to students were commonalities that spanned across interviews, the focus group, and the open-ended questionnaires. Evelyn mentioned, “I find that
when we do a brain break, say right before math, they [students] are a lot more focused.”
(personal communication with interviewee, December 11, 2015). Fern said, “It [brain break]
helps them [students] focus more on the academics and makes the time more efficient.”
(personal communication with interviewee, December 14, 2015). Ingrid said, “They [students]
focus better after getting the movement and getting the free play time.” (personal
communication with interviewee, December 14, 2015). Don mentioned, “I think that after recess,
students come back more focused. When we go out, I really feel that when we come back in,
that they can pull it back together and focus better.” (personal communication with interviewee,
December 16, 2015).

The words focus and stamina were evident in surplus throughout the data. Gertrude
noted, “It [recess] makes them [students] more attentive. It helps them focus.” (personal
communication with interviewee, December 10, 2015). Gertrude also said, “It [brain break]
keeps them focused . . . especially if we are doing something difficult . . . if they move and
stretch, it really helps. If we are doing higher level thinking and critical thinking, a brain break
can really help them to refocus on the task and think deeper.” Fern stated, “Brain breaks refocus
their [students] attention so that they can get back on task. When stamina starts to lack . . . when
more than four or five of them start to lose their stamina in the learning activity, it is time to take
a break, just do it, don’t waste the time fighting it. It is time to move on because they are no
longer being productive even if we then go back to what we were doing before. It gives them a
reset time.” (personal communication with interviewee, December 14, 2015). Betty said,
“Anything done for a long time can be monotonous . . . so . . . it is just a good break so that
everyone can go back into the classroom refreshed and refocused. You’d be surprised how much
more learning happens when you get a break from it.” (personal communication with
The mention of focus on academics as a benefit of having recess and brain breaks was abundant throughout data collection. Fern mentioned, “When they [students] need a break, they aren’t focusing and I know to stop and take a break.” (personal communication with interviewee, December 14, 2015). Don mentioned, “I think it is good for the mind to have breaks. Physical activity leads to the kids being more focused and more attentive to lessons.” (personal communication with interviewee, December 16, 2015). Jennifer said, “The brain needs a break before starting something new or to refocus during difficult tasks.” (personal communication with interviewee, December 15, 2015). Jennifer also said, “Breaks are much needed. The kids benefit from small breaks, and for my kids especially, they need frequent small breaks allowing them to get their thoughts together, to get excess energy out, and then they are more focused. Again, it [recess and breaks] is much needed.” (personal communication with interviewee, December 15, 2015). Ingrid mentioned, “There is research that says it [physical activity] helps you focus.” (personal communication with interviewee, December 14, 2015). The essence of teachers’ perceptions is that students have observable and noteworthy academic benefits when their teachers include physical breaks (comprising of recess and brain breaks) within instructional schedules.

**Social and Behavioral Benefits**

Improved social skills and behavioral choices were a perceived benefit of maintaining recess and brain breaks in the elementary school schedule. Fern mentioned:

Well, I think it really helps build their social skills. So much of their day is directed, and redirected, and guided by an adult, that really, when they are outside at recess, or during a brain break, they really learn, oh, people don’t like that, I should do this and shouldn’t do
that. They aren’t going to be my friend if I act like that. Oh, this is not an acceptable behavior. Or this is how I make friends. We always want to give them an experience. If you take that away, you are taking away that experience that will serve them well in life. They need to learn how to socialize with peers in free situations. (personal communication with interviewee, December 14, 2015).

Other participants were observed agreeing with this statement by nodding during the focus group. Jennifer also reflected on the development of social skills during the focus group when she stated:

I was just thinking, it is safe and secure at school. I know that may sound funny, but for my population, they are outside playing, they can be vulnerable. Adults are here to intervene if anything happens. They know that we are watching. They know that if something transpires that they need an adult that we are there. We are going to be fair. That is really important for my kids is that trust. That may or may not make sense to some. My kids need that trust. They need to figure these things out now. No one at home has the time to give them these opportunities. They have the opportunity, I know for my kids, parents may not be home, there is no one there. They don’t have the supervision at home. Parents are working. Parents are busy. Divorce. One parent. They know at school that someone is always watching. They know if something happens, that we are here to work it out. They have the opportunity to just be a kid and develop those social skills appropriately.

The development of social skills was mentioned repeatedly during data collection. Evelyn mentioned in reference to her perceived benefits of recess for elementary students, “It helps them develop their socialization skills. Um . . . we do a lot of group work in the classroom
but it is so structured that they rarely have unstructured time to interact with other kids. I feel like most of that comes from that brief 15 minutes or so of recess a day.” (personal communication with interviewee, December 11, 2015). Betty said:

It just gives the kids free time to interact with each other, to socialize, to develop their socialization skills, to be able to be creative because they don’t have that structure. If you watch them play, they come up with their own games outside with their own minds. They may not have tools or games, they create their own. I just think that builds their creativity and their imaginations. It is very beneficial for them to be kids and be imaginative. (personal communication with interviewee, December 10, 2015).

Gertrude said, during the focus group, in reference to perceived benefits of free play recess, “It gives them those socialization skills. It is important to be able to interact with people.” Another participant mentioned in the focus group, “It is really important for my ADHD kids to stop and get some of that energy out.” It is the essence of the perception of the teachers’ in this study that physical activity in the form of recess and brain breaks has notable social and behavioral benefits for elementary students.

**Personal Health and Lifelong Habit Building**

Personal health and lifelong positive habit building were important to participants as perceived benefits of recess and brain breaks. Jennifer said, “I think it teaches them to be healthy and to incorporate exercise into their lives. People not being active is a big problem in our country. They really need it to stay active and be healthier. They need to start at a young age.” (personal communication with interviewee, December 15, 2015). Health and positive lifelong habit building were mentioned repeatedly in all methods of data collection. In the focus group, it was said, “It is an important part of a healthy life. They don’t think about it like that,
they just do it, because we taught it.” Eight other participants were observed nodding their heads in agreement with this statement. Another statement made in the focus group about health and lifelong habit building was:

I tell my kids all the time, the habits you form as a kid, many you will have as an adult. Good or bad. Drink more water, be physically active, and make good choices. Obviously habits can be good or bad. You know, just try to eat a little healthier, it gives you a better chance of eating healthier when you are older. Try a new fruit or vegetable. Keep trying fresh fruits and vegetables. Try to get out and get 60 minutes of exercise a day. You know, I’m not asking you to train for a marathon, but get outside and get active. Do something.

All nine of the other participants in the focus group were observed nodding in agreement to this statement. Another participant added, “Ride your bike. Play a pick-up game of basketball, you know, just get out and do it.” Then another participant added, “Move for 60 minutes every day. A lot of the research now is if you are active for 60 minutes a day, you are going to be healthier.” Another participant bounced off this conversation with this statement:

And then the other thing is, that when we have kids that maybe their families don’t have a habit of reading, or they aren’t very strong at math, we become that substitute parent. We need to do that for physical activity and healthy habits too. We have become that back up. We need to do that with activity especially. Maybe parents don’t have time, or just aren’t good role models for that. They might let them go out at home, but they might not give any direction on what to do, and they might not supervise. You’d be surprised. Have you ever seen kids that just go outside for recess and sit? They do that at home.
We have to encourage them to play and be active. We become the teacher for healthy physical activity habits too.

A sixth participant weighed in on this conversation adding:

Having a good feeling about yourself is tied to physical activity. As far as having self-confidence. It comes from being healthy too. It isn’t just one thing. Being physically active is a big part of it and they will carry that with them through life.

When a seventh participant weighed in with, “I agree, they need us to be role models in every aspect of life to help them become the best adult they can be.” the room erupted with agreement.

The momentum was evident that all were in agreement that healthy lifestyle choices must be taught in school. It was then that the remaining participants chimed in with, “I agree,”, “Me too,”, and “Definitely.” Hearing the collective voice of the group and their passion on this aspect of teaching was significant in that all 10 teachers were speaking from one voice of the necessity for incorporating physical activity in the form of recess and brain breaks and its perceived significance on students as lifelong learners.

**Empowerment**

When prompted to discuss who should make the decisions about how much recess and brain breaks should be incorporated into an instructional day, the topic of empowering teachers and students to make the best choices for themselves came to the surface. Amelia stated:

If they are not current and up to date with what happens in the classroom every day, they should not have input with how our day goes or if we have brain breaks. They don’t see our kids on a day to day basis. They don’t see how their little brains work as far as how much recess or how many brain breaks they need throughout the day. We want our students to be successful. We want them to be able to make choices on their own. We
have to give them the tools. We have to make it possible. (personal communication with interviewee, December 10, 2015).

Fern expressed frustration with anyone other than the classroom teacher making decisions about recess and brain breaks when she said, “I think if they are going to make decisions that regulate physical activity that it should be research based. Otherwise, I don’t think they should be making decisions regarding that.” (personal communication with interviewee, December 14, 2015). Don had a strong opinion on this topic also when he said:

I don’t agree with it at all. I think decisions should be made by people in the trenches every day. We have to create an environment for students where they are able to make good decisions and succeed. Why would we take that decision making away from teachers? It doesn’t make sense. (personal communication with interviewee, December 16, 2015).

Evelyn also felt strongly when she said in the focus group:

Well, I have a problem, you know when the whole No Child Left Behind big thing started and you know, basically, by law, we don’t have to give our kids recess at all, and um, I think that each class with their individual students, I think that it should be left up to the teacher. I think that no one should ever try to take away any kind of physical activity from children, because I think it is imperative that they do that during the day. We want to empower students to be thinkers and problem solvers, but as a society we also want to dictate to teachers exactly how they do that. Why? Does that make sense to anyone?

Jennifer also exhibited strong emotion with her voice in the focus group when she said:

As far as how many brain breaks in a day, that should just be up to the teacher because you know what your class needs. You might have a class one year that needs more or
less than other years. You may have a class one year that needs a lot of brain breaks. 
Myself, I teach special needs students, and focus is a huge deal so we take frequent brain 
breaks. They really need them. A regular education classroom may not take as many but 
that kind of decision needs to be up to the individual teacher. Leaders need to empower 
teachers in the same way teachers are attempting to empower students to be their best. 
Leaders that are forcing things on teachers just aren’t getting it.

Harry chuckled aloud when asked about this topic. Then he said:

I feel like sometimes those judgements are made without having prior knowledge or 
experience in our kind of environment and in our situation here at my school. I want my 
students to feel empowered to make good decisions. I want to feel like everyone from 
the top down gets that. I would highly encourage any politician or decision maker to 
spend time in a real classroom before making such laws or rules about education or 
recess. (personal communication with interviewee, December 10, 2015).

Ingrid answered (with a voice indicating passion for her thoughts) with the following statement 
about decision making:

I think that is ridiculous unless they have an education background and are in the 
classroom or consulting with multiple teachers that are currently teaching. I think adults 
outside of the classroom have a tendency to make decisions based on what they 
remember about school and they forget the fact that they are remembering it from a 
child’s perspective, so, they don’t understand the why and why nots behind what they did 
as a child and how important it really was. Too much of their decisions might be based 
on what they think was going on when they were a child and they think now as an adult 
that they can make a decision without any research. That’s ridiculous. Teachers are
trained to do everything based on research. But outside of education, others can make
decisions based on what they remember from say third grade. It is crazy. We want
students to be successful. Don’t they get that? We want students to make good decisions
and be independent and self-motivated learners. Why aren’t we showing the same
respect to teachers? (personal communication with interviewee, December 14, 2015).
The opinions in the focus group were strong on this topic also. The essence of the voice of
participants expressed concern over anyone who was not currently teaching making decisions
without consulting teachers. One participant said during the focus group:

Most of those people, making those decisions, don’t have any or enough experience with
the decisions that they are making. If they want to make those kinds of decisions, they
need to come in the classroom and see how it impacts the students. They need to be in
the classroom before they make those kinds of decisions. Empowering teachers is not
valued in the way that teachers value empowering students. Politicians and school
leaders do with any other decision they make – they go see what is going on – but not
with education and teachers. Everyone is an expert and thinks they can tell teachers how
to do it. It is sad.

Another focus group participant added:

Most of those people, making those decisions, don’t have any or enough experience with
the decisions that they are making. If they want to make those kinds of decisions, they
need to come in the classroom and see how it impacts the students. They need to be in
the classroom before they make those kinds of decisions. It just doesn’t make sense with
all the emphasis we put on creating empowered students that are self-directed and then
our leaders treat us like preschoolers and then wonder why scores aren’t going up.
Summary

This chapter described study participants individually and summarized their views both individually and collectively within themes that emerged from data analysis. Those themes included academic benefits (focus and stamina), social and behavioral benefits (classroom behavior and social skills), personal health benefits (overall wellness and decrease in obesity), lifelong habit building for positive results (health, academic, and personal) and empowerment. Commonalities in concerns for students’ perceived benefits were evident throughout the data collected. Quotes were typed verbatim into this document ignoring grammar errors to maintain the integrity of the actual statement made by the participant. Themes were described and elucidated with participant quotes within this chapter.
CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Overview

The purpose of this phenomenological study was to collect the perceptions of 10 teachers in regards to recess and brain breaks in a public school district in a southeastern state in the United States, capturing the essence of those perceptions through analysis. Brain breaks in this study were understood as physical activity breaks where children are asked to do a short series of physical activities in order to activate their physical bodies and reenergize them for further school work. Chapter Four reported participant perceptions individually as well as collectively by themes. Those themes included (a) academic benefits (focus and stamina), (b) social and behavioral benefits (classroom behavior and social skills), (c) personal health and lifelong habit building for positive results (health, academic, and personal), and (d) empowerment. This chapter will include a summary of the findings, a discussion of the highlighted themes, implications, limitations, and recommendations for future research based on the findings of this study.

Summary of Findings

Elementary teachers stand united in answering the research questions within this study. The research questions addressed in this study were:

RQ1: What is the essence of the perception of elementary teachers in regards to the benefits of recess and brain breaks for students occurring during the instructional day?

RQ2: What is the essence of the perception of elementary teachers in regards to the long term benefits of recess and brain breaks for elementary students occurring during the instructional day impacting them as lifelong learners?
The essence of the voice of elementary teachers’ perceptions of the benefits of recess and brain breaks occurring during the instructional day included academic benefits of improved focus and stamina, health benefits of decreased obesity and increase in overall health, improved social skill development and therefore classroom behavior, and overall wellness. Elementary teachers also stood united in their perception that recess and brain breaks had positive impacts on students as lifelong learners. The essence of the voice of participants was that they perceived positive lifelong habit building, and empowerment to become self-directed and self-motivated lifelong learners.

Discussion

One of the theories guiding this study was Maslow’s Hierarchy of Needs (Maslow, 1954) as it was in question whether elementary teachers perceive that students must have their need for physical movement met in order for optimal learning to occur. The essence of the voice of elementary teachers was consistent in this study with the belief that students of this age have the need for physical movement that is both necessary and beneficial to their academic success. Students were observed by their teachers as being more focused and having improved stamina for problem solving when physical activity in the form of recess and brain breaks were incorporated into the instructional day.

Another theory guiding this study was Bandura’s Theory of Social Cognition. Bandura’s theory asserts that people learn through social interactions and by watching others (Bandura, 2004). This concept relates to this study in that physical activity in the school setting is a social event that produces observable benefits. Elementary teachers noted a variety of benefits when including physical activity in the form of recess and brain breaks into the instructional day. These benefits include students’ overall wellness, health, focus on academics, and stamina for
academics, social skills, behavioral choices, and empowerment.

Participants noted academic benefits to recess and brain breaks as part of the instructional day for elementary students, specifically focus and stamina for problem solving. The essence of participant perception on this topic was that students are better able to focus when provided with frequent physical activity breaks. The essence of participant perception is also that stamina for problem solving and difficult tasks is increased with frequent physical activity breaks including recess and brain breaks.

Study participants also noted behavioral and social skill development benefits attributed to physical activity including recess and brain breaks. Participants observed student behavior improved, especially for those students with learning challenges such as Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder (ADD/ADHD). Participants reported that students developed critical social skills for life during these “break” times.

Personal health benefits were perceived for students and particularly noted for lifelong positive habit building. Participants reported that recess and brain breaks were critical in helping form lifelong healthy habits of taking care of one’s body, mind, and soul. Participants reported observing health, academic, and personal benefits that were long lasting and impacted students as lifelong learners. Developing lifelong learners that are self-directed and self-motivated was important to the participants, which leads to the final theme that emerged in this study.

Empowerment of both teachers and students to achieve their potential was important to participants. The essence of their perception was that, in much the same way that teachers strive to empower students to become successful lifelong learners, society should empower teachers to develop positive habits in their students. Participants were clear in stating that it should be teachers, not policy makers who are not currently teaching, making key educational decisions. It
was also critical to participants that decision making should be based on research and direct observations of teachers. Students need to be taught to feel empowered to make positive decisions for themselves.

It is noteworthy that quantitative research within the literature review in Chapter Two supported the improvement of cognition, memory, and brain activity with increased physical activity for elderly, adolescents, and children, which led me to believe that similar results could be found within the elementary school setting. The findings of this qualitative study of the essence of perceptions of elementary teachers corroborates and amplifies the findings within the studies in the literature review for this study. The essence of teachers’ perceptions is not surprising; it further clarifies and intensifies the need for physical activity in the form of brain breaks and recess for elementary students.

**Implications**

The findings in this study imply that any move towards limiting or eliminating recess and/or brain breaks in elementary school would not be prudent. The findings also imply a collective frustration from elementary teachers in the decision making about school policies occurring without the consultation of current research and without the consultation of those currently teaching. Since elementary teachers in the study reported the benefits of recess and brain breaks far outweighing the drawbacks, it is important to note that the essence of their collective voice was to empower teachers to make the best decisions for their students, as teachers are working to empower their students to become self-directed and self-motivated lifelong learners. Parents need to be made aware of both the quantitative research and of the research findings uncovered within this study so that they are able to make informed decisions in regards to advocating for their children within their community schools. Administrators need to
be aware that not only the quantitative research findings substantiate the need for physical activity for children interspersed throughout learning, but that the qualitative research findings within this study corroborate the need for physical activity therefore support of teachers that incorporate physical brain breaks and recess could be supported not undermined. It is imperative, as a country, that we improve education to compete with a global market and therefore critical that we do not make monumental errors in decision making, guided by mere opinions instead of research. Physical brain breaks and recess need to be included in instructional schedules for elementary students in order to improve both academic achievement and quality of life which impacts these students both in the short term and in the long term.

**Limitations**

This was a qualitative study. As any other study, this one contained limitations. This study occurred in the southeastern region of the United States, therefore restricting the generalizability. The size of the participant poll was small in order to maintain a reasonable time frame for completion of the study, which also restricts the generalizability. The size of the participant poll impacted the representation of participants by varied ethnicity, which may have also impacted generalizability.

**Recommendations for Future Research**

One of the goals of this study was to guide future research on this topic and help spur positive educational policy change in the United States. One recommendation for future research would be that additional studies be performed in other regions of the United States. Another recommendation for future research would be that quantitative studies correlating the possible connections between increases in physical activity and increases in student achievement be conducted within the elementary school setting.
Summary

The purpose of this phenomenological study was to describe the perceptions of 10 teachers in regards to recess and brain breaks in a public school district in a southeastern state in the United States, capturing the essence of those perceptions through analysis. Brain breaks in this study were understood as physical activity breaks where children are asked to do a short series of physical activities in order to activate their physical bodies and reenergize them for further school work. Data analysis led to the identification of four key themes, which included (a) academic benefits (focus and stamina), (b) social and behavioral benefits (classroom behavior and social skills), (c) personal health and lifelong habit building for positive results (health, academic, and personal), and (d) empowerment. This chapter included a summary of the findings and a discussion of the highlighted themes. The essence of teachers’ perceptions on this topic clearly supported the need for physical exercise in the form of brain breaks and recess for elementary students. Teachers were clear in their beliefs that physical exercise produces observable benefits for elementary students including academic benefits of focus and stamina. Students that participated in physical activity were perceived to have improved focus on academics and increased stamina for problem solving. Teachers were also distinct in their perceptions of social and behavioral benefits to physical exercise being a part of the instructional day. Teachers’ perceived that students had improved classroom behavior after physical breaks and benefited from the opportunity for needed social skill development during these physical breaks. Perceptions of teachers’ within the study also included personal health benefits and positive lifelong habit building to include health, academic, and personal improvements. The final identified theme within this study was empowerment. Teachers common perception was that in the same way that they must empower their students to be successful, leaders need to
follow suit and empower teachers to be successful by allowing decision making to be made at the classroom level following research as opposed to opinion. Implications, limitations, and recommendations for future research based on the findings of this study were also included in this chapter.
REFERENCES


Centers for Disease Control and Prevention (CDC). (2010). *The association between school-based physical activity, including physical education, and academic performance.* Retrieved from:


doi: 10.1080/17518420801997007


December 9, 2015

Laura Beth Knight
IRB Approval 2349.120915: Phenomenological Study of the Significance of Recess and Brain Breaks during the Instructional Day from the Perspective of Elementary Teachers

Dear Laura Beth,

We are pleased to inform you that your study has been approved by the Liberty IRB. This approval is extended to you for one year from the date provided above with your protocol number. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
The Graduate School
APPENDIX B
RECRUITMENT LETTER

December 2015
Participant
Teacher

County School District

Dear Participant,

As a graduate student in the school of education at Liberty University, I am conducting research as part of the requirements for a doctorate degree to better understand a process or phenomenon. The purpose of my research is to investigate the phenomenon of the perception of elementary teachers on physical brain breaks and recess on elementary students when the activity occurs during the instructional day. My research questions are:

RQ1: What is the essence of the perception of elementary teachers in regards to the benefits of recess and brain breaks for students occurring during the instructional day?
RQ2: What is the essence of the perception of elementary teachers in regards to the long term benefits of recess and brain breaks for elementary students occurring during the instructional day impacting them as lifelong learners?

I invite you to participate in my study.

Participants in this study must be elementary teachers, not administrators, who are willing to participate. You will be asked to participate in a one-on-one interview with the researcher, participate in a focus group with a group of 5 or 10 participants, and complete an open ended questionnaire at the conclusion of the study. It should take approximately four hours for you to complete the procedures listed. Your name and district will not be used in any documents pertaining to this study. Identifying information will not be used in any documentation for this study.

A consent document is attached to this letter and will be collected when you decide to participate and before the initial interview. The consent document contains additional information about my research. Please sign it and return it to me. A copy will be provided to you within 24 hours of receipt.

Sincerely,

Laura Beth Knight Ed.S.

Teacher and Team Lead
APPENDIX C

The Liberty University Institutional Review Board has approved this document for use from 12/9/15 to 12/8/16
Protocol # 2349.120915

CONSENT FORM

PHENOMENOLOGICAL STUDY OF THE SIGNIFICANCE OF RECESS AND BRAIN BREAKS DURING THE INSTRUCTIONAL DAY FROM THE PERSPECTIVE OF ELEMENTARY TEACHERS
Laura Beth Knight
Liberty University
School of Education

You are invited to be in a research study of the perception of elementary teachers of recess and brain breaks during the instructional day. You were selected as a possible participant because you are an elementary teacher that currently teaches students as your primary job function. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

Laura Beth Knight, a doctoral candidate in the School of Education at Liberty University, is conducting this study.

Background Information:

The purpose of this phenomenological study is to describe the perceptions of 10 teachers in regards to recess and brain breaks in a public school district in a southeastern state in the United States, capturing the essence of those perceptions through analysis. Brain breaks in this study are understood as physical activity breaks where children are asked to do a short series of physical activities in order to activate their physical bodies and reenergize them for further school work.

Procedures:

If you agree to be in this study, I would ask you to do the following things:
1) Participate in a one-on-one interview with me that will be audio recorded and transcribed verbatim. This interview will take approximately one hour.
2) Participate in a focus group with other participants that will also be audio recorded and transcribed verbatim. This focus group will take approximately one hour.
3) Complete an open-ended questionnaire. Completion of the questionnaire will take approximately 30 minutes.
Risks and Benefits of being in the Study:

The risks involved in this study are no more than one would encounter in everyday life.

The benefits to participation are reflective thinking and collaboration with peers. The study may also be able to inform future decisions in regards to public education.

Compensation:

You will not receive compensation for participation in this study.

Confidentiality:

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records.

Data will be stored in a locked filing cabinet in the home of the researcher and within password protected files on the computer of the researcher. While confidentiality will be explained before the start of the focus group, as a researcher, I am not able to take ultimate responsibility for the confidentiality of information shared within those focus groups.

Audio recordings will be transcribed verbatim and destroyed. All identifiable information will be kept in a locked filing cabinet or in password protected files. These files may be kept for up to three years after conclusion and publication of the study at which time they will be destroyed.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or your district. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

If you choose to withdraw from the study, please contact the researcher at this phone number XXX-XXX-XXXX. Should you choose to withdraw, data collected from you, apart from focus group data, will be destroyed immediately and will not be included in this study. Focus group data will not be destroyed, but your contributions to the focus group will not be included in the study if you choose to withdraw.
Contacts and Questions:

The researcher conducting this study is Laura Beth Knight. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at XXX-XXX-XXXX. You may also contact the research’s faculty advisor, Dr. Leldon Nichols, at LWNichols@libery.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Carter 134, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information to keep for your records.

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

(Note: Do not agree to participate unless IRB approval information with current dates has been added to this document.)

☐ The researcher has my permission to audio-record me as part of my participation in this study.

Signature: ___________________________ Date: ______________

Signature of Investigator: ___________________________ Date: ______________
APPENDIX D

Open-Ended Interview Questions for Semi-Structured Interviews

1) Ice Breaker Question:
   
a. What is your favorite thing to do outside of work for leisure or fun?

2) Background questions:
   
a. What grade do you currently teach?
   
b. How long have you been teaching elementary school?
   
c. What is your current age?
   
d. What is your gender?
   
e. Are you comfortable sharing information about your ethnicity? Do you consider yourself African American, Caucasian, Hispanic, Asian, or other?

3) Perception questions:
   
a. What do you observe about your students in regards to recess being part of your daily schedule?
   
b. What do you observe in your students regarding physical brain breaks within your daily schedule?
   
c. What is your opinion about politicians and school leaders making decisions about how much or how little recess and or brain breaks you should incorporate into your daily class schedule?
   
d. What are some of the benefits of recess and brain breaks in an elementary school day?
   
e. What are some of the drawbacks of recess and brain breaks in an elementary school day?
f. Do you observe differences in your students’ ability to concentrate on academics after Physical Education (PE), recess, or a physical brain break as opposed to other times in your instructional day?

g. How do you perceive physical activity affecting students as lifelong learners?

h. Is there anything else that you haven’t mentioned that you would like to tell me that I haven’t asked?
APPENDIX E

Focus Group Semi-Structured Prompts

1) What do you observe about your students in regards to recess and brain breaks being part of your daily schedule?

2) What do you observe about your students cognitive focus before and after brain breaks and recess?

3) What is your opinion about politicians and school leaders making decisions about how much or how little recess and or brain breaks you should incorporate into your daily class schedule?

4) How do you perceive recess and brain breaks impacting lifelong learning for your students?
APPENDIX F

Open Ended Questionnaire Prompts

1) After reflecting on your interview and on our focus group conversation, how do you perceive the importance of recess and brain breaks as part of a daily elementary class schedule?

2) After reflecting on your interview and on our focus group conversation, what would you like to say to politicians and educational policy makers on this topic?

3) After reflecting on your interview and on our focus group conversation, how do you perceive recess, brain breaks, and physical activity impacting lifelong learning for students?
APPENDIX G

<table>
<thead>
<tr>
<th>Date</th>
<th>Task</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2015</td>
<td>Defend Proposal</td>
<td>Received excellent feedback and permission to apply for IRB</td>
</tr>
<tr>
<td>December 2015</td>
<td>Received IRB approval</td>
<td></td>
</tr>
<tr>
<td>December 2015</td>
<td>Interview Peer Review</td>
<td>Gave the proposed interview questions and received input from 3 peers</td>
</tr>
<tr>
<td>December 2015</td>
<td>Pilot Interviews</td>
<td>Piloting interviews with 2 colleagues helped me gain confidence in the process and provided me with quality feedback</td>
</tr>
<tr>
<td>December 2015</td>
<td>Completed One-On-One interviews with 10 participants</td>
<td>Letting participants schedule their own interviews at their convenience and at a location of their choosing helped increase their comfort</td>
</tr>
<tr>
<td>December 2015</td>
<td>Verbatim Transcriptions</td>
<td>This process was impactful for me. I am glad that I chose to do it by hand. It helped to support me in beginning to internalize the essence of the voice of participants.</td>
</tr>
<tr>
<td>December 2015</td>
<td>Focus Group Peer Review</td>
<td>Received input from 3 peers about the focus group prompts</td>
</tr>
<tr>
<td>January 2016</td>
<td>Focus Group</td>
<td>Teachers were at ease and candid during focus group. Collecting participants together seemed to increase comfort in answering candidly. It is also possible that participants are more comfortable since this is not their first study interaction with me.</td>
</tr>
<tr>
<td>January 2016</td>
<td>Questionnaire Peer Review</td>
<td>Received feedback from 3 peers about the questionnaire prompts</td>
</tr>
<tr>
<td>January 2016</td>
<td>Questionnaire</td>
<td>Questionnaire was hand delivered to participants and returned within 24 hours.</td>
</tr>
<tr>
<td>February 2016</td>
<td>Data Analysis</td>
<td>Data analysis was enlightening. The most impactful step for me was the repeated reading of all transcriptions. It really helped me as I was beginning to notice themes emerging. Coding was also interesting. Doing it by hand was time consuming but a worthwhile experience in my opinion.</td>
</tr>
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</table>