STUDENT ENGAGEMENT: AN ASSESSMENT OF MOTIVATION PROCESSES DURING

LATE ELEMENTARY SCHOOL

by

Christine Anne Akagi

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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ABSTRACT

Based in Self-Determination Theory (SDT) and Effectance Theories, this correlational study of student engagement assessed the impacts of basic psychological need satisfaction upon engagement in the context of prior achievement during late elementary school. The purpose of the study is to offer another tool for educators to use as they continue personalizing interventions. Multiple regression analyses assessed the predictive value of prior achievement levels alongside present satisfaction levels of each basic psychological need – autonomy, competence, and relatedness – upon engagement. In post-hoc analyses, The Johnson-Neyman technique was also used for the purpose of determining regions of significance across the sample of prior achievement, showing the specific levels of prior achievement at which each basic psychological need significantly predicted student engagement. The RAPS-SE survey was used for measuring basic psychological need satisfaction and engagement. Scores from PARCC exams were used for measuring prior achievement. The multiple regression analyses yielded statistically significant, high predictive values. Additionally, the post-hoc analyses yielded significant outcomes relevant to the moderating value of prior achievement and gender differences relevant to that moderating value. Suggestions for future research include additional studies on basic psychological need satisfaction relevant to their interaction with prior achievement, longitudinal impact, the differential impact of basic psychological need satisfaction among subgroups, and relevance to engagement during the late elementary years.

Keywords: autonomy, competence, engagement, motivation, relatedness

Dedication

To my remarkably loving husband, Greg Akagi. You've endured many evenings, weekends, and even holidays of me stuck to a computer while you changed diapers, bathed little ones, prepared meals, drove kids to practice, and generally kept the house running. I'd be lost without you. You took my older kids on as your own to give them a daddy and now you continue giving everything you have to the three little ones as well. You're truly an answer to prayer. Team Akagi! – always.

To my children. None of you have known a time when I wasn't in school. Anne and Noah, thank you for taking care of the little ones while I worked, and for being my study buddies all those nights. Justin, you were born while I completed my coursework, but you've been so patient and doing your best to help every day. Daniel and Alison, you were born as I wrote my dissertation and learned how to depend on Daddy, Annie, Noah, and Justin when I wasn't available. Now you can have a mama who's no longer pursuing a degree.

To my parents. Thank you for somehow not taming the spirit out of me. Now I'm learning that's far easier said than done. And thank you for all the times you watched the kids for me while I was in class and for providing a home when Anne, Noah, and me when we had nowhere else to go before I met Greg. Knowing my babies were in good hands allowed me keep putting one foot in front of the other.

And the most foundational dedication is to my Heavenly Father, and Savior, Jesus Christ. You know that when everyone thought I'd never finish my bachelor's degree, you kept opening new doors. You know the times I wanted to quit, you know the times I had no idea what tomorrow would bring, but you held me and carried me through. I'm still learning how to surrender.

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My supervisors and colleagues in my school system have been particularly instrumental in completing the present research. Specifically, I'd be remiss without acknowledging the research department and the counseling coordinator, for helping me organize, and standing with me through this entire process, and helping me gather data.

Thank you to the many parents, students, teachers and administrators who agreed to participate. I hope the information you shared will help educators guide many more children towards making the most of students' gifts and talents.

Without the fine faculty and staff at Liberty University, I never would have pursued my doctorate. The professors, library staff, academic advisors, and registrar personnel helped to facilitate this process in ways that made it possible to balance pursuit of my doctorate with the demands of raising five children and working full time.

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List of Abbreviations

Basic Psychological Needs Theory (BPNT)

Elementary and Secondary Education Act of 1965 (ESEA)

English Language Arts/Literacy (ELA)

Every Student Succeeds Act (ESSA)

National Assessment of Educational Progress (NAEP)

No Child Left Behind Act (NCLB)

Partnership for Readiness for College and Careers (PARCC)

Programme of International Student Assessment (PISA)

Progress in International Reading Literacy Study (PIRLS)

Research Assessment Package for Schools, Student Self-Report for Elementary School (RAPS-

SE)

Self-Determination Theory (SDT)

Trends in International Mathematics and Science Study (TIMSS)

CHAPTER ONE: INTRODUCTION

Overview

Student engagement is among the topics currently at the forefront of education because of the wide breath of positive outcomes associated with it. Although many educators and researchers readily acknowledge its importance, the concept is still maturing and is in need of further investigation, especially during the late elementary school years. The processes behind how to improve engagement, how those processes differ among subgroups of students, and how the processes differ across developmental levels are all in need of research because extant data suggests that engagement is a very robust concept with correspondingly robust processes driving it. Using motivation as a proxy for engagement, this dissertation is based on Self-Determination Theory and Effectance Theory. It examines the impact of basic psychological need satisfaction upon engagement in the context of prior achievement. Specifically, the present study seeks to offer new insight into the structure of student engagement and provide clear quantitative information about the mechanisms behind it.

Background

Engagement is a sign of flourishing within the human spirit, a classic indicator of healthy functioning (Nakamura & Csikszentmihalyi, 2014). Children need to be active participants in their own world in order to grow and become the adult they are meant to be. Adults often reminisce about the excitement they see in children's eyes on Christmas morning because of the innocence and love for life it inspires. Children eagerly open presents because they know something exciting is inside, given specifically with them – their interests and desires – in mind. Ideally, school provides a similar experience for children, an opportunity to find something designed specifically for them and to feel excited to experience it. Such is the current trend in

education – the pursuit of personalizing educational experiences to the unique strengths and life contexts of each student (Rutledge, Cohen-Vogel, Osborne-Lampkin, & Roberts, 2015).

Excellent teachers live to see the same wonder in children's eyes at school, and excellent schools are set-up to allow for that opportunity. They create dynamic environments with the goal of encouraging students to participate. However, even among the environments steeped in best practices, there are times when children still struggle to engage. In the school setting, engagement refers to "active, goal-directed, flexible, constructive, persistent, focused interactions with the social and physical environments" (Furrer & Skinner, 2003, p. 149). Inherent to engagement is the risk-taking process, because achieving goals involves trying something new, and trying something new involves clumsiness and the risk of failure, accompanied by the risk of shame. Children may feel hesitant to make be vulnerable enough to take risks because they believe they are not good enough, not smart enough, or not cool enough to be accepted by their teacher or peers if they make mistakes. Similarly, children may believe they are not in control enough of their own lives, so refuse to participate in school activities as a means to retain control of their own existence. While research has been conducted on social emotional learning with the purpose of helping students engage, and many educators are expertly versed in pedagogy and developing relationships with students, there is still work to be done in understanding how to help students fully engage in school.

The problem of students holding back to protect themselves from fully engaging during the school day is a crisis within education. Research suggests that up to 60% of high school students suffer from insufficient engagement in school, meaning that children's gifts and talents are squandered every day (Klem & Connell, 2004). Recent studies have begun tackling this problem, but much work is still to be done (Cappella, Kim, Neal, & Jackson, 2013; Raufelder,

Kittler, Lätsch, Wilkinson, & Hoferichter, 2014; Shih, 2012; Van Ryzin, Gravely, & Roseth, 2009). From a humanitarian perspective, engagement has substantial implications for outcomes as individuals grow older, such as active participation in society, life satisfaction, and mental health (Lewis, Huebner, Malone, & Valois, 2011; Reschly, Huebner, Appleton, & Antaramian, 2008; Wang & Fredricks, 2014). Pragmatically speaking, engagement is also important because of its consistently positive association with student achievement (Fredricks, Blumenfeld, & Paris, 2004; Klem & Connell, 2004; Skinner, Furrer, Marchland, & Kinderman, 2008) and is known to serve an integral role in subsequent achievement and other indicators of success (Frank, 2011; Klem & Connell, 2004; Finn & Zimmer, 2012; Miserandino, 1996; Thayer-Smith, 2007). Optimal engagement is conceptualized as the driver of innovation (Connell & Wellborn, 1991), which is considered a driver of success in 21st century society (Friedman, 2007; Newton & Newton, 2014).

Student engagement first gained attention in the literature during the 1980s with Finn's work on preventing school dropouts (Finn, 1989). Also during the 1980s and into the 1990s, Deci, Connell, & Ryan (1989) studied autonomy and competence as a means to predict self-determination, with all three scholars adding the concept of relatedness to their work in later years. Connell & Wellborn (1991) applied the concepts of autonomy, competence, and relatedness to student engagement while Ryan & Deci (2000a & 2000b) continued to pursue the study of these constructs from a motivation perspective, conceptualizing them as basic psychological needs and applying them to the broader study of motivation by formalizing Self-Determination Theory. Connell focused his efforts on developing the Institute of Research and Reform in Education, partly resulting in the Research Assessment Package for Schools (RAPS) questionnaires. Meanwhile, Ryan & Deci's (2000a & 2000b) work in Self-Determination

Theory has continued to receive attention in the literature in a wide variety of contexts that examined the impact of basic psychological need satisfaction upon motivation.

Student engagement has gained more attention in the 21st century, which is often focused on researching its relationships with motivation (Barnett, Morgan, van Beurden, & Beard, 2008; Bergey, Ketelhut, Liang, Natarajan, & Karakus, 2015). For example, Anderman, Gray, & Chang (2012) proposed a list of approaches that are traditionally categorized as motivation theory, but are relevant to student engagement. Their list includes self-determination, attribution, social cognitive, expectancy-value, and achievement goal theories. Goldberg's (1994) dissertation on intrinsic motivation suggests that Effectance Theory also deserves a place on this list. While all of these theories are relevant to engagement, none of them fully account for varied levels of student engagement in school. Engagement has gained even more attention recently because the Every Student Succeeds Act identified student engagement as a legally acceptable indicator of student success (U.S. Congress, 2015).

Understanding the role of basic psychological need satisfaction is a valid pursuit for understanding engagement. In many ways, Connell & Wellborn (1991) were before their time, in that basic psychological need satisfaction is achievable in the school setting when an emphasis on social-emotional learning exists and when differences in student groups can be explained. Over the past two decades, educators in the United States have gained a better appreciation for social emotional learning and its important role in student success; this has created an environment that is amenable to revisiting the applicability of basic psychological need satisfaction for the purpose of improving engagement. Additionally, improved statistical procedures for measuring how processes differ between groups have been developed in recent years to better understand the role of life circumstances in how psychological processes work,

and make for more robust measures of the impact of basic psychological needs in various contexts. (Hayes, 2013).

Several studies of engagement based on motivation theory are grounded in the fulfillment of the basic psychological needs of autonomy, competence, and relatedness (Connell & Wellborn, 1991; Haivas, Hofmans, & Pepermans, 2013; Jowett, Hill, Hall, & Curran, 2016; Shuck, Zigarmi, & Owen, 2015; Van den Broeck, Vanseenkiste, De Witte, & Lens, 2008). So far, empirical studies based on various independent theories on achievement and engagement have accounted for less than 35% in the variance of output (Furrer & Skinner, 2003; King, 2015; Murray, 2009). However, recent research suggests that basic psychological need satisfaction as a predictor of engagement may depend upon context (Hodge, Lonsdale, & Jackson, 2009; Logan, Robinson, Webster, & Barber, 2013; Wallhead, Garn, & Vidoni, 2014). Although scholars believe that motivation is a requisite precursor to engagement, the association between the two constructs is still unclear and warrants further investigation (Reschly & Christenson, 2012). Recent studies such as Hodge, Lonsdale, & Jackson (2009) have demonstrated that prior achievement may play a role in the degree to which basic psychological need satisfaction matters for engagement, but the research has been very limited and additional studies on the topic are warranted. Additionally, Finn & Zimmer (2012) have suggested that achievement itself may impact later engagement behaviors. Therefore, this study will compare students according to past achievement levels for the purpose of determining if prior achievement impacts the degree to which each basic psychological needs contributes to engagement.

Problem Statement

Researchers have established a link between academic achievement and engagement, and between basic psychological need satisfaction and engagement, but they have not been able to

fully explain how academic achievement and basic psychological need satisfaction interact to affect engagement in school (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011; Bradshaw, Zmuda, Kellam, & Ialongo, 2009; Connell & Wellborn, 1991; Dotterer & Lowe, 2011; Hodge, Londale, & Jackson, 2009; Klem & Connell, 2004; Miserandino, 1996). Therefore, a need exists to more fully understand the impact of prior achievement alongside basic psychological need satisfaction as predictors of school engagement, for the purpose of both assessing the combined impact of these variables, and each variable's independent contribution to engagement. Data from this research will help to equip educators with the ability to better personalize interventions and improve the student-teacher relationships.

While the basic psychological needs identified in Self-Determination Theory (SDT) are considered essential for school engagement, research is needed to identify the applicability in the school setting in order to improve educators' ability to tailor strategies to children's needs. Because SDT has not been able to fully explain engagement across heterogeneous samples, research is needed to test for differences across subgroups for the purpose of understanding if the basic psychological needs identified in SDT apply more to certain groups or within certain contexts more than others. In particular, it is important to test for interaction effects between each of the basic psychological needs and prior achievement. The problem is that while basic psychological need satisfaction is known to contribute to engagement, the process behind how basic psychological need satisfaction contributes to engagement in the school setting is not fully understood.

Late elementary school is a time of particular interest for developing interventions to improve engagement, this is because motivation is known to start falling during late elementary school and continue falling through middle school (Gottfried, Fleming, & Gottfried, 2001; Klem

& Connell, 2004; Midgley, Feldlaufer, & Eccles, 1989; Wylie & Hodgen, 2012). While some studies have investigated the impact of basic psychological need satisfaction upon engagement during late elementary school, the research is very limited.

Purpose Statement

The purpose of this study is to more fully understand the combined impacts of prior achievement and basic psychological need satisfaction as a whole as for each construct when controlling for the others. Understanding more about contextual factors behind engagement will help educators create better, more individualized programming to help increase engagement school-wide. SDT and Effectance Theory, in addition to recent empirical research, have led to the need to test the impact of past achievement on the relative predictive value of each basic psychological need as they pertain to engagement. Specifically, the present study will test the predictive value of each basic psychological need upon later engagement while controlling for prior achievement.

Achievement scores will be drawn from the Partnership for Assessment of Readiness for College and Careers (PARCC) exam. Feelings of competence, identified autonomy, relatedness, and school engagement will be assessed using the RAPS-SE Questionnaire (Research Assessment Package for Schools – Student Self-Report for Elementary School, 1998). Identified autonomy is the subtype of autonomy used for the present study because it is the form of extrinsic autonomy identified in the RAPS-SE that will most likely lead to quality engagement (Ryan & Deci, 2000a). Remaining focused on extrinsic autonomy instead of intrinsic autonomy is important, because extrinsic autonomy is amenable to outside interventions (Ryan & Deci, 2000a).

Significance of the Study

While many studies have investigated the connection between basic psychological need satisfaction and engagement (Connell & Wellborn, 1991; Haivas, Hofmans, & Papermans, 2013; Jowett, Hill, Hall, & Curran, 2016; Shuck, Zigarmi, & Owen, 2015; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008), the nuances of the relationship between basic psychological need satisfaction and engagement are still largely unknown. Similarly, while an abundance of research shows that achievement and engagement are positively correlated, the general assumption has been that engagement drives achievement (Finn & Zimmer, 2012). However, the possibility of achievement also contributing to engagement is in need of investigation (Chase, Hilliard, Geldhof, Warren & Lerner, 2014; Martin & Liem, 2010; McClelland, Atkinson, Clark, & Lowell, 1953; White, 1959), and will be assessed in the present study. In fact, Hodge, Lonsdale, & Jackson (2009) suggested that prior achievement levels may interact with basic psychological need satisfaction, resulting in engagement being affected differently by each of the basic psychological needs, depending on achievement context.

Two additional details about the relationship between basic psychological need satisfaction and engagement are still in need of investigation, with the present study designed to help fill those gaps: the first need is to assess the impact of all three basic psychological needs within the same study, and the second need is to investigate the impact of basic psychological need satisfaction upon engagement during elementary school. For the purpose of investigating the comparative contribution of each of the three basic psychological needs, several studies have assessed their impact on engagement by measuring the satisfaction of either a single need or a pair of basic psychological needs (Cappella, et al., 2013; Furrer & Skinner, 2003; Martin, 2009; Van Ryzin, Gravely, & Roseth, 2009), but comparative assessments of the three needs within the

same sample are scarce. Secondly, a paucity of research addresses basic psychological need satisfaction as a means for promoting engagement during elementary school, with most of the studies on this topic focused on middle school and high school (Raufelder, et al., 2014; Shih, 2012; Van Ryzin, Gravely, & Roseth, 2009), leaving a need for additional investigations into the concept during elementary school. The present study purposes to fill these two needs by assessing the impact of all three basic psychological needs upon engagement and studying the concept among students in grades 4 & 5.

Research Questions

The central question for this study is: How do the basic psychological needs as defined in Self Determination Theory contribute to engagement in the context of prior achievement during late elementary school?

The specific questions for this study are:

RQ1: Does past achievement in Mathematics combined with satisfaction of the basic psychological needs autonomy, competence, and relatedness significantly predict engagement?

RQ2: Does past achievement in Language Arts combined with satisfaction of the basic psychological needs autonomy, competence, and relatedness significantly predict engagement?

Definitions

1. *Autonomy* - "regulation by the self" (Ryan & Deci, 2006, p. 1557).

2. *Basic Psychological Needs* - "a set of innate or essential nutriments" comprised of autonomy, competence, and relatedness (Deci & Ryan, 2000, p. 229)

3. *Competence* - feelings of self-efficacy (Ryan & Deci, 2000b) and effectiveness (Deci & Ryan, 2000).

4. *Engagement* - "active, goal-directed, flexible, constructive, persistent, focused interactions with the social and physical environments" (Furrer & Skinner, 2003, p. 149).

5. *Motivation* - "to be moved to do something" (Ryan & Deci, 2000a)

6. *Relatedness* - a sense of belonging (Deci & Ryan, 2000); "individuals' inherent propensity to feel connected to others" and to "experience a sense of communion" (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010); emotional security (Deci & Ryan, 2000).

CHAPTER TWO: LITERATURE REVIEW

Overview

A literature review on the nature of student engagement and the present state of research on the topic provides the basis for the present study. Theoretical literature and empirical studies in the fields of developmental, educational, and industrial/organizational psychology guided the researcher in creating the framework for this study, and will be examined accordingly. This chapter addresses how student engagement is conceptualized in the most recent scholarly literature and how the present study is situated to contribute to the growing body of research on the topic. The rationale for why specific variables were chosen for the present model, definitions of major concepts, and the empirical basis for the research will be discussed.

Motivation and learning context are the two main concepts that show promise in the most recent literature for better understanding engagement, and therefore are the subject of inquiry in the present study. In particular, basic psychological need satisfaction and past academic achievement have emerged as potentially fertile ground for better understanding engagement. For purposes of thoroughly explaining the framework guiding the present study, this chapter will address the conceptual framework and related literature. The conceptual section will first discuss how engagement is defined in the literature and why it matters in education and will then provide the theoretical background relevant to the present study. The related literature section will contain five subsections: how prior achievement promotes engagement, how basic psychological need satisfaction promotes engagement, why this topic is important during late elementary school, how basic psychological needs are amenable to intervention, and relevance of engagement to the current status of public education in the United States. These topics will provide the rationale for the current study and the groundwork for its methodology.

Conceptual Framework

This section provides a thorough definition of engagement and the theoretical background of the concept. These points of discussion will explain the rationale for the design of the present study and how the study will contribute to scholarly literature.

Engagement Defined

Engagement is a relatively new concept in the psychological literature, growing out of multiple disciplines and several fields of psychology, including cognitive, social, and motivational areas of study (Anderman, Gray, & Chang, 2013; Christenson, Reschly, & Wylie, 2012; Connell & Wellborn, 1991; Csikszentmihalyi, 2014a; Csikszentmihalyi, 2014b; Eccles, 2016). The study of engagement is rooted in the desire to better understand the processes and origins behind healthy patterns of behavior (Christenson, Reschly, & Wylie, 2012; Connell & Wellborn, 1991; Csikszentmihalyi, 2014a; Csikszentmihalyi, 2014b; Eccles, 2016). Resulting from the emergent nature of the study of engagement and the diversity of approaches on the topic, the concept still lacks definitional clarity (Christenson, Reschly, & Wylie, 2012), but is broadly conceptualized as where "the rubber meets the road" (Eccles, 2016, p. 71) between an individual's psychological assets and how an individual interacts with the world. One of the most accepted definitions of engagement is that of "active, goal-directed, flexible, constructive, persistent, focused interactions with the social and physical environments" (Furrer & Skinner, 2003, p. 149). This definition implies that engagement is a broad, singular construct. Although Furrer and Skinner's (2003) definition is generally considered acceptable for purposes of defining engagement, it is important to remain cognizant that no definition has yet reached total consensus (Finn & Zimmer, 2012).

To complicate matters, not only has engagement not reached a fully agreed-upon definition, it is not even totally conceptualized as a single phenomenon, and is often described as occurring in narrowly-defined categories: cognitive engagement, behavioral engagement, and emotional engagement (Eccles, 2016; Fredricks, Blumenfeld, & Paris, 2004). Each of these engagement categories is characterized by particular behaviors. For example, hallmarks of behavioral engagement include active participation in academic tasks (Connell & Wellborn, 1991; Liu, Calvo, Pardo, & Martin, 2015), attention, effort (Cappella, Kim, Neal, & Jackson, 2013), persistence, contribution to class discussions (Gregory, Allen, Mikami, Hafen, & Pianta, 2014), participation in extracurricular activities (Connell & Wellborn, 1991; Finn, 1993), and positive conduct with the accompanying lack for disruptive behaviors (Finn, 1993; Finn, Pannozzo, & Voelkl, 1995; Finn & Rock, 1997). Cognitive engagement is characterized by phenomena such as desire for mastery (Sani & Rad, 2015) and preference for challenge (Connell & Wellborn, 1991; Fredricks, Blumenfeld, & Paris, 2004). Emotional engagement when considered specifically in the context of education is highlighted by identification with school, which has been identified, in part, as feelings of belonging (Finn, 1989), excitement, happiness, and interest (Connell & Wellborn, 1991). As these states of mind indicate, engagement quality is associated with desires to participate, which is commonly known as motivation (Reeve, Jang, Carrell, Jeon, & Barch, 2004; Skinner, et al., 2008). Motivation therefore provides a line of inquiry for better understanding student engagement, as it has since Connell and Wellborn (1991) presented at the 23rd Minnesota Symposium on Child Psychology.

While engagement has been implied through a variety of ideas over the past several decades in the developmental psychology literature, only since the late 20th century has it gained specificity (Connell & Wellborn, 1991; Eccles, 2016). For example, the concept of engagement

was implied as a part of early positive psychology theories in the term "approach behaviors" (McClelland, et al., 1953) and within the principle of effectance (White, 1959); both the terms "approach behaviors" and "effectance" are grounded within motivation theory, considered an essential vehicle for connecting growth-oriented desires for action to the development of the self (McClelland et al., 1953; White, 1959). When published, these growth-oriented conceptualizations of engagement stood in contrast to the drive-reduction forms of engagement commonly studied up to that point in behaviorist theories. For example, drive reduction is focused on behaviors that are fundamental to survival, such as alleviating hunger, as illustrated in Skinner's famous operant conditioning experiment that involved a rat pressing a lever for food. The difference between drive-reduction and growth-based motivation is subtle, but significant. The power of successfully engaging activities from a growth perspective is receiving more attention in the literature for its potential to help individuals develop a sense of purpose, foster excellence (Seligman & Csikszentmihalyi, 2000), and consequently establish a strong sense of identity (Connell & Wellborn, 1991; Sumner, Burrow, & Hill, 2015). With engagement recognized as a fundamental contributor to healthy psychological functioning, identifying the means to promote engagement is a worthy end in its own right.

As motivation theory developed beyond approach behaviors and effectance, the concept of engagement gained more attention, but remained a diffused concept (Deci & Ryan, 1985; McClelland, et al., 1953; Ryan & Deci, 2000b; Seligman & Csikszentmihalyi, 2000; White, 1959). Towards specifying the importance of engagement in the development of self, Connell and Wellborn's (1991) model of self-system processes conceptualized engagement as a conglomerate of cognitive, behavioral, and emotional indicators, and as a critical element of identity development. Although the concept of engagement remains under investigation in the

literature, researchers agree on its importance in education and healthy development (Eccles, 2016; Finn & Zimmer, 2012; Fredricks, Blumenfeld, & Paris, 2004; Klem & Connell, 2004; Lewis, Huebner, Malone, & Valois, 2011; Reschly, Huebner, Appleton, & Antaramian, 2008; Skinner, Furrer, Marchand, & Kindermann, 2008; Wang, Fredricks, 2014). Because children spend thousands of hours in school, it is important to understand how to promote engagement in that setting as a part of overall wellbeing.

Studying engagement has gained traction in the literature as a cornerstone of development and healthy functioning, but defining and measuring engagement has proven challenging (Christenson, Reschly, & Wylie, 2012; Eccles, 2016). Viewing engagement as an outcome of motivation gives credence to studying engagement as a whole instead of focusing exclusively on its categories, because motivation is considered a single, broad construct. Treating engagement as a whole as opposed to assessing the three individually is also supported by the literature. For example, each of the subtypes of engagement is believed to be closely related or fundamentally the same as other subtypes (Fredricks, Blumenfeld, & Paris, 2004). This is evidenced by research that indicates the subtypes of engagement are highly correlated with one another (Raufelder, et al., 2014; Reeve, 2012) and lack definitional clarity (Eccles, 2016; Reschly & Christenson, 2012). Although some scholars continue subscribing to the distinct subtype model of engagement (Appleton, Christenson, Kim, & Reschly, 2006), research has borne out a singular, multi-dimensional concept of engagement that provides a more accurate picture of student experience (Cavanagh, 2015; Glanville & Wildhagen, 2007). Considering engagement as a single construct is consistent with Csikszentmihalyi's (2014a) conceptualization of flow, a state of ultimate psychological arousal that occurs at optimal intersections of skill and challenge, analogous to a highly engaged state.

A wealth of previous research has investigated the cognitive, behavioral, and emotional subtypes of engagement separately, in addition to assessing for other nuances in engagement (Eccles, 2016). While such a level of assessment is a worthy endeavor, and has gone a long way in understanding theory, a need exists for moving the body of research towards more practical applications. The research on engagement is in need of studies that examine the unified nature of the concept, particularly how it operates in various settings (Eccles, 2016). Therefore, the present study assesses engagement as a whole instead of focusing on its varied parts and will investigate its functionality in the school setting. While the basic research on this topic provides a strong foundation for moving forward, the applied research on engagement is much more limited and would benefit from additional studies.

Theoretical Background

Studies on engagement have routinely led to inquiries into the nature of motivation, because motivation is understood as a central feature of engagement, recognizing the fundamental connection between the desire to act and the production of the desired action (Fredricks, Blumenfeld, & Paris, 2004; Klauda & Guthrie, 2015; Reschly & Christenson, 2012; Reeve, 2012; Skinner, et al., 2008). In fact, the report entitled *Engaging Schools* (National Research Council & Institute of Medicine, 2004) conceptualized motivation as inextricably linked to engagement. As such, motivational quality is thought to directly impact one's level of engagement, with more intrinsic motivation yielding higher levels of engagement (Connell & Wellborn, 1991; Ryan & Deci, 2000b; Siu, Bakker, & Jiang, 2014).

Self-Determination Theory. The nature of studying motivation-producing qualities is grounded in the positive psychology frame of reference, standing in contrast to drive reduction theories of motivation (Seligman & Csikszentmihalyi, 2000; White, 1959). A thorough review

of the literature on the topic of motivation led to Self-Determination Theory (SDT) as the guiding frame of reference for the current study, because it is one of the most common positive motivational theories for investigating the processes behind student engagement (Connell & Wellborn, 1991; Deci & Ryan, 1985; Deci & Ryan, 2000; Haivas, Hofmans, & Pepermans, 2013; Jowett, Hill, Hall, & Curran, 2016; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). The present study employs the use of positive motivational theory over drive reduction motivation theory because of the role positive psychology theory plays in engagement (Seligman & Csikszentmihalyi, 2000). Specifically, positive motivational theory focuses on human growth tendencies while drive reduction theory focuses on quelling deficiency-based impulses (White, 1959). Ongoing engagement is, by nature, about growth and productivity, lending itself to study through a positive motivation frame of reference.

SDT focuses on growth as opposed to reducing drives, identifying three basic psychological needs as essential to human motivation: autonomy, competence, and relatedness (Ryan & Deci, 2000b). Autonomy refers to the level of personal volition relative to a given activity (Ryan & Deci, 2006). Competence refers to the belief in one's ability to successfully complete a task (Ryan & Deci, 2000b). Relatedness refers to feelings of belongingness (Deci & Ryan, 2000). These three needs form the basis of the current study, because they are also considered essential for engagement (Connell & Wellborn, 1991; Reeve, et al., 2004). According to these conceptualizations, beliefs about one's autonomy, competence, and relatedness impact motivation and engagement (Connell & Wellborn, 1991; Ryan & Deci, 2000b). While the literature has consistently demonstrated the impact of basic psychological need satisfaction upon motivation, the processes behind it remain comparatively unknown (Eccles, 2016). For example, the relative impact of each basic psychological need upon

engagement appears to change across contexts, but those changes are not yet well understood (Eccles, 2016; Hodge, Lonsdale, & Jackson, 2009; Miner, Dowson, & Malone, 2013; Shernoff, Kelly, Tonks, Anderson, Cavanaugh, Sinha, et al., 2016). Accordingly, the present study seeks to contribute to a more comprehensive understanding of the roles of autonomy, competence, and relatedness as they contribute to student engagement.

Understanding student engagement as a function of motivation is still maturing as an area of research in education (Eccles, 2016; Reeve, et al., 2004). While the study of motivation is broad in the area of developmental psychology, applying it to education has proven challenging, specifically in regards to how children perceive their environment and subsequently behave in it (Dweck, 1986; Senko, Hulleman, & Harackiewicz, 2011). For instance, while Dweck (1986) and Senko, Hulleman, & Harackiewicz (2011) focused on the motivational outcomes of various goal contents, they recognized that the psychological underpinnings of these goals pertain to how a child views oneself in comparison to other people, versus a main focus on self-improvement. From that perspective, it is important to continue investigating the impact of self-perceptions as they pertain to engagement, widening the focus beyond goal content. The basic psychological needs within SDT provide a strong framework for assessing self-perceptions for the purposes of furthering this line of research because of their central role in motivation theory (Reeve, et al., 2004). Employing a well-established theoretical framework is essential for providing further clarity to the entire concept of engagement in the scholarly literature, and SDT meets the need quite well (Eccles, 2016). Applications for basic psychological need satisfaction as understood in SDT for day-to-day education is gaining momentum, as illustrated by current educational frameworks such as The Triple Focus (Goleman & Senge, 2014) and PROSPER (Noble & McGrath, 2015), which employ strategies that are designed to strengthen feelings autonomy,

competence, and relatedness as means for improving student engagement. Connell and Wellborn (1991) conceptualized autonomy, competence, and relatedness as essential for promoting student engagement; however, the applications for these basic psychological needs have focused on other areas of psychology, while motivation theories such as Goal Attribution Theory have found more favor in the study of student engagement (Dweck, 1986; Senko, Hulleman, & Harackiewicz, 2011). Continuing the line of research on basic psychological need satisfaction is important for its potential to serve as a means for improving student engagement, and is therefore the topic of the present study.

Within SDT, perceptions of one's autonomy, competence, and relatedness are rooted in previous fields of study (Deci & Ryan, 1985; Deci & Ryan, 2000; Ryan & Deci, 2000a, Ryan & Deci, 2000b). Autonomy and relatedness are each rooted in a single body of scholarly thought; autonomy is rooted in deCharms' (1968) personal causation model, and relatedness is rooted in attachment theory (Ryan & Deci, 2000b). Competence is a different construct, because it is rooted in both Bandura's Social Cognitive Theory (1986) and White's (1959) Effectance Theory. While effectance is part of Social Cognitive Theory, Bandura used it as a springboard to focus on a person's state of mind, bearing out as the concept of self-efficacy. As a result, the definition of competence is somewhat diffused. So while it makes sense to assess autonomy and relatedness as singular constructs, assessing competence as two separate constructs is worthy of consideration.

Effectance Theory. The inquiry into self-determination theory yielded a dichotomous conceptualization of competence. As articulated in SDT's Basic Psychological Needs sub-theory, competence is conceptualized as self-efficacy, or the belief in one's ability to produce desired results in the present or future (Deci & Ryan, 2000). While a person's history of

achievement is believed to be integrated into perceptions of self-efficacy (Deci & Ryan, 1985; Deci & Ryan, 2000), the dependence on past experiences as a component of motivation has become so marginalized, that it has lost its empirical relevance in the context of SDT. This marginalization has led to the present investigation into the relevance of past achievement within other theories of motivation. Effectance is described as one's ability to exert influence over the environment, resulting in desired outcomes (White, 1959). White (1959) posited that memories of success motivate future endeavors in similar areas, with the intention of producing additional victories. Initial success is often the result of a happy accident or the outcome of instinctual behavior; actions are then repeated purposefully because of a desired outcome that was achieved in the past (White, 1959). Similar to Isaac Newton's law of inertia, defined in part as "an object at rest tends to stay at rest unless acted upon by an unbalanced force," success as conceptualized through Effectance Theory is analogous to the unbalanced force needed in inertia to create movement. In school, success can be conceptualized as achieving curricular goals.

It is useful to delineate between the two fundamental definitions SDT employs for competence. Competence when framed as an element of one's state of mind is based in the self-efficacy principle of Bandura's Social Cognitive Theory (Bandura, 1986). Self-efficacy, defined as "the conviction that one can successfully execute the behavior required to produce [identified] outcomes" (Bandura, 1977, p. 193), is developed through a variety of feedback strategies in regard to competence, including mastery performance (Bandura, 1977). Mastery performance is considered particularly influential towards developing self-efficacy (Bandura, 1977). The contribution of mastery performance as a means for building self-efficacy is rooted in Robert White's (1959) Effectance Theory. Among the original theories of positive psychology, Effectance Theory recognizes the motivating qualities of exercising mastery over one's

environment, spurring individuals on towards continued engagement with similar activities (White, 1959); this is similar to McClelland, et al.'s (1953) Achievement Theory that focused on approach behavior as an outcome of past success. Although effectance contributes to self-efficacy, the concepts are different enough to merit separate investigation. Because of its emphasis on the past, effectance can be conceived as context – the environment in which a person operates. In this case, effectance will be conceptualized as the context of student functioning. Specifically, it will be assessed as the backdrop for school engagement in terms of prior achievement. This offers a new way to address the needs for assessing the impact of context on engagement per the suggestion articulated by Eccles (2016). Therefore, both conceptualizations of competence – past success and self-efficacy – will be addressed in this study.

Related Literature

With Self-Determination Theory (SDT) gaining momentum as a widely accepted theory for understanding motivation, and how engagement is cultivated (Reeve, 2012 in Christenson & Reschly, 2012), its basic psychological needs have been frequently studied as a means for predicting engagement (Connell & Wellborn, 1991; Haivas, Hofmans, & Pepermans, 2013; Jowett, Hill, Hall, & Curran, 2016; Shuck, Zigarmi, & Owen, 2015; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). While results have generally indicated a positive correlation between basic psychological need satisfaction and engagement, very few studies have examined the relative contribution of each basic psychological need, nor have they approached the study of engagement by separately assessing the difference between the effectance and self-efficacy conceptualizations of competence. Even more limited are such studies as they apply to school children. Sample homogeneity in previous studies limits the applicability of research

conducted on this topic so far. Four themes have emerged in the literature relative to this topic: 1) past achievement relative to engagement, 2) satisfying basic psychological needs for the purpose of improving engagement, 3) basic psychological needs satisfaction in the context of past achievement, and 4) motivation during late elementary school. In order to provide additional relevance for these four themes, interventions for improving the satisfaction of basic psychological needs and the relevance of these concepts to education will be covered at the end of this chapter.

Past Achievement as a Contributor to Engagement

To begin the discussion about past achievement, it is important to address types of achievement, and the associated goal types identified in the literature. McClelland, et al. (1953) articulated approach behaviors in the context of performance goals, that is, goals based upon meeting pre-established criteria that are often steeped in competition. Goal content remained relatively untouched in the literature for several decades, but finally received its due in educational psychology with Carol Dweck's work on mindset, specifically for her advocacy of mastery goals over performance goals (Dweck, 2007; Smiley & Dweck, 1994). As she explained, mastery goals are about individual progress, free of competition, with the sole purpose of learning (Dweck, 2007; Smiley & Dweck, 1994). Although performance goals, standardized tests in particular, have been considered antagonistic to motivation over the past few decades (Kohn, 2000), some studies suggest that performance goals themselves are not entirely deleterious (Deci & Ryan, 2000; Elliot & Dweck, 1988; Senko, Hulleman, & Harackiewicz, 2011). Considering the implications of Effectance Theory in the school context, especially with the present emphasis on achievement testing, it makes sense to assess past achievement for its predictive value upon later engagement.

Scholars recognize that achievement in school tends to occur in upward and downward spirals (Cohen, Garcia, Apfel, & Master, 2009; Goldberg, 1994; Hall, 2007; Lackaye & Margalit, 2006; Lemos, Abad, Almeida, & Colom, 2014), referring to the tendency for success to breed success and for failure to beget failure. This same phenomenon appears to occur with engagement, with initial engagement leading to greater engagement, and disengagement predicting subsequent disengagement (Jang, Kim, & Reeve, 2015). This spiral can also be conceptualized as psychological momentum. Momentum-based action is a common phenomenon in many activities such as business (Pryor, 2015), politics (Griffith, Welch, Cardone, Valdemoro, & Jo, 2008), and sports (Briki, den Hartigh, Markman, Micaleff, & Gernigon, 2013), in addition to school (Lee, Belfiore, & Budin, 2008; Spiro, 2012), suggesting that engagement with an activity encourages subsequent engagement, often resulting in greater future success.

Many interventions attempt to reverse the downward spiral of both achievement and engagement for school children, but none have fully done so. Remediation programs have historically been the focus of academic intervention programs, but social-emotional programs grounded in a positive psychology framework are showing promise (Goleman & Senge, 2014; Noble & McGrath, 2015; Yeager, Walton, & Cohen, 2013) for strengthening achievement. Similarly, social-emotional interventions are showing potential for improving engagement (Jang, Kim, & Reeve, 2016). Specifically, it is of interest to determine if students who are stuck in a low achievement pattern have different needs relative to strengthening engagement than students who exhibit higher achievement. Finding ways to reverse the downward spiral for both achievement and engagement stands to offer substantial benefits to students, since achievement is quite often an outcome of engagement (Finn & Zimmer, 2012).

While much research shows that achievement and engagement are positively correlated, the main focus in the literature has been on engagement's contribution to achievement (Finn & Zimmer, 2012). However, scholars have indicated that the relationship between engagement and achievement may be reciprocal (Chase, Hilliard, Geldhof, Warren, & Lerner, 2014; Finn & Zimmer, 2012; Martin & Liem, 2010; McClelland, et al., 1953; White, 1959). Based on Effectance Theory, a reciprocal relationship is likely, with outcome expectations and results of action creating a feedback loop with one another (White, 1959). Bandura (1986) and Ryan (1982) argued that feedback about competence has the potential to impact students through altered perceptions about self-efficacy and motivation. Despite these arguments, the effect of previous academic achievement upon later engagement has received very little attention in the literature, with prior academic achievement and later engagement measured decades ago, which yielded insignificant results (Marks, 2000), occurred within narrowly defined populations (Martin, Papworth, Ginns, & Liem, 2014), or the two constructs were compared over different environments (Mahoney, Parente, & Lord, 2007).

Emerging research suggests that prior achievement may interact with basic psychological need satisfaction, giving different relative importance to each basic psychological need, dependent upon level of previous achievement (Hodge, Lonsdale, & Jackson, 2009). Such external feedback that impacts effectance may take a variety of forms, and include examples such as measures of the degree to which a goal is achieved, creating a desired change in the physical environment, verbal feedback from another person, or formal evaluations (Bandura, 1977; Harter, 1974; Harter, 1977; Harter & Zigler, 1974; White, 1959). Academic achievement is, by nature, purported to measure competence, so it follows that academic achievement is a way to measure effectance, or competence based on the past. School is full of formal evaluations,

with schools across cultures placing increased emphasis on achievement (Raufelder, et al., 2014).

Therefore, it is important to know more about the impacts of formal evaluations. Research is

needed in order to more fully understand the impact of perceptions of one's own competence as

measured through assessments (Gonida, Kiosseoglou, & Leondari, 2006). In order to contribute

towards filling this need, the present study seeks to provide further information about the impact

of academic achievement upon student engagement.

Satisfying Basic Psychological Needs for Improving Engagement

   The role of context in basic psychological need satisfaction. Basic psychological need

satisfaction pertains to an individual's feelings of personal autonomy, competence, and

relatedness relevant to the present or future, noting the importance of a person's thoughts and

feelings, in contrast to focusing on the outside environment (Ryan & Deci, 2000b).

Environmental variables have shown promise for strengthening perceptions of autonomy,

competence, and relatedness (Eccles, 2016; Wallhead, Garn, & Vidoni, 2014; Logan, et al.,

2013), but no particular environment is guaranteed to fill every child's psychological needs

(Connell & Wellborn, 1991). Consequently, it is more effective to assess individual perceptions

than to assume that everyone's needs are met in any particular context. When the three basic

psychological needs are satisfied, individuals are believed to be in a position to flourish, able to

use their innate gifts and talents (Ryan & Deci, 2000; Saeki & Quirk, 2015).

   Research over the past several years has consistently demonstrated the importance of

basic psychological need satisfaction as a means for promoting engagement across a variety of

cultures, age groups, and activities. Countries where these outcomes have been demonstrated in

the literature include Australia (Martin, 2009), Belgium and the Netherlands (Schreurs, van

Emmerik, Van den Broeck, & Guenter, 2014), Canada (Trépanier, Fernet, & Austin, 2013),

China (Siu, Bakker, Jiang, 2014), Germany (Raufelder, et al., 2014), Taiwan (Shih, 2012), and the United States (Cappella, et al., 2013; Cole & Korkmaz, 2013; Van Ryzin, Gravely, Roseth, 2009; Shuck, Zigarmi, & Owen, 2015). Although several of these studies were conducted in the United States, only one researched the effects of basic psychological need satisfaction among children during elementary school as a predictor of engagement. While the majority of research on this topic has focused on adults, the literature specific to assessing children in grades Pre-K-12 has included students in grades 2-5 (Capella, Kim, Neal, & Jackson, 2013), 7 and 8 (Raufelder, et al., 2014), 9 (Shih, 2012), and one study simply reporting "students from secondary schools" as the sample (Van Ryzin, Gravely, & Roseth, 2009). The contexts of studies that investigate the impact of basic psychological need satisfaction have included school (Cappella, et al., 2013; Cole & Korkmaz, 2013; Faye & Sharpe, 2008; Martin, 2009; Raufelder, Kittler, Braun, Lätsch, Wilkinson, & Hoferichter, 2014; Shih, 2012; Siu, Bakker, & Jiang, 2014; Van Ryzin, Gravely, & Roseth, 2009), athletics (Álvarez, Balaguer, Castillo, & Duda, 2009; Gucciardi & Jackson, 2015; Hodge, Lonsdale, & Jackson, 2009; Smith, Duda, Tessier, Tziomakis, Fabra, & Quested, et al., 2016), and work (Kovjanic, Schuh, & Jonas, 2013; Schreurs, van Emmerik, Van den Broeck, & Guenter, 2014; Shuck, Zigarmi, & Owen, 2015; Trépanier, Fernet, & Austin, 2013; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008). The areas of investigation on this topic have been wide, and yielded significant results, which lends credence to the proposition that basic psychological needs are inherently part of the human experience across cultures and across the lifespan.

While these studies have demonstrated the importance of satisfying each basic psychological need, they have not assessed the relative importance of each psychological need across different settings. Identifying the relative contribution of each basic psychological need

across contexts is important for purposes of designing meaningful interventions to help students when they experience difficulties engaging in school (Turner, 2010). Basic research on this topic is plentiful, but a substantial need exists for applied research (Eccles, 2016; Turner, 2010). Although the present study does not assess a specific pre-existing intervention in a school, it is designed to contribute to the need for applied research by assessing children's basic psychological needs and engagement in the context of past achievement in situ.

      Comparative contributions of each basic psychological need. Notwithstanding the fact that several studies have investigated the contribution of psychological need satisfaction upon engagement within the Pre-K – 12 setting, a need still exists to further this line of inquiry, because the vast majority of these studies have assessed either a single need, or the needs were only investigated in dyads instead of assessing all three basic psychological needs within the same study (Cappella, et al., 2013; Furrer & Skinner, 2003; Martin, 2009; Van Ryzin, Gravely, & Roseth, 2009). Results have consistently demonstrated that basic psychological need satisfaction contributes to engagement, but the structure of these studies have not allowed for substantial comparison of the relative importance of each basic psychological needs in particular contexts. Early research on the topic, examining only children's motivation instead of actual engagement, indicated that perceived competence and autonomy were the two main factors driving motivation, with perceived competence serving as the foundation and autonomy serving as a launch pad (Deci, Nezlek, & Sheinman, 1981). Only one study was found that assessed all three basic psychological needs together among school children, but it only included students in 7th and 8th grade in Germany, indicating that competence plays a greater role in engagement than either autonomy or relatedness, with both of the latter needs offering relatively small contributions (Raufelder, et al., 2014).

The finding of competence as the greatest contributor to engagement raises questions about how consistent that finding would be across samples, because although this finding is consistent with Deci and Ryan's (1985), Elliot and Dweck's (2005), and White's (1959) perspectives that competence is the core of motivation, it does not address the premise that autonomy drives motivation quality (Ryan & Deci, 2000b). When autonomy and relatedness were assessed within the same study among secondary students in the United States, autonomy was found to predict engagement better than relatedness (Van Ryzin, Gravely, & Roseth, 2009), and although this study did not compare the contribution of autonomy compared to competence, it still demonstrated that autonomy may serve as a driving force for engagement. Since autonomy is conceptualized as the core of motivation quality, it follows to investigate if autonomy is the main contributor to engagement, since quality of motivation may influence the degree to which action (engagement) follows desire (motivation). The relative importance of autonomy over relatedness is consistent with Deci and Ryan's (1985) conceptualization of the importance of autonomy, but stands in contrast to results from Kovjanic, Schuh, & Jonas's (2013) study about employment, which showed the relative importance of relatedness over autonomy. Although Bartholomew, et al. (2011) specifically called for studies to examine the relative contributions of each psychological need, Raufelder et al. (2014) was the only study found that addressed this need to date among school children. Without assessing all three basic psychological needs across heterogeneous samples, it is difficult to ascertain which basic psychological needs are most important for helping students engage cross-culturally.

Basic Psychological Need Satisfaction in the Context of Prior Achievement

As in any emergent field, a great many questions arise as knowledge grows. Basic psychological need satisfaction is generally thought to contribute to engagement, but the

relatively low variance outputs in the research suggest that basic psychological need satisfaction is not the exclusive cause of engagement. For example, although basic psychological need satisfaction has been found to predict up to 30% in the variance of engagement (Hodge, Londale, & Jackson, 2009), past experience (Hodge, Lonsdale, & Jackson, 2009; Jun, Kyle, Graefe, & Manning, 2015) and other environmental variables (Cappella, et al., 2013; Curran, Hill, & Niemiec, 2013; Iwasaki & Mannell, 1999) have been found to explain an additional 10-22% in variance. As Gonida, Kiosseoglou, and Leondari (2006) stated, more research is needed to refine existing theories of motivation, particularly in reference to perceptions of competence.

In the context of the present study, previous research suggests that an interaction effect may exist between previous levels of achievement and basic psychological need satisfaction as they contribute to engagement.prior   As occurs in any new line of inquiry, the present body of research on this topic is relatively small, but the literature suggests that moderation effects may be significant (Hodge, Lonsdale, & Jackson, 2009). Information on the interaction between achievement and basic psychological needs is based on measurements of engagement in athletics and across different age groups and samples, so the effects among school children within a single sample are not very well understood. Studying the relative contributions of each psychological need in the context of past achievement would provide more insight into student needs and methods for encouraging student growth. While initial findings suggest an interaction effect between past achievement and relatedness, it would also be of interest to test for interaction effects between past achievement and the other two basic psychological needs, that is, autonomy and competence. As past achievement is increasingly associated with differences in later engagement across age groups and activities, and is coupled with a fledgling body of research on

the impact of basic psychological need satisfaction upon engagement, a natural path to follow is to test for interaction effects between the two concepts.

Given the pervasive nature of achievement in public schools as they currently operate within the United States (Botwinik, 2007; Common Core State Standards Initiative, 2015; Thibodeaux, Labat, Lee, & Labat, 2015; U.S. Department of Education, 2014; U.S. Department of Education, 2015), it is important to know how past achievement predicts later engagement. Just as differentiation is considered a best practice for purposes of classroom instruction (Lopez Kershen, 2015; Van Tassel-Baska, Quek, & Feng, 2007; Williams, Swanlund, Miller, Konstantopoulos, Eno, van der Ploeg, et al., 2014), it would make sense to begin identifying if group differences in students relative to basic psychological need satisfaction exist in order to help children maximize engagement.

Motivation during Late Elementary School

Even when reviewing studies from around the world, the investigation of basic psychological need satisfaction as it pertains to engagement during elementary school is extremely limited. Continuing the investigation into how to improve engagement during elementary school is important, because the earlier children are engaged in school, the better their long-term outcomes are likely to be, or as Murphy (2009) phrased it, "prevention always trumps remediation" (p. 12). For example, evidence suggests that active involvement in education increases brain plasticity across a variety of domains (Ansari, 2012), and brain plasticity gradually falls with age (Pascual-Leone, Freitas, Oberman, Halko, Eldaief, & Bashir, et al., 2011); these two phenomena suggest a need to promote early engagement in order to maximize learning potential. Additionally, early school engagement is associated with greater academic achievement, higher graduation rates, and better odds of college attendance (Bradshaw,

Zmuda, Kellam, & Ialongo, 2009). Conversely, school engagement is negatively associated with a later need for special education services and behavior difficulties (Bradshaw, Zmuda, Kellam, & Ialongo, 2009). It is also important to reach students early because children tend to exhibit greater motivation to engage during the early school years than during later years (Klem & Connell, 2004).

Motivation is known to decline from late elementary school through middle school (Gottfried, Fleming, & Gottfried, 2001; Klem & Connell, 2004; Midgley, Feldlaufer, & Eccles, 1989; Wylie & Hodgen, 2012). Although motivation declines have been documented from kindergarten onward through high school, the declines exacerbate during middle school and high school (Skinner, et al., 2008). It is unclear if this decline is a function of normal development or if motivation declines as an outcome of school programming that is ill-equipped to give older children and young adolescents developmentally appropriate experiences (American Psychological Association, 2016). When students are not motivated, they are not engaged. Giving away years of engagement sacrifices valuable time that students could be using to contribute to their world and grow. Because engagement is linked to a myriad of positive outcomes, and is closely tied to motivation, assessing strategies for improving engagement during late elementary school is of interest for the benefit of children, parents, educators, and the community at large. While a number of studies have assessed engagement in school, few have specifically examined engagement during grades 4-5, particularly as an outcome of basic psychological need satisfaction or previous achievement. Only Cappella, et al.'s (2013) study was found to assess engagement during elementary school in the United States, and the only basic psychological need it assessed as a contributor to engagement was relatedness. The present study will involve assessing basic psychological need satisfaction and achievement among

students in grades 4 and 5 in order to gain a better understanding about how to help children engage in school before motivation begins to substantially falter in the later grades. Ideally, early engagement interventions would have the added benefit of preventing later declines in motivation. Finally, the present study is designed to fill gaps in the literature by assessing all three basic psychological needs among this age group in the school setting.

Interventions for Improving Basic Psychological Need Satisfaction

This section on interventions that have shown promise for improving basic psychological need satisfaction is included in this chapter for the purpose of increasing the applicability of the present study. Over the past few decades, an abundance of research has given credibility to the idea that basic psychological need satisfaction is important for engagement. While this knowledge is an essential starting point for improving student engagement, it created a distinct need for identifying strategies that satisfy the basic psychological needs so that situations of low need fulfillment can be rectified, improving the applicability of the research. Without specific strategies for helping to improve students' perceptions of autonomy, competence, and relatedness, the knowledge about basic psychological needs holds little practical value. Only within the past decade has solid literature on the topic been published. Therefore, although the extant knowledge is limited, a summary of current strategies follows.

Autonomy. In order for the need for autonomy to be satisfied, an individual must first have at least an emerging sense of identity, because the basis for autonomy involves pursuing activities for the purpose of experiencing outcomes that are congruent with the self and personal desires (de Charms, 1968; Skinner, et al., 2008); in other words, doing what an individual perceives as either fun or necessary. Three categories of autonomy-based motivation exist as defined in Self-Determination Theory: amotivation, extrinsic motivation, and intrinsic

motivation (Ryan & Deci, 2000b). For purposes of understanding how to improve engagement, extrinsic motivation is the motivation category of interest because of its amenability to intervention. Within extrinsic motivation are four levels of autonomy, listed from lowest autonomy to greatest: external, introjected, identified, and integrated (Ryan & Deci, 2000b). Identified and integrated autonomy are considered productive forms of motivation because they are comprised of personal investment in a goal (Ryan & Deci, 2000b).

One common issue children experience in this area relevant to autonomy is getting stuck in a situation of knowing what they want in the present, but neglecting their future plans, creating a situation of placing little value on skill development; in this case, helping students envision a best possible self in the future and creating action plans to become that person may help to align personal goals with productive behaviors (Spitzer & Aronson, 2015). While not all work that needs to be accomplished in school may lend itself to intrinsic self-regulation, varied degrees of extrinsic self-regulation may be amenable to intervention (Ryan & Deci, 2000b). To help students focus on the future and create goals that are aligned with their desires assists in the process of achieving identified self-regulation (Connell & Wellborn, 1991). Identified self-regulation is desirable because although it is still a characteristic of external motivation, it is an internalized form of autonomy (Ryan & Deci, 2000b). A step down from identified self-regulation is introjected regulation, which links self-esteem to outcomes such as grades and test scores, followed by external self-regulation, which is focused on simply avoiding punishment (Connell & Wellborn, 1991). Teachers have been known to inspire greater autonomy through the types of strategies they employ for the purpose of initiating student participation (Reeve, et al., 2004). Autonomy-promoting strategies include tailoring instruction to student interests and providing a sense of challenge as well as encouraging independent choice-making and curiosity

among students (Reeve, et al., 2004). Because autonomy is known to falter under times of emotional distress, helping students work through negative feelings may also help to increase external forms of self-regulation (Tice, Bratslavsky, & Baumeister, 2001). Symptoms of low autonomy may include boredom and frustration (Skinner, et al., 2008). Identifying symptoms of low autonomy is a starting point for tailoring interventions such as the ones listed in this section for the purpose of helping students better invest in the world around them.

Competence. A sense of competence can help increase enjoyment for activities, and ultimately, engagement (Skinner, et al., 2008). Conversely, a fear of failure is believed to result in lower engagement (Sherman, et al., 2013). While schools often rely on token economies for rewarding good behavior or achievement, this appears to negatively impact motivation, whereas positive verbal feedback on a job well done has been shown to result in either increased motivation, or no significant change in motivation (Deci & Ryan, 1985). Symptoms of low feelings of competence may include concerns such as anxiety and procrastination, so employing strategies to improve beliefs in one's competence may be more effective than only employing anxiety-reduction and procrastination-reduction strategies (Haghbin, McCaffrey, & Pychyl, 2012; Skinner, et al., 2008).

In order for success to bolster students' belief in personal competence, the students must view their achievements as the result of personal work and ability (Deci & Ryan, 1985). It has been suggested that opportunities for deeper learning have the additional effect of increasing self-perception of competence through strategies such as think time, and giving students an opportunity to pretend to be the teacher by questioning other students' conclusions and defending one's own conclusions during class discussions (Turner, 2010). Providing structured class atmospheres and explicitly teaching strategies for achieving success help students see

avenues for the appropriate channeling of their abilities, and consequently a stronger belief in their own ability to achieve (Connell & Wellborn, 1991; Skinner, et al., 2008). Towards expanding personal capacities for learning, mindfulness training has shown promise for improving attention span, working memory, and achievement test scores (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013).

Relatedness. Feelings of relatedness – that is, emotional security with parents, teachers, and friends with accompanying good feelings – are known to improve engagement (Connell & Wellborn, 1991). On the contrary, fear of rejection leads to lower engagement (Sherman, et al., 2013). One of the primary ways educators can help satisfy students' needs for relatedness is by approaching interactions with students from a place of emotional warmth (Skinner, et al., 2008). While educators can help to provide situations for students to make friends, one of the biggest challenges in schools is the more systemic, subtle messages about belongingness. Overcoming subtle messages about belonging, or lack thereof, is often a particular challenge for students who are members of racial minority groups (Schmader, Johns, & Forbes, 2008).

Three strategies have demonstrated positive outcomes for improving feelings of relatedness, particularly in situations that present systemic issues pertaining to belongingness. These strategies include journaling, meditation, and cooperative learning activities (Cohen, et al., 2009; Sherman, et al., 2013; Shnabel, et al., 2013; Spitzer & Aronson, 2015). The journaling strategies that have shown promise are focused on social belonging and personal value affirmation (Cohen, et al., 2009; Sherman, et al., 2013; Shnabel, et al., 2013). These strategies have been shown to help increase feelings of self-worth, provide students with an avenue for actively engaging in positive narratives about themselves, and give participants a focus on a broader view of their lives beyond the daily challenges they face (Cohen, et al., 2009; Sherman,

et al., 2013; Shnabel, et al., 2013). Meditation has also shown promise for improving relationships through the personal assets it builds such as anxiety reduction, improved executive function, self-awareness, and self-control (Flook, Smalley, Kitil, Galla, Kaiser-Greenland, Locke, et al., 2010); building these personal assets help individuals create better relationships with other people. Finally, cooperative learning activities such as the jig-saw technique help improve feelings of relatedness by providing a structured platform for social interaction while allowing for students to both learn about and learn through one another (Spitzer & Aronson, 2015).

Relevance to Education in 21st Century America

    Current Trends. Teaching for the purpose of maximizing student engagement stands in contrast to the "teaching to the test" method of instruction that gained prevalence in the early part of the 21st century. While engagement inspires creativity, testing as an end-game diminishes it (Beghetto, 2005). This should give all educators pause, because creativity and innovation are the skills that will allow today's children to fully participate in their world as adults (Friedman, 2007; Newton & Newton, 2014). Current educational frameworks such as The Triple Focus (Goleman & Senge, 2014) and PROSPER (Noble & McGrath, 2015) have created methods for encouraging students to innovate through a foundation of confidence in themselves. Each framework is founded in the idea that children need a supportive atmosphere in order to fully engage, taking the risks inherent to creativity.

    In his 2006 speech, "Do Schools Kill Creativity?" Sir Ken Robinson advocated for a strengths-based approach to education instead of the anxiety-ridden model inherent in test-based education (Zeidner & Matthews, 2005). Similarly, Carol Dweck (2006) inspired educators to help students broaden their own abilities by equipping them with a growth mindset, that is, the

notion that intelligence is fluid and broadened through experience. Failure is considered a valuable experience in the course of education under a growth mindset, and is something to be learned from instead of limited by (Elliot & Dweck, 1998). Educating from a growth mindset is a noble cause, but applying it within the current structure of standards-based and test-based education is analogous to fitting a square peg in a round hole. As public education operated under the No Child Left Behind Act during the first part of the 21st century, it trapped students in a "one size fits all" approach to education (Allen, Altwerger, Edelsky, Larson, Rios-Aguilar, Shannon, et al., 2007). Children cannot engage with the same material at the same rate with the same efficiency because of the diverse backgrounds and skill-sets children bring to school with accompanying interests (Allen, et al., 2007). With the passage of the ESSA, public schools now have increased flexibility to demonstrate student success, with student engagement listed as one of the acceptable indicators (S. 1177, U.S. Congress, 2015). However, the testing culture is so ingrained in the fabric of public education, that an achievement oriented culture is likely still pervading student and educator mindsets. This new legislation opens the door to programs centered on engagement instead of pre-determined standards, but leaves states with the authority to decide whether to use engagement or standardized test data for reporting on student progress (S. 1177, U.S. Congress, 2015). This suggests that engagement itself has potential for serving as the gateway for recapturing authentic education and actively involving children in their own growth.

The Triple Focus (Goleman & Senge, 2014) and PROSPER (Noble & McGrath, 2015) are two new educational frameworks that emphasize the process of learning over a particular product. Both systems are built around the premise of student-directed learning. One of the most promising elements of these frameworks is their celebration of diversity through a

strengths-based approach to education. The value of emphasizing strengths is grounded in a

strong social-emotional basis for knowledge pursuit. Giving students opportunities to try new

ideas and to work through failure instead of getting stuck in past mistakes is based on

environments of trust as opposed to humiliation (Friedman, 2007). Strategies articulated in The

Triple Focus (Goleman & Senge, 2014) and PROSPER (Noble & McGrath, 2015) are grounded

in basic psychological need satisfaction. For example, The Triple Focus encourages the growth

of autonomy, competence, and relatedness through self-directed learning, self-regulation, and

group projects. Similarly, the PROSPER framework seeks to fulfill the basic psychological

needs through its emphasis on building new strengths and improving pre-existing strengths,

fostering a sense of purpose, and forming positive relationships. The present study's

investigation of how basic psychological needs contribute to engagement will add further insight

regarding the applicability of these educational frameworks.

Further Closing the Achievement Gap. In the United States, educational opportunities

are disparate by socio-economic class and race, creating what is commonly referred to as the

achievement gap (Allen, 2008). Strictly speaking, these gaps are as old as the country itself

(Allen, 2008). The Elementary and Secondary Education Act of 1965 (ESEA) was the first piece

of federal legislation aimed a closing the achievement gap, with Title I funding as the main

remedy designed to rectify this long, sordid pattern in education (Hunt, Carper, Lasley, &

Raisch, 2010). As the gap widened during the 1990's, the 2001 reauthorization of the ESEA,

commonly known as the No Child Left Behind Act (NCLB) marked the institution of federal

government-based accountability measures that were designed to expedite the gaps' closures

(Hunt, et al., 2010; McClaren & Farahmandpur, 2006). Despite earmarked funding, targeted

interventions, and a focus on pedagogical improvements, the achievement gaps have persisted,

albeit narrowed, between races and economic classes, leading researchers to continue exploring how to close them (Cohen, et al., 2006; Murphy, 2009; Shnabel, et al., 2013; Spitzer & Aronson, 2015). Recent studies suggest that psychological assets may be a part of the answer (Cohen, et al., 2009; Goleman & Senge, 2014; McClaren & Farahmandpur, 2006; Schmader, Johns, & Forbes, 2008; Sherman, et al., 2013; Spitzer & Aronson, 2015; Yeager, Walton, & Cohen, 2013; Van Velsor, 2009).

Although educators have been criticized for practicing simplistic psychological interventions such as teaching students to engage in positive self-talk (McClaren & Farahmandpur, 2006), the interventions identified in recent studies and in the present study are individualized and have demonstrated success in a variety of settings (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Connell & Wellborn, 1991; Ryan & Deci, 2000b; Yeager, Walton, & Cohen, 2013). Some of these interventions include identifying and elaborating on personal values (Sherman, et al., 2013), personal goals (Spitzer & Aronson, 2015), and the maintenance of positive relationships (Cohen, et al., 2009; Shnabel, et al., 2013) in addition to mediation (Flook, et al., 2010), cooperative learning activities (Spitzer & Aronson, 2015), and targeted verbal feedback (Deci & Ryan, 1985).

The goal of the present study is to determine if strategies such as the ones described in this section that are already successful in school, athletics, and work settings can be further refined in order to increase benefit to children in school; this will be achieved by measuring the degree to which the basic psychological needs these interventions are designed to satisfy matter for the purpose of increasing engagement. The practice of building psychological assets has taken center stage in educational psychology for the purpose of helping children who are members of historically disadvantaged groups to gain the same benefits from education as their

more advantaged peers. Mindset, social belonging, mediation, role-model exposure, and self-affirmation interventions are among the specific areas of focus on psychological strategies for closing the achievement gaps and helping students engage in school (Cohen, et al., 2009; Goleman & Senge, 2014; Schmader, Johns, & Forbes, 2008; Sherman, et al., 2013; Spitzer & Aronson, 2015; Yeager, Walton, & Cohen, 2013). Results indicate that positive psychological interventions may help to further close the achievement gaps (Cohen, et al., 2006; Cohen, et al. 2009; Sherman, et al., 2013; Spitzer & Aronson, 2015). Each of these strategies is centered on improving engagement in part by overcoming the fear of failure (De Castella, Byrne, & Covington, 2013; Elliot & Thrash, 2004; Haghbin, McCaffrey, & Pychyl, 2012). The outcomes of past research suggest that students who struggle to achieve in the present state of education may reap exceptional benefits from interventions designed to develop these psychological assets, thereby improving engagement. This area of research is new, and the number of specific interventions researched for purposes of understanding their impact on engagement have been limited, so additional studies are needed in order to verify this idea and to assess the potential effectiveness of additional interventions. Therefore, this study seeks to contribute to this need by assessing the impact of basic psychological need satisfaction upon engagement in the context of prior achievement.

Summary

The present study fills important gaps in the literature on student engagement. Very few studies to this point have assessed basic psychological needs as predictors of student engagement (Siu, Bakker, Jiang, 2014). Among the studies investigating the impact of basic psychological need satisfaction and past achievement upon engagement, the results have consistently shown a positive relationship between satisfaction of at least one basic psychological need and

engagement when both variables are assessed within highly similar contexts. Because basic psychological need satisfaction, while critical for engagement, still does not fully account for variance in engagement levels, scholars have recognized the need to assess for covariates. When covariates such as autonomy support (Curran, Hill, & Niemiec, 2013), classroom organization (Cappella, et al., 2013), and personality (Iwasaki & Mannell, 1999) have been assessed alongside basic psychological need satisfaction for purposes of predicting engagement, up to 47% of the variance in engagement was explained. Within the study of elite young adult athletes, 30% of the variance of engagement in sport was explained by satisfaction of psychological needs (Hodge, Lonsdale, & Jackson, 2009); while this study demonstrated a positive impact of basic psychological need fulfillment upon engagement for individuals who demonstrated high achievement in a given area, it is important to know the comparative impact of basic psychological need satisfaction at differing levels of prior achievement.

Given the empirical significance of past achievement, it makes sense to test for the amount of variance explained in engagement based upon past achievement and basic psychological need satisfaction, for purposes of furthering the knowledge base about how to help students succeed. As Gonida, Kiosseoglou, & Leondari (2006) have stated, more research is needed in order to refine existing theories of motivation, particularly in reference to student perceptions of competence. The present study purposes to help meet that need. Therefore, assessing the comparative impact of basic psychological need satisfaction upon engagement in the context of past achievement is the purpose of the present study.

When applied to the school setting, it is of interest to determine if past achievement drives future engagement. Empirical literature has articulated both an upward and downward spiral of achievement and engagement (Goldberg, 1994; Hall, 2007; Lackaye & Margalit, 2006;

Lemos, Abad, Almeida, & Colom, 2014; Skinner, et al., 2008). If a student is not successful in those areas, that child is likely to continue struggling. However, if a student experiences success with achievement and engagement, additional success is likely to follow. Academic achievement is, by nature, purported to measure competence. Empirical data suggests that while achievement itself may impact future engagement, internal psychological states may also contribute to it (Connell & Wellborn, 1991). Therefore, it is of interest to identify the relative predictive value of each basic psychological need upon future engagement. Understanding how to help students engage during late elementary school is particularly important, because this is the stage shortly before motivation is known to falter (Gottfried, Fleming, & Gottfried, 2001; Midgley, Feldlaufer, & Eccles, 1989; Wylie & Hodgen, 2012). Results from the present study will contribute to the existing literature on how to increase student engagement relative to achievement and the satisfaction of basic psychological needs, particularly during late elementary school.

CHAPTER THREE: METHODS

Overview

This chapter discusses the structure and process for the current study. Structurally, the design, research questions, null hypotheses, participants, setting, and instrumentation will be identified and described. The processes for data collection, measurement, and interpretation will be detailed in the procedures and data analysis sections.

Design

The present study is a correlational design. It employs multiple regression in order to test for the combined effect of prior academic achievement and basic psychological need satisfaction and upon the predictive value of student engagement while also measuring the relative impact of each basic psychological need upon student engagement.

Research Questions

RQ1: Does past achievement in Mathematics combined with satisfaction of the basic psychological needs autonomy, competence, and relatedness significantly predict engagement?

RQ2: Does past achievement in Language Arts combined with satisfaction of the basic psychological needs autonomy, competence, and relatedness significantly predict engagement?

Hypotheses

The null hypotheses for this study are:

$H_0 1$: There is no statistically significant predictive value of prior Math achievement as measured by the PARCC Math exam combined with the basic psychological needs of autonomy, competence, and relatedness, as measured by the RAPS-SE, upon engagement.

$H_0$2: There is no statistically significant predictive value of prior Language Arts achievement as measured by the PARCC ELA exam combined with the basic psychological needs of autonomy, competence, and relatedness, as measured by the RAPS-SE, upon engagement.

Participants and Setting

Participants in this study were 41 students in grades 4 and 5 in mainstream classrooms from a mid-sized county school system in the Mid-Atlantic region of the United States. The county consists of a mix of suburban, rural, and mid-sized urban development. Racial breakdown of the district is as follows: White: 63.5%, Hispanic/Latino: 14.3%, Black: 11.4%, Asian: 5.2%, 2 or more races: 4.9%, American Indian/Alaskan Native: 0.5%, Pacific Islander/Native Hawaiian: .02%. The district high school graduation rate is 93.5%, which is about 6% higher than the state average high school graduation rate. Approximately 20% of the district's elementary schools are eligible for schoolwide Title 1 programming, while another 8% are eligible for targeted Title 1 programming.

School selection was dependent upon building administrators' availability and willingness for participation. Teacher participation was also voluntary. University and district IRB approval was secured prior to beginning this study.

Instrumentation

Information for the present study was collected through a student-completed questionnaire and data gathering through central office. Basic psychological need satisfaction and engagement were assessed through the RAPS-SE questionnaire (see Appendix A). Academic achievement was assessed through the Partnership for Readiness for College and

Careers (PARCC) assessment; data from the 2016 PARCC administration was collected from students' records.

RAPS-SE

All students completed the RAPS-SE (Research Assessment Package for Schools, Student Self-Report for Elementary School). It was adapted by Dr. James P. Connell and published by the Institute for Research and Reform in Education, Inc. As described in the assessment manual, it is "a survey given to students to assess their levels of engagement in school [and] their beliefs about themselves" (p. I-2). One of the intended uses of the RAPS-SE is "as a diagnostic instrument that can provide simple, valid and compelling information about the current status of a particular population of students" (p. I-3); this is aligned with the purpose of the present study. The RAPS-SE questionnaire consists of 79 items, assessed on a Likert scale of 1-4, with 1 indicating "Not At All True" and 4 indicating "Very True." Reliability coefficients for the subscales (i.e. engagement, beliefs about self) range from 0.71-0.87. Validity measures were derived from comparing scores on the engagement composite score to student attendance and standardized test scores; phi coefficients for these measures ranged from 0.10 - 0.49.

PARCC

Prior academic achievement was assessed through recording full summative scores from the previous school year on both the ELA and mathematics portions of the PARCC assessment; this information was collected from students' cumulative files. PARCC does not publish a single, composite score, so the full summative scores from each subject test were used to get the best estimation of academic achievement. Each of these scores was used separately as context for how basic psychological needs predict engagement.

Parallel forms reliability for grades 4 and 5 is high. For the ELA test, the average reliability estimate is .90, with a range of .89-.91. For the mathematics test, the average reliability estimate is .94, with a range of .93-.94. When reliability estimates were calculated among subgroups, the coeffients were still strong, although sometimes lower, with .83 reported as the lowest coefficient calculated.

Content validity was assessed through external and internal measurements. External measurements included comparisons to instruction and other assessments. The instruction that served as the basis of comparison was aligned with the Common Core State Standards. Other assessments against which PARCC scores were compared included the SAT, ACT, and National Assessment of Educational Progress (NAEP), Trends in International Mathematics and Science Study (TIMSS), Programme of International Student Assessment (PISA), and Progress in International Reading Literacy Study (PIRLS) tests. Strategies for internal validity assessment were classical item analysis and differential item functioning. Classical item analysis assessed test questions for difficulty, flaws in response options, correlations between individual test items and the whole test, rates of question omission and test incompletion, and distribution of item scores. Differential item functioning checked for differences in responses among subgroups.

Procedures

The researcher visited all 4th and 5th grade classrooms assented to by principals and teachers in order to explain the nature of the research and to supply students with a letter to the parents/guardians. The letter explained the study with a permission form included. All participants completed the RAPS-SE . Achievement data was then collected from the prior school year.

The researcher administered the survey at a time agreeable to the teacher and administration. During administration of the RAPS-SE, all participants were provided with two file folders and paperclips in order to make a "personal office" to minimize social pressure in responses. The time to complete the survey was 50-60 minutes. Each student received a pre-coded survey and kept their signed permission form. Paper clipped to each survey was an index card with the same code written on it, and each participant wrote their name on the card. Each student also received a Child Assent Form that they signed before beginning the survey. At the end of the survey period, the researcher collected all surveys, index cards, signed permission forms, and Child Assent Forms. The index card was temporarily clipped to the Child Assent Form and permission form in order to make the code list. All documents were consequently separated and data was filed according to IRB approval.

Participating students, teachers, and administrators received a small token of appreciation. The researcher then received scores of participants from central office. A database of questionnaire results matched with PARCC scores was made, with a code identifying each student.

Data Analysis

This study used multiple regression to test for the predictive value of prior achievement and basic psychological need satisfaction upon student engagement. A separate regression analysis was run for each PARCC scores to determine how each contributed to engagement alongside satisfaction of the three basic psychological needs.

This was a repeated measures design, with all participants included in each of the analyses. The first measurement assessed the predictive value of the Math PARCC score together with autonomy, competence, and relatedness upon engagement. The second

measurement assessed the predictive value of the ELA PARCC score together with autonomy,

competence, and relatedness upon engagement.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this study was to identify variables that explain student engagement in a way that is applicable to current practices in education. Basic psychological need satisfaction has been linked to engagement in previous research, but the processes behind it are still in need of investigation. This study expands previous research by measuring the impact of basic psychological need satisfaction alongside prior achievement for the purpose of predicting engagement as well as comparing the relative impact of prior achievement and each basic psychological need upon engagement during late elementary school.

Research Questions

RQ1: Does past achievement in Mathematics combined with satisfaction of the basic psychological needs autonomy, competence, and relatedness significantly predict engagement?

RQ2: Does past achievement in Language Arts combined with satisfaction of the basic psychological needs autonomy, competence, and relatedness significantly predict engagement?

Hypotheses

The null hypotheses for this study are:

$H_0 1$: There is no statistically significant predictive value of prior Math achievement as measured by the PARCC Math exam combined with the basic psychological needs of competence, autonomy, and relatedness, as measured by the RAPS-SE, upon engagement.

$H_0 2$: There is no statistically significant predictive value of prior Language Arts achievement as measured by the PARCC ELA exam combined with the basic psychological needs of competence, autonomy, and relatedness, as measured by the RAPS-SE, upon engagement.

Descriptive Statistics

Two types of descriptive data will be described in this section: demographic and statistical summaries. Table 1 displays the demographic data collected. The participants in the present study were disproportionately female and Caucasian compared to the school district in which the participants are enrolled. While a proportional number of Asian students participated, a disproportionately low number of Black students participated, and no Hispanic students participated in the present study. Additionally, the grade levels participating were not evenly split, with 68% of the participants enrolled in 5th grade, and only 32% enrolled in 4th grade. Table 1 illustrates the demographic data of the sample. Within the sample, 5% were Asian, 7% were Black, and 88% were White/Caucasian. Overall, the students in this sample scored higher on both sections of the PARCC exam than the state average.

Table 1
Demographic Data

Demographic	N	Percentage
Total Participants	41	
Gender		
Males	16	39%
Females	25	61%
Grade		
4	13	32%
5	28	68%
Race		
Asian	2	5%
Black/African American	3	7%
White/Caucasian	36	88%
Participants with PARCC Scores	38	
Mathematics Score of 5	4	10%
Mathematics Score of 4	16	42%
Mathematics Score of 3	9	24%
Mathematics Score of 2	8	21%
Mathematics Score of 1	1	3%
ELA Score of 5	3	8%
ELA Score of 4	18	47%
ELA Score of 3	11	29%

ELA Score of 2	2	5%
ELA Score of 1	4	10%

Table 2 provides an illustration of the descriptive statistics for the measures of basic psychological need satisfaction, engagement, and performance on the ELA and mathematics PARCC exams in the present sample. Basic psychological need satisfaction (autonomy, competence, and relatedness) and engagement were measured on a scale with a minimum score of 1 and a maximum score of 4 for each of the constructs. Higher scores indicate better outcomes, that is, higher levels of autonomy, competence, relatedness, and engagement. The ELA and mathematics scores were each measured on a scale of 1-5, with higher scores indicating higher levels of mastery.

Examination of the minimum, maximum, mean, and standard deviation provide specific details of this sample beyond the information available in the demographic data. At least one participant scored at the maximum level for the assessments measuring engagement, autonomy, relatedness, ELA, and Mathematics. Although no participants scored at the maximum level for competence, the maximum score was only 0.025 units away from the maximum. A different story emerges when examining the minimum scores: at least one participant scored at the lowest possible value for ELA and mathematics, but none of the participants scored at the lowest value for any of the basic psychological needs or engagement. The lowest score measuring basic psychological needs was in autonomy, and that was 0.4 units away from the minimum. Scores in competence, relatedness, and engagement were all at least 1.4 units from the lowest possible score. Means in all categories reflect a similar pattern of a tendency toward high scores. The standard deviations for engagement and all basic psychological needs are quite small; this will be discussed in greater detail in Chapter 5 as they apply to the post-hoc analyses.

Table 2
Descriptive Statistics

		Engagement	Competence	Identified Autonomy	Relatedness	ELA	Math
N	Valid	41	41	41	41	38	38
	Missing	0	0	0	0	3	3
Mean		3.56	3.47	3.33	3.32	3.37	3.36
Std. Deviation		.38	.41	.63	.37	1.08	1.02
Minimum		2.500	2.463	1.4	2.48	1.00	1.00
Maximum		4.000	3.975	4.0	4.00	5.00	5.00

Note. Math=Mathematics

Because of the limited amount of extant research on the impact of basic psychological need satisfaction upon engagement during late elementary school, a multiple regression analysis was run to confirm that self-perceptions of autonomy, competence, and relatedness serve as significantly positive predictors of engagement in this age group. As illustrated in Tables 3-5, a significant regression equation was found ($F(3,37)=32.016$, $p = 0.000$) with an R^2 of .722. It was found that identified autonomy ($\beta=0.296$, $p = 0.015$), competence ($\beta=0.458$, $p=0.002$), and relatedness ($\beta=.0278$, $p = 0.013$) all significantly predicted engagement. With 72% of the variance in engagement explained by basic psychological need satisfaction; this model suggests a greater than twofold explanation of variance in engagement by basic psychological needs than other models in the literature.

Table 3
Model Summary Basic Psychological Needs Only

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.850[a]	.722	.699	.205628	.722	32.016	3	37	.000

a. Predictors: (Constant), Rel, IdAut, Comp

Table 4

ANOVA Basic Psychological Needs Only

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.061	3	1.354	32.016	.000[b]
	Residual	1.564	37	.042		
	Total	5.626	40			

a. Dependent Variable: Eng

b. Predictors: (Constant), Rel, IdAut, Comp

Table 5

Coefficients Basic Psychological Needs Only

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.563	.327		1.720	.094
	Comp	.424	.124	.458	3.406	.002
	IdAut	.177	.069	.296	2.562	.015
	Rel	.282	.107	.278	2.624	.013

a. Dependent Variable: Eng

Although basic psychological need satisfaction explains a large amount of the variance in engagement, much is still left to be explained. To that end, the effect of previous achievement was explored. Because the PARCC exams do not yield an overall composite score, but instead report an overall score in each ELA and Mathematics, separate analyses were run for each set of scores.

Results

The data for the present study was analyzed in SPSS. Measures of skewness and kurtosis fall within acceptable ranges for each construct, with autonomy, competence, relatedness, ELA, and mathematics scores not exceeding +/-1 in either skewness nor kurtosis, and engagement not exceeding +/-2 in skewness nor kurtosis (see Table 6). The Mahalanobis test was also run for

each of the moderation analyses, with all values <13.82, indicating that removal for outliers was

not needed. Finally, Pearson correlation coefficients run for the independent variables (Table 7)

indicate the data is free of collinearity issues, with all coefficients < 0.4.

Table 6
Tests of Assumption

	Engagement	Competence	Identified Autonomy	Relatedness	ELA	Math
Skewness	-1.052	-.875	-.991	-.245	-.945	-.340
Std. Error of Skewness	.369	.369	.369	.369	.383	.383
Kurtosis	.352	-.074	.798	-.624	.468	-.647
Std. Error of Kurtosis	.724	.724	.724	.724	.750	.750

Note. Math=Mathematics

Table 7
Tests of Collinearity

Pearson Correlation Coefficients	ELA	Mathematics
Competence	.269	.341
Identified Autonomy	.231	.300
Relatedness	.027	.275

Hypothesis 1

H_{01}: There is no statistically significant predictive value of prior Math achievement as

measured by the PARCC Math exam combined with the basic psychological needs of autonomy,

competence and relatedness, as measured by the RAPS-SE, upon engagement.

The overall model of Math achievement, autonomy, competence, and relatedness as

predictors of engagement yielded a significant regression equation ($F(4,33)=36.44$, $p=0.000$),

with an adjusted R^2 value of 0.793, $p = 0.000$. Because $p < 0.05$, H_01 is rejected. In this model,

competence yielded the highest Beta coefficient, of 0.742 ($p = 0.000$), and was the only

statistically significant predictor variable. Beta values for the other predictor variables were

0.147 (p = 0.160) for relatedness, 0.092 (p = 0.256) for prior math achievement, and 0.024

(p=0.827) for autonomy.

Table 8
Model Summary Hypothesis H_01

				Std. Error	Change Statistics				
Model	R	R Square	Adjusted R Square	of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.903[a]	.815	.793	.168526	.815	36.444	4	33	.000

a. Predictors: (Constant), Math, Rel, IdAut, Comp

Table 9
ANOVA Hypothesis H_01

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.140	4	1.035	36.444	.000[b]
	Residual	.937	33	.028		
	Total	5.077	37			

a. Dependent Variable: Eng

b. Predictors: (Constant), Math, Rel, IdAut, Comp

Table 10
Coefficients Hypothesis H_01

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.605	.275		2.202	.035
	Comp	.664	.119	.742	5.588	.000
	IdAut	.016	.075	.024	.220	.827
	Rel	.155	.108	.147	1.439	.160
	Math	.033	.029	.092	1.155	.256

a. Dependent Variable: Eng

Hypothesis 2

H_02: There is no statistically significant predictive value of prior Language Arts

achievement as measured by the PARCC ELA exam combined with the basic psychological

needs of autonomy, competence, and relatedness, as measured by the RAPS-SE, upon

engagement.

The overall regression model of Language Arts achievement, competence, autonomy, and

relatedness as predictors of engagement yielded a statistically significant regression equation

$(F(4, 33)$ 34.712, p=0.000) with an adjusted R2 value of 0.7895, $p = 0.000$. Because $p < 0.05$,

H_02 is rejected. In this model, competence yielded the highest Beta coefficient, of 0.759 ($p =$

0.000) and was again the only significant predictor variable. Beta values for the remaining

predictor variables were 0.156 ($p = 0.152$) for relatedness, 0.034 ($p = 0.766$) for autonomy, and

0.005 ($p = 0.949$) for Language Arts achievement.

Table 11
Model Summary Hypothesis H_02

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.899[a]	.808	.785	.171890	.808	34.712	4	33	.000

a. Predictors: (Constant), ELA, Rel, IdAut, Comp

Table 12
ANOVA Hypothesis H_02

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.102	4	1.026	34.712	.000[b]
	Residual	.975	33	.030		
	Total	5.077	37			

a. Dependent Variable: Eng
b. Predictors: (Constant), ELA, Rel, IdAut, Comp

Table 13
Coefficients Hypothesis H_02

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.606	.287		2.113	.042
	Comp	.679	.124	.759	5.474	.000
	IdAut	.023	.076	.034	.300	.766
	Rel	.165	.113	.156	1.466	.152
	ELA	.002	.028	.005	.065	.949

a. Dependent Variable: Eng

Post-Hoc Analyses

In addition to statistically significant regression equations that resulted in both of the null hypotheses being rejected, several points of data arose that deserve attention because of the patterns they exhibit. A series of post-hoc analyses were run to further explore the data from Hodge, Lonsdale, & Jackson's (2009) study that suggests relatedness matters more for promoting engagement among individuals who have experienced less success in the past than for individuals who have experienced greater success (Hodge, Lonsdale, & Jackson, 2009). While the proceeding data does not bear statistical significance for the present study, it offers information that may provide fertile ground for future research by assessing the potential moderating impact of prior achievement upon the relationship between basic psychological need satisfaction and engagement. Four categories of data will be presented in this section: 1) a summary of the data yielded from Johnson-Neyman technique (Hayes, 2013) of the predictive value of each basic psychological need upon engagement across values of prior achievement, 2) a summary of the effect sizes for each of the categories in this study, 3) gender differences, and 4) a comparison of the relative contributions of each basic psychological need towards engagement across achievement levels.

Johnson-Neyman technique summary. The Johnson-Neyman technique provides a detailed report of the precise levels of a moderator variable at which at impact of basic psychological need satisfaction is a significant predictor of engagement (Hayes, 2013). Table 14 displays a summary of these analyses, organized according to basic psychological need and area of prior achievement. For these analyses, prior achievement was measured as a moderator variable. It suggests a pattern of different relative importance of each basic psychological need according achievement level. Feelings of competence and relatedness are significant predictors of engagement at the lowest levels of achievement, while autonomy is not. All three basic psychological needs significantly predict engagement in the middle ranges of achievement. Finally, competence is the only basic psychological need that significantly predicts engagement at the highest level of achievement.

Table 14
Summary of Johnson-Nayman Technique Analyses

Autonomy	
ELA	Insignificant effect sizes of autonomy on engagement for the top 8% of ELA scores and the bottom 11% of ELA scores.
Mathematics	Insignificant effect sizes of autonomy on engagement for the top 11% of mathematics scores and the bottom 3% of mathematics scores.
Competence	
ELA	Significant at all levels
Mathematics	Significant at all levels
Relatedness	
ELA	Insignificant for the top 8% of ELA scores, but significant for all others.
Mathematics	Insignificant for the top 11% of scorers, but significant for all others.

Effect size summary. Table 15 presents an overall picture of effect sizes across basic psychological needs and achievement area based on the results of measuring prior achievement as a moderator of each basic psychological need as they predict engagement. This moderation analysis was conducted using the PROCESS plug-in for SPSS (Hayes, 2016), with a bootstrap value of 5000. It is notable that effect sizes change indirectly with achievement level across all

basic psychological needs and across both subject areas. Implications for this table will be discussed in Chapter 5. Additionally, effect sizes are significant at 94% of the groups included in this table. Although the differences in effect sizes did not meet statistical significance levels, it is worth noting that the effect size of the predictive value of each basic psychological need increased as prior achievement decreased in both subject areas although the scores on the subject areas were only correlated at r=0.584 (p<.01).

Table 15
Effect Sizes for Each Basic Psychological Need Across Achievement Levels – Full Sample

BPN	Achievement Level	ELA	Mathematics
Autonomy	High	.4029*	.3851
	Average	.4407*	.4079*
	Low	.4785*	.4308*
Competence	High	.7324*	.6962*
	Average	.7882*	.7499*
	Low	.8440*	.8036*
Relatedness	High	.5266*	.4964*
	Average	.6911*	.6827*
	Low	.8556*	.8691*

*p<.05

Gender differences. The effect of gender upon the predictive values of prior achievement and basic psychological need satisfaction was assessed by adding gender as a variable to the regression equations and with the PROCESS plug-in for SPSS (Hayes, 2016). No significant effects for gender were found when added to the regression analyses. However, when the moderation effects of prior engagement were analyzed separately for each gender, significant effect sizes were found in over 70% of the sections analyzed (see Tables 16 & 17) and different patterns of effect sizes in the context of prior achievement were observed according to gender.

Table 16
Effect Sizes for Each Basic Psychological Need Across Achievement Levels – Girls Only

BPN	Achievement Level	ELA	Mathematics
Autonomy	High	.5228*	.5107
	Average	.4615*	.4654*
	Low	.4002*	.4202*
Competence	High	.8219*	.7429*
	Average	.7481*	.7375*
	Low	.6743*	.7321*
Relatedness	High	.5082	.4861
	Average	.5707*	.5263*
	Low	.6331*	.5665*

*p<.05

Table 17
Effect Sizes for Each Basic Psychological Need Across Achievement Levels – Boys Only

BPN	Achievement Level	ELA	Mathematics
Autonomy	High	.2505	.2892
	Average	.6082*	.5624*
	Low	.9659*	.8356
Competence	High	.6574*	.7426
	Average	.8151*	.7859*
	Low	.9729*	.8291*
Relatedness	High	.6387	.7196
	Average	1.0104*	.9970*
	Low	1.3821*	1.2744

*p<.05

Comparison of effect sizes across achievement levels. In addition to an inverse trend of effect sizes, a comparison of the relative importance of each basic psychological need was measured at each achievement level. These measurements were run for the whole sample, and then separate analyses were run for boys and girls.

Competence and relatedness yielded the highest effect sizes (see Table 15). At high and average achievement levels, competence yielded the largest effect size, followed by relatedness

and then autonomy for both achievement areas. At low achievement levels, the effect size for relatedness was the largest, followed by competence, and then autonomy.

For girls, the effect sizes for each basic psychological need across achievement levels exhibited different patterns compared to the whole sample (see Table 16). At high levels of achievement, competence yielded the highest effect sizes, followed by autonomy and then relatedness. At average and low levels of achievement, competence again yielded the largest effect sizes, followed by relatedness, and then autonomy.

Among boys (see Table 17), high and average levels of achievement yielded the largest effect size for competence, followed by relatedness, and then autonomy. Low achievement yielded relatedness with the largest effect size, and competence and autonomy sharing similar effect sizes afterward.

CHAPTER FIVE: CONCLUSIONS

Overview

Basic research on the topic of student engagement is plentiful, but a great need exists for applied research on the topic (Eccles, 2016; Turner, 2010). Therefore, the goal of the present study was to help fill that need. To the best of the researcher's knowledge, this is the only study that has examined all three basic psychological needs as they contribute to engagement in the context of previous academic achievement during late elementary school. In fact, only one other study was found that measured all three basic psychological needs as they contribute to student engagement (Raufelder, et al., 2014) and one other study has examined the impact of prior success on how well basic psychological need satisfaction contributes to engagement (Hodge, Lonsdale, & Jackson, 2009). The results about the relative contribution of each basic psychological need in general, and in the context of prior achievement, were somewhat consistent with the results found by Raufelder, et al. (2014) and Hodge, Lonsdale, & Jackson (2009), but the inconsistencies also warrant further discussion. Raufelder, et al. (2014) and Hodge, Lonsdale, & Jackson (2009) each approached the investigation about the impact of basic psychological needs upon engagement in different ways from each other and from this study. A discussion about how the present study fits with the present body of literature, implications of the present study, limitations of the present study, and recommendations for future research follow.

Discussion

The purpose of this study was to identify variables that contribute to student engagement. This is very much a fledgling area of research, but as the idea of personalized learning is gaining traction, research on how to improve student engagement is a timely goal to pursue (Rutledge, Cohen-Vogel, Osborne-Lampkin, & Roberts, 2015). Through better understanding about the

ways in which past experiences influence how each of the basic psychological needs impact student engagement, research in this area may help to improve student experiences in school.

Understanding how to keep students engaged in school is important, because engagement is associated with a variety of positive outcomes (Fredricks, Blumenfeld, & Paris, 2004; Klem & Connell, 2004; Skinner, et al., 2008; Lewis, et al., 2011; Reschly, et. al,, 2008; Wang & Fredricks, 2014) and is a reportable measure of school effectiveness (U.S. Congress, 2015). Because engagement is considered closely related to motivation, variables associated with motivation were used to create this study. Specifically, Self-Determination Theory was chosen as the theory on which to build this study because of its history of affiliation with Connell & Wellborn's (1991) work on understanding the impact of autonomy, competence, and relatedness on school engagement. Because the basic psychological needs identified in Self-Determination Theory are autonomy, competence, and relatedness, they were the variables chosen for this study for their predictive value upon engagement. Previous research has indicated that although basic psychological need satisfaction is important for motivation and engagement, it does not explain all of it, and appears to have different levels of contribution in different contexts (Hodge, Lonsdale, & Jackson, 2009; Raufelder, et al., 2014).

Given all of these circumstances, the present study was designed to assess for the combined predictive values of basic psychological need satisfaction and prior achievement. The variable identified as potentially impacting the predictive value of basic psychological need satisfaction upon engagement was derived from Effectance Theory (White, 1959). Effectance Theory emphasized the value of preexisting levels of competence. When considering competence from the perspective a student engagement, it makes sense to search for a variable that can stand as a proxy for preexisting competence. Additionally, a reciprocal interaction

between engagement and achievement has been suggested in the literature (Hughes, Luo, Kwok, & Loyd, 2008; Van Ryzin, 2011), so it followed to check for the predictive value of prior achievement upon later engagement. In this case, the variable chosen for measuring achievement was standardized test scores from the previous school year.

Raufelder et al. (2014) presented solid data on the impact of basic psychological need satisfaction upon engagement. In contrast to the present study, Raufelder et al. (2014) measured behavioral engagement and emotional engagement separately, which may have resulted in lower predictive values for each of the basic psychological needs than the values calculated in the present study, because the present study measured engagement as a unified whole. In both Raufelder, et al. (2014) and the present study, competence was generally the best predictor of engagement. While the results from Raufelder et al. (2014) suggested that autonomy and relatedness appear to carry greater weight in certain contexts more than others, the present study offered some clarity to that issue. The present study suggests that autonomy may better predict engagement in girls as prior achievement increases. Conversely, autonomy may better predict engagement in boys as prior achievement decreases. The present study also demonstrated that relatedness appears to have greater influence upon engagement in the context of lower prior achievement for both genders, with more dramatic effects for boys. Autonomy and relatedness as impacted by gender and prior achievement are in substantial need of further research, because although the patterns were consistent across achievement levels, many of the correlations on these measurements did not yield significant results.

Hodge, Lonsdale, & Jackson's (2009) study provided the "spark" for the present research because of the differential impact of each basic psychological need among elite young adult athletes. Since only competence and autonomy significantly predicted engagement in the Hodge,

Lonsdale, & Jackson (2009) study, it raised questions about the impact of the athletes' elite level of performance and subsequent meaning for the predictive value of competence and autonomy over relatedness. The results from the present study were consistent with Hodge, Lonsdale, & Jackson's (2009) study in that relatedness mattered less in circumstances of higher prior achievement. It is interesting that these results were consistent with different age groups (adults vs. children), different activities (sport vs. school), and different countries (Canada vs. USA). Additional research on this topic would be beneficial for the purpose of confirming if these two studies are indeed accurate reflections of human functioning.

For purposes of assessing basic psychological need satisfaction and engagement, the RAPS-SE was administered to 41 4th and 5th grade students, but data from only 38 of these students were able to be included in these analyses because 3 of the students did not have PARCC scores from the 2016-2017 school year. Test scores from the 2016-2017 school year were documented through the PARCC ELA and Mathematics assessments. Data analysis on the whole group yielded statistically significant results for each of the hypotheses In addition to the significant regression equations, several patterns arose that are deserving of attention. First, when looking at the whole group, and comparing the effect sizes of each basic psychological need in each subject area for the purpose of predicting engagement, the effect sizes for each of the basic psychological needs increased as prior achievement decreased. Second, this same pattern occurred when only boys scores were measured, while some of the patterns were revered for girls. Third, the results of the Johnson-Neyman technique suggest that differences in the impact of basic psychological need satisfaction as they predict engagement exist to varying degrees according to prior achievement levels. As Hayes (2013) explained, it is advantageous to use the Johnson-Neyman technique in order to check for detailed moderation patterns within the

data. Because the Johnson-Neyman technique yielded consistent patterns within the sample for the present study, it suggests that further investigation of this topic could be fruitful.

The patterns in the present study differ from the data in previously published studies (Hodge, Lonsdale, & Jackson, 2009; Miner, Dowson, & Malone, 2013; Shernoff, Kelly, Tonks, Anderson, Cavanaugh, Sinha, et al., 2016). For example, Hodge, Lonsdale, & Jackson's (2009) findings suggest that autonomy and competence matter more than relatedness in the context of high prior success; the present study's findings suggested that relatedness matters across achievement levels, and that relatedness appears to play a larger role as prior achievement decreases, for boys in particular. Given the difference in the measured impact of relatedness between these two studies and the large amount of variance in engagement explained by basic psychological need satisfaction in the present study, additional work is needed for better understanding the impact of basic psychological need satisfaction for this age group. Especially because this study examined outcomes during late elementary school, where little previous research exists and is the age group, which is known as the stage of life right before motivation tends to quickly decline (Gottfried, Fleming, & Gottfried, 2001; Klem & Connell, 2004; Midgley, Feldlaufer, & Eccles, 1989; Wylie & Hodgen, 2012), additional research on this level of development is needed in order to draw strong conclusions about how to help children at this age engage in their own education. The difference in the impact of relatedness between this study and Hodge, Lonsdale, & Jackson's (2009) study may also be a result of age differences, and warrants further investigation.

Implications

With 72% of the variance in engagement explained exclusively by basic psychological need satisfaction in this study, and 79% of the variance in engagement was explained by the

combined contributions of basic psychological need satisfaction and prior achievement, more than twice the variance was explained with this sample than in other samples in the literature. Knowing that the combination of all three basic psychological needs significantly contributed to a moderate-strong level of engagement, and that autonomy, competence, and relatedness have been shown to be amendable to intervention (Florez, 2011; Seeley & Gardner, 2003; Zhang, Fang, Wei, & Huaping, 2010), continued study in this area is warranted. The statistical significance of this particular finding combined with the amount of variance explained provides a strong argument for looking more closely at strategies to improve basic psychological need satisfaction. The 79% of variance in engagement that was explained once prior achievement was added creates an additional argument about the importance of school readiness and early success.

One finding in this study that is consistent is prior research is that relatedness matters more for promoting engagement in the context of lower past success than in circumstances of average or high levels of success (Hodge, Lonsdale, & Jackson, 2009). This finding appears more salient for boys than for girls, but more research is needed to confirm this gender difference. Establishing a greater understanding about how to prioritize interventions in order to maximize engagement is especially important in the school context since achievement tends to occur in upward and downward spirals (Cohen, Garcia, Apfel, & Master, 2009; Goldberg, 1994; Hall, 2007; Lackaye & Margalit, 2006; Lemos, Abad, Almeida, & Colom, 2014). Creating solid intervention plans based on basic psychological need satisfaction could help reverse the downward spirals. Because relatedness appears to have the greatest potential for remedying low achievement patterns, schools, and the education community at large should consider how to strengthen relationships between students and staff members and focus on ways to equip students

with relational skills so they take a more active role in strengthening relationships not only with adults in the school building, but with peers and adults outside of school as well.

Limitations

Several factors likely influenced the outcome of the present study. First, the sample size was rather small as a whole and particularly for assessing subgroups. Secondly, the method for recruitment likely yielded participants who scored higher on engagement and relatedness than the general population. The reason for making this suggestion about higher engagement is because students were requested to take the permission form home and bring it back completed if their parents granted permission to participate – this led to a bias in favor of students who already tend to engage in school activities and were present at school for the recruitment presentation. Similarly, the participants in this study may have scored higher on relatedness than the general population because teachers chose to allow their classes to participate and parents allowed their children to participate with the knowledge that the survey would ask questions relevant to the relationships participants have with adults. Correspondingly, the values for engagement and relatedness were rather high, with engagement M=3.56, SD=0.38 and relatedness M=3.32, SD=0.37. The values for both of these constructs appear high for a scale that ranges from 1-4.

Some idiosyncrasies occurred during test administration that may have impacted outcomes. During the course of survey administration, many students expressed confusion about the negative orientation of many of the questions. Additionally, Question 29, "I can get my teacher to like me," caused a particular amount of confusion, in that many students couldn't understand why they would need to get their teacher to like them, since the teacher "already" or "automatically" likes them. Finally, at least one of surveys was completed without attending to

at least some of the questions, as the student created one page-long oval to encompass all of the "B" answers on the page; in a bit of irony remarkably befitting a study on the impact of autonomy upon engagement, the child explained that participation was only occurring in order to get the token of appreciation.

RAPS-SE creates the relatedness scores from a combination of questions about relationships with parents, teachers, and peers across settings. For purposes of assessing school engagement, it would be useful to have a tool that assess relatedness specifically within the school setting and offers different scores for relationships with peers and faculty members.

Demographically, the present sample was not representative of the population by gender or race. Future research should pursue larger sample sizes, and pursue foci on subgroups such as gender, race, prior achievement, and economic status. Especially since previous research has indicated that students who belong to racial minority groups often experiences greater challenges with satisfying their need for relatedness as a result of subtle messages of exclusion (Schmader, Johns, & Forbes, 2008), further investigation similar to the present study with a special emphasis on students who belong to racial minority groups would be helpful. The findings of the present study suggest that a good place to continue research would be on the value of various types of relationships with boys who are struggling academically.

Recommendations for Future Research

The recommendations for future research focus on the areas of gender differences, race, academic risk, the late elementary population, more specific assessments of relatedness, and longitudinal investigations:

1. Further investigation into the differential impact of basic psychological need satisfaction in the context of prior achievement between boys and girls. The results of

the present study indicated that gender may play a substantial role in the moderating impact of prior achievement as it impacts the relationship between basic psychological need satisfaction and engagement. More thorough understanding of how gender impacts these relationships would help educators better tailor interventions to student needs.

2. Further investigation of this topic across races.

3. Further investigation of the impact of low prior achievement as a moderator of basic psychological need satisfaction upon engagement. The present sample consisted of participants with higher scores than the state average. Given that some of the basic psychological needs appear to have more significant effects at lower levels of achievement, it is important to look further into the impacts of basic psychological need satisfaction among students who exhibit lower levels of past achievement.

4. Continued research on the impact of basic psychological need satisfaction during late elementary school.

5. Examining the differences in the impact of parent, teacher, and peer relationships upon engagement. The present study assessed relatedness as a conglomerate of parent, teacher, and peer relationships, but gaining more detailed knowledge about how particular relationships contribute to student success will also help guide educators in establishing more effective plans, especially for intervening in low-achievement situations.

6. Longitudinal studies of the impact of basic psychological need satisfaction and long-term engagement are needed.

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Appendix A

Tables

Table 1
Demographic Data

Demographic	N	Percentage
Total Participants	41	
Gender		
Males	16	39%
Females	25	61%
Grade		
4	13	32%
5	28	68%
Race		
Asian	2	5%
Black/African American	3	7%
White/Caucasian	36	88%
Participants with PARCC Scores	38	
Mathematics Score of 5	4	10%
Mathematics Score of 4	16	42%
Mathematics Score of 3	9	24%
Mathematics Score of 2	8	21%
Mathematics Score of 1	1	3%
ELA Score of 5	3	8%
ELA Score of 4	18	47%
ELA Score of 3	11	29%
ELA Score of 2	2	5%
ELA Score of 1	4	10%

Table 2
Descriptive Statistics

		Engagement	Competence	Identified Autonomy	Relatedness	ELA	Math
N	Valid	41	41	41	41	38	38
	Missing	0	0	0	0	3	3
Mean		3.56	3.47	3.33	3.32	3.37	3.36
Std. Deviation		.38	.41	.63	.37	1.08	1.02
Minimum		2.500	2.463	1.4	2.48	1.00	1.00
Maximum		4.000	3.975	4.0	4.00	5.00	5.00

Note. Math=Mathematics

Table 3
Model Summary Basic Psychological Needs Only

				Std. Error	Change Statistics				
Model	R	R Square	Adjusted R Square	of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.850[a]	.722	.699	.205628	.722	32.016	3	37	.000

a. Predictors: (Constant), Rel, IdAut, Comp

Table 4
ANOVA Basic Psychological Needs Only

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.061	3	1.354	32.016	.000[b]
	Residual	1.564	37	.042		
	Total	5.626	40			

a. Dependent Variable: Eng

b. Predictors: (Constant), Rel, IdAut, Comp

Table 5

Coefficients Basic Psychological Needs Only

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.563	.327		1.720	.094
	Comp	.424	.124	.458	3.406	.002
	IdAut	.177	.069	.296	2.562	.015
	Rel	.282	.107	.278	2.624	.013

a. Dependent Variable: Eng

Table 6

Tests of Assumption

	Engagement	Competence	Identified Autonomy	Relatedness	ELA	Math
Skewness	-1.052	-.875	-.991	-.245	-.945	-.340
Std. Error of Skewness	.369	.369	.369	.369	.383	.383
Kurtosis	.352	-.074	.798	-.624	.468	-.647
Std. Error of Kurtosis	.724	.724	.724	.724	.750	.750

Note. Math=Mathematics

Table 7

Tests of Collinearity

Pearson Correlation Coefficients	ELA	Mathematics
Competence	.269	.341
Identified Autonomy	.231	.300
Relatedness	.027	.275

Table 8
Model Summary Hypothesis $H_0 1$

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.903[a]	.815	.793	.168526	.815	36.444	4	33	.000

a. Predictors: (Constant), Math, Rel, IdAut, Comp

Table 9
ANOVA Hypothesis $H_0 1$

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.140	4	1.035	36.444	.000[b]
	Residual	.937	33	.028		
	Total	5.077	37			

a. Dependent Variable: Eng
b. Predictors: (Constant), Math, Rel, IdAut, Comp

Table 10
Coefficients Hypothesis $H_0 1$

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.605	.275		2.202	.035
	Comp	.664	.119	.742	5.588	.000
	IdAut	.016	.075	.024	.220	.827
	Rel	.155	.108	.147	1.439	.160
	Math	.033	.029	.092	1.155	.256

a. Dependent Variable: Eng

Table 11
Model Summary Hypothesis H$_0$2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.899[a]	.808	.785	.171890	.808	34.712	4	33	.000

a. Predictors: (Constant), ELA, Rel, IdAut, Comp

Table 12
ANOVA Hypothesis H$_0$2

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.102	4	1.026	34.712	.000[b]
	Residual	.975	33	.030		
	Total	5.077	37			

a. Dependent Variable: Eng
b. Predictors: (Constant), ELA, Rel, IdAut, Comp

Table 13
Coefficients Hypothesis H$_0$2

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.606	.287		2.113	.042
	Comp	.679	.124	.759	5.474	.000
	IdAut	.023	.076	.034	.300	.766
	Rel	.165	.113	.156	1.466	.152
	ELA	.002	.028	.005	.065	.949

a. Dependent Variable: Eng

Table 14

Summary of Johnson-Nayman Technique Analyses

Autonomy	
ELA	Insignificant effect sizes of autonomy on engagement for the top 8% of ELA scores and the bottom 11% of ELA scores.
Mathematics	Insignificant effect sizes of autonomy on engagement for the top 11% of mathematics scores and the bottom 3% of mathematics scores.
Competence	
ELA	Significant at all levels
Mathematics	Significant at all levels
Relatedness	
ELA	Insignificant for the top 8% of ELA scores, but significant for all others.
Mathematics	Insignificant for the top 11% of scorers, but significant for all others.

Table 15

Effect Sizes for Each Basic Psychological Need Across Achievement Levels – Full Sample

BPN	Achievement Level	ELA	Mathematics
Autonomy	High	.4029*	.3851
	Average	.4407*	.4079*
	Low	.4785*	.4308*
Competence	High	.7324*	.6962*
	Average	.7882*	.7499*
	Low	.8440*	.8036*
Relatedness	High	.5266*	.4964*
	Average	.6911*	.6827*
	Low	.8556*	.8691*

*p<.05

Table 16

Effect Sizes for Each Basic Psychological Need Across Achievement Levels – Girls Only

BPN	Achievement Level	ELA	Mathematics
Autonomy	High	.5228*	.5107
	Average	.4615*	.4654*
	Low	.4002*	.4202*
Competence	High	.8219*	.7429*
	Average	.7481*	.7375*
	Low	.6743*	.7321*
Relatedness	High	.5082	.4861
	Average	.5707*	.5263*
	Low	.6331*	.5665*

*p<.05

Table 17

Effect Sizes for Each Basic Psychological Need Across Achievement Levels – Boys Only

BPN	Achievement Level	ELA	Mathematics
Autonomy	High	.2505	.2892
	Average	.6082*	.5624*
	Low	.9659*	.8356
Competence	High	.6574*	.7426
	Average	.8151*	.7859*
	Low	.9729*	.8291*
Relatedness	High	.6387	.7196
	Average	1.0104*	.9970*
	Low	1.3821*	1.2744

*p<.05

Appendix B

IRB Documents

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

April 6, 2017

Christine Akagi
IRB Approval 2807.040617: Student Engagement: An Assessment of Motivation Processes during Late Elementary School

Dear Christine Akagi,

We are pleased to inform you that your study has been approved by the Liberty University 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.

Your IRB-approved, stamped consent form is also attached. This form should be copied and used to gain the consent of your research participants. If you plan to provide your consent information electronically, the contents of the attached consent document should be made available without alteration.

Please retain this letter for your records. Also, if you are conducting research as part of the requirements for a master's thesis or doctoral dissertation, this approval letter should be included as an appendix to your completed thesis or dissertation.

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

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PARENT/GUARDIAN CONSENT FORM
Student Engagement: An Assessment of Motivation Processes during Late Elementary School
Christine Akagi
Liberty University
School of Education

Your child is invited to be in a research study of student engagement during elementary school. All 4th and 5th grade students in ▮▮▮▮ were selected as possible participants because they fit the age range for this study and participated in the PARCC assessment during the 2015-2016 school year. Please read this form and ask any questions you may have before agreeing to allow your child to be in the study.

Christine Akagi, a doctoral candidate at Liberty University and ▮▮▮▮▮▮▮▮▮▮▮▮ is conducting this study.

Background Information: The purpose of this study is better understand how children engage during late elementary school by investigating the motivation processes of self-perceived competence, autonomy, and relationships combined with prior academic achievement impact engagement.

Procedures: If you agree to allow your child to be in this study, I will review his or her PARCC scores from the 2015-2016 school year and would ask him or her to do the following:

- Complete the RAPS-SE survey. This may take up to one hour away from class. Survey items are answered by circling "Very True," "Sort of True." "Not Very True," or "Not at all True." Sample items include "I have to be lucky to do well in school," "Trying hard is the best way to do well in school," "My teacher cares about how I do in school," "My parents like to talk to me about school." "I do my homework because I want to understand the subject," and "I work on my classwork because it's fun." The full RAPS-SE survey is available for parent preview upon request.

Risks and Benefits of being in the Study: The risks involved in this study are minimal, which means they are equal to the risks your child would encounter in everyday life.

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include helping educators better understand how to help strengthen student engagement, which is very important because it helps children reap greater benefits from their education.

Compensation: Your child will be compensated for participating in this study with a small token of appreciation such as a pencil, pencil grip, or other similar item.

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. I may share the data I collect from your child for use in future research studies or with other researchers; if I share the data that I collect about your child, I will remove any information that could identify him or her, if applicable, before I share the data.

- Participants will have a "personal office" made out of 2 file folders and 2 paper clips for privacy while completing the survey.
- Instead of writing their name on the survey, each child will write his or her name on a numbered index card, and the number on the index card will be written on the survey instead of the child's name.

- The researcher will create a code list matching the numbers on the survey with participants' names for the purpose of matching survey responses with PARCC scores.
- All information will be kept in a locked cabinet, only accessible by the researcher. Note: Per federal regulations, data must be retained for three years upon completion of the study. After that point, all data will be shredded.

Voluntary Nature of the Study: Participation in this study is completely voluntary. Your decision whether or not to allow your child to participate will not affect his or her current or future relations with Liberty University or ███████. If you decide to allow your child to participate, he or she is free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study: If your child chooses to withdraw from the study, you or your child should contact the researcher at the email address/phone number included in the next paragraph. Should your child choose to withdraw, data collected from him or her will be destroyed immediately and will not be included in this study.

Contacts and Questions: The researcher conducting this study is Christine Akagi. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at ███████ or ███████████. You may also contact the researcher's faculty advisor, ████████████ at ████████████.

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, Green Hall 1887, Lynchburg, VA 24515 or email at ███████████.

Please notify the researcher if you would like a copy of this information 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 allow my child to participate in the study.

(NOTE: DO NOT AGREE TO ALLOW YOUR CHILD TO PARTICIPATE UNLESS IRB APPROVAL
INFORMATION WITH CURRENT DATES HAS BEEN
ADDED TO THIS DOCUMENT.)

_____

Name of Child

_____

Signature of Parent   Date

_____

Signature of Investigator   Date

ASSENT OF CHILD TO PARTICIPATE IN A RESEARCH STUDY

Mrs. Akagi, an ███████████████████ is conducting a study called Student Engagement: An Assessment of Motivation Processes during Late Elementary School. For this project, she's also sometimes called 'the researcher.'

She is doing the study in order to learn more about how to help kids enjoy school and do well. By being in this study, you will be helping teachers and other educators learn more about how to help kids do their very best.

Why are we asking you to be in this study?
You are being asked to be in this research study because information that you share will help educators better understand how to help kids learn.

If you agree, what will happen?
If you are in this study, you will complete a survey that asks about your thoughts and feelings. Mrs. Akagi will guide you through it.

Do you have to be in this study?
No, you do not have to be in this study. If you want to be in this study, then tell the researcher. If you don't want to, it's OK to say no. The researcher will not be angry. You can say yes now and change your mind later. It's up to you.

Do you have any questions?
You can ask questions any time. You can ask now. You can ask later. You can talk to the researcher. If you do not understand something, please ask the researcher to explain it to you again.

Signing your name below means that you want to be in the study.

_____   _____
Signature of Child   Date

Researcher Contact information:
Christine Akagi

███████████████████████

Faculty Advisor:
Dr. Chris Taylor

██████████████████

Liberty University Institutional Review Board,
1971 University Blvd, Green Hall 1887, Lynchburg, VA 24515
or email at ████████████.