

**The Will to Do Well:**

Conceptualizing student motivation in adolescence through the frameworks of  
social cognitive theory and self-determination theory

A thesis submitted by

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in partial fulfillment of the requirements for the degree of

Master of Arts

in

Child Study and Human Development

Tufts University

May 2019

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**Abstract**

This paper explores the relation between motivation and academic achievement among middle school and high school students in the United States. In particular, I compare the predictive utility of motivation; as conceptualized by two process theories: social cognitive theory and self-determination theory. Given that motivation is a key component of academic success, the goal of this study is to provide a clearer understanding of student motivation and clarify which theory better accounts for academic success among a nationally representative sample of 8<sup>th</sup> and 10<sup>th</sup> grade students. I found that the model of motivation based on social cognitive theory better accounted for achievement in the 10<sup>th</sup> grade cohort, whereas the model of motivation based on self-determination theory better explained academic achievement for the 8<sup>th</sup> grade cohort. Accordingly, these findings, may be useful in designing interventions aimed at cultivating and sustaining motivation in adolescence, a developmental period in which motivation reaches an all-time low and where the stakes for academic success are at an all-time high.

### **Acknowledgements**

I would like to thank the Eliot-Pearson Department of Child Study and Human Development for the opportunity and privilege to complete my master's studies at Tufts University. I would like to express my gratitude to my primary thesis advisor, Assistant Professor, Sara K. Johnson, Ph.D. of the Eliot-Pearson Department of Child Study and Human Development at Tufts University. Thank you for your valuable insight and thoughtful comments during this research process. I felt supported by your words of encouragement and your guidance helped me consider the results and implications of my research in new and exciting ways. Furthermore, I would like to thank Senior Lecturer, Mary Casey, Ph.D. of the Eliot Pearson Department of Child Study and Human Development at Tufts University, as the second reader of this thesis. In class and during this project, you helped me find the language to tell a meaningful story with my research. Thank you for sharing your passion for research and stories of your own experiences, as they were ultimately the inspiration for this thesis. Also, I would like to acknowledge Erin Seaton, Ed.D. of the Department of Education at Tufts University, for her contributions as my third committee member. You were both a welcomed and critical addition to this project, bringing an interdisciplinary perspective to our team. Thank you for contributing your time and expertise.

**Table of Contents**

ABSTRACT.....	ii
ACKNOWLEDGEMENTS.....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
1. INTRODUCTION.....	1
2. LITERATURE REVIEW.....	2
2.1 Defining Motivation.....	3
2.2 Types of Motivation.....	5
2.2.1 Intrinsic Motivation.....	5
2.2.2 Extrinsic Motivation.....	6
2.2.3 Amotivation.....	9
2.3 Components of Motivation.....	10
2.3.1 Activation.....	10
2.3.2 Persistence.....	11
2.3.3 Intensity.....	12
2.4 Motivation in Education.....	13
2.4.1 Achievement.....	14
2.4.2 Personal Characteristics.....	16
2.5 A Developmental Perspective on Motivation.....	17
2.6 Theories of Motivation.....	19
2.6.1 Social Cognitive Theory (SCT).....	20

2.6.2 Self-Determination Theory (SDT).....	26
2.6.3 SCT and SDT Similarities and Differences .....	30
3. RESEARCH QUESTIONS .....	33
4. METHODS .....	35
4.1 Procedures .....	35
4.2 Measures/Variables .....	37
4.3 Analysis .....	38
5. RESULTS .....	39
5.1 Data Screening .....	39
5.2 Preliminary Analysis .....	40
5.2.1 Social Cognitive Theory (SCT) .....	41
5.2.3 Self-Determination Theory (SDT).....	41
5.3 Primary Analysis.....	42
5.3.1 Multiple Linear Regression Analysis.....	42
5.3.2 SCT Model-8 <sup>th</sup> Grade Population .....	43
5.3.3 SCT Model-10 <sup>th</sup> Grade Population .....	44
5.3.4 SDT Model-8 <sup>th</sup> Grade Population .....	45
5.3.5 SDT Model-10 <sup>th</sup> Grade Population .....	46
5.4 Post Analysis .....	48
5.4.1 Outliers and Influential Cases-SCT-8 <sup>th</sup> Grade Population.....	50
5.4.2 Outliers and Influential Cases-SCT-10 <sup>th</sup> Grade Population.....	51
5.4.3 Outliers and Influential Cases-SDT-8 <sup>th</sup> Grade Population .....	51
5.4.4 Outliers and Influential Cases-SDT-10 <sup>th</sup> Grade Population .....	52

6. DISCUSSION .....	53
6.1 Motivation and Academic Achievement in 8 <sup>th</sup> Graders .....	54
6.2 Motivation and Academic Achievement in 10 <sup>th</sup> Graders .....	59
7. IMPLICATIONS .....	62
7.1 Motivation as a Learned Habit .....	63
7.2 Motivation as a Protective Factor .....	66
8. VALIDITY AND LIMITATIONS .....	67
9. RECOMMENDATIONS AND FUTURE DIRECTIONS .....	69
REFERENCES .....	76
TABLES .....	103
Table 1 .....	103
Table 2 .....	104
Table 3 .....	105
Table 4 .....	106
Table 5 .....	107
Table 6 .....	108
Table 7 .....	109
Table 8 .....	110
FIGURES .....	111
Figure 1. ....	111
Figure 2. ....	112
Figure 3. ....	113

APPENDICES .....	114
Appendix A .....	114
Appendix B.....	117

**List of Tables**

Table 1	Descriptive Statistics for Study Variables (SCT)
Table 2	Descriptive Statistics for Study Variables (SDT)
Table 3	Bivariate Correlational Analysis (SCT)
Table 4	Bivariate Correlational Analysis (SDT)
Table 5	Regression Coefficients (SCT) 8 <sup>th</sup> Grade Population
Table 6	Regression Coefficients (SCT) 10 <sup>th</sup> Grade Population
Table 7	Regression Coefficients (SDT) 8 <sup>th</sup> Grade Population
Table 8	Regression Coefficients (SDT) 10 <sup>th</sup> Grade Population



**List of Figures**

- Figure 1      Theoretical Components of Social Cognitive Theory
- Figure 2      Conceptual Model of Social Cognitive Theory
- Figure 3      Conceptual Model of Self-Determination Theory

## Introduction

Researchers have long been interested in understanding what motivates human behavior. As motivation is a universal component of the human experience, the implications for understanding this concept are significant. Motivation has been examined using biological, social, cognitive, and eclectic/integrated lenses (Freud, 1927; Hull, 1935, 1943; Maslow, 1943; Deci & Ryan, 1985; Locke & Latham, 1990a; Bandura, 1977). Motivation has received particular attention in the fields of psychology, sociology, and economics (Kusurkar, Croiset, Mann, Custers, & Ten Cate, 2012). Conceptually motivation has been operationalized via a host of individual psychological processes including social cognition (Riley, 2016), self-determination (Deci & Ryan, 1985; Vallerand, Fortier, & Guay, 1997), inhibition (Reeve, 2015), regulation (Vancouver, 2008), goal-setting (Locke & Latham, 2013; Schunk, 1990; Sheldon & Cooper, 2008), and self-efficacy (Bandura, 1977; Pajares & Graham, 1999; Sullivan, O'Connor, & Burris, 2006). Additionally, motivation is addressed in system-level processes of operational management (Rokeach, 1979; Spector, 2008; Vroom 1964), and the social construction of knowledge (Landy & Becker, 1987; Lazowski & Hulleman, 2016).

Theories of motivation are valuable in the field of education and may help clarify why some students succeed while others fail to thrive. (Miserandino, 1996; Nicholls, 1979; Ormond, 2003; Pintrich, 2003). When integrated with learning theories, theories of achievement motivation may foster positive student outcomes (Turabik & Baskar, 2015). Unfortunately, research shows that many approaches

currently applied within the American public-school system are genuinely ineffective in eliciting student motivation (Deci; 2009; Tollefson, 2000; Weiner & Calfee, 1990). Though well intended, many programs, including those designed to target motivation, do not sustain long-term intrinsic motivation in students. Programs that employ tangible rewards and incentives and those that are based on a system of earned points, can actually undermine students' innate drive for learning and achievement (Kohn, 1993). This situation is alarming, as literature strongly suggests that motivation and more specifically intrinsic motivation, is an essential component of academic success (Deci & Ryan, 2000b; Miller, Behrens, & Greene, 1993; Miserandino, 1996; Pajares & Graham, 1999; Tollefson, 2000; Vallerand, Fortier, & Guay, 1997; Weiner & Calfee, 1990). Additionally, despite data that indicates that relying on extrinsic sources of motivation is detrimental to intrinsic or self-initiated motivation, many schools continue to operate on reward-based programs.

As researchers and policy makers emphasize that American schools continue to exist in a state of crisis (Apple, 2014; Schneller, 2017; Williams, 2012) and with achievement and opportunity gaps that have yet to be closed (Bali & Alvarez, 2004; Palumbo & Kramer-Vida, 2012), now more than ever, school systems need to consider the predictors of motivation and how to implement learning models that capitalize on student capacity for motivation. Further yet, understanding motivation among adolescents is paramount, as motivation reaches an all-time low during this developmental period (Lazowski & Hulleman, 2016).

### **Literature Review**

People have always sought to understand human behavior and since the 1930's, many researchers have focused on examining motivation (Kusurkar, Croiset, Mann, Custers, & Ten Cate, 2012). The striking amount of literature in the fields of psychology, education, biology, and business represents the extent to which understanding motivation has captured the interest of academics.

### **Defining Motivation**

Though it has been defined in many ways, simply stated, motivation is the force that drives human behavior (Lazowski & Hulleman, 2016). Motivation influences the way we think and explains our reasons for undertaking specific actions (Petri, 1996), as well as sustaining certain behaviors (Schunk, Meece, & Pintrich, 2014). Because motivation is relevant across disciplines, there is a tremendous amount of research available on the topic. Despite the extent of information available, however, a limitation of this research relates to a lack of cohesion in the way that motivation is defined and measured among fields.

Across disciplines, the terms used to describe the quality of motivation often overlap or disagree and the perspectives that researchers use to frame motivation, also differ (Lazowski & Hulleman, 2016; Pekrun & Linnenbrink-Garcia, 2012; Schiefele, Schaffner, Holler, & Wigfield, 2012). Additionally, as Lee and Reeve (2012) point out, motivation is not readily observable because it is largely invisible. As such, understanding the concept of motivation is a complicated task (Conradi, Jang, & McKenna, 2014) and researchers have struggled to establish consistent means of measuring and quantifying motivation.

Researchers have created theoretical models that view motivation as an individual internal process, whereas others attend to motivation as a social and cultural phenomenon. Theorists have examined motivation using several types of perspectives including: biological/instinctual (e.g., Dollard & Miller, 1950; Freud, 1927; Hull, 1935, 1943; McDougall, 1923; Zajonc, 1965), tension-based/needs-based (e.g., Alderfer, 1969; Herzberg, 1971; Maslow, 1943; McClelland, 1965; McDougall, 1932; McGregor, 1957), social (e.g., Adams, 1963; Heider, 1958; Kelley, 1967; Weiner, 1979), emotional (Harter, 1978; Weiner, 1985; White, 1959), behavioral (e.g., Bandura, 1977; Skinner, 1969; Vroom, 1964), and cognitive (e.g., Bandura, 1977; Deci & Ryan, 1985; Deci & Ryan, 2000a; Locke & Latham, 1990a).

Each perspective is characterized by specific strengths and weaknesses, and attends to some aspects of motivation at the expense of a focus on others. This study examined motivation using a psychological lens. Within that lens, motivation is still thought to explain the way humans think and act, but also, that motivated behavior is goal-oriented and the product of internally located needs, drive, or instincts (McGregor, 1960). As this study aimed to understand the ways in which adolescent students are motivated to achieve academic success, employing a psychological framework of motivation was advantageous. By conceptualizing motivation as a unique personal experience, one that takes place largely within an individual, it is possible to examine a greater number of thoughts, attitudes, beliefs, and intentions that play a role in student motivation.

Despite taking a view of motivation that is grounded in psychology, this study acknowledged that there are many frames from which to view motivation, not all of which examine motivation as internally located. Although it is beyond the scope of this piece, other fields and theories conceptualize motivation in terms of social and cultural influences (Rueda & Moll, 1994). Also, it is important to realize that without additional research that thoroughly considers the contexts in which motivation is cultivated and sustained, a complete understanding of the topic cannot be accomplished.

### **Types of Motivation**

Despite their varied approaches, theorists generally acknowledge that there are two types of motivation: intrinsic (autonomous) and extrinsic (external) (Pinder, 2011; Pintrich, 2003). Additionally, researchers recognize the lack of or absence of motivation through the construct of amotivation (no motivation) (Legault, Green-Demers, & Pelletier, 2006). Researchers also suggest that motivation is comprised of three main components: activation, persistence, and intensity. (Pinder, 2011; Pintrich, 2003).

**Intrinsic motivation.** Intrinsic motivation refers to behaviors that are pursued based on the value or enjoyment of the behavior itself (Deci, 1971). Behaviors motivated by pleasure and satisfaction are considered intrinsic (Pinder, 2011). Individuals who engage in behaviors by choice and not by threat of punishment or promise of external reward, are said to have intrinsic motivation (Deci & Ryan, 1985). Another way to conceptualize intrinsic motivation is to think of it as self-motivation (Dweck & Holyoak, 2017). Those high in intrinsic

motivation possess a strong sense of autonomy and identity, and they seek to create their own definitions of success.

Intrinsic motivation increases when individuals participate actively in several important processes: decision making at school, work, or home; internalizing positive feelings that translate to improved self-esteem; setting challenging but realistic goals; and enhancing curiosity and attention by varying the tasks they undertake and the environments in which they interact (Deci & Ryan, 2000b; Dweck & Holyoak, 2017; Locke & Latham, 1990a; Spector, 1985).

Research has confirmed the importance of intrinsic motivation in producing positive outcomes (Reis, Sheldon, Gable, Roscoe & Ryan, 2000). Intrinsic motivation, as the most autonomous type of motivation, has been linked to psychological well-being and academic success (Grolnick & Deci, 1987). Studies have shown that primary school-aged children and adolescents who are intrinsically motivated have greater conceptual learning of material (Grolnick & Ryan, 1987), greater academic performance (Grolnick, Deci, & Ryan, 1991), exhibit positive coping strategies (Ryan & Connell, 1989), report more enjoyment of school (Black & Deci, 2000; Ryan & Frederick, 1997), positive mood (Reis et al., 2000), and persist longer in the face of educational challenges (Vallerand, & Bissonnette, 1992).

**Extrinsic motivation.** In contrast to intrinsic motivation that originates within the individual, extrinsic motivation refers to behaviors prompted by outside influences. Ryan (2000) describes extrinsically motivated behavior as “goal oriented” action that is stimulated by the external environment.

Extrinsically motivated behaviors are engaged in as means to an end and not for their own sakes (Mandler, 1975). Theorists discuss extrinsic motivation in terms of incentives, reinforcements/rewards, and consequences or punishment (Reeve, 2015).

Incentives are defined as motivators provided to elicit a specific behavior. They create expectation and are based on past learning experiences (Reeve, 2015). Individuals are propelled toward a behavior or deterred from action on the basis of incentives (Skinner, 1976). Although they are similar, incentives differ from the next category of rewards/reinforcements in that incentives are factors that pull an individual toward a certain action and exist prior to that action (Reeve, 2015). Reinforcements/rewards on the other hand, are external tangible objects or stimuli that influence behavior because they are desirable and are provided after a behavior occurs.

Some theorists view reinforcements or rewards as an independent category of extrinsic motivation, whereas others suggest that reinforcements belong under the umbrella of punishers or consequences (Reeve, 2015). Literature further specifies that reinforcements can be either positive or negative (Ferster & Skinner, 1957). Whether positive or negative, however, a reinforcer is defined as anything that will increase the likelihood that a certain behavior will occur (Skinner, 1969). Additionally, all reinforcements pull individuals toward a certain behavior or push them away from a certain behavior (Rani & Kumar-Lenka, 2012). Generally speaking, humans are pulled toward behaviors that provide a positive experience or reward and are pushed away from behaviors that have negative consequences.



Positive reinforcements otherwise referred to as rewarding stimuli, exist when an individual receives something desirable following a certain behavior (Skinner, 1957). An example of positive reinforcement includes giving a student a sticker each time he or she does a good job on a school assignment. The idea being, that the external stimulus (the sticker), will motivate the student and increase the likelihood that he/she will do a good job on future assignments.

Negative reinforcement is what happens when a behavior is initiated as an attempt to reduce or escape an undesirable stimulus (Skinner, 1957). If a student completes an assignment because a teacher yells each time he/she wants the student to engage, this is an example of negative reinforcement. The child is only completing the assignment or engaging in the behavior to eliminate the negative reinforcer, which in this case is the teacher yelling.

Within extrinsic motivation, consequences or punishers also serve to influence behavior, however, unlike reinforcers, punishers decrease the likelihood of a certain behavior (Skinner, 1969). Like reinforcement, punishment is considered either positive or negative and also occurs after a specific behavior or task is performed. Positive punishment exists when, after a specific behavior occurs, an undesirable outcome is added. (Skinner, 1969). Referring to the example used above, if a student poorly completes an assignment and the teacher hits the student's knuckles with a ruler, this is an example of positive punishment. The word positive in positive punishment does not describe the experience itself as being positive or pleasant, but rather that something is positively/definitely added to the situation. Negative punishment refers to taking a desirable stimulus

away following the occurrence of a specific behavior (Skinner, 1957). That same student who does a poor job on his/her assignment and has their favorite toy taken away as a result, has just experienced negative punishment.

**Amotivation.** The term amotivation is used to describe individuals who have no motivation (Legault, Green-Demers, & Pelletier, 2006). According to motivational theorists, however, this one-dimensional view is insufficient in capturing the complex nature of amotivation (Pelletier, Dion, Tuson, & Green-Demers, 1999). As Cheon and Reeve (2015, p. 100) argue, a singular understanding of the concept is particularly inadequate to represent the full range of “motivational deficits students experience and display during a state of amotivation.”

Alternatively, other theorists suggest a four-dimensional model for conceptualizing amotivation. This model describes amotivation as taking several forms including: *amotivation-low ability* (an individual believes that he/she does not have the ability to complete a specific task); *amotivation-low effort* (an individual does not have the desire to expend the effort required for a specific task); *amotivation-low value* (an individual does not view a task as important); and *amotivation-unappealing* (an individual views a task as undesirable or unenjoyable) (Green-Demer, Legault, Pelletier, & Pelletier, 2008; Legault, Green-Demers, & Pelletier, 2006; Shen, Wingert, Li, Sun, & Rukavina, 2010).

A four-dimensional model is critical to understanding students' orientation toward achievement because it considers: 1) competence/ability; 2) personal beliefs/perceived locus of control; 3) values; and 4) interest as sharing a

predictive role in amotivation (Cheon & Reeve, 2015). In other words, a multifaceted view of amotivation explains why students can be amotivated not only by a lack of competence or ability for a task, but also due to a lack of interest or value of a task.

Students who are described as amotivated demonstrate poor academic engagement (Baker, 2004), lower academic performance (Shen, et. al, 2010), decreased concept retention (Ntoumanis, Pensgaard, Martin, & Pipe, 2004), disingenuous learning styles (Ntoumanis, 2002) and are more likely to drop out of school (Vallerand, 2001). An amotivated student engages in task avoidance, misbehaves, sleeps in class, skips school altogether, and superficially participates in class activities (Burton, Lydon, Alessandro, & Koestner, 2006).

There is additional literature available on the topic of amotivation in education (e.g., Cheon, Reeve, Yu, & Jang, 2014; Green-Demer et al., 2008; Legault et al., 2006; Ntoumanis, Pensgaard, Martin & Pipe, 2004; Shen et al., 2010), but for purposes of this study, readers should understand that amotivation is: 1) a lack of motivation, no motivation, or inconsistent motivation; 2) influenced by students' values, interests, needs-satisfaction, and abilities; 3) complex, contextual, and potentially differs among students; 4) has an average long-term developmental trajectory; and 5) generally stable cross-sectionally, but has the capacity to differ moment-to-moment.

### **Components of Motivation**

**Activation.** As the first component of motivation, activation refers to the cause or catalyst of behavior (Spector, 2008). From a biological perspective,

motivation is activated by innate drives that are located within the human genome (Freud, 1923; McDougall, 1932). Biological theorists presume that motivational forces are encoded and passed down from one generation to the next, and that all human beings have the same base motivations (Freud, 1927; McDougall, 1932).

Social theories of motivation suggest that our drive to engage in certain activities is determined by our surrounding environment (Adams 1963; Bandura, 1977) Social theorists consider culture, geography, political climate, peers, coworkers, and families as influences on motivation (Pinder, 2011).

Cognitive and emotional theories of motivation are perhaps most similar as they suggest that motivation is situated in within-person processes (Deci & Ryan, 1985; Locke & Latham, 1990a; Vroom, 1964).

Although biological theories also refer to internal processes, most cognitive and emotional theories do not presume that motivational drives are encoded in our DNA. The theories recognize that there is a component of personality that is heritable but are more concerned with motivation as it relates to feeling and thinking. Emotion theories of motivation examine arousal as it relates to determining human behavior and cognitive perspectives study thought processes as the catalyst of motivation (Vroom, 1964).

**Persistence.** The factors that compel an individual to continue toward a goal or those that deter an individual from a behavior make up the second category of motivation known as persistence (Spector, 2008). In research on motivation, persistence refers to the degree to which someone will persevere to

achieve a goal, when faced with challenges. Persistence includes the time, effort, and resources involved with accomplishing a certain task.

Biological theorists, such as Sigmund Freud (1927) and Clark Hull (1943), suggested that individuals will persist because of an innate drive to survive. Drive theorists and instinct theorists speculate that humans are motivated by inherited predispositions that allow them to seek out and acquire resources that will ensure the continuation of the human species (Freud, 1927; Hull, 1943; Maslow, 1943).

Social theories look to interpersonal relationships and the way humans interact with the environment to understand why people persist with some tasks and forgo others (Adams, 1963; Deci & Ryan, 1985) When studying motivation, social theorists consider the aspects of the workplace, educational setting, peer/romantic attachments, community, culture, and religion to understand what compels individuals to maintain certain behaviors or accomplish specific tasks (Bandura, 1977; Deci & Ryan, 1985, Heider, 1958; Kelley, 1967; Locke & Latham, 1990b; Vroom, 1964; Weiner, 1979).

**Intensity.** The third and final component of motivation; intensity, acknowledges that not all tasks will be pursued with the same degree of effort (Spector, 2008). The vigor of an individual's action is shaped by factors including necessity, desire, beliefs, values, and targeted outcome.

From a biological standpoint, how strongly one pursues the acquisition of food and water for example, is influenced by resource availability and competition for those resources (Darwin, 1909). Drive and instinct theories stipulate that if there is an abundance of resources or no one to compete with, the

intensity of motivation does not have to be high, but if there are threats to survival, individuals will be motivated to a stronger degree (Darwin, 1909; Freud, 1927).

Social theories of motivation identify workplace factors, community values, social interactions, and societal mores as playing a role in determining the intensity of one's motivation (Adams, 1963; Bandura, 1977; Deci & Ryan, 1985). For example, if a person works in a field where there is a tremendous amount of competition for jobs, they are likely to approach their work with greater intensity than if they worked in a position with significant security or in which there is a scarcity of employees.

Emotional and cognitive theories of motivation suggest that the way an individual perceives, interprets, and processes information will likely have an influence on the concentration of their motivation (Deci & Ryan, 1985; Locke & Latham, 1990a; Vroom, 1964). Self-efficacy and self-determination are two concepts frequently discussed in cognitive theories of motivation and suggest that the more determined a person is, and the more someone believes they can succeed, higher intensity of motivation they will show (Deci & Ryan, 1985; Vroom, 1964).

### **Motivation in Education**

Understanding how motivation operates in schools has been among the most popular settings in which to study this topic (Linnenbrink-Garcia & Patall, 2016). Tollefson (2000) points out that researchers, parents, and schools have long been interested in determining why some students succeed while others fail

and to what extent motivation plays a role in academic outcomes. Opinions on the topic of motivation in schools typically fall in one of two camps; one that sees a student's motivation as being a matter of personal responsibility and a second that looks at teachers, parents, and curriculums as the cause when a student fails (Lazowski & Hulleman, 2016). More likely, motivation is a complex function of both ability and competence, as well as a reciprocal relationship among students and educators, and the larger school and learning environment (Baron, 1991). Although it is complicated to understand how adolescents are motivated, there is sufficient theoretical work, as well as peer reviewed empirically-based research that could be used to inform education policies and practices (Turabik & Baskan, 2015).

**Achievement.** Motivation matters. Though researchers differ in their understanding of how intrinsic and extrinsic motivation affect academic outcomes, what they do agree on is that motivation matters in education (Deci & Ryan, 2000b). Based on available literature, several things are known about the impact of motivation in educational settings. Motivation can increase a student's energy level and effort, boost cognitive processing, and lead to improved overall academic performance (Ormond, 2003). Motivation can reveal relevant reinforcers, enhance goal-directed behavior, and foster a student's ability to self-initiate tasks (Fredericks et al., 2011). Students with high levels of motivation persist longer on challenging projects and report feeling supported by schools and teachers (Maehr & Midgley, 1999). There is a positive relationship between student motivation and quarterly grades (Miserandino, 1996), standardized test

scores (Fredericks, et al., 2011), and involvement in extracurricular activities (Beiswenger & Grolnick, 2010).

Additional research suggests that motivated students learn more and retain concepts more effectively than their less motivated peers. For example, Nida (2015), examined the link between motivation and short-term memory and found that in elementary-aged children, students with higher levels of motivation performed better on tests of object recall. From elementary school through high school, motivation has a positive impact on overall academic performance (Boiche, Sarrazin, Grouzet, Pelletier, & Chanal, 2008; Burton, Lydon, D'Alessandro, & Koestner, 2006; Lepper, Corpus, & Iyengar, 2005), cognitive engagement (Miller, Behrens, & Greene, 1993), conceptual learning (Benware & Deci, 1984), creativity (Hennessey, 2000), and school attendance (Vallerand & Bissonnette, 1992).

It is clear that having motivation is quite advantageous for students, but what about students with lesser motivation or amotivation (no motivation), what kind of outcomes do they experience? Students who are described as having low-level motivation, inconsistent or unreliable motivation, and amotivation are at increased risk for several outcomes including: low grades (Miserandino, 1996), absenteeism, school drop-out (Vallerand, Fortier, & Guay, 1997), and poor academic performance (Boiche, Sarrazin, Grouzet, Pelletier, & Chanal, 2008; Burton, Lydon, D'Alessandro, & Koestner, 2006; Grolnick, Ryan, & Deci, 1991; Lepper, Corpus, & Iyengar, 2005).



A lack of motivation is linked to poorer cognitive function (Miller, Behrens, & Greene, 1993), decreased concept retention, reduced logical reasoning, and higher rates of disruptive or conduct disordered behavior (McDermott, Mordell, & Stoltzfus, 2001). Additionally, because of the correlation between academic achievement and outcomes later in life, a lack of motivation can have negative implications for further education, job acquisition, career advancement, and income. Crano, Kenny, and Campbell (1972) describe this accumulation of adverse outcomes as a “spiraling effect” that begins with poor educational attainment.

**Personal characteristics.** The link between motivation and academic outcomes is clear, however, the process by which motivation is cultivated and sustained is more challenging to understand. There is evidence, however, that there are several interpersonal and intrapersonal characteristics that contribute to the development of motivation or serve as mediators between motivation and educational success. Individuals who display a high level of motivation, specifically intrinsic motivation, report increased self-esteem, self-efficacy, and engage in challenging goal-oriented activities (Fortier, Vallerand, & Guay, 1995; Ryan & Grolnick, 1986). Additionally, motivated individuals report higher perceived self-worth and report being happier in academic settings and extracurricular activities (Baker, 2004; Haworth & Hill, 1992; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000).

When an individual is motivated, they are more likely to engage in self-directed learning, participate in social activities, and develop close bonds to

friends, teachers, and family. Active and enthusiastic participation in school-oriented and extracurricular activities, in turn fosters the development of autonomous motivation (Deci & Ryan, 2000a). Additionally, through the activities they pursue, motivated individuals create relationships with peers and teachers that serve to enhance academic outcomes. Furrer and Skinner (2003), as well as Vallerand, Pelletier, and Ryan (1991), indicate that positive relationships with friends and teachers facilitate autonomous motivation and engagement in school.

These same individuals report feeling more accepted and supported by their parents, than do their lesser motivated peers (Ryan & Lynch, 1989). When perceiving their parents as supportive, adolescents are more likely to confidently engage in self-directed exploration in academics, as well as career options and stay involved in extracurricular activities like clubs and sports, for longer periods of time (Soenens & Vansteenkiste, 2005; Vallerand, Pelletier, & Ryan, 1991). Students with lesser intrinsic motivation or that are solely motivated by extrinsic factors, report a lack of parental support that is associated with increased activity drop out (Fletcher, Elder, & Mekos, 2000).

### **A Developmental Perspective on Motivation**

Studies on the link between motivation and academic achievement have also yielded compelling evidence that average student motivation undergoes a series of changes between elementary, middle, and high school attendance. Nicholls (1979) states that decline in student motivation is a serious factor that threatens academic outcomes. Research has consistently confirmed that student

motivation erodes from the time children are in elementary school to the time they are in high school (Otis, Grouzet, & Pelletier, 2005). Studies show that rates of motivation notably decrease between 3<sup>rd</sup> and 8<sup>th</sup> grade (Lepper, Corpus, & Iyengar, 2005) and reach an all-time low during high school (Seidman & French, 1997 in Wormington et al., 2012). This trend is alarming because high school is a time during which individuals are meant to begin planning for their future, and accordingly being unmotivated to do so, has long term implications.

It is not just the amount of motivation that undergoes change during the school years, but the type of motivation as well. Research indicates that as students progress through each grade, they generally become less intrinsically motivated and rely more and more on external motivation (Eccles, Lord, & Buchanan, 1996). Additionally, multiple studies have confirmed a specific decrease in motivation related to mathematics and science-based curriculums. Gottfried, Fleming, and Gottfried (2001) found a decrease in intrinsic motivation for math and science from elementary school into high school, and Pajares and Graham (1999) demonstrated that motivation and perceived importance of mathematics, consistently decreased from 1<sup>st</sup>-12<sup>th</sup> grade.

The fact that motivation becomes more externalized as students move from grade to grade, is distressing. As they progress further in their educational careers, students become increasingly responsible for their own academic success. This situation is complicated by the fact that perceived self-efficacy, interest, and personal goal-setting all drop during adolescence (Bouffard, Boileau, & Vezeau, 2001; Wigfield & Eccles, 1992). So, if as the research implies, students are not

motivated, there are two questions that must be asked and answered; why not?

And what can be done differently?

### **Theories of Motivation**

Most theories of motivation are placed in one of two categories; content theories or process theories (Wright & Mischel, 1987). Content theories, also referred to as needs theories, presume that behavior is determined by a set of internal requirements (Pinder, 2011). Process theories on the other hand, assume that an individual selects his or her own goals and purposefully decides how to pursue them (Deci & Ryan, 2000a). Theories within both categories examine motivation through biological, social, emotional, cognitive, or eclectic/integrative lenses (Dweck & Holyoak, 2017); however, content theories are concerned with *what* motivates, whereas process theories address *how* something motivates (Vancouver, 2008).

Most early theories of motivation were content theories and although they remain popular today, over time, these theories have been assessed as being too universal in their understanding of human behavior. Content theories leave little room to consider factors such as sex, gender, culture, or age, as playing a role in motivation. Early content theories were based on workers in middle-class American businesses and failed to consider workers in different countries or socio-economic statuses. Additionally, content theorists demonstrated a heavy emphasis on the way that motivation functions in the work place and largely ignore how motivational forces operate in other settings.

Process theories, a second and more nuanced branch of motivational theories, developed in response to the criticisms of content theories. As they were largely influenced by earlier theories of motivation, process theories, like content theories, acknowledge the biological underpinnings of human behavior and emphasize a stage-based or developmental approach to behavior. As the goal of this study was to understand *how* middle-school- and high-school-aged students are motivated to pursue academic achievement, this study will attend to process theories of motivation rather than content theories. Additionally, as student motivation and academic success take place largely in a school setting, content theories, having been founded on observations in the workplaces of middle-class American businessmen, are less relevant for purposes of this analysis. The decision to focus on process theories was further influenced by the limitations of content theories to adequately allow and account for variations in age, culture, sex, and gender in their theoretical foundations.

Research indicates that intrinsic motivation is critical in producing positive academic outcomes (Deci & Ryan, 2000a). As a result, I have selected two process theories of motivation that consider extrinsic sources of motivation, while also focusing largely on the components of intrinsic motivation. The theories that I chose for my analyses are social cognitive theory and self-determination theory.

**Social cognitive theory (SCT).** As opposed to viewing them as three distinct theories, social learning theory, self-efficacy theory, and social cognitive theory are better understood as representing three stages of psychologist Albert

Bandura's lifelong research in psychology and education (Tollefson, 2000). While each of these concepts represents a distinct entity, social cognitive theory is the integration of social learning theory and self-efficacy theory. Bandura's earliest work focused on the ways in which individuals learn by observing the behavior of others (Bandura, 1977). He conducted experiments that examined modeling behaviors of aggression and in 1963, published work suggesting social learning theory (Bandura, 1963, 1977, 1978).

The theory viewed human behavior from cognitive, social, and behavioral perspectives, building on work done by theorists including, B.F. Skinner (Bandura, 1986). Social learning theory has two basic tenets; individuals learn behavior from their surrounding environment and mediating factors exist between a stimulus and the response (Bandura 1977, 1978). Unlike Skinner and other early behaviorists who proposed a simple stimulus/response relationship in which the environment influences the individual, Bandura suggested that individuals can also impact their environment. He referred to this phenomenon as reciprocal determinism and the concept represents a social component that was not considered by earlier behavioral theorists (Bandura, 1977).

The second phase of Bandura's life work focused on examining the role that self-efficacy plays in motivating behavior. Bandura understood self-efficacy as the way an individual believes they are capable of achieving in certain situations (Snyder & Lopez, 2007). In other words, Bandura supposed that a portion of what people accomplish can be attributed to what they feel they can do. (Bandura, 1982). Later, he combined self-efficacy theory and social learning

theory to create social cognitive theory (See Figure 1.) (Bandura, 1982; Mitchell, Hopper, Daniels, George-Falvy, & James, 1994; Mitchell & Silver, 1990).

Social cognitive theory (SCT) is an integrated theory (also referred to as an eclectic theory) having cognitive, behavioral, and social underpinnings.

Bandura's theory suggests that humans do not simply respond to stimuli in their environment but play an active and intentional role in determining how to act (Bandura, 1997). Relationships between behavioral, cognitive, and environmental factors interact to shape human behavior according to this theory. How does SCT conceptualize motivation? Assimilating several perspectives, the theory suggests that environmental stimuli and cognitive processes work in tandem to produce motivated behavior. An individual encounters a stimulus (social) which activates one of four mediating processes (cognitive) and the result is motivated action (behavioral).

SCT describes that an orientation toward motivation and achievement behaviors, develops over time through repeated stimulus/response interactions and is the result of learned behavior (Bandura, 1977). In the context of education, environmental stimuli during child rearing either steer students toward or away from being academically motivated. Students who repeatedly observe their parents, teachers, peers, and siblings engaging in achievement-oriented behaviors *or* receive reinforcements or rewards for their own achievement-oriented behaviors, are more likely to develop a higher level of overall motivation than students without the same environmental conditions.

Additional research has confirmed that there is a developmental or stage-based aspect to the way in which SCT conceptualizes motivation. Bargh and Chartrand (2000) describe how conscious motivation can become implicit or automatic in students who, via social learning, have been primed for achievement. Some students who have engaged in the behavioral and social learning of motivation as it relates to academic achievement, reach a point in which they no longer require the modeled behavior to elicit motivation, but rather specific cues unconsciously activate motivation (Ratelle, Baldwin, & Vallerand, 2005).

Burton, Lydon, Alessandro, and Koestner (2006) shed light on how this process unfolds in the realm of education and learning. First, through opportunities for social learning and/or experiences that repeatedly reward or reinforce academic achievement, students develop motivation as a habitual behavior. Then, two things happen: 1) the reliance on social learning, reward, and reinforcement decreases; and 2) other environmental stimuli become unconscious cues for motivation. For example, the simple sight of a textbook or notebook, may serve to activate a student's motivation. Theorists suggest that once achievement motivation becomes implicit, individuals no longer need to exert the same amount of effort, attention, or energy on a task (Burton, Lydon, Alessandro, & Koestner, 2006).

To further understand what this looks like in an academic setting, consider that a student comes to school tired from a lack of sleep or distracted because they are thinking about a test scheduled later that day. Now assume that this same student, over time, has developed implicit motivation for achievement. SCT



explains that this student's motivated behavior and in turn, their academic performance will be less affected by fatigue or distraction than the motivation and academic performance of a peer who has not received the same opportunity to integrate motivation as a behavioral habit. This phenomenon serves as one explanation for why some students succeed while others struggle.

This study explored the relationship between motivation as conceptualized by SCT and academic achievement in adolescents. To accomplish this task, three components of Bandura's SCT were considered: 1) self-efficacy; 2) expectancy; and 3) psychological state. Within SCT, self-efficacy refers to the way an individual believes they are capable of achieving in certain situations (Snyder & Lopez, 2007). According to SCT, if an individual has high self-efficacy, they are more likely to pursue a goal rather than avoid it (Sullivan, O'Connor, & Burris, 2006). In other words, a student who believes he/she has the ability or skill to complete a task will achieve on more occasions and more positively than a student who does not perceive that they have the ability to complete a task (Bandura, 1982).

Bandura suggested that additional cognitive processes within the concept of self-efficacy, serve as mediators between a stimulus and a response. These processes include, self-observation, self-satisfaction, self-evaluation, and self-reaction (Redmond, Mumford, & Teach, 1993). In other words, individuals who are satisfied with themselves, reflect positively about their own capabilities, and perceive their own behaviors as valuable, are likely to experience greater motivation and hence positive academic outcomes.

The second component of SCT, expectancy, describes the way in which an individual is oriented to their future. SCT suggests that students with positive expectations for their futures are hypothesized to have greater academic achievement than students with uncertain or negative expectations for their futures (Bandura, 1982). Expectancy refers to both an individual's overall orientation to long-term outcomes *and* the expectations they have for specific tasks. For example, a high school student who believes that their future as an adult is likely to be an improvement compared to their current life, are showing positive expectancy. Students are also exhibiting expectancy when they anticipate a specific outcome in discrete instances. Within SCT, individuals who expect that the impact of their own behavior will have a positive outcome, are more likely to be motivated to achieve that outcome. A student who believes that they will do well on the SATs for example, is expected to have more motivation to do well on the SATs and this motivation translate to achievement.

Lastly, psychological state describes an individual's emotional profile in the moment of a specific task or behavior, as well as overall psychological well-being. Bandura theorized that in general, students who are happier and enjoy their lives will achieve greater academic success than peers who report low levels of happiness or enjoyment (Bandura, 1982). SCT suggests that when assigned a task in school, students who are happy, confident, and optimistic at the moment the task is given, *and* who generally have positive emotional profiles overall, will achieve the greatest academic success. It is important to note, however, that motivation and achievement are *not* conditional on psychological well-being.

Although beneficial in producing positive outcomes, SCT prescribes that students who are unhappy or do not enjoy schoolwork, can still experience academic success. Within SCT, the framework of social learning explains that individuals who have been reared in an environment that has facilitated motivated behavior as a habit do not necessarily require happiness or enjoyment to achieve positive academic outcomes. In other words, motivation as a habit is more predictive of achievement than is psychological well-being, according to SCT.

**Self-determination theory (SDT).** This study also explored the relationship between motivation as conceptualized by SDT and academic achievement in adolescents. To do so, three elements of SDT were considered: 1) autonomy 2) relatedness and 3) competence. As the name implies, SDT is concerned with understanding the ways in which behavior is self-motivated and intrinsically located.

SDT grew out of comparative research on intrinsic and extrinsic motivation that began in the 1970's. It is an integrated/eclectic theory featuring biological, emotional, social, and cognitive perspectives (Eccles & Wigfield, 2002). Although it is a process theory concerned with understanding how (not what) individuals are motivated, SDT is also considered a needs-based theory (Lazowski & Hulleman, 2016). Unlike SDT, many needs-based theories are content theories. Regardless, all needs-based theories presume that behavior is motivated by a set of internal biological needs (Pinder, 1998).

Like theorists before them (e.g., Alderfer, Freud, Herzberg, Maslow, McClelland, McDougall, Miller, Zajonc) Edward Deci and Richard Ryan (1985)

acknowledged that all behavior was oriented around a group of innate and universal requirements. SDT stipulates that there are three central categories of “basic needs” including autonomy, relatedness, and competence.

Unlike traditional definitions that describe autonomy singularly as a sense of independence from others, SDT conceptualizes autonomy as the innate desire to be a “causal agent” and participate in your own life (Deci, 1971). In literature on achievement motivation and education, autonomy includes the way an individual is self-motivated to actively engage with and value their schoolwork, and set academic goals. SDT suggests that students who, on their own, purposefully participate in the classroom and are interested in their schoolwork, are likely to demonstrate higher levels of motivation and achieve positive academic outcomes. Individuals who do not value their schoolwork or do not find it interesting, will be more inclined avoid schoolwork or participate superficially in classroom activities.

Relatedness, the second category and social component of SDT, involves a natural desire to interact with and achieve physical and emotional closeness with others (Deci & Ryan, 1985; Schuler, Sheldon, & Frolich, 2010). Deci and Ryan (1985) describe that individuals with secure attachments verses those with insecure or avoidant attachments (Ainsworth, Blehar, Waters, & Wall, 1978; Ainsworth & Bowlby, 1965; Main & Solomon, 1990) are more likely to be motivated to engage in achievement behaviors. SDT proposes that students who have positive interpersonal relationships with peers and adults, and feel supported

in their academic endeavors experience greater academic success than students who do not feel connected to friends, teachers, or family.

The term competence is widely used across disciplines and as a result has many different meanings (Campbell et al., 2015). SDT acknowledges common definitions that view competency as knowledge-based or referring to a skill, however, the theory also refers to competency as a psychological need (Sheldon & Cooper, 2008). Competency includes the need to experience mastery, as well as exert control over an outcome (White, 1959). Deci and Ryan (2000a) indicate that an individual's temperament and tendencies toward thinking and feeling constitute their understanding of competencies.

Teachers, for example can contribute to satisfying competence as a psychological need, by providing praise for the work that students do. This positive feedback is thought to increase intrinsic motivation (Deci, 1975) *if* the need for autonomy is also being satisfied (Reeve, 1996). Also, some research suggests that this positive feedback serves not only to enhance intrinsic motivation, but also weakens extrinsic motivation for the same task or behavior (Deci, 1971). SDT further acknowledges that a characteristic or skill that may be a competency in one scenario may not necessarily be a competency in another (Deci & Ryan, 1985).

Though they believed that the desire to grow was instinctual, Deci and Ryan (2000a) also recognized that human action sometimes requires outside influence. To acknowledge the role that extrinsic motivation plays in behavior, Deci and Ryan created a sub-theory called organismic integration theory (OIT) as

part of their self-determination theory (Koestner & Losier, 2002). OIT clarifies the different kinds of extrinsic motivation and the environments in which they exist. SDT attends to the latter aspect of OIT that is concerned with understanding how extrinsic motivators can become internally located (Deci & Ryan, 1985). OIT outlines four types of extrinsic motivation including, external regulation, introjected regulation, regulation through identification, and integrated regulation (Gagne & Deci, 2005).

According to Deci and Ryan (1985) a category of motivators they refer to as integrated motivators emerges if an individual fully adopts an external motivator as a personal need. Though integrated motivation is still considered extrinsic in nature, theorists view it as the most autonomous kind of extrinsic motivation (Ryan & Deci, 2000a). The degree to which a particular context fulfills the needs of autonomy, relatedness, and competence influences if an individual will resist or accept an external motivator (Deci, Eghrari, Patrick, & Leone, 1994; Vallerand, 1997) If accepted, these external motivators may become integrated into an individual's internal drive (Koestner & Losier, 2002; Ntoumanis, 2002; Wang & Biddle, 2001). Ryan, Stiller, and Lynch (1994) found that adolescent perceptions of relatedness to teachers and parents, were related to the internalization of schoolwork and class participation.

When further applied to education, SDT suggests that individuals must experience high levels of autonomy, engagement, interpersonal support, and perceived self-competence in order to optimize their academic outcomes. It is important to understand, however, that even the most optimal supports will *not*

facilitate motivation unless an individual is participating in the process by their own choice and/or values the goal being pursued. As such, within SDT framework, the category of autonomy is critical in shaping motivation (Grolnick, Gurland, Jacob, & Decourcey, 2000).

**SCT and SDT similarities and differences.** As two of the current dominant theories of motivation, social cognitive theory (SCT) and self-determination theory (SDT) share some similarities. Both theories fall into the newer category of motivational theories known as process theories and consider cultural influences as well as differences in socio-economic status, age, and gender. As process theories, SCT and SDT address not *what* motivates people, but *how* people are motivated (Vancouver, 2008). Both theories examine motivation through an integrated or eclectic lens and acknowledge that external and internal factors play a role in creating and sustaining motivation. Though they employ different terminology, both theories stipulate that extrinsic motivation is necessary. SCT conceptualizes social learning opportunities as the sources of external motivation, whereas SDT describes relational and environmental supports as extrinsic motivators.

Both theories also consider psychological states as contributing to motivation. SCT attends to circumstances that are potentially more transitory, such as emotional well-being (e.g., happiness, hope, sadness), whereas SDT focuses on potentially more stable conditions such as temperament and personality characteristics. Regardless, each of the theories examine the relationship between psychological well-being and motivation. Additionally, both

theories have been used in educational settings to explain and understand student motivation (Lazowski & Hulleman, 2016).

Although alike in several ways, SCT and SDT are distinct in their understanding of motivation. SCT supposes that motivation is a learned behavior and develops through a stimulus-response relationship (Bandura, 1977). In other words, it is an event or environment *outside* of an individual that is responsible for creating and sustaining the motivation to act. In this way, it would be correct to identify SCT as a behavioral theory of motivation. Unlike earlier behavioral theorists including Ivan Pavlov and B. F. Skinner, however, Albert Bandura's SCT identifies a modifying process that occurs between a stimulus and its response (Bandura, 1978). Bandura suggested it was not just the stimulus that determined an individual's response, but that through reciprocal determinism, the individual played a role in motivating behavior (Bandura, 1977). What does reciprocal determinism look like and how does it occur? SCT proposes that self-efficacy is the moderating factor between a stimulus and a response (Bandura, 1982). In short, SCT indicates that social learning plus self-efficacy equals motivation, with increasing levels of self-efficacy being predictive of increased levels of motivation. As such, it is correct to conceptualize SCT as viewing motivation through an integrated lens that includes behavioral, social, emotional, and cognitive considerations.

SDT is similar to early theories of motivation referred to as needs-based or drive theories. Like Charles Darwin's concept of survival of the fittest, Sigmund Freud's notion of the id, ego, and superego, and Abraham Maslow's hierarchy of



needs, Edward Deci and Richard Ryan's SDT suggests that there are an innate set of needs that guide human behavior (Deci & Ryan, 2000a). Unlike earlier needs-based and drive theories, however, SDT acknowledges that these needs *can* differ among individuals and *do* develop in a social context (Pritchard, Campbell, & Campbell, 1977). It is in this way that the theory recognizes and accounts for variations that appear along lines of sex, gender, socioeconomic status, and culture, when systems and structures of inequity place certain individuals at risk.

Though the theory suggests that variations in motivation differ based on an individual's environment, SDT posits that all human beings' orientation toward achievement is linked to three internally embedded needs; autonomy, relatedness, and competence (Deci & Ryan 1995; Deci, Vallerand, Pelletier, & Ryan, 1991; Ryan & Deci, 2000a). Within SDT these three needs are innate and universal, instinctive and not learned, and persist across time and culture (Chirkov, Ryan, Kim, Kaplan, & Dovidio, 2003; Deci & Ryan, 2000a). SDT assumes that each of us select and purposefully decide how to pursue our goals based on our personal need for autonomy, relatedness, and competence, and the degree to which we are engaged with and invested in these goals, determines our motivation (Deci & Ryan, 2000a). When applied to learning, SDT implies that the extent to which a student is connected to, values, and willingly participates in his or her education and educational goals, is the key component of motivation to pursue academic success.

The fundamental difference between the two theories, and a detail to which this study attends, is whether and to what extent self-efficacy (as suggested

by SCT) or autonomy (as suggested by SDT) is more predictive of motivation and academic success in adolescents.

### **Research Questions**

The main research question that will guide this proposed study is as follows: How do SCT and SDT, as two alternative theoretical conceptualizations of motivation, compare in their predictions of adolescent academic achievement?

This question is intended to measure and compare the usefulness SCT and SDT in conceptualizing motivation of adolescent students as it relates to academic success. In other words, this study will examine the relationship between self-efficacy, expectancy, and psychological state (SCT) and academic achievement, and the relationship between autonomy, relatedness, and competence (SDT) and academic achievement.

Studies on the link between motivation and academic outcomes, suggest that student motivation undergoes a series of changes between elementary, middle, and high school (Lepper, Corpus, & Iyengar, 2005; Nicholls, 1979; Otis, Grouzet, & Pelletier, 2005). Therefore, do different theoretical models of motivation better account for academic achievement in middle schoolers (8<sup>th</sup> grade cohort) than high schoolers (10<sup>th</sup> grade cohort)? Or is motivation among members of the two age cohorts similar enough that the same model is a best fit?

If SCT is a better model for understanding student motivation, then I expect self-efficacy to be the most significant factor of motivation, with higher levels of self-efficacy being predictive of greater academic achievement and lower levels of self-efficacy being predictive of lesser academic achievement. If

SDT is a better model for understanding student motivation, then I expect autonomy to be the most significant factor of motivation, with higher levels of autonomy being predictive of greater academic achievement and lower levels of autonomy being predictive of lesser academic achievement.

Generally speaking, because motivation significantly erodes from the time children are in middle school through the time they are in high school (Otis, Grouzet, & Pelletier, 2005); decreases following a school transition; and reaches an all-time low in high school (Lepper, Corpus, & Iyengar, 2005); the 10<sup>th</sup> grade population in this study should demonstrate lower rates of motivation than the 8<sup>th</sup> grade cohort. Perceived self-efficacy, interest, and goal-setting all decrease in adolescence (Bouffard, Boileau, & Vezeau, 2001; Wigfield & Eccles, 1992).

Therefore, if the tenets of SCT and SDT are “true,” we can expect to see a decrease in motivation as perceived self-efficacy, interest, and goal-setting decrease between the two cohorts. Motivation becomes more externalized as students move from grade to grade (Eccles, Lord, & Buchanan, 1996) and therefore I expect SCT to be a stronger predictor of academic success for the 10<sup>th</sup> grade population than the 8<sup>th</sup> grade population. As intrinsic motivation decreases from elementary school into high school (Pajares & Graham, 1999), I anticipate that SDT will be a better predictor of motivation and academic success in the 8<sup>th</sup> grade cohort than the 10<sup>th</sup> grade cohort.

SDT additionally necessitates that for students to be motivated, they must be engaged with and value their academic goals, and because research indicates that perceived importance of academics reaches an all-time low in high school, it

is even more likely that SDT will not adequately explain motivation in the 10<sup>th</sup> grade cohort. Whereas SCT emphasizes learned behaviors and developed self-efficacy as being the causal links in motivation, it is expected that this theory is more appropriate in understanding motivation in 10<sup>th</sup> grade students.

### **Methods**

Data for this study were taken from the Monitoring the Future (MTF) series, a longitudinal study examining adolescents' behaviors, values and attitudes in the United States. A secondary data analysis was completed using information from four content areas (education, interpersonal relationships, happiness, and personality characteristics) in the 2017 MTF 8<sup>th</sup> and 10<sup>th</sup> Grade Surveys. Using variables from the survey, statistical models were created to represent social cognitive theory (SCT) and self-determination theory (SDT). Four multiple linear regressions were conducted, testing the relationship between motivation as conceptualized by SCT (defined by measures of self-efficacy, expectancy, and psychological state) and academic achievement, as well as the relationship between motivation as conceptualized by SDT (defined by measures of autonomy, relatedness, and competence) and academic achievement. This was done for both the 8<sup>th</sup> grade cohort and 10<sup>th</sup> grade cohort.

### **Procedures**

Monitoring the Future (MTF) study is an ongoing longitudinal study examining changes in American adolescents' behaviors, attitudes, and values over time. The study began in 1975, with surveys administered to high school seniors in the United States. In 1991, additional surveys for 8<sup>th</sup> and 10<sup>th</sup> graders were

added. In conducting these surveys, researchers have two main goals; 1) deliver a precise and representative portrait of American youth and 2) provide an analysis of the trends observed between surveys over time.

Significant portions of the study were designed to assess trends in drug use/abuse among youth populations; however, there is a “core” section that addresses other trends and behaviors. I used information from this “core” section of the MTF surveys. The survey contains more than 450 variables sorted into multiple categories ranging from education to personal relationships to emotional health. This analysis focused specifically on questions taken from four content areas from the study: education, interpersonal relationships, happiness, and personality characteristics.

The data I have selected came from the most recent edition of the MTF series, the 2017 survey of 8<sup>th</sup> and 10<sup>th</sup> graders. The data set includes a total of 30,181 adolescent participants: 16,010 students in the 8<sup>th</sup> grade and 14,171 students in the 10<sup>th</sup> grade. Forty seven percent of respondents are boys, 47.5% are girls, and 5.5% of respondents did not answer the gender identification question. In the sample, 11.2% respondents are Black, 43.3% are White, 22% are Hispanic, and 23% of respondents had missing data on Race. The study is representative of the population of students in the 8<sup>th</sup> and 10<sup>th</sup> grades at academic/college preparatory, general education, and vocational schools in the public sector in all geographic regions of the United States. To collect data for this survey, students were asked to complete a survey regarding their personal beliefs, values, behaviors, and attitudes.

**Measures/Variables**

Monitoring the Future (MTF) data set contains variables that are appropriate for this study including, suitable measures of academic achievement, social cognitive theory (SCT), and self-determination theory (SDT).

**Academic achievement.** To measure academic achievement, I used the MTF variable on respondents' self-reported overall grade point average (GPA).

**Social cognitive theory (SCT).** I used 10 MTF variables to measure three elements of SCT including: 1) self-efficacy 2) expectancy and 3) psychological state. To measure perceived self-efficacy, students were asked questions about their self-perceptions of ability compared to their peers, perceptions of self-worth, sense of pride related to their schoolwork, and general perceptions of their utility in school. To understand student levels of expectancy (the degree to which they have possible expectations for their own future), respondents were asked to indicate if they were hopeful for the future and to what extent they anticipated that the future would be better or worse than the present. Student psychological state was evaluated using questions about levels of overall self-satisfaction, attitude toward self, as well as their enjoyment and happiness with their lives. (Please refer to the Appendices for a list of specific questions).

**Self-determination theory (SDT).** I used 12 MTF variables to measure three components of SDT including: 1) autonomy 2) relatedness and 3) competence. To assess levels of autonomy, students were asked questions about their plans for the future, enjoyment of school, and their interest in schoolwork. For relatedness, respondents were asked about the quantity and perceived quality

of their interpersonal relationships. Competence was evaluated using information about students' perceived self-competence related to schoolwork. (Please refer to the Appendices for a list of specific questions).

Each of these models offers an opportunity to look at the relationship between the variables of self-efficacy, expectancy, and psychological state, and academic success, as well as the relationship between the variables of autonomy, relatedness, and competence, and academic success.

### **Analysis**

I analyzed the data using four linear multiple regression models. I estimated the relationship between motivation as conceptualized by SCT (defined by measures of self-efficacy, expectancy, and psychological state) and academic achievement. I also estimated the relationship between motivation as conceptualized by SDT (defined by measures of autonomy, relatedness, and competence) and academic achievement. I did this for both the 8<sup>th</sup> grade cohort and 10<sup>th</sup> grade cohort.

I conducted a linear multiple regression for each of the following scenarios, where my dependent variable (outcome) was academic achievement (measured by respondent GPA). For SCT I looked at the relationship between three variables: 1) self-efficacy 2) expectancy and 3) psychological state, and academic achievement. For SDT I looked at the relationship between three variables: 1) autonomy 2) relatedness and 3) competence, and academic achievement.

To answer my research question: How do SCT and SDT compare in their explanation of adolescent student motivation? I compared and contrasted the estimated relationship for motivation (as conceptualized by SCT) and academic achievement to the relationship between motivation (as conceptualized by SDT) and academic achievement.

## **Results**

### **Data Screening**

Tables 1 and 2 provide descriptive statistics for the variables selected from the 2017 Monitoring the Future: A Continuing Study of American Youth (8<sup>th</sup> and 10<sup>th</sup> Grade Surveys). Table 1 indicates which variables were used to measure one of the three components of SCT (self-efficacy, expectancy, or psychological state), while Table 2 describes variables that measured one of the three components of SDT (autonomy, relatedness, or competence).

As shown in Tables 1 and 2, several variables deviated from a normal distribution with respect to skewness and kurtosis. As each of the variables employed a 3- or 5-point Likert scale to categorize respondent data, this type of departure from the normal distribution is expected and unlikely to be problematic in analysis (Field, 2013), especially with such a large sample size.

I conducted Mahalanobis tests to assess for multivariate outliers for each variable. Cutoff was set at  $x^2 = 41.6$ ,  $df = 23$ ,  $p \leq .01$  level. I found multiple multivariate outliers in this analysis. Outliers can be meaningless aberrations due to errors in measurement or recoding, however, outliers can also be legitimate observations that contain valuable information (Field, 2013). I included outlying



scores in the primary analysis and re-evaluated during the post-analysis screening.

### **Preliminary Analysis**

First, bivariate correlations were computed to explore relations among the variables used to measure the two theories (Table 3 and Table 4). Not surprisingly, as these variables are typically correlated (Sheldon & Hilpert, 2011), analyses showed a positive relationship between autonomy, relatedness, and competence, as well as self-efficacy, expectancy, and psychological state.

Second, given the high magnitude of several relationships, I explored the possibility of multicollinearity among variables. Tolerance, VIF, and variance proportions were examined for all relationships in which there was a large effect size ( $r > .5$  as defined by Cohen, 1988). Relationships with small or moderate effect sizes ( $r < .01$  and  $r > .3$  respectively, as defined by Cohen, 1988) were not examined further multicollinearity.

Multicollinearity was detected among several variables. Field (2013) suggests three options to remedy multicollinearity: 1) remove one of the related variables from the model 2) collect more data for each measure or 3) accept the multicollinearity as is and acknowledge the unreliability of the model. I addressed multicollinearity by removing three variables from the model for SCT (Expectancy\_2; Psych\_3; Psych\_6) and three variables from the model SDT (Autonomy\_3; Relatedness\_3; Relatedness\_5). The variables that I removed were selected based on the following criteria: 1) the number of variables they displayed multicollinearity with 2) the degree of multicollinearity between variables and 3) variables that utilized language most similar to the constructs within SCT and

SDT were retained. A fourth variable in the model for SDT (Competence\_2) was removed due to an error in coding during the original (Monitoring the Future) data collection process.

**SCT.** There were statistically significant positive relationships between each of the variables for self-efficacy at the  $p < .01$  level (Table 2). A large effect size ( $r > .5$  as defined by Cohen, 1988) was detected between Efficacy\_2 and Efficacy\_4. Several moderate effect sizes ( $r > .3$  as defined by Cohen, 1988) between model variables were detected. For each relationship, indices for Tolerance, VIF, eigenvalue, and variances proportions were within acceptable ranges and accordingly, I did not take any additional steps to address multicollinearity.

There was a statistically significant positive relationship between the two measures of expectancy at the  $p < .01$  level (Table 2). A small effect size ( $r > .2$  as defined by Cohen, 1988) was detected between Expectancy\_1 and Expectancy\_2 and additional steps to address multicollinearity were not necessary.

There were statistically significant positive relationships between each of the measures for psychological state at the  $p < .01$  level (Table 2). Large effects sizes ( $r > .5$  as defined by Cohen, 1988) were identified in several relationships and multicollinearity became apparent between Psych\_3 and other variables. To remedy the multicollinearity, three variables were removed from the model including; Psych\_3, Psych\_6, and Expectancy\_2.

**SDT.** There were statistically significant positive relationships between

each of the variables for autonomy at the  $p < .01$  level (Table 3). A moderate effect size ( $r > .3$  as defined by Cohen, 1988) was detected between two sets of variables and a large effect size ( $r > .05$  as defined by Cohen, 1988) was identified in three pairs of variables, but not so large as to warrant concern over multicollinearity. A large effect size ( $r > .05$  as defined by Cohen, 1988) found in two other relationships, necessitated further consideration of multicollinearity. To remedy existent multicollinearity, three variables were removed from the model including: Autonomy\_3; Relatedness\_3; and Relatedness\_5.

Competence\_2 was later removed from the model for SDT as it became apparent in the primary analysis stage, that SPSS software was unable to identify any cases within this variable that could be included in the regression model. Value assignments during the initial MTF study prevented the Competence\_2 variable from being recoded for appropriate inclusion in the regression model. The model for SDT then relied on a single variable to measure the construct, a point which I return to in the Discussion.

### **Primary Analysis**

**Regression analysis.** I conducted four multiple linear regression models: one model for each of the two theories in each of the two grade cohorts. Two of the models assessed whether and to what extent motivation as conceptualized by SCT (self-efficacy, expectancy, and psychological state) was related to academic achievement (among both 8<sup>th</sup> and 10<sup>th</sup> graders). The second pair of two models tested whether and to what extent motivation as conceptualized by SDT (autonomy, relatedness, and competence) was related to academic achievement

(among both 8<sup>th</sup> and 10<sup>th</sup> graders).

**SCT and academic achievement in 8<sup>th</sup> graders.** The set of variables measuring motivation as conceptualized by SCT (self-efficacy, expectancy, and psychological state) were significantly positively related to 8<sup>th</sup> graders' academic achievement (Table 5). An adjusted *R* square value of 0.164 suggests that the model for social cognitive theory explained 16.4% of the variation in academic success in the 8<sup>th</sup> grade cohort. The ability to predict academic achievement as an outcome variable is significantly improved by this model ( $F = 77.365, p \leq .001$ ) as compared to a model with no predictors.

***Intercept.*** The intercept of the model was 1.936, indicating that a student with a score of zero on all measures included in the regression analysis would be expected to have an achievement score (GPA) of 70-72% or a C- (letter grade).

***Self-efficacy.*** Higher levels of academic achievement (as measured by respondent's overall G.P.A.) were associated with higher levels of perceived self-efficacy (Table 5).

***Expectancy.*** SCT hypothesizes that individuals with positive expectations for their future experience more academic success than individuals with negative expectations. Results did not support this tenet of the theory, as students with positive expectations had statistically significant lower levels of academic achievement (Table 5).

***Psychological state.*** SCT also suggests a positive relationship between perceived self-satisfaction, self-esteem, and happiness, and academic success. Findings for this tenet of the theory were mixed. Self-satisfaction was not a

statistically significant predictor of academic achievement (Table 5). Self-esteem was also not a statistically significant predictor of academic achievement (Table 4). Of the two measures of happiness, one was a significant predictor (negatively) of achievement and the second measure was not a statistically significant predictor of academic achievement (Table 5).

**SCT and academic achievement in 10<sup>th</sup> graders.** The set of variables measuring motivation as conceptualized by SCT (self-efficacy, expectancy, and psychological state) were significantly positively related to 10<sup>th</sup> graders' academic achievement (Table 6). An adjusted *R* square value of 0.199 suggests that the model for social cognitive theory explained 19.9% of the variation in academic success in the 10<sup>th</sup> grade cohort. The ability to predict academic achievement as an outcome variable is significantly improved by this model ( $F = 99.684, p \leq .001$ ) as compared to a model with no predictors.

***Intercept.*** The intercept of the model was 1.224, indicating that a student with a score of zero on all measures included in the regression analysis would be expected to have an achievement score (GPA) of <65% or a D or below (letter grade).

***Self-efficacy.*** Higher levels of perceived self-efficacy were associated with greater academic achievement (Table 6).

***Expectancy.*** SCT hypothesizes that respondents with more positive expectations for their future experience more academic achievement than individuals with negative expectations. Results supported this tenet of the theory, as students with positive expectations had higher levels of academic achievement

(Table 6).

***Psychological state.*** SCT also suggests a positive relationship between perceived self-satisfaction, self-esteem, and happiness, and academic success. Findings for this tenet of the theory were mixed. Self-satisfaction was not a statistically significant predictor of academic achievement and self-esteem was a statistically significant predictor (negatively) of academic achievement (Table 6). Of the two measures of happiness, one was a significant predictor (negatively) of achievement and the second measure was a statistically significant predictor (positively) of academic achievement (Table 6).

**SDT and academic achievement in 8<sup>th</sup> graders.** The set of variables measuring motivation as conceptualized by SDT (autonomy, relatedness, and competence) were significantly positively related to 8<sup>th</sup> graders' academic achievement (Table 7). An adjusted *R* square value of 0.199 suggests that the model for self-determination theory explained 20% of the variation in academic success in the 8<sup>th</sup> grade cohort. The ability to predict academic achievement as an outcome variable is significantly improved by this model ( $F = 33.046, p \leq .001$ ) as compared to a model with no predictors.

***Intercept.*** The intercept of the model was 1.945, indicating that a student with a score of zero on all measured variables included in the regression analysis would be expected to have an achievement score (GPA) between 70-72% or a C- (letter grade).

***Autonomy.*** Out of the five measures of autonomy, four supported a positive relationship between autonomy and academic achievement (Table 7).

One of the five measures of autonomy did not demonstrate a positive relation between autonomy and academic achievement of the model's five measures of autonomy did not reveal the same relationship. Instead on this measure, academic achievement was predicted (negatively) by autonomy at a statistically nonsignificant level (Table 7).

***Relatedness.*** SDT hypothesizes that individuals with positive experiences of relatedness experience more academic success than individuals with negative relatedness. Findings for this tenet of the theory were mixed. Of the seven measures of relatedness, two were statistically significant predictors (positive) and one was statistically significant (negative) of academic achievement. Wanting more friends was significantly negatively predictive of academic achievement, whereas having friends to spend time with was significantly positively predictive of academic achievement.

Among all measures of relatedness being able to talk to go to one's parent for help or to talk about a problem, was the strongest predictor (positive) of academic achievement. Of the four remaining measures of relatedness, two were negative predictors of academic achievement, two were positive predictors of academic achievement, but none were statistically significant. (Table 7).

***Competence.*** SDT suggests that individuals with high perceptions of self-competence also have high academic achievement. Results supported this tenet of the theory, as students who reported more self-competence had higher levels of academic achievement (Table 7).

**SDT and academic achievement in 10<sup>th</sup> graders.** The set of variables

measuring motivation as conceptualized by SDT (autonomy, relatedness, and competence) were significantly positively related to 10<sup>th</sup> graders' academic achievement (Table 8). An adjusted *R* square value of 0.164 suggests that the model for self-determination theory explained 16.4% of the variation in academic success in the 10<sup>th</sup> grade cohort. The ability to predict academic achievement as an outcome variable is significantly improved by this model ( $F = 23.766, p \leq .001$ ) as compared to a model with no predictors.

***Intercept.*** The intercept of the model was 1.295, indicating that a student with a score of zero on all measures included in the regression analysis would be expected to have an achievement score (GPA) of <69% or a D or below (letter grade).

***Autonomy.*** Out of the five measures of autonomy four supported a positive relationship between autonomy and academic achievement and one measure was a non-significant predictor (negative) of academic achievement (Table 8).

***Relatedness.*** SDT hypothesizes that individuals with positive experiences of relatedness experience more academic success than individuals with negative relatedness. Results regarding perceptions of relatedness and academic achievement were mixed. Of the seven measures of relatedness four measures were predictors (positive) of academic achievement and the remaining three measures of relatedness were predictors (negative) of academic achievement (Table 8).

***Competence.*** SDT suggests that individuals with high perceptions of self-



competence also have high academic achievement. Results supported this tenet of the theory, as students who reported more self-competence had higher levels of academic achievement (Table 8).

### **Post Analysis**

During post analysis screening I examined the four regression models for outliers and influential cases. I used several residual statistics to assess the influence of cases. I examined standardized residuals in each regression analysis to 1) determine how well the models fit the sample data and 2) identify specific cases that were cause for concern.

Less than 1% of standardized residual scores in the two regressions for SCT (one for 8<sup>th</sup> graders and one for 10<sup>th</sup> graders) had a value of 2.58 and less than 5% of cases in each regression had standardized residuals with an absolute value greater than 1.96, and as such, the model for SCT was an adequate fit for the sample data (Field, 2013).

The model SDT was less ideal for both the 8<sup>th</sup> and 10<sup>th</sup> grade cohorts. In the two regression analyses for SDT, more than 1% of standardized residual scores had a value greater than 2.58 and more than 5% of cases in each regression had standardized residuals with an absolute value greater than 1.96.

During the post-analysis screening I identified several cases that exceeded the acceptable value for standardized residuals (*std. residual absolute value* > 3.29 as defined by Field, 2013). These cases were examined further to assess for undue influence within each regression model. I inspected adjusted predicted values for outlying cases within each of the four regression models under the

assumption that cases with little influence on the model would have adjusted predicted values quite similar to the case's original predicted value.

Though residuals are helpful in assessing the influence of a case on the model's ability to predict that specific case, they do not provide adequate information for the way in which an individual case impacts the model's ability to predict other cases (i.e., how much the parameter estimates are influenced). To counter this limitation, I assessed Cook's distance for each outlier within the four models. Cases with a Cook's distance value greater than one were identified as requiring additional investigation for undue influence.

As a second way to measure influence, I examined leverage values for each outlying case. I calculated an average leverage value for each of the four models (defined by the formula  $(k+1)/n$  in which  $k$  = the number of predictors and  $n$  is the sample size). Cases with undue influence would be expected to have a leverage value that is two-three times larger than a model's average leverage value (Hoaglin & Welsh, 1978; Stevens, 2002).

As leverage values alone are not enough to infer influence of a particular case within a regression model, I examined Mahalanobis distances. I established a cut-off point for each of the four models by identifying the appropriate chi-square distribution using degrees of freedom equal to the number of predictors within the model and selecting an appropriate alpha level of reliability (Tabachnick & Fidell, 2012). The Mahalanobis distances for outlying cases were compared to the appropriate model's chi-square value.

I reviewed standardized DFBeta values and cases with an absolute value

greater than two were marked for further assessment. I next observed DFFit values. Given this study's sample size, cases were considered a good fit and non-influential at or less than a value of 0.5 (McDonald & Ho, 2002).

My last step in analyzing for influential cases was to examine covariance ratios. Cases having a covariance ratio with an absolute value differing significantly from one, are likely to have an influence on the parameter estimates of the model (Belsey, Kuh, & Welsch, 1980).

**SCT in 8<sup>th</sup> graders.** The model for SCT was a good fit for the 8<sup>th</sup> grade cohort, with less than 1% of standardized residual scores having a value of 2.58 and less than 5% of cases having a standardized residual with an absolute value greater than 1.96. I identified four cases with a standardized residual greater than 3.92 which therefore required additional assessment. There were no instances in which a case's adjusted predicted value significantly differed from its original predicted value. Cook's distance did not reveal any influential cases, as all values were less than one. The average leverage value for this model (defined by the formula  $(k+1)/n$ ) was .0029. There were 135 cases with a leverage value greater than .00845 ( $3(k+1)/n$ ). Among these 135 cases, 88 of them were still considered potentially influential after when considering Mahalanobis distance values that were greater than the model's Chi-square distribution (*Chi-square critical value* = 35.56, *Tail probability p* 0.0001, *df* = 10). Despite 88 cases with significant Mahalanobis distances, all covariance ratios were near one, all standardized DFFit values were less than 0.5, and as mentioned, all Cook's distances were less than one. As such, all cases were retained in this model.

**SCT in 10<sup>th</sup> graders.** The model for SCT was a good fit for the 10<sup>th</sup> grade cohort, with less than 1% of standardized residual scores having a value of 2.58 and less than 5% of cases having a standardized residual with an absolute value greater than 1.96. I identified six cases with a standardized residual greater than 3.29 that required additional assessment. There were no instances in which a case's adjusted predicted value significantly differed from its original predicted value. Cook's distance did not reveal any influential cases, as all values were less than one. The average leverage value for this model (defined by the formula  $(k+1)/n$ ) was .0029. There were 171 cases with a leverage value greater than .00862 ( $3(k+1)/n$ ). Among these 171 cases, 109 of them were still considered potentially influential after considering Mahalanobis distance values that were greater than the model's Chi-square distribution (*Chi-square critical value* = 35.56, *Tail probability p* 0.0001, *df* = 10). Despite 88 cases with significant Mahalanobis distances, all covariance ratios were near one, all standardized DFFit values were less than 0.5, and as mentioned, all Cook's distances were less than one and. As such, all cases were retained.

**SDT in 8<sup>th</sup> graders.** The model SDT was a less ideal fit for the 8<sup>th</sup> grade cohort, with more than 1% of standardized residual scores having a value of greater than 2.58. and more than 5% of cases having a standardized residual with an absolute value greater than 1.96. I identified four cases with a standardized residual greater than 3.29 that required additional assessment. There were no instances in which a case's adjusted predicted value significantly differed from its original predicted value. Cook's distance did not reveal any influential cases, as

all values were less than one. The average leverage value for this model (defined by the formula  $(k+1)/n$ ) was .0083. There were 14 cases with a leverage value greater than .0251 ( $3(k+1)/n$ ). All 14 of these cases were still considered potentially influential after considering Mahalanobis distance values that were greater than the model's Chi-square distribution (*Chi-square critical value* = 39.13, *Tail probability p* 0.0001, *df* = 12). Despite 14 cases with significant Mahalanobis distances, all covariance ratios were near one, all standardized DFFit values were less than 0.5, and as mentioned, all Cook's distances were less than one. As such, all cases were retained.

**SDT in 10<sup>th</sup> graders.** The model for SDT was a less ideal fit for the 10<sup>th</sup> grade cohort, with more than 1% of standardized residual scores having a value of greater than 2.58. and more than 5% of cases having a standardized residual with an absolute value greater than 1.96. I identified one case with a standardized residual greater than 3.29 that required additional assessment. There were no instances in which a case's adjusted predicted value significantly differed from its original predicted value. Cook's distance did not reveal any influential cases, as all values were less than 1. The average leverage value for this model (defined by the formula  $(k+1)/n$ ) was .0085. There were 24 cases with a leverage value greater than .0256 ( $3(k+1)/n$ ). All 24 of these cases were still considered potentially influential after considering Mahalanobis distance values that were greater than the model's Chi-square distribution (*Chi-square critical value* = 39.13, *Tail probability p* 0.0001, *df* = 12). Despite 24 cases with significant Mahalanobis distances, all covariance ratios were near one, all standardized DFFit

value were less than 0.5, and as mentioned, all Cook's distances were less than one and as such, all cases were retained.

As a final step to ensure that these cases were not statistically influential, I conducted a sensitivity analysis. I removed the 24 cases with significant Mahalanobis distances from the sample and ran each of the four multiple linear regression models a second time. Coefficients that were statistically significant when the cases were included in the regression analysis were still statistically significant when the cases were excluded from the regression analysis, and coefficients that were non-statistically significant when the cases were included in the regression analysis were still statistically non-significant when the cases were excluded from the regression analysis. Accordingly, these regression results suggested that these potential influence cases did not exert undue influence on either of the models (SCT or SDT) for either grade cohort (8<sup>th</sup> or 10<sup>th</sup> grade). As there were no substantive changes observed, the decision to retain all cases was further supported.

### **Discussion**

The aim of this study was to explore whether and to what extent motivation as conceptualized by social cognitive theory (SCT) and motivation as conceptualized by self-determination theory (SDT), explained academic achievement in a sample of 8<sup>th</sup> grade students and a sample of 10<sup>th</sup> grade students. To do this, I created statistical models containing measures of the key elements of each theory. The model for SCT included self-efficacy, expectancy, and psychological state, while the model for SDT examined autonomy, relatedness,

and competence. Results suggested that different theoretical models of motivation better account for academic achievement in the middle school cohort (8<sup>th</sup> graders) than the high school cohort (10<sup>th</sup> graders). As predicted, the model of motivation constructed in accordance with SDT was a better fit for predicting academic achievement in the 8<sup>th</sup> grade sample. Also predicted, the model of motivation in SCT was a better predictor of achievement in the 10<sup>th</sup> grade sample.

A second goal of this study was to explore which constructs that were specific to each theory (i.e., not shared between the two theories), namely self-efficacy (as suggested by SCT) or autonomy (as suggested by SDT) were the strongest predictors of academic achievement.

### **Motivation and Academic Achievement in 8<sup>th</sup> Graders**

As expected, the model for SDT of motivation was a better predictor of academic achievement in 8<sup>th</sup> graders, than was motivation as conceptualized by SCT. As suggested by SDT, this study found higher levels of autonomy were related to higher levels of academic achievement. Students that reported thinking about their future, enjoying school, and finding their schoolwork interesting, reported higher average GPA's than students who reported lower on these measures. In other words, students that were more engaged with and valued their classes and schoolwork experienced greater academic achievement.

Also predicted by SDT, students who endorsed feeling capable of completing the level of schoolwork that they were assigned and thereby indicating higher levels of perceived self-competence, were also more likely to report positive academic achievement than students who reported lower levels of self-

competence. It should be noted, however, that this study's model was only able to employ one measure for competence and therefore conclusions related to the influence of self-competence within SDT as it applies to academic achievement, should be drawn with caution.

This study did *not* find the strong association between relatedness and academic achievement that SDT hypothesizes. Within the model, both *autonomy* and *competence* were stronger predictors of academic achievement than was relatedness. This finding is contrary to SDT which suggests that *autonomy* and *relatedness* are the two most critical components of motivation for achievement (Deci & Ryan, 2000a). Instead, this study found that higher levels of relatedness were not consistently predictive of better academic outcomes. Students who reported that they usually had friends to spend time with, reported higher academic achievement than students who did not have friends to spend time with. However, students who endorsed higher levels of loneliness and feeling left out, (indicating lower levels of relatedness), did not report lower academic achievement (here, lower GPA), as would be expected by SDT.

Further, the more time students spent with friends on a weekly basis, the lower their reported grade point averages. This pattern is not all-together surprising, as the more time one spends with friends likely correlates to less time spent on schoolwork or school-related extracurricular activities. Additionally, as research has already established the salience of peer relationships during adolescence (Berndt, 1979; Steinberg & Silverberg, 1986) it is likely that the peer context is influential in adolescents' engagement with schoolwork. Accordingly,



what happens during the time with friends, more than simply how much time, is important for fully understanding this relationship.

Relatedness that *was* a predictor of positive academic achievement in this study was parental relatedness. Students who acknowledged parents as a source of support and/or a resource for problem-solving, had higher levels of academic achievement than students who did not perceive their parents as supportive. For each unit higher score in reported relatedness on this measure, a 3% higher score in academic achievement (student GPA), was observed. Therefore, it seems that it is not simply having relatedness that is predictive of academic achievement, but rather, having the right type of relatedness matters in producing positive academic outcomes. This is consistent with previous research that has established the link between students' self-reported perceptions of parental relatedness and positive outcomes including better dating competence, separation adjustment, and resistance to peer pressure (Kenny, 1987).

Though the model for SDT was a stronger predictor of academic success in the 8<sup>th</sup> grade cohort, motivation as outlined by SCT was still positively linked to academic achievement and is therefore worth discussing. As autonomy and competence were the strongest predictors of academic achievement from SDT, it is logical that the construct within SCT that is most similar to these measures (self-efficacy), demonstrated the strongest relationship to academic success. Measures of self-efficacy in the model for SCT were the most positively correlated with academic achievement, with students reporting higher levels of self-efficacy, experiencing greater academic achievement than peers with lower

perceived self-efficacy. Students who endorsed feeling just as capable as their peers, having much to be proud of, leading a useful life, and able to do their best work on a regular basis, experienced positive academic achievement compared to students who rated themselves lower on these measures. These findings confirm existent research that demonstrates the essential role that perceived self-efficacy plays in setting and achieving academic goals (Locke & Latham, 2013).

Although this study supported the tenet of SCT that suggests that a positive psychological state is linked to positive academic outcomes, results also supported the suggestion that academic achievement is not conditional on psychological well-being. For example, happiness and self-esteem were inconsistent predictors of academic achievement and did not necessarily contribute to greater academic outcomes. In this study, students who reported higher levels of happiness and described regularly enjoying life demonstrated poorer academic outcomes than peers who endorsed less enjoyment of their lives.

Additionally, students who reported feeling that they are “good” and “do the right thing,” actually reported lower academic achievement than peers who rated feeling “less good” or “doing the wrong thing.” It is possible that this finding is consistent with a line of research that suggests that increasing levels of self-esteem can actually work against academic success by leading students to a state of overconfidence or over justification in which their expectations become misaligned with their actual abilities (Lazowski and Hulleman, 2016). It is also possible that these poorer academic outcomes occur because these students do not value or prioritize their academic achievement as much as others. It would seem

then, that in some cases, higher self-efficacy and self-esteem are beneficial in producing positive academic outcomes only to a certain point and under specific circumstances.

This finding also aligns with the portion of SCT that suggests that self-efficacy is more crucial to motivation and thereby academic success, than is self-satisfaction or happiness. SCT does not necessitate that individuals must be content with their sense of self in order to be motivated but rather, that their social environment and contextual supports foster motivation. This may explain why SCT was a better predictor of academic success in the 10<sup>th</sup> grade cohort as compared to the 8<sup>th</sup> grade cohort. Having not yet reached high school, a time in which intrinsic motivation generally reaches an all-time low, 8<sup>th</sup> graders do not rely on extrinsic measures of motivation as much as their 10<sup>th</sup> grade peers.

SCT also suggests that one's expectations for the future are linked to academic achievement, with more positive orientations being associated with positive academic outcomes. This study did not confirm this finding but rather, results indicated that positive expectations for one's future were negatively correlated to academic achievement. It is possible that this finding is based on limitations in the quantity and quality of MTF variables available to assess expectancy. There were only two variables suitable for measuring expectancy and in the preliminary analysis, the two variables were found to have intolerable multicollinearity. As a result, one variable was removed from the model, leaving a single variable as the sole measure of expectancy. It is conceivable that this occurrence limited the model's ability to adequately assess the relationship

between expectancy and academic achievement.

### **Motivation and Academic Achievement in 10<sup>th</sup> Graders**

As predicted, motivation as conceptualized by SCT was a stronger predictor of academic achievement in the 10<sup>th</sup> grade cohort than was motivation as described SDT. Consistent with existent research that indicates intrinsic motivation decreases from elementary school through high school (Pajares & Graham, 1990) and becomes more externalized as students move from grade to grade (Eccles, Lord, & Buchanan, 1996), this study found that the constructs of self-efficacy, expectancy, and psychological state (SCT) better conceptualized motivation in 10<sup>th</sup> grade students than constructs of autonomy, relatedness, and competence (SDT).

Albert Bandura's social learning theory (the foundation for SCT) prescribes that individuals become oriented toward achievement based on the context of their environment. Social learning theory suggests that youth who repeatedly engage with a stimulus-response relationship in which motivation for achievement is framed as positive, incentivized, or rewarded, will develop motivation out of habit. Within SCT, this socially learned orientation toward achievement combined with high perceptions of self-efficacy, predict the greatest levels of motivation. In other words, SCT posits that motivation is a learned habit that develops in the framework of a stimulus-response relationship and that self-efficacy serves as the cognitive moderating process through which motivation is optimally activated.

It is possible that one reason SDT was less effective in explaining

motivation in the 10<sup>th</sup> grade cohort is due to the emphasis the theory places on engagement and value as playing a role in motivation. Previous research has established that the perceived importance of and interest in academics reaches an average all-time low in high school, and SDT suggests that these are the very qualities that are essential to motivation. Accordingly, SDT was inadequate in conceptualizing academic achievement in the 10<sup>th</sup> grade cohort. SCT on the other hand places a specific emphasis on external supports and sources as eliciting the motivation for the pursuit of academic achievement, which appeared to provide a better accounting of motivation among 10<sup>th</sup> graders.

Results of this study confirmed self-efficacy as a crucial component of motivation for academic achievement. In the 10<sup>th</sup> grade population, measures of self-efficacy (as suggested by SCT) were significantly predictive of academic achievement, with students reporting higher levels of self-efficacy experiencing greater academic achievement than peers with lower perceived self-efficacy. Students who endorsed feeling just as capable as their peers, having much to be proud of, leading a useful life, able to do their best work on a regular basis, and being a person of worth, experienced more positive academic achievement compared to students who ranked lower on these measures. This finding suggests that a significant portion of the academic achievement that a 10<sup>th</sup> grader achieves, is related to what they *believe* they can achieve. Similarly, it would appear as though academic achievement is not solely dependent on having the right training or specific skill, but rather a student's psychological experience is also important.

It is worth considering that these relationships may work in the opposite

direction and that rather than self-efficacy eliciting academic achievement, positive academic achievement leads to increased self-efficacy. This suggestion is supported by a number of researchers who have found that academic performance is a predictor (positive) of mood, attitude, satisfaction, and well-being (Nix, Ryan, Manly, & Deci, 1999; Reis et al., 2000; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Ryan & Frederick, 1997). In order to discern the direction of the relationship between self-efficacy and academic achievement, a longitudinal study is needed. A study in which respondents' academic achievement and self-efficacy levels are measured before and after the implementation of an intervention that attempts to manipulate motivation or after a length of time has passed/the developmental stage has shifted, would help to clarify the nature of the relationship between self-efficacy and academic achievement.

Although positive expectations for the future were not predictive of better academic outcomes in the 8<sup>th</sup> grade cohort, they were for the 10<sup>th</sup> grade population. Despite there being a positive relationship between expectations for the future and academic achievement, the relationship was not statistically significant and as one of the strengths of this study was the sample size, this relationship is determined to be miniscule and not adequate for drawing generalizable conclusions, and therefore this finding does not necessarily represent a meaningful difference between the two age-cohorts. Further, as additional variables were removed from the statistical model of SCT due to multicollinearity, this study's ability to examine expectancy was limited to a

single item. It is conceivable that this occurrence constrained this study's ability to adequately assess the relationship between expectancy and academic achievement.

SCT suggests that self-efficacy is the intrinsic construct that is most essential to motivation. Though not stated outright within the theory, what is interesting is that although SCT recognizes the way in which motivation can be enhanced by one's emotional state, it does not stipulate psychological well-being as a requirement of motivation. More simply stated, for a student to be motivated to pursue academic success he or she must have "practiced" the social learning of motivation, but not necessarily have high self-satisfaction, self-esteem, or happiness.

Results of this study support this suggestion. 10<sup>th</sup> grade students who reported higher levels of happiness, enjoyment of life, and self-satisfaction reported lower academic success, which suggests that academic achievement may not necessarily be impeded by lower levels of happiness or self-satisfaction *if* other elements necessary to promote motivation are present. Within SCT, these necessary elements are described as external supports that create the opportunity for motivation to develop as a habit and help explain how an unhappy, dissatisfied individual can still achieve academic success and potentially avoid the long-term negative outcomes typically associated with poor psychological well-being.

### **Implications**

Teachers, administrators, and school districts have much to gain by understanding student motivation. As adolescence is a time in which motivation

generally reaches an all-time low and where the stakes for academic success are at an all-time high, it is essential to continue our pursuit to comprehend motivation during this developmental period. As we already know that motivation is a key component of academic success, the goal of this study was to provide a clearer understanding of student motivation, as well as identify which theory of motivation may be useful in designing interventions aimed at cultivating student motivation. The results of this study have two primary implications for parents, educators, and researchers to consider: 1) cultivating motivation as a learned habit; and 2) habituated motivation as a protective factor.

### **Motivation as a Learned Habit**

It is exciting to consider the possibility that there may be a process through which motivated behaviors can become habit for an individual. The ability of social cognitive theory (SCT), specifically the social learning framework within the theory, to predict academic achievement in this study, provides a compelling way to understand motivation in adolescence. This portion of the theory serves as one explanation for why some adolescents achieve academic success despite decreases in self-esteem, self-satisfaction, interest, and enjoyment that characterize this developmental period. Although all adolescents are at-risk for low motivation, particularly during high school, this finding suggests that students who experienced an environment which fostered motivation as a learned habit may not be as vulnerable to academic failure as their peers who did not experience this type of environment.



If this is the case, and SCT and recent neurological research suggests that it is, there are many questions that need to be addressed. Among them, what is the timeframe for cultivating motivation as a habit? Is it ever too late for a student to develop the habit of motivation? How does motivated behavior become innate? What does it take to cultivate motivation as a habit? Are there limits to the process? What does an environment that cultivates motivation as a habit look like? And, what can be done by parents, teachers, schools, communities, and policy makers to foster motivation-oriented environments for a greater number and more diverse population of students? While I do not have answers for all of these questions, I do have some suggestions, based on the results of this study, regarding where to start and how to build upon the notion of cultivating motivation as a habit.

Although additional research is necessary to further test and re-confirm the link between environmental supports in nurturing habituated motivation in students, the implications of such a finding are great. Understanding the specific conditions that contribute to motivation as a habit, would allow researchers to develop recommendations for creating a rearing environment and educational settings that effectively initiate and support habituated motivation. Second, individual educators and school systems in general, could develop curriculums to teach the habit of motivation to their students. And for those students who are identified as at-risk for amotivation, interventions can be implemented to ensure that their academic achievement does not suffer.

As some research suggests that motivated behavior is a continuum of self-regulation and thereby an indicator of emotional intelligence (Deci & Ryan, 2000a), then teaching motivation may not only positively impact achievement as defined by standardized test scores and GPAs, but also achievement defined by autonomy and self-efficacy. And, although SCT and findings of this study suggest that academic achievement is not contingent upon happiness, enjoyment, or self-satisfaction, there is a host of literature that supports that motivation and psychological state during adolescence is related to other positive outcomes and overall well-being later in life (Baker, 2004; Baumeister & Leary, 1995; Beiswenger & Grolnick, 2010; Fortier, Vallerand, & Guay, 1995; Haworth & Hill, 1992; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Rosenberg, 1985; Ryan & Grolnick, 1986), meaning that efforts to teach motivation may not only serve to encourage habituated motivation, but foster other unintentional positive outcomes for adolescents.

Additionally, with its behaviorist underpinnings, Bandura's SCT suggests that although the supports for the social learning of motivation are initially external to the individual, the drive toward motivated behaviors, becomes internalized over time. In other words, what begins as a form of extrinsic motivation, transforms into intrinsic motivation as the habit of motivation is integrated into an individual's repertoire of behavioral tendencies. This means that not only can motivation as a habit be taught, but specifically intrinsic motivation, the type of motivation that research indicates is most critical to

producing positive student outcomes (Deci & Ryan, 1985; Grolnick & Ryan, 1987; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000), can be taught.

### **Motivation as a Protective Factor**

Although researchers must continue to develop an understanding of how to cultivate motivation as a habit, an equally thrilling notion is the use of motivation as a protective factor. At present, I see two distinct ways in which habituated motivation could be employed as a protective factor: 1) buffering the risks associated with certain developmental stages; and 2) shielding against the disadvantages placed on specific at-risk populations.

The results of this study have illuminated the potential for habituated motivation to protect against negative outcomes associated with average developmental trajectories. Specifically, this study suggested the way in which a learned orientation toward motivated behavior may compensate for the decrease in interest, enjoyment, engagement, and value of schoolwork associated with adolescence, as well as the intrapersonal decreases in self-satisfaction, self-esteem, attitude toward self, and self-confidence that are also common to adolescence.

While not conditional on these trajectories alone, achievement or well-being later in life, can be negatively affected. As such, habituated motivation could prove effective in protecting against such adverse outcomes. Why might this be the case? Though a surprisingly small number of studies have examined the neurological processes of motivation to date, researchers have begun to explore the cognitive properties of motivation. Ratelle, Baldwin, and Vallerand

(2005) found that motivation can be triggered by contextual prompts. Within a classroom, items such as whiteboards, textbooks, and dictionaries may serve to stimulate the motivated behaviors associated with achieving an academic goal. Though a student may initially be aware that they associate these items with academic pursuits, with repetition, activation of the motivated behavior becomes subconscious and automatic.

Additionally, low self-esteem and negative self-perceptions are related to anxiety and depression (Bachman, 1970; Rosenberg, 1965, 1985). Therefore, habituated motivation may serve a secondary function as research indicates that motivation enhances self-esteem, perceptions of self, and personal well-being (Fortier, Vallerand, & Guay, 1995; Reis; 2001; Ryan & Grolnick, 1986).

As this study revealed the potential for motivation to buffer against the effects of developmental risk factors, it is likewise reasonable to consider that habituated motivation may be useful for shielding specific at-risk populations from certain negative outcomes. Within an educational context, it is intriguing to consider the ways in which motivation as a habit could contribute to the academic success of students who are marginalized due to race, sex, gender, immigration status, and special needs.

### **Validity and Limitations**

This study is limited in several ways. First, I recognize that personal bias is one way in which this study's validity could be threatened. As I have applied experience working with students in a classroom setting, I have my own beliefs regarding the relationship between motivation and academic success. Aware of

this bias I controlled for any threats to validity on its basis by wholly and objectively attending to both the data set and results of the analyses. I presented and discussed results empirically in cases where the outcomes support my anecdotal experiences, as well as outcomes that do not match my personal understandings of student motivation.

Second, the limitations of performing a secondary data analysis present a challenge to any study's validity. In all secondary analyses, researchers are always constrained by error or oversight in the original data collection process. As I did not directly gather and disseminate the data, it is impossible to know what the environmental circumstances were like for participants of this study. As I was not present when these surveys were administered, I have no way of knowing for certain, that conditions were consistent and that the integrity of the survey management and completion makes for honest, accurate, and reliable data. While there is no analysis that can account for this kind of error it is important to acknowledge these limitations.

Third, an additional consideration relates to utilizing a data set that was not originally designed to examine student motivation in detail. Although I have been careful in selecting variables that match the criteria outlined by each theory, it is possible that the MTF variables are not the most optimally suited for testing theories of motivation. To account for this threat to validity I opted to employ variables that were designed to capture a complete and representative portrait of American youth in the United States and excluded variables that were designed

and written exclusively for assessing adolescent risk-taking behaviors (the purpose upon which the MTF series was originally designed).

Fourth, this study recognizes the potential for bias when self-reports are used to measure certain psychological aspects. Additional reports from parents and teachers would strengthen the reliability of results, as would third-party observations that categorize, code, and rate the behavior of participants.

Lastly, due to the cross-sectional nature of this study, I cannot make any causal inferences about the directionality of the relationship between motivation and academic success. Though beyond the scope of this study, future research of a longitudinal nature, in which the motivation and academic success of a consistent group of individuals is monitored over time, is advisable.

Though this study had several limitations, as most studies do, a remarkable strength of this study is the size and composition of the sample population, as well as the breadth of the survey. The 2017 MTF 8<sup>th</sup> and 10<sup>th</sup> grade surveys included 30,181 participants and was representative of the population of students in the 8<sup>th</sup> and 10<sup>th</sup> grades at academic/college preparatory, general education, and vocational schools in the public sector of the United States. Additionally, the study measured attitudes, beliefs, and behaviors using a startling 450 variables among multiple content areas. Further, as an ongoing study since 1975, each new survey is created in an iterative manner in which flaws or limitations of previous surveys are able to be addressed.

### **Recommendations and Future Directions**

This study explored the relation between motivation and academic achievement among middle school and high school students in the United States. Understanding that motivation is a key component of academic success, the goal of this study was to provide a clearer understanding of student motivation and clarify which of two process theories: social cognitive theory (SCT) or self-determination theory (SDT) better accounts for academic success in adolescents. Accordingly, findings of this study may be useful in designing interventions aimed at cultivating and sustaining motivation in adolescence, a developmental period in which motivation reaches an all-time low.

Results of this study indicated that the social learning of motivation as suggested by SCT, may be critical to understanding why some adolescents achieve academic success while others do not. As such, this study has also suggested a new way to understand the development of motivation and the ways in which motivation may serve as a protective factor in students' lives. To build on this finding, I suggest that researchers: 1) move toward an applied theory of student motivation; 2) re-conceptualize academic achievement; and 3) move toward an understanding of motivation and academic achievement as perceived by adolescent populations.

Although the breadth of information available on motivation is valuable for researchers, the sheer amount of interdisciplinary terminology and methodology of the topic, presents challenges as well. To better understand the relationship between motivation and academic success, the way in which motivation is discussed needs to change. The definitions, terminology, measures,

and theories of motivation need to evolve to conceptualize motivation in a more dynamic manner. Current language of motivation is too static, dichotomous and inflexible, whereas motivation, by nature, is active and highly variable.

The transition from content theories of motivation to process theories, was a good first step toward a more wholistic view of motivation. Process theories' consideration of how individuals are motivated and not just what motivates individuals, as well as their acknowledgement that culture, sex, gender, and age play a role in motivation, oriented research in the right direction. As theoretical frameworks remain far too rigid, formulaic, and absolute in their conceptualization of motivation, however, there is still work to be done. In fact, the reality that researchers have failed to develop and agree upon a single, adequate theory of motivation or consistent means of defining and measuring motivation as it applies to all human behavior, suggests that perhaps a unified theory is not the solution. It is possible that a unified theory of motivation would be too broad and in doing so, explain very little about motivation.

Instead, I suggest that researchers should focus *not* on consolidating motivation into a singular theory but turn their energy toward developing a framework or view of motivation that is practical, rather than all inclusive, and contextualized to the specific circumstances of students in particular settings. At present, the language used to discuss motivation is incredibly dichotomous and typified. Literature continues to focus on the differentiation between two distinct types of motivation: intrinsic and extrinsic motivation. Additionally, research implies that motivation is either something that students have or don't and largely



ignores the ways in which the experiences of students, even motivated students, can be undermined by social and societal structures, and inequalities of opportunity or the ways in which motivation can vary from one situation or task to the next.

I recommend that conceptualizing motivation much like the multi-dimensional model of amotivation (Green-Demer et al., 2008; Legault et al., 2006; Shen et al., 2010), and as existing on a spectrum of regulation (Deci & Ryan, 2000) would be beneficial. Further, as there is a paucity of research on the ways in which individual differences in motivation play a role in academic outcomes (Pearce & Larson, 2006), future constructs should consider variations between students.

As a second recommendation and future direction, I advise that the way in which achievement, and more specifically, academic achievement is discussed, also needs to change. A limitation of this study, as well as many other studies on academic achievement, is the narrow way in which the achievement or success is defined. Most research on academic achievement conceptualizes or measures student success as standardized test scores, quarterly grades, GPAs, college acceptance, and other quantitative data. In reality, what it means to achieve academic success is far more complicated and variable. While helpful in understanding achievement, test scores and GPAs are valuable only in certain situations and only to a certain point. Student success is *not* and *should not* be limited to assessment scores. What the term academic achievement *should*

constitute is a wider definition of success that acknowledges additional items as indicators of achievement.

A more comprehensive understanding of academic achievement should encourage parents, teachers, school systems, and researchers to recognize measures beyond those that are purely numerical in nature and consider the ways that age, gender, sex, culture, social interactions, societal structures, and personal characteristics influence definitions of student success. Additionally, although process theories including SCT and SDT consider autonomy, competence, and self-efficacy as *components* of achievement, I argue that these psychological states of being or perceived skills, *are in themselves* a form of success. An overarching goal of the educational process in the United States is to cultivate self-efficacy, independence, and competence and especially during adolescence, during which students are preparing to plan for and direct their own futures. Accordingly, individuals experiencing these characteristics are already achieving one kind of success. As opposed to viewing these states and skills as a tool within a theory, researchers, educators, and especially students would benefit from understanding them as a type of achievement.

Lastly, a review of literature for this study revealed an additional gap in research. I found that despite the amass of information available on motivation, learning, and education, there is little content that illuminates how American middle and high school students in the 21<sup>st</sup> century, conceptualize their own motivation as it relates to academic success, as well as how they define and understand academic success. The link between motivation and academic

achievement and the fact that students who are motivated, either internally or externally, are more likely to experience positive school outcomes, is undisputed. But, what do students think, feel, and know, when it comes to their own motivation? This question is one that remains largely unanswered by research. If we want to know how students are motivated and what they consider success, it is not a particularly novel idea to ask them. And yet, the student point of view has been largely overlooked in literature.

The link between motivation and academic success can only become fully understood if *first*, the time is taken to understand what exactly the many meanings of academic success and achievement are, based on adolescents' own perceptions. It is only by situating the student perspective within the discussion of achievement and motivation, that my former recommendations to move toward an applied theory of student motivation and to re-structure the notion of academic achievement, can be wholly realized.

In an ideal world, this study, my thesis, would produce an understanding of the underlying processes of motivation and the use of motivational theories in fostering academic success, while also providing students a platform to share how *they* think and feel about their own motivation. Completing and attending to both of these tasks with the level of investigation and detail that they deserve, however, was simply unrealistic for a master's thesis timeline. Instead, this study serves to expand research on theories of motivation and assess their application and relevance in a 21<sup>st</sup> century classroom. This secondary data analysis is a first step in achieving a comprehensive understanding of the relationship between

processes of student motivation and academic success. An understanding that when possible, should include the student perspective and in doing so, may be used to guide the integration of effective evidence-based classroom strategies and interventions.

I suggest that incorporating the student perspective is an exciting and fitting the next step for this line of inquiry, and for any researcher interested in better understanding how students are motivated or for anyone who simply has a desire to help more students achieve academic success. In understanding student motivation, it is possible to contribute to positive academic outcomes for a larger number of and a more diverse population of students, and in doing so, help to close opportunity gaps in the United States.

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Table 1

*Descriptive Statistics for Study Variables- Social Cognitive Theory (SCT)*

		<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
Social Cognitive Theory (SCT)	Efficacy 1 do well as others	13,121	3.85	1.20	-0.95	0.00
	Efficacy 2 proud of self	13,189	3.63	1.40	-0.58	-1.05
	Efficacy 3 life useful	12,998	3.87	1.33	-0.86	-0.53
	Efficacy 4 do best work	29,839	4.27	0.87	-1.16	1.08
	Efficacy 5 person of worth	13,145	3.78	1.29	-0.84	-0.41
	Expectancy 1 future is hopeful	13,076	3.83	1.34	-0.83	-0.58
	Expectancy 2 future gets better	8,635	4.13	0.94	-1.08	0.89
	Psych 1 satisfied w/self	13,018	3.75	1.32	-0.80	-0.54
	Psych 2 resp. enjoys life	13,122	3.81	1.31	-0.86	-0.44
	Psych 3 happy these days	29,868	1.98	0.60	0.01	-0.18
	Psych 4 am no good	13,152	3.45	1.47	-0.40	-1.27
	Psych 5 life is meaningful	13,253	3.60	1.39	-0.54	-1.03
	Psych 6 good to be alive	13,019	4.13	1.19	-1.31	0.72



Table 2

*Descriptive Statistics for Study Variables- Self-Determination Theory (SDT)*

		<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
Self-Determination Theory (SDT)	Autonomy 1 think about future	28,879	3.41	0.75	-1.22	1.21
	Autonomy 2 plans after high school	28,786	2.55	0.86	0.14	-0.68
	Autonomy 3 #x resp. misbehaves	29,828	4.60	0.82	-2.34	5.46
	Autonomy 4 often enjoys school	29,896	3.18	1.03	-0.28	-0.19
	Autonomy 5 often hates school	29,852	2.91	1.13	-.002	-0.70
	Autonomy 6 finds work interesting	29,633	2.78	1.02	-0.02	-0.45
	Relatedness 1 have enough friends	25,762	3.25	1.53	-0.20	-1.45
	Relatedness 2 feel lonely	25,699	3.43	1.40	-0.34	-1.23
	Relatedness 3 feel left out	25,747	3.29	1.34	-0.22	-1.25
	Relatedness 4 usually have friends to be with	25,774	4.02	1.24	-1.28	0.64
	Relatedness 5 someone to talk to	25,748	3.98	1.28	-1.20	0.32
	Relatedness 6 time spent with friends	347	3.74	1.07	-0.75	0.00
	Relatedness 7 parental support	8,993	2.06	0.74	-0.09	-1.15
	Relatedness 8 other adult support	25,711	3.92	1.29	-1.13	0.11
	Competence 1 capable of schoolwork	394	3.20	1.01	-0.24	-0.24
	Competence 2 do right thing	13,002	3.69	1.38	-0.65	-0.90

Table 3

*Correlations for Study Variables of Social Cognitive Theory (SCT)*

	EFFIC ACY_	EFFIC ACY_	EFFIC ACY_	EFFIC ACY_	EFFIC ACY_	EXPEC TANCY	EXPEC TANCY	PSY CH_	PSY CH_	PSY CH_	PSY CH_	PSY CH_	PSY CH_
	1	2	3	4	5	1	2	1	2	3	4	5	6
EFFICA CY_1	1.0	0.31**	0.31**	0.15**	0.52**	0.27**	0.27**	0.55*	0.56*	0.25*	0.27*	0.26*	0.52*
								*	*	*	*	*	*
EFFICA CY_2	0.31**	1.0	0.66**	0.18**	0.37**	0.62**	0.32**	0.45*	0.47*	0.40*	0.65*	0.64*	0.42*
								*	*	*	*	*	*
EFFICA CY_3	0.31**	0.66**	1.0	0.16**	0.40**	0.69**	0.33**	0.47*	0.50*	0.40*	0.67*	0.66*	0.50*
								*	*	*	*	*	*
EFFICA CY_4	0.15**	0.18**	0.16**	1.0	0.18**	0.16**	0.14**	0.17*	0.18*	0.15*	0.12*	0.13*	0.18*
								*	*	*	*	*	*
EFFICA CY_5	0.52**	0.37**	0.40**	0.18**	1.0	0.36**	0.29**	0.61*	0.64*	0.33*	0.35*	0.36*	0.59*
								*	*	*	*	*	*
EXPECT ANCY_1	0.27**	0.62**	0.69**	0.16**	0.36**	1.0	0.35**	0.42*	0.45*	0.38*	0.65*	0.65*	0.44*
								*	*	*	*	*	*
EXPECT ANCY_2	0.27**	0.32**	0.33**	0.14**	0.29**	0.35**	1.0	0.33*	0.36*	0.30*	0.30*	0.30*	0.36*
								*	*	*	*	*	*
PSYCH_ 1	0.55**	0.45**	0.47**	0.17**	0.61**	0.42**	0.33**	1.0	0.68*	0.39*	0.45*	0.42*	0.69*
									*	*	*	*	*
PSYCH_ 2	0.56**	0.47**	0.50**	0.18**	0.64**	0.45**	0.36**	0.68*	1.0	0.42*	0.46*	0.47*	0.69*
								*		*	*	*	*
PSYCH_ 3	0.25**	0.40**	0.40**	0.15**	0.33**	0.38**	0.30**	0.39*	0.42*	1.0	0.40*	0.42*	0.37*
								*	*		*	*	*
PSYCH_ 4	0.27**	0.65**	0.67**	0.12**	0.35**	0.65**	0.30**	0.45*	0.46*	0.40*	1.0	0.63*	0.40*
								*	*	*		*	*
PSYCH_ 5	0.26**	0.64**	0.66**	0.13**	0.36**	0.65**	0.30**	0.42*	0.47*	0.42*	0.64*	1.0	0.44*
								*	*	*	*		*
PSYCH_ 6	0.52**	0.42**	0.50**	0.18**	0.59**	0.44**	0.36**	0.69*	0.70*	0.37*	0.40*	0.44*	1.0
								*	*	*	*	*	*

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 4

Correlations for Study Variables of Self-Determination Theory (SDT)

	AUT ONO MY_1	AUT ONO MY_2	AUT ONO MY_3	AUT ONO MY_4	AUT ONO MY_5	AUT ONO MY_6	RELA TED NESS 1	RELA TED NESS 2	RELA TED NESS 3	RELA TED NESS 4	RELA TED NESS 5	RELA TED NESS 6	RELA TED NESS 7	RELA TED NESS 8	COM PETE NCE_1	COM PETE NCE_2
AUT ONO MY_1	1.0	0.37*	0.13*	0.13*	0.07*	0.14*	-	-	-	0.11*	0.12*	0.04*	0.08*	0.10*	0.05*	0.02
AUT ONO MY_2		1.0	0.02*	0.11*	0.10*	0.11*	0.07*	0.05*	0.03*	*	*	*	*	*	*	*
AUT ONO MY_3			1.0	0.15*	0.17*	0.11*	-0.01	-0.02	-	0.08*	0.12*	-	0.12*	0.12*	0.13*	0.07*
AUT ONO MY_4				1.0	0.61*	0.47*	0.12*	0.18*	0.14*	0.14*	0.20*	0.03*	0.19*	0.22*	0.17*	0.20*
AUT ONO MY_5					1.0	0.41*	0.14*	0.24*	0.19*	0.08*	0.16*	0.00	0.20*	0.18*	0.23*	0.25*
AUT ONO MY_6						1.0	0.04*	0.08*	0.06*	0.08*	0.14*	0.01*	0.18*	0.15*	0.11*	0.13*
RELA TEDN ESS_1							1.0	0.44*	0.50*	-0.01	0.05*	0.10*	0.12*	0.08*	0.11*	.c
RELA TEDN ESS_2								1.0	0.66*	0.06*	0.20*	0.17*	0.29*	0.23*	0.14*	.c
RELA TEDN ESS_3									1.0	0.03*	0.12*	0.16*	0.22*	0.15*	0.14*	.c
RELA TEDN ESS_4										1.0	0.50*	0.23*	0.17*	0.46*	0.05*	.c
RELA TEDN ESS_5											1.0	0.13*	0.36*	0.82*	0.10*	.c
RELA TEDN ESS_6												1.0	0.09*	0.12*	-	0.10*
RELA TEDN ESS_7													1.0	0.37*	0.10*	0.27*
RELA TEDN ESS_8														1.0	0.10*	.c
COM PETE NCE_1															1.0	0.19*
COM PETE NCE_2																1.0

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

c. Cannot be computed

Table 5

*Regression Coefficients Social Cognitive Theory (SCT) 8<sup>th</sup> Grade Population*

Model	Unstandardized		Standardized		Sig.
	B	Std. Error	Beta	t	
(Constant)	1.94	0.21		9.34	< 0.001
Efficacy_1 do well as others	0.09	0.03	0.05	2.64	0.008
Efficacy_2 proud of self	0.14	0.03	0.09	4.01	< 0.001
Efficacy_3 life is useful	0.10	0.04	0.06	2.66	0.008
Efficacy_4 do best work	0.81	0.04	0.32	20.84	< 0.001
Efficacy_5 person of worth	0.19	0.03	0.11	5.52	< 0.001
Expectancy_2 future gets better	-0.10	0.04	-0.04	-2.67	0.008
Psych_1 satisfied w/self	0.04	0.04	0.02	1.01	0.311
Psych_2 happy these days	-0.11	0.04	-0.07	-2.91	0.004
Psych_4 am no good	-0.05	0.03	-0.03	-1.46	0.146
Psych_5 life is meaningful	0.04	0.03	0.02	1.06	0.290

Table 6

*Regression Coefficients Social Cognitive Theory (SCT) 10<sup>th</sup> Grade Population*

Model	Unstandardized Coefficients		Standardized	t	Sig.
	B	Std. Error	Coefficients Beta		
(Constant)	1.22	0.21		5.95	< 0.001
Efficacy_1 do well as others	0.12	0.03	0.07	3.69	< 0.001
Efficacy_2 proud of self	0.22	0.03	0.15	6.69	< 0.001
Efficacy_3 life is useful	0.08	0.04	0.05	2.21	0.027
Efficacy_4 do best work	0.88	0.04	0.36	24.34	< 0.001
Efficacy_5 person of worth	0.09	0.03	0.05	2.54	0.011
Expectancy_2 future gets better	0.00	0.04	0.002	0.10	0.917
Psych_1 satisfied w/self	-0.05	0.04	-0.03	-1.26	0.206
Psych_2 resp. enjoys life	-0.14	0.04	-0.09	-3.71	< 0.001
Psych_4 am no good	-0.08	0.03	-0.06	-2.54	0.011
Psych_5 life is meaningful	0.13	0.03	0.08	3.76	< 0.001

Table 7

*Regression Coefficients Self-Determination Theory (SDT) 8<sup>th</sup> Grade Population*

Model	Unstandardized Coefficients		Standardized	t	Sig.
	B	Std. Error	Coefficients		
(Constant)	1.97	0.34		5.76	< 0.001
Autonomy_1 think about future	0.33	0.07	0.12	4.79	< 0.001
Autonomy_2 plans after high school	-0.10	0.06	-0.04	-1.63	0.104
Autonomy_4 often enjoys school	0.16	0.06	0.08	2.54	0.011
Autonomy_5 often hates school	0.19	0.06	0.10	3.34	0.001
Autonomy_6 finds work interesting	0.05	0.05	0.02	0.86	0.388
Relatedness_1 have enough friends	-0.05	0.04	-0.04	-1.50	0.133
Relatedness_2 feel lonely	-0.01	0.04	-0.01	-0.27	0.791
Relatedness_4 feel left out	0.10	0.04	0.06	2.27	0.024
Relatedness_6 time spent with friends	-0.04	0.05	-0.02	-0.93	0.354
Relatedness_7 parental support	0.29	0.08	0.10	3.84	< 0.001
Relatedness_8 other adult support	0.02	0.05	0.01	0.43	0.665
Competence_1 school too hard	0.62	0.05	0.30	12.48	< 0.001

Table 8

*Regression Coefficients Self-Determination Theory (SDT) 10<sup>th</sup> Grade Population*

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Sig.
(Constant)	1.23	0.39		3.20	0.001
Autonomy_1 think about future	0.45	0.08	0.15	5.71	< 0.001
Autonomy_2 plans after high school	-0.04	0.06	-0.02	-0.64	0.523
Autonomy_4 often enjoys school	0.21	0.07	0.10	3.23	<0.001
Autonomy_5 often hates school	0.03	0.06	0.02	0.48	0.628
Autonomy_6 finds work interesting	0.21	0.06	0.10	3.66	< 0.001
Relatedness_1 have enough friends	-0.05	0.04	-0.03	-1.30	0.194
Relatedness_2 feel lonely	0.01	0.04	0.01	0.21	0.835
Relatedness_4 feel left out	0.08	0.05	0.05	1.72	0.085
Relatedness_6 time spent with friends	0.00	0.05	0.00	0.03	0.977
Relatedness_7 parental support	0.25	0.07	0.09	3.42	<0.001
Relatedness_8 other adult support	-0.00	0.05	-0.00	-0.15	0.881
Competence_1 capable of schoolwork	0.55	0.05	0.25	10.14	< 0.001

Figure 1.

*Albert Bandura's Theoretical Contributions and the Development of Social Cognitive Theory.*

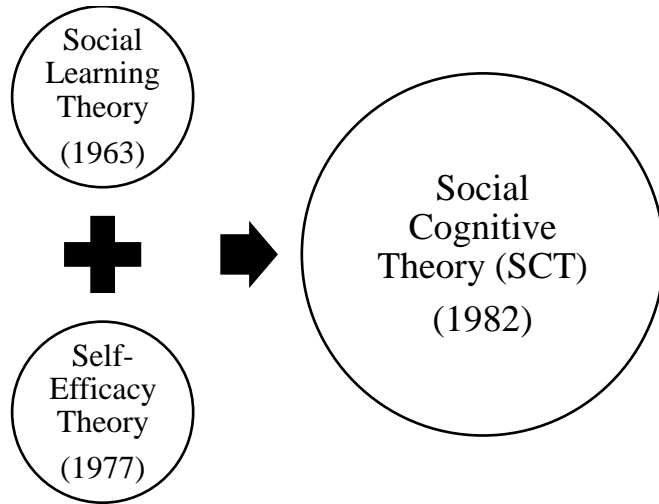




Figure 2.

*Motivation as conceptualized by Social Cognitive Theory (SCT)*

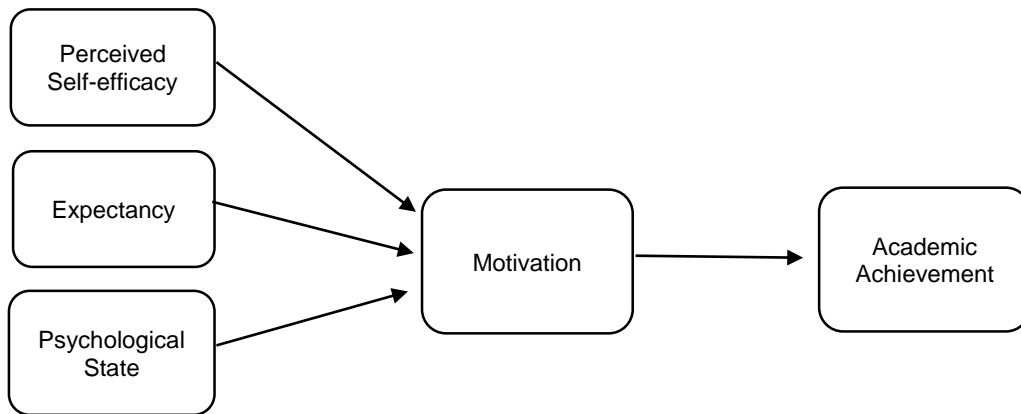
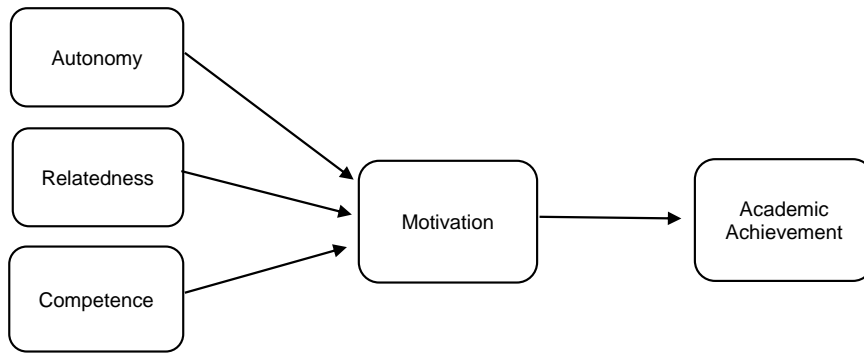


Figure 3.

*Motivation as conceptualized by Self-determination theory (SDT)*



Appendix A

*Variables from Monitoring the Future (MTF) 2017 8<sup>th</sup> and 10<sup>th</sup> Grade Surveys, used to construct a model for social cognitive theory (SCT).*

Theoretical Construct	MTF Variable	Variable Label	Item Number	MTF Question
Efficacy_1	V8508	<i>2017 Q01 DO WELL AS OTHR F24</i>	12580 F24	How much do you agree or disagree with each of the following statements? I am able to do things as well as most other people 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Efficacy_2	V8503	<i>2017 Q01 -MUCH TO B PROUD F24</i>	12660 F24	How much do you agree or disagree with each of the following statements? I feel I do not have much to be proud of 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Efficacy_3	V8513	<i>2017 Q01 MY LIFE NT USEFL F24</i>	12750 F24	How much do you agree or disagree with each of the following statements? I feel that my life is not very useful 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Efficacy_4	V7331	<i>2017 B01 LSTYR/DO BEST WK F1234</i>	23110F1234	Now thinking back over the past year in school, how often did you . . . try to do your best work in school? 1="Never" 2="Seldom" 3="Sometimes" 4="Often" 5="Almost always"

Efficacy_5	V8504	2017 Q01 AM PRSN OF WORTH F2	12570 F24	How much do you agree or disagree with each of the following statements? I feel I am a person of worth, on an equal plane with others 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Expectancy_2	V8536	2017 P01 FUTR R LIFE WRSE F2	25670 F2	How do you think your own life will go in the next few years -- do you think it will get better or worse? 1="Get much better" 2="Get somewhat better" 3="Stay about the same" 4="Get somewhat worse" 5="Get much worse"
Psychological State_1	V8512	2017 P01 SATISFD W MYSELF F24	12620 F24	How much do you agree or disagree with each of the following statements? On the whole, I'm satisfied with myself 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Psychological State_2	V8505	2017 P01 I ENJOY LIFE F24	23710 F24	How much do you agree or disagree with each of the following statements? I enjoy life as much as anyone 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Psychological State_4	V8507	2017 Q01 I AM NO GOOD F24	12680 F24	How much do you agree or disagree with each of the following statements? Sometimes I think that I am no good at all

				1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Psychological State_5	V8502	2017 P01 LIFE MEANINGLESS F24	23700 F24	How much do you agree or disagree with each of the following statements? Life often seems meaningless 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"

Appendix B

*Variables from Monitoring the Future (MTF) 2017 8<sup>th</sup> and 10<sup>th</sup> Grade Surveys, used to create a model for self-determination theory (SDT).*

Theoretical Construct	MTF Variable	Variable Label	Item Number	MTF Question
Autonomy_1	V7251	2017 B01 THINK FUT BYND SC F1234	25830 F1234	How often do you think about your future beyond high school? 1="Never" 2="Seldom" 3="Sometimes" 4="Often"
Autonomy_2	V7252	2017 B01 PLANS AFTER SCHL F1234	25840 F1234	Which best describes your plans after high school? 1="I have no idea what I will do." 2="I have a few ideas about what I might do." 3="I know pretty well what I will do." 4="I know exactly what I will do."
Autonomy_4	V7329	2017 B01 LSTYR/ENJOY SCHL F1234	23090 F1234	Now thinking back over the past year in school, how often did you . . . enjoy being in school? 1="Never" 2="Seldom" 3="Sometimes" 4="Often" 5="Almost always"
Autonomy_5	V7330	2017 B01 LSTYR/HATE SCHL F1234	23100 F1234	Now thinking back over the past year in school, how often did you . . . hate being in school? 1="Never" 2="Seldom" 3="Sometimes" 4="Often" 5="Almost always"
Autonomy_6	V7333	2017 B01 LSTYR/WK INTRSTG F1234	24840 F1234	Now thinking back over the past year in school, how often did you . . . find your school work interesting? 1="Never"

				2="Seldom" 3="Sometimes" 4="Often" 5="Almost always"
Relatedness_1	V7507	2017 Q03 OFT WSH MOR FRND F3	12730 F3	Do you agree or disagree with each of the following? G: I often wish I had more good friends 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Relatedness_2	V7501	2017 Q03 OFTN FEEL LONELY F3	12650 F3	Do you agree or disagree with each of the following? A: A lot of times I feel lonely 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Relatedness_3	V7504	2017 Q03 OFTN FEEL LEFT OUT F3	12759 f3	Do you agree or disagree with each of the following? A: A lot of times I feel left out 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Relatedness_4	V7508	2017 Q03 USLY FRDS BE WTH F3	12760 F3	Do you agree or disagree with each of the following? H: I usually have a few friends around that I can get together with 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Relatedness_6	V7378	2017 C07 DALY VIS FRDS FR F1234	05925 F1234	How often do you do each of the following? Get together with friends informally (in your free time) 5="Almost every day" 4="At least once a week" 3="Once or twice a month"

				2="A few times a year" 1="Never"
Relatedness_7	V7254	2017 M03 TALK PROB W/PRNT F1234	25860 F1234	If you were having problems in your life, do you think you would talk them over with one or both of your parents? 3="Yes, for most or all problems" 2="Yes, for at least some of my problems" 1="No" Responses from the Western region intentionally deleted.
Relatedness_8	V7502	2017 Q03 ALWYS SMI HELP R F3	12670 F3	Do you agree or disagree with each of the following? B: There is always someone I can turn to if I need help 1="Disagree" 2="Mostly Disagree" 3="Neither" 4="Mostly Agree" 5="Agree"
Competence_1	V7332	2017 B01 LSTYR/SCH 2 HARD F1234	23120 F1234	Now thinking back over the past year in school, how often did you . . . find the school work too hard to understand? 1="Never" 2="Seldom" 3="Sometimes" 4="Often" 5="Almost always"