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Increasing Autonomous Academic Motivation in Intermediate Elementary Students by Reducing Fear of Failure

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INCREASING AUTONOMOUS ACADEMIC MOTIVATION IN INTERMEDIATE ELEMENTARY STUDENTS BY REDUCING FEAR OF FAILURE

by

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Introduction

Introduction

Failure is a scary word. Just hearing it can evoke self-doubt, thoughts of incompetence, and feelings of disappointment. Failure implies that a person is not good enough. No one wants to be labeled a failure.

Failure, however, is inherent to learning. Students must attempt unfamiliar processes when learning new skills, exposing them to initial failures in the form of mistakes and errors. Only repeated practice leads to ease of use and mastery. Still, many students are afraid of failing. In efforts to avoid failure, or the appearance of failure, students cause distractions, cheat, and avoid challenging tasks. In short, they put forth less than their maximum level of effort in order to avoid experiencing failure.

These reactions to fear of failure show low autonomous academic motivation, or motivation to pursue academic learning of one's own accord, without which students will not achieve their potential. My primary interest as a teacher is to help students achieve their potential, which led me to the focus of this capstone project: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students?

The Development of my Perspective

As a ten-year-old in fifth grade, doing schoolwork was never optional for me. I certainly remember disliking certain assignments, lessons, and projects, but I always felt the need to do my work and to do it well. To be honest, aside from being in the school band, I never felt out of my element in school until my 12th grade AP calculus class. And despite the struggle that year, I graduated with above a 4.0 grade point average. I credit my parents for instilling the vision of graduating from a four-year college as an expectation for each of their children. After high school graduation, my brother, my sister and I all followed the course of attending and graduating from well-known universities. I loved writing and aspired to apply that talent by earning a bachelor's degree in journalism. I never doubted that graduating from college was the course I would follow.

I did surprise myself by returning to school in pursuit of a master's degree in teaching just two years later. Following service in the Peace Corps in El Salvador and six months as a paraprofessional in a suburban middle school, I stepped into my first year of teaching as a Teaching Fellow, an alternative licensure program. I am now in my seventh year teaching fifth grade at a public inner-city school. Over ninety percent of the students at my school qualify for free or reduced lunch and nearly seventy percent are labeled English language learners. Coming from my suburban, middle class, nuclear family, I often struggle to relate with my students' backgrounds and experiences.

The Development of a Question

In my first year of teaching, I observed that many of the fifth graders entering my classroom did not attempt challenging tasks or were only willing to apply a minimal

amount of effort, enough to get by. I was commonly faced with defeatist natured questions such as, “How much more do I have to do to be done?” or, “Do I have to do this?” I was speechless as a naïve first year teacher when asked bluntly, “What if I don’t do it?” These questions were never in my repertoire as a student. It took most of that first year for me to comprehend that such attitudes of apathy could exist in my ten and eleven-year-old students. At that point I began asking, “How can they not care about learning fifth grade material?”

I was less shocked, but not less appalled, over the next three years as I continued to confront attitudes of apathy from students entering my classroom. I combated this lack of autonomous academic motivation with tireless efforts to externally motivate my classes. My school adopted a process called Positive Behavior Intervention Systems (PBIS) in which we emphasized recognizing and rewarding positive behavior within individual classrooms and school wide. I employed reward systems for work completion, positive reinforcement for following directions, negative consequences for off task behavior, and even threats for missing assignments. As I tallied class points, filled reward jars with marbles, and handed out tickets constantly, it became exhausting and impossible to keep up with so many systems operating simultaneously. Even worse, though, I found external motivation follows the rule of diminishing return. With every reward, positive reinforcement, consequence, or threat, the effect was lessened. Soon students expected to be rewarded for any positive behavior. I struggled to justify giving prizes for what my students should have been doing on their own. My question became, “Why am I working so hard if they still do not care about learning?”

Three years ago my battle with motivation in the classroom reached a peak. I heard the words, “This is hard,” and, “I can’t do this,” multiple times a day. The same students would repeat those phrases before even attempting a task. They would give up without ever trying. It was not a surprise that this set of students’ achievement level in fifth grade was low. In that same class I also had students with high levels of autonomous academic motivation. These motivated students would constantly seek to clarify difficult tasks, would challenge themselves to improve their work, and would ask for next steps if they finished early. Within one year, two of these students went from partially passing the comprehensive achievement test in math in fourth grade to passing or even exceeding the standards by the end of fifth grade. In reading, those same two students who began the year at third grade reading levels had surpassed the fifth grade reading levels by the year’s end. This dichotomy inspired a change in the nature of my question: “How can I build autonomous academic motivation in the students who are lacking it?”

Finalizing the Research Question

As I began this capstone project, I reexamined the questions I had been asking about student motivation over the past seven years. With autonomous academic motivation at the forefront of my thoughts, I began noticing patterns of behavior that had existed in my classes for years, but to which I had paid little attention.

Every year a few students stood out as obviously lacking autonomous academic motivation. These students often interrupted classes, rarely attempted work, and visibly or audibly expressed their disinterest in learning. I found many more students who were quiet and reserved, though, who went to great lengths to hide what they did not know.

They worked quietly and usually had something to turn in. Answers on their homework led me to believe they were learning academic content, but they continually scored low on assessments.

As I analyzed the work of students in this category I noticed pages of math calculations with work that looked in its shape similar to the algorithms we practiced in class, but that were conceptually erred, and yet magically included a correct final answer. I noticed that while they were quiet and seemingly engaged in appropriately challenging books for their grade level, their lengthy reading responses were not only shallow, but also full of misinformation. When I asked students with work written down why they do not raise their hands to participate, they responded that is was because they were not certain that their answer was correct.

These students had stayed under the radar in my classroom for years, and I am sure in many other classrooms as well. They appeared to be students who were shy and tried their best to complete schoolwork but in the end just did not understand fifth grade content. What I came to realize was that beyond not learning academic content, what appeared to be well-intentioned effort on schoolwork were actually elaborate designs to disguise what students did not know. Not only were these students not participating in class and avoiding academic risks that are key in learning, they were investing a great deal of effort to cover up that they did not understand academic content. These designs seemed to be a way for students to avoid failure. The measures they took to hide what they did not know suggests they were aware of not understanding the content, but the

fake work suggests an underlying lack of autonomous academic motivation. In an effort to save face, they were avoiding applying genuine effort to learning.

Fear of failure, or important others noticing that failure, has caused lower levels of autonomous academic motivation in my class for years. From the students my first year doing just enough work to get by to the students in subsequent years who could not be moved to success by external motivators, and from the loud complaints and avoidance of academic challenges to effort misplaced in hiding rather than learning, a fear of academic failure has stood between my students and their motivation to learn. By not taking academic risks and not putting forth a great amount of effort to master academic content, students avoid the possibility of failure. With nothing risked, nothing can be lost. At the same time, little stands to be gained.

After careful consideration and years of modifying my question regarding student motivation, my interest in motivation has developed into this: "How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students?"

Rationale for the Question

Academic motivation is what drives students to put effort into their learning. Regardless from where the motivation stems, it is necessary if students are to work or participate in a classroom. All teachers seek motivation systems to keep students engaged, on task, and completing assignments.

Many of these motivation systems are external in nature; the source of motivation resides outside of the student. In my classroom, external motivators include me setting a

high level of expectation, reward charts, class competitions, earned privileges, and negative consequences for off task behavior and incomplete assignments. These are popular methods of increasing academic motivation because they are relatively easy to employ and they produce almost instant results.

Students entering my class with low levels of autonomous academic motivation rely heavily on external motivators, but they are only temporary in nature. Once a reward is given, a privilege is granted, or a consequence is complete, the motivation is gone. The teacher has to continually renew external motivators. After a while, the effects of external motivators diminish. The thrill of small rewards dwindles and they no longer inspire the same level of motivation as before. Students grow accustomed to the negative consequences and are no longer deterred by them. Teachers are left to resort to bigger or more severe external motivators. This quickly becomes an unsustainable cycle.

While most teachers employ some systems of external academic motivation, I cannot trust my students' academic success to such unreliable factors. External motivation is not consistent or reliable over extended time periods. The external academic motivators differ from one class to another, one grade to the next and between schools. In order for students to be successful, they need to be academically motivated regardless of the class or teacher they have; they need a more reliable form of academic motivation.

Autonomous motivation is a self inspired determination to accomplish something in order to satisfy oneself. It is a drive that comes from within to learn or be able to do something for personal interest. With autonomous motivation, satisfaction comes from

one's completion of the task at hand or the achievement of a set goal that has personal value. The motivating factors are personal and internal, not relying on others' creation. Autonomous academic motivation is reliable and sustainable because the student carries it with them wherever they go. While it can be stifled or worn away, if autonomous academic motivation is cultivated and understood, students internalize their desire to learn. They become willing to put forth effort to tackle challenges and difficult tasks to gain the satisfaction of task completion. That effort is the key to learning.

If fear of failure is an obstacle to my students attempting academic challenges and putting forth a maximum amount of effort, then intervening to reduce that fear should elevate levels of autonomous academic motivation in my classroom. If students can be taught that intelligence is not something you have a lot of only because you are lucky, but rather is a quantity that can be grown (an incremental theory of intelligence), then failure becomes easier to view as a part of that growth and learning rather than an indication of inability. Also, if students can be guided to attribute failures to factors that are within their control, such as not applying sufficient effort or not using effective strategies, then they become empowered to try again, instead of fearing that failure is due to a helpless inability. Combining these two strategies to reduce my students' fear of failure can penetrate the barrier that has been restricting their autonomous academic motivation.

Conclusion

Internal factors that drive effort and, therefore, achievement have taken center stage as the hot topic in education. Autonomous types of motivation are a part of the ongoing conversations about other internal factors such as character, grit, resiliency,

perseverance and optimism, among others. The central idea among all of these factors is notably the same; they describe something within the student that creates a willingness to put forth effort to achieve in difficult situations. For the purposes of this capstone, I refer to this as autonomous motivation. When applied in school, this is perhaps the most powerful tool within a student's locus of control in terms of reaching high levels of academic achievement.

Too many students have developed a fear of failure that stands as a barrier blocking their motivation to achieve academically. These students show a lack of effort toward their learning, which leads to lower levels of academic achievement. At the same time, students who maintain high levels of autonomous academic motivation are engaged and hard working in the classroom. This motivation leads to increased levels of academic achievement. Such a powerful tool for achievement merits extensive research into how fear of failure can be overcome so that all students can attain high levels of autonomous academic motivation. This leads me to ask: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students?

The next chapter is a review of literature. It begins by defining autonomous academic motivation and placing it within the context of today's educational system. Next, the chapter details the factors that influence autonomous academic motivation. Finally, it reasons that interventions that can reduce fear of failure can lead to higher levels of autonomous academic motivation.

CHAPTER TWO

Literature Review

Introduction

Motivation in its simplest terms is the cause for any behavior. Such a domain is of interest to the fields of medicine, psychology, economics, business, and education alike. Therefore, the existing research regarding motivation is extensive. Autonomous forms of motivation, namely intrinsic motivation, as applied to the school setting, have been of increasing interest to researchers since the 1980s. Since then, many aspects of autonomous academic motivation and its influence on the student have been studied; though its multidimensional nature has precluded even the most motivated researchers from fully explaining the phenomena of motivation.

Overview

This chapter is intended to highlight and synthesize the existing research in my pursuit to address the question at hand: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? The literature review is divided into five sections.

The first section distinguishes the types of motivation as characterized by self-determination theory. Motivation has typically been differentiated between intrinsic motivation, where the source of motivation is inherent in the behavior, and extrinsic

motivation, where motivation stems from a source outside of the behavior. Self-determination theory presents these motivation orientations as a continuum rather than a dichotomy. Ryan and Deci (2000) argue that extrinsic motivation is actually further differentiated into four types, that range in their level of autonomy or self-determination. While all four types of extrinsic motivation have a source of motivation that is separate from the behavior itself, they differ in terms of how willing a person of their own accord is to engage in the behavior. Two types of extrinsic motivation, external regulation and introjected regulation, are considered controlling because the impetus to act is a result of external pressure. Controlled types of motivation are viewed as negative. The other two types of extrinsic motivation, identified regulation and integrated regulation, are considered autonomous because the motive for the behavior originates from within the person. As the person chooses to engage in the behavior free of external pressures, identified and integrated regulation along with intrinsic motivation are autonomous and are viewed as the optimal types of motivation (Deci, Vallerand, Pelletier, & Ryan, 1991; Guay et al., 2010; Ryan & Deci, 2000).

The second section begins by providing a context for autonomous academic motivation within the cognitive and noncognitive schools of thought that currently dominate education practices in the United States. It also describes the value of the student being autonomously academically motivated. There has been a recent surge of research detailing the positive effect strong internal qualities have on student success and academic achievement. The research helps to link the strength of these qualities that the student possesses to the amount of effort the student is willing to put into their

schoolwork; the key to unlocking their potential for success. Despite its value as the most autonomous type of motivation, intrinsic motivation has been shown to steadily decline as the student progresses through elementary school. It is unclear if this decline is a result of social development, the development of cognitive processes, or school experiences. Given the positive influence of autonomous academic motivation, it is important to consider the causes of this decline and how to minimize or reverse it.

The third section begins with the suggestion that the intermediate elementary grades are a prime time to target interventions to affect autonomous academic motivation. Then it explains the psychological traits that control motivation according to self-determination theory.

The fourth section outlines the research that supports a combined approach to increasing autonomous academic motivation by training students to attribute failures and successes to effort and strategy-use and directly teaching an incremental theory of intelligence. Fear of failure is an obstacle that prevents the student from being willing to sincerely attempt challenges. This section looks at how fear of failure develops, its detrimental effects on the student's autonomous academic motivation, and how such a roadblock might be removed, allowing the student to put forth effort to attempt challenging academic situations.

The final section provides a summary of the literature review and a preview of the following methods chapter.

Autonomous Academic Motivation within Self-Determination Theory (SDT)

Understanding motivation within SDT.

Motivation is what energizes a person to act (Ryan & Deci, 2000). The student's primary purpose in school is academic learning so academic motivation can be defined as the impetus to engage in behaviors that are conducive to academic learning (Deci et al., 1991; Guay et. al., 2010).

Self-determination theory, primarily conceptualized by two University of Rochester faculty Edward Deci and Richard Ryan, offers a differentiated spectrum of types of motivation that vary in desirability and quality (Deciet al., 1991; Guay et. al., 2010; Ryan & Deci, 2000). Optimal types of motivation are those that originate from within the person; they are said to be autonomous or self-determined. Types of motivation that are considered lesser in quality are those in which the person feels controlled, not autonomous. An absence of motivation of act is classified as amotivation (Ryan & Deci, 2000).

Autonomous motivation according to SDT.

Autonomous motivation types are characterized as having in internal locus of control. Locus of control refers to the point from which the motivation stems.

The most desired motivational orientation is intrinsic motivation, when the individual chooses to engage in an activity for enjoyment or the inherent satisfaction of the task itself (Ryan & Deci, 2000). It is autonomous because the individual acts based on their own preference for an activity and because of the pleasure they receive from participating in something they find enjoyable. Everyone has preferences, and no student will find all learning tasks inherently interesting or enjoyable. In fact, motivation

becomes increasingly differentiated according to academic subjects as the student progresses through school, showing a development of interests and preferences (Gottfried, 1985 anad1990; Gottfried, Fleming, & Gottfried, 2001; Guay et. al., 2010; Spinath & Steinmayr, 2008). Given this, extrinsic motivation, where the impetus to act comes from a source other than the activity itself, becomes necessary.

Although intrinsic motivation is the most autonomous type of motivation, two types of extrinsic motivation are also considered autonomous. Integrated regulation is the most autonomous form of extrinsic motivation and occurs when a behavior is aligned with one's self-identified values and beliefs (Ryan & Deci, 2000). The elementary student does not have the developed sense of identity required to integrate behaviors according to a self-definition and, therefore, it has previously been left out of motivation assessments of elementary school students (Guay et. al., 2010). Identified regulation is also considered autonomous, though less so than integrated regulation. Identified regulation occurs when one accepts the personal importance or value of a behavior (Guay et. al., 2010; Ryan & Deci, 2000). In identified regulation, one acts because they believe there is personal value to be gained from the action. Intrinsic motivation, integrated regulation, and identified regulation all stem from an internal locus of control and are autonomous because one does not feel controlled by an external force to act. These types of motivation are not dependent on external, less reliable factors. For this reason, they are considered optimal or positive types of motivation (Ryan & Deci, 2000).

Controlling motivation according to SDT. The least desirable types of motivation are those considered controlling. Both external and introjected regulations have an

external locus of control; that is the impetus for the behavior stems from outside of the individual. These types of motivation, therefore, are extrinsic in orientation and are not considered autonomous. External regulation is characterized by one behaving in order to receive a reward or avoid a punishment and is seen as the most controlling type of motivation. Introjected regulation describes behaving in order to gain or maintain approval from others or from one's own self. It involves acting to avoid negative feelings of guilt, shame, or anxiety or to experience positive feelings of pride. While such feelings are internal, one does not identify with or adopt the behavior as personally important. The impetus to act is still from an external locus of control and is, therefore, considered controlling (Guay et. al., 2010; Ryan & Deci, 2000). When the source of motivation is external, if that source falters or is no longer present, the motivation to engage in the behavior also disappears.

Internalization. Internalization is the process of progressing from controlling toward autonomous types of motivation. The types of motivation according to SDT are situated along a continuum ranging from the most controlling (external regulation) to the most autonomous (intrinsic motivation) with the implication that motivation is not static (Deci et al., 1991; Ryan & Deci, 2000). SDT posits that the internalization of socially useful behaviors is an innate human process that is dependent upon social context. Autonomous motivation is achieved when a behavior is successfully internalized (Deci et al., 1991).

Understanding intrinsic and extrinsic motivation within the context of SDT. Classic understandings of intrinsic and extrinsic motivation differ from those outlined in

self-determination theory. The SDT definition of intrinsic motivation as engaging in a behavior for personal enjoyment or pleasure derived from the activity itself has been widely used and accepted in research (Carlton & Winsler, 1998; Deci et al., 1991; Dev, 1997; Gottfried 1985 and 1990; Gottfried et al., 2001; Guay et. al., 2010; Ryan & Deci, 2000; Spinath & Steinmayr, 2008). Extrinsic motivation, however, has been much more generally defined as behavior inspired from a source other than the behavior itself.

While SDT separates extrinsic motivation into four distinct types ranging from controlled (external regulation and introjected regulation) to autonomous (identified regulation and integrated regulation), much research only incorporates a controlled understanding of extrinsic motivation (Ryan & Deci, 2000). This means that identified and integrated forms of regulation have either been ignored or, more likely, grouped with intrinsic motivation. Due to their internal locus of control and autonomous nature, identified and integrated regulation have much in common with intrinsic motivation and, in fact, do not exist outside of SDT. Due to this lack of distinction, extrinsic motivation has a long-standing reputation as an undesirable form of motivation. It is understandable then, that much of the literature about autonomous motivation only includes intrinsic motivation.

Summary of important definitions. Autonomous academic motivation for the purposes of this study refers to intrinsic motivation and identified regulation as applied to the student's learning in school. It is, therefore, the student freely choosing to engage in activities conducive to learning. Controlled academic motivation refers to both external regulation and introjected regulation of the student's learning behaviors (Guay et al.,

2010). Internalization is the process by which the student progresses from controlled academic motivation to autonomous academic motivation (Deci et al., 1991; Ryan & Deci, 2000). As the reflective processes required to achieve integrated regulation do not develop until late adolescence or even into adulthood (Guay et. al., 2010), integrated regulation is not applicable to this study of the elementary school student. Much of the literature surrounding autonomous academic motivation does not differentiate identified regulation, so the main focus of academic motivation studies has been intrinsic motivation. In this review, intrinsic motivation will be referred to in isolation at times when studies do not consider identified integration. Still, much research exists detailing how autonomous academic motivation influences the elementary student.

The Influence of Autonomous Academic Motivation

The cognitive hypothesis.

Since the inception of the teaching profession, the job of the teacher generally has been to prepare students for success in adulthood. The question of what teachers should teach and how they should teach it in order to best educate students, though, has been an ongoing debate.

Over the last two decades, the cognitive hypothesis has been at the forefront of determining what and how teachers teach (Tough, 2012). This cognitive hypothesis is described by Paul Tough as the idea that success is dependent upon academic intelligence. The more content the student knows and can access, the better he or she can perform on cognitive achievement tests. These tests are today's predictors for how successful the student will be as an adult. In 2009, a joint effort of the National Governor's Association and the Council of Chief State School Officers created the

Common Core State Standards detailing the English language arts and mathematics academic content standards for kindergarten through twelfth grade as a model to implement nationwide. “The Common Core State Standards represent what American students need to know and do to be successful in college and careers” (NGA and CCSSO, 2010, p.1). These standards are intended to ensure that all students in the United States are being taught what they need to be prepared for college and career success; and they focus solely on academic content. Since the No Child Left Behind Act (2002), schools have been pushed to measure student success, and therefore overall school success, in terms of mastering academic standards as determined by scores on annual achievement tests.

Noncognitive traits. During the years of the cognitive hypothesis’ push for emphasizing academic intelligence, another school of thought has been gaining momentum that emphasizes the importance of noncognitive traits. Economists, psychologists, and education experts alike have produced numerous studies linking internal traits that are distinct from cognitive ability to success both in school and beyond school years. Different research studies have labeled these traits in different ways. Heckman refers to noncognitive skills that account for the higher levels of success of certain research subjects versus others in a study of the Perry Preschool Program. Such noncognitive skills are defined as, “personality factors, motivation and the like” (2010, p. 51). Angela Duckworth defined the trait grit as, “perseverance and passion for long-term goals” (2007, p.1087). Her research reveals that grit leads to higher achievement in that grit measures accurately predicted subjects’ ability to stick with and achieve challenging

goals. Carol Dweck has advocated for resilience, or the ability to respond positively when faced with adversity. She defines the key to success as seeing challenges, effort, and setbacks as opportunities for learning and improvement. Such a mindset has been linked to persistence in school and increased grade point averages (Yeager & Dweck, 2012; Blackwell, Trzesniewski, & Dweck, 2007). The Character Education Partnership, a national nonprofit coalition, endorses expanding the traditional view of character beyond moral qualities to include performance values like effort, initiative, diligence, self-discipline and perseverance. These character strengths are linked to higher levels of academic achievement in terms of test scores as well as the student reaching his or her potential for success (Character Education Partnership, 2008). Forgeard and Seligman credit the trait of optimism with increasing persistence and pursuit of goals and opportunities (2012).

The value of autonomous academic motivation as a noncognitive trait.

Autonomous academic motivation fits well within this school of thought of noncognitive traits. The research linking autonomous motivation to increased levels of learning and school success is plentiful. Several studies involving school age children, including students with and without learning disabilities, have found that academic intrinsic motivation leads to higher grades and achievement on standardized tests. Autonomous academic motivation is linked with the student being more curious, accepting challenges, persisting to mastery, and enjoying the process of learning (Carlton & Winsler, 1998; Deci et al., 1991; Dev, 1997; Guay et. al., 2010; Eccles, Wigfield, & Schiefele, 1998; Gottfried 1985 and 1990; Ryan & Deci, 2000). Autonomously motivated students display

higher levels of interest, engagement, and learning that result in higher levels of achievement (Pintrich, 2003; Ryan & Deci, 2000). Students lacking academic intrinsic motivation were linked to lower levels of academic achievement and higher levels of academic anxiety (Gottfried 1985 and 1990). Controlled academic motivation orientations, meaning external regulation and introjected regulation, have been linked to reduced levels of persistence and involvement (Ryan & Deci, 2000).

Valuing noncognitive traits within the cognitive hypothesis. Regardless of the name given, all of these experts have found that internal traits that are distinct from cognitive ability are positively related to higher levels of success and achievement. Whether labeled noncognitive skills, grit, resilience, character strengths, optimism or autonomous academic motivation, what is represented is an internal trait that, when present and active within the student, creates a willingness to put forth effort to engage in academic learning. This matches the definition of autonomous academic motivation in this study.

This school of thought does not render cognitive ability unimportant, however, it does effectively argue that noncognitive factors are more influential in determining the student's potential for success (Character Education Partnership, 2008; Dev, 1997; Duckworth, 2007; Forgeard & Seligman, 2012; Heckman 2010; Segal, 2008). Intelligence measures illustrate that cognitive ability differs from one person to the next. High amounts of cognitive ability do not result in achievement, though, if they are not applied (Character Education Partnership, 2008; Segal, 2008; Tough, 2012). Application of the cognitive ability the student possesses through effort is the key to achieving the

maximum potential for success for that student. Autonomous types of academic motivation increase willingness to apply effort. Even with low levels of cognitive ability, such as in the case of a learning disability, academic intrinsic motivation leads to higher levels of achievement (Dev, 1997; Segal, 2008).

Given its positive correlation to academic achievement, autonomous academic motivation undoubtedly is a trait that should be fostered within the student. Despite its clear value to the student, autonomous academic motivation generally declines during the elementary years; the time when this trait would ideally be developed.

The Nature of Intrinsic Motivation

Humans are born with intrinsic motivation to interact with and master their environment. Excepting particular cases of children born with special needs, this intrinsic motivation is innate; indeed it is human nature. It stems from an internal source within the infant and no extrinsic motivation is required to compel him or her to begin interacting with his or her surroundings (Carlton & Winsler, 1998; Deci & Ryan, 2000; Pedersen, 1995). From birth, experiences begin to shape and influence this innate trait.

Levels of intrinsic academic motivation for the elementary student are at their highest when the student begins school. Longitudinal studies that tracked levels of academic intrinsic motivation in elementary school and through high school showed a steady decline in the participant group's mean level of academic intrinsic motivation through all the school years until the end of high school where there was a small increase (Bouffard, Marcoux, Vezeau, & Bordeleau, 2003; Gottfried et al., 2001; Spinath & Steinmayr, 2008).

Explanation of the decline in intrinsic academic motivation as a function of cognitive development. This decline in intrinsic academic motivation has been, in part, attributed to social and cognitive developments in the student. Research suggests the young child is less aware of the relationship of his or her performance to that of peers. The young child is not apt to compare him or herself with others unless that comparison is made salient (Stipek & Daniels, 1988).

This awareness of peer performance and process of social comparison are heightened in upper elementary classrooms and beyond and by the student as he or she ages and progresses through grade levels (Spinath & Steinmayr, 2008; Stipek & Daniels, 1988). As the student is made aware of his or her ability level compared to classmates, an increasingly stable rank order of intrinsic academic motivation emerges within a peer group (Gottfried et al., 2001). This implies that the student adjusts their level of academic intrinsic motivation based on social comparisons of ability. Students with the highest levels of academic ability in a class also have the highest levels of intrinsic academic motivation whereas the students with the lowest levels of academic ability have the lowest levels of intrinsic academic motivation.

Additionally, the student's cognitive ability to process and interpret feedback, whether externally supplied or in the form of self-evaluation, increases with age (Stipek & Daniels, 1988). Feedback begins to limit the student's perception of ability. The young child maintains higher levels of intrinsic motivation because he or she remains overly optimistic about the limitations of his or her ability and is willing to attempt challenges that the older student would determine his or herself unable to accomplish and therefore

would not attempt (Bjorklund & Green, 1992).

Also, the older student is able to differentiate between the general orientation toward learning that is characteristic of the young student and subject specific motivation (Carlton & Winsler, 1998; Gottfried, 1985 anad1990; Guay et. al., 2010). As the student is cognitively able to make this distinction, his or her school experiences play a greater role in shaping levels of intrinsic academic motivation in each subject area.

Explanation of the decline in intrinsic academic motivation as a function of student experience. The decline in intrinsic academic motivation through the elementary school years is also attributed to the student's experiences. Student achievement in primary elementary grades is a strong predictor of intrinsic academic motivation in intermediate elementary grades (Gottfried, 1990).

Schools from the intermediate elementary grades onward are often characterized as more stressful learning environments than in primary elementary grades. At an age in which cognitive and social developments already incline the student to compare their ability with that of peers, schools implement high stakes testing, normative grades, and grouping based on academic ability (Gottfried et al., 2001; Spinath & Steinmayr, 2008; Stipek & Daniels, 1988). Such threatening or intimidating situations such as these increase the student's experience of anxiety, which is linked to lower levels of intrinsic academic motivation (Gottfried, 1985 and 1990; Gottfried et al., 2001).

Because academic achievement, which is linked to subsequent levels of intrinsic academic motivation, is increasingly based on social comparisons of ability level, there is only room for a few students to be judged as high achieving or academically able in any

given classroom. Year after year, the majority of students in every classroom are forced to perceive themselves as less able academically than the top performing students, and such an experience results in lower levels of intrinsic academic motivation as the student progresses through elementary school.

The interplay of the social and cognitive developments the student undergoes as he or she progresses through elementary school with the tendency of schools to heighten awareness of student ability comparisons may explain the characteristic decline of intrinsic academic motivation through the elementary school years. While the causes of the widespread tendency for intrinsic academic motivation to decline as the elementary school student ages have been mostly speculated, the causes of individual intrinsic academic motivation have been researched more in depth.

A Summary of the Contextual Setting

Autonomous academic motivation has been strongly tied to increased levels of academic engagement and achievement. It is arguably more influential in determining the student's academic success than cognitive ability. Today's educational policies, though, are explicitly focused on cognitive ability. Autonomous academic motivation is one of several internal noncognitive qualities that researchers have sought to interpret. Despite the different names given these varying qualities, all share broad and substantial commonalities. They are all concerned with producing a willingness to apply effort to achieve which, when applied to school learning, is the definition of autonomous academic motivation. Intrinsic motivation has a long history of study as applied to school learning, but other types of autonomous motivation, namely identified regulation, are

largely absent in research in the realm of education motivation. It is widely agreed that intrinsic motivation is an innate human quality, but it tends to decline throughout the elementary school years. The causes of this decline have been implied, not confirmed, and are important to uncover if such a systemic decline in intrinsic academic motivation is to be stopped or reversed.

With a greater understanding of the context in which intrinsic academic motivation exists today and the overall nature of its course from birth through elementary school, the next step is to explore how autonomous academic motivation can be affected at the individual level. That will involve considering at what age the student is most ready for intervention and what is known about the factors that stimulate autonomous academic motivation.

Stimulating Autonomous Academic Motivation in the Intermediate Elementary Student

The ideal age for intervention.

Interventions targeted at stimulating autonomous academic motivation may be too advanced for the primary elementary student. The young child's level of academic motivation is both relatively high (Bouffard et. al., 2003; Gottfried et al., 2001; Spinath & Steinmayr, 2008) and unstable (Gottfried, 1990) and is seemingly nourished by the young child's overly optimistic view of his or her own ability (Bjorklund & Green, 1992; Spinath & Steinmayr, 2008). The young student's lack of experience results in an underdeveloped sense of preference and competence in specific subject areas (Guay et. al., 2010). The young student has not yet developed to the point where they can attend to and incorporate evaluative feedback, so their self-image and correlating level of academic motivation are definitively unrealistic. It is not until later in

childhood that natural cognitive and social developments create within the child a more realistic understanding of their own ability (Bjorklund & Green, 1992; Spinath & Steinmayr, 2008; Stipek & Daniels, 1988). Additionally, the ability to differentiate between types of motivation increases with age (Guay et. al., 2010).

In middle school and high school the student may be trapped in a self- and socially-defined role, limiting the effectiveness of interventions concerning autonomous academic motivation. For example, academic intrinsic motivation has been found to increase in stability through high school (Gottfried et al., 2001). By middle school and high school, the student has reached adolescence. Even from age nine, the student's level of academic intrinsic motivation as compared to that of peers in their group is stable and increases over time in stability (Gottfried et al., 2001). As the student ages, the amount of time in which he or she has perceived his or herself to be in a certain social ranking increases. The increase in the stability of the level of intrinsic academic motivation from year to year suggests that the adolescent student's definition of his or herself solidifies as it is reinforced by years of experience. It would be increasingly difficult to influence such a stable construct as intrinsic academic motivation as the student progresses through adolescence.

While the young child is too immature for interventions and the adolescent student is too set in his or her way, the intermediate elementary student strikes an ideal balance between the two. By the intermediate elementary grades, the student developmentally is able to better reflect and use a process of metacognition to evaluate thoughts and behaviors (Bjorklund & Green, 1992). This type of self-reflection is

necessary for the student to be able to understand the concept of motivation that drives his or her behaviors. Academic intrinsic motivation in the intermediate elementary student has only recently become stable and, therefore, is more able to be changed (Gottfried et al., 2001). The most effective time to intervene is when the student is developmentally ready, yet not overly molded into a social rank order. Intermediate elementary grades are that ideal time.

The source of motivation. Self-determination theory details three variables that control motivation: autonomy, competence, and relatedness. These variables are considered to be universal and inherent psychological needs (Deci et al., 1991; Ryan & Deci, 2000). Therefore, it is reasoned that in situations where the student's needs for autonomy, competence and relatedness are satisfied, he or she will be optimally motivated and his or her subsequent learning and performance will be at its highest. The human need to be autonomous is given a greater weight than are competence and relatedness because autonomy is linked not only to the quantity of motivation it inspires, but also the quality of motivation type. Identified regulation, integrated regulation and intrinsic motivation cannot be attained if the need for autonomy is not met (Deci et al., 1991).

Autonomy is the degree to which the student feels in control of determining his or her own behavior. Autonomy is synonymous with self-determination and is necessary for the student to optimally internalize the regulation of a behavior. The student needs to feel freely engaged in an activity, without external pressure, in order to perceive an internal locus of control that is characteristic of autonomous academic motivation. Pressure to

act, think or feel a certain way that is perceived to come from an external source undermines the student's sense of autonomy (Deci et al., 1991; Ryan & Deci, 2000). Choice, on the other hand, even when only implied supports the student's sense of autonomy. The degree to which the student perceives his or her teacher and parents as supportive of autonomy positively correlates to the student's level of autonomous academic motivation. Additionally, the student needs to find personal value in a behavior in order to internalize it. When the behavior aligns with the student's own values and interests, the perceived locus of control is internal and supports autonomous academic motivation (Deci et al., 1991). The key to satisfying the student's need for autonomy is giving him or her a sense of choice and control over his or her behavior.

Competence involves understanding how to reach a desired outcome and having the necessary skills to be successful. It is not competence as an absolute or cognitive value that determines the level of motivation, but rather the student's perception of his or her competence (Deci et al., 1991; Guay et al., 2010; Ryan & Deci, 2000). The student's previous experiences with feedback often shape his or her perception of competence. This feedback may come from external sources such as when the teacher praises or criticizes the student's performance (Deci et al, 1991; Ryan & Deci, 2000) or from within the student when he or she attributes successes or failures to a specific cause (Deci et al., 2000). If the student believes intelligence is a fixed trait, negative feedback will threaten his or her sense of competence. Whereas if the student believes intelligence is changeable, all feedback becomes an opportunity to learn and grown rather than a measure of a set level of competence (Yeager & Dweck, 2012). Matching the student

with appropriate tasks also influences his or her perceived competence. SDT names this matching optimal challenge (Deci et al, 1991; Ryan & Deci, 2000) and it is supported by the widely accepted idea of the zone of proximal development put forth in Vygotsky's sociocultural theory. The zone of proximal development suggests that learning takes place when the concept presented is just slightly above what the student has already mastered (Bozhovich, 2009). Tasks that are too easy do not present an opportunity to learn anything new and tasks that are too difficult cause frustration and a sense of helplessness. SDT suggests that the need for competence is stimulated when the student is presented with an optimal level of challenge. The need for competence is met when the student knows what must be done to attain a goal and feels able to execute the required tasks (Deci et al, 1991; Ryan & Deci, 2000).

Relatedness is the student's sense of social connection. SDT views motivation as a function of the social setting in which it occurs. If the student feels connected to others who pertain to that setting, the level and quality of motivation will increase (Deci et al, 1991; Ryan & Deci, 2000). Autonomous levels of academic motivation increase when the student feels connected with the adults involved in his or her education, namely teachers and parents (Deci et al. 1991).

A summary of stimulating internalization. The intermediate elementary school years are an ideal time to implement interventions aimed at increasing the level of internalization of academic behaviors. The student needs to be developmentally ready to reflect on his or her own values and developed interests and to realistically perceive his or her own abilities but not be rigidly defined by a long-standing rank order within the

peer group. Any intervention seeking to increase autonomous academic motivation must include supports for the student's psychological needs for autonomy, competence, and relatedness. If optimal levels of internalization are desired, autonomy supports are crucial.

Some methods for supporting autonomy, competence, and relatedness within the classroom setting have been tried and found to be successful. Providing for academic choice, giving positive feedback, and matching students with optimal challenges are situational supports and are very dependent upon the teacher. Teaching the student how to accurately attribute the causes of his or her successes or failures and that intelligence can be developed, though, provides the student with tools that can be applied to many challenging academic situations.

Altering Perceptions of Failure

Failure is an unavoidable life experience. Everyone fails at times in attempting new behaviors. Humans engage in many behaviors that must be learned, from walking and talking to interpreting text and solving math problems. Early attempts at these behaviors are unsuccessful, making failure a natural part of the learning process. Each experience of failure is interpreted and reacted to differently by the individual. While failure is a definitively negative form of feedback, it means success was not achieved, reactions to failure vary. Some failures seem to inspire motivation to try harder to accomplish the behavior while other failures result in withdraw or decrease of motivation to attempt the behavior (Yeager & Dweck, 2012). When the student views failure as a direct reflection of a low level competence, a fear of failure may develop.

Fear of failure in relation to autonomous academic motivation. Fear of failure in school stems from a fear that failure will be linked to academic incompetence (Bartels & Ryan, 2013; De Castella, Byrne, & Covington, 2013). It has been linked to the development of maladaptive coping strategies. Defensive pessimism is one such strategy in which the student sets low expectations in order to minimize the experience of shame or humiliation after failure. Self-handicapping is another strategy used to cope with a fear of failure in which the student behaves in such a way so as to provide an excuse for failure other than incompetence (De Castella, Byrne, & Covington, 2013). These coping strategies directly oppose the student's engagement in behaviors that promote learning and, therefore, hinder autonomous academic motivation. It is unsurprising then, that fear of failure is negatively related to academic achievement and retention of course material but is positively related to truancy and disengagement from school (Bartels & Ryan, 2013; De Castella, Byrne, & Covington, 2013). Fear of failure and the subsequently developed coping strategies negatively influence autonomous academic motivation because they directly threaten the student's sense of autonomy, competence, and relatedness.

Fear of failure affects autonomy in that it limits the student's ability to freely choose to engage in behaviors. Fear becomes a source of control that limits the sense of choice the student feels. The student seeks to avoid tasks in which his or her incompetence might become salient (Bartels & Ryan, 2013). This control is reminiscent of introjected regulation in that the behavior of the student acting out of fear of failure stems from an external locus of control in the form of fear of shame and embarrassment

or of lessened self-esteem. This control threatens the student's sense of autonomy.

Competence is affected by fear of failure because the student feels unable to successfully accomplish the task. Fear of failure stems from the student's underlying fear that they lack the necessary ability to achieve their goal (De Castella, Byrne, & Covington, 2013). The fear lies in the possibility of having to lower his or her own perceived level of competence (Bartels & Ryan, 2013). The coping strategies often employed by the student who fears failure ineffectively seek to self-support the need for competence. Defensive pessimism protects the student from having to lower his or her perceived level of competence too much because the level of expected achievement is already so low. Self-handicapping allows the student to make excuses for failure that do not relate to ability (De Castella, Byrne, & Covington, 2013). In both cases, the student hides their true ability by deflecting the consequences of failure, and the need for competence is left unmet.

Fear of failure also belittles the student's sense of relatedness to others. One aspect of fear of failure lies in the possibility of disappointing others. In such a case, relatedness is threatened by the idea of failure because it may alienate the student from people he or she considers important (Bartels & Ryan, 2013).

Fear of failure, though common in a learning environment such as the school where failure is often a necessary part of the learning process (Rowlett, 2011), poses a severe threat to autonomous academic motivation. Interventions that help students cope with failure and view it as a learning opportunity would, then, increase autonomous academic motivation. Attribution retraining and incremental theory of intelligence

interventions have successfully addressed the student's fear of failure.

Attributions of failure and success. Causal attributions refer to what the student views as the cause of a success or a failure. The student's response following a failure or success depends on the way the student attributes that outcome.

Attributions, much like sources of motivation, can be classified according to an internal or an external locus of control. Internal attributions include effort, ability, and use of strategy, whereas external attributions include factors of the learning environment such as task difficulty or quality of instruction.

Attributions also differ in terms of being stable verses transient and controllable verses unable to be influenced (Perry, Stupnisky, Daniels, & Haynes, 2008). Controllable and transient (or unstable) attributions are favorable because they imply that the student can affect the outcome in the future. Insufficient effort and the ineffective use of strategy are recommended as functional failure attributions because they offer clear and controllable pathways to improve performance (Dweck, 1975; Haynes, Ruthig, Perry, Stupnisky, & Hall, 2006; Perry et al., 2008; Shelton, Anastopoulos, & Linden, 1985). In the same manner, attributing success to applied effort and effective use of strategy empowers the student to continue to affect successful outcomes (Shelton et al., 1985). Alternately, stable and uncontrollable attributions, especially that of ability, can leave the student feeling helpless in improving his or her current situation and cause lower expectations and achievement levels (Dweck, 1975; Klein, Fencil-Morse, & Seligman, 1976; Perry et al., 2008). Sakaki and Murayama (2013) found that higher rates of attribution to ability predicted lower levels of intrinsic motivation.

Attribution retraining. Multiple experiments have tested and confirmed the use of attribution retraining interventions in different settings to redirect ability attributions to attributions of effort and use of strategy.

In an early study of 12 children in public elementary schools who were identified as helpless because they had come to expect failure, Dweck (1975) found that encouraging effort attributions following failures led to persistence in the task at hand. In this study, experimenters interacted individually with subjects outside of the classroom setting in twenty-five sessions. The attribution retraining treatment consisted of the experimenters telling students that they failed because they should have tried harder following predetermined failure experiences.

Shelton et al. (1985) compared students with a learning disability to general education students who had been identified as helpless and found that both groups of students, when exposed to the attribution retraining intervention, made more effort attributions and persisted more in reading two weeks after completing the intervention. The attribution retraining treatment in this study was administered to participating fourth and fifth graders individually during six sessions outside of the classroom where the students practiced saying phrases that indicated effort attributions and were then directed in applying those phrases appropriately following successes and failures on reading exercises.

In contrast to the focus on low-achieving and hopeless students in the previous studies, Haynes et al. (2006) saw the possible benefit of attribution retraining for overly optimistic college freshmen whose high expectations might be misplaced in a new

academic setting. Seventy students in the introductory psychology class were exposed to a single session attribution retraining intervention in a laboratory setting that consisted of analyzing an article about controllable verses uncontrollable attributions and applying it to their own experience. The low optimist participants and, to an even greater extent, the overly-optimistic participants made more controllable attributions and had greater academic success following attribution retraining than the control group that did not experience the intervention.

The success of these interventions in inspiring effort following failure experiences with students from a wide range of ages and ability levels advocates favorably for the use of attribution retraining to help the student confront a fear of failure.

Implicit theories of intelligence. An implicit theory of intelligence is the belief that the student holds about the nature of intellectual ability. Carol Dweck (1975) has led the research and development for forty years around the idea that beliefs about intelligence vary and predict how the student will react to academic challenges and failure. While implicit theories of intelligence vary, they fall within the range of one of two categories: entity theory or incremental theory. An entity theory of intelligence is characterized by a fixed mindset, or the belief that each person has a set amount of intelligence. An incremental theory, on the other hand, holds that intelligence is malleable and can be changed or developed. The most important finding, in consideration of the student that fears failure, is that implicit theories of intelligence have been shown to be changeable (Bempechat, London, & Dweck, 1991; Yeager & Dweck, 2012).

The student with an entity theory of intelligence believes intellectual ability exists

as a fixed quantity. Within this fixed mindset, the student is prone to fearing failure because not succeeding at a task may indicate a lack of ability. The student who prescribes to an entity theory of intelligence views effort as a sign of lacking ability and behaves in a way to avoid looking dumb (Yeager & Dweck, 2012). Bempechat et al. (1991) found fifth grade students with an entity theory of intelligence recovered poorly following a failure experience compared to those with an incremental theory of intelligence. In their initial study, fourth and fifth grade entity theorists were more likely to judge intelligence based on performance outcomes such as grades instead of effort. In general, the student with an entity theory of intelligence is more likely to attribute failure to a lack of ability (Blackwell et al., 2007). In such a condition, the student is more likely to either give up or to employ maladaptive coping strategies to deal with fear of failure such as defensive pessimism or self-handicapping.

An incremental theory reflects the student's belief that intelligence can grow. The student views failure or challenge as a source of learning that helps him or her to improve abilities. Effort is the trademark of a student with an incremental theory of intelligence because effort and hard work in the face of setbacks will result in growth (Bempechat et al., 1991; Yeager & Dweck, 2012). Yeager and Dweck (2012) cite several studies in which incremental theories of intelligence are linked to persistence and better grades in school. Bempechat et al. (1991) found that intermediate elementary students with an incremental theory of intelligence judge intelligence based on learning processes and effort and make an adaptive recovery after experiencing failure. The student with an incremental theory of intelligence is more likely to attribute failure to insufficient effort

or ineffective strategy use and, therefore, is likely to resolve to try harder to improve his or her ability (Blackwell et al., 2007). Because the incremental theorist views ability as something that can be changed and developed, ability attributions no longer imply an uncontrollable circumstance. The positive effects on achievement related to incremental theories of intelligence explain why interventions have been aimed at fostering such a malleable belief about intelligence.

Research has linked an incremental theory of intelligence to greater academic achievement and has demonstrated that intrinsic theories of intelligence are, themselves, malleable. Some of these studies have involved brief interventions that teach university students about the malleability of intelligence that have resulted in significant reductions in dropout rates and increases in grade point averages (as cited in Yeager & Dweck, 2012).

Two studies that are more relevant to the present study have found similarly positive results following interventions that teach an incremental theory of intelligence to middle school and intermediate elementary school students. Blackwell et al. (2007) in their second study led an intervention with seventh graders that lasted eight weeks, was implemented in a small classroom setting, and included lessons, activities, and discussions that promoted a malleable belief of intelligence. When compared to a control group, the students who received the intervention showed improved grades and were characterized by teachers as being more motivated in class.

In another study, Bempechat et al. (1991) tested the responses to failure of fifth and sixth graders who had been exposed to either an entity message or an incremental

message regarding ability as related to the task. The students were tested individually during one session outside of the classroom. The students exposed to an incremental message were influenced to choose challenging tasks more often, even when failure was likely, showing an orientation toward learning rather than simply preserving the appearance ability.

These results support the idea that an incremental theory of intelligence can be developed in the student, giving him or her a new view of failure; one that accepts failure as an opportunity to learn rather than a source of fear.

Summary of intervening to decrease the fear of failure. Failure is an inevitable part of the human experience and a necessary part of the learning process, yet the negative feedback caused by failure often leads to a fear of failure. Such a fear negatively affects the student's learning and threatens the psychological needs that control autonomous academic motivation. Because it discourages the student's sense of autonomy, competence, and relatedness, fear of failure acts as a barrier that inhibits autonomous academic motivation. Interventions that reduce the student's fear of failure, then, will positively affect autonomous academic motivation.

Attribution retraining and incremental theory of intelligence interventions both help the student to effectively confront and cope with failure. Attribution retraining interventions have been largely successful in laboratory settings with students ranging from intermediate elementary grades through college age. The results of such studies give rise to hope for the effectiveness of training students in a classroom setting to attribute their failures and successes to controllable factors such as effort and strategy use.

Incremental theory of intelligence interventions have also been successful with a wide age range of students. While some researchers have documented successful theory of intelligence interventions outside of the classroom setting, other researchers have implemented successful interventions made for classroom use. The small setting size of the classrooms used in the study by Blackwell et al. is not typical, but the classroom intervention model does give a framework from which to build. Each approach makes a valuable contribution to reducing the student's fear of failure. Attribution retraining helps students to effectively cope with failure situations while incremental theory of intelligence interventions help the student to redefine failure as a learning opportunity.

While attribution retraining and incremental theory of intelligence interventions are distinct approaches, their core concepts support one another, allowing for a combination of the two. Attribution retraining teaches the student to explain success and failure in terms of controllable factors. The student is then empowered to affect future outcomes by applying more effort or seeking to use more effective strategies. Incremental theory of intelligence interventions teach the student to view intellectual ability as something that can be changed and developed. It empowers the student by showing them the connection between effort in the face of challenges and increased intellectual ability, redefining failure experiences as learning opportunities. The combination of these two intervention types will more fully combat the student's fear of failure.

Conclusion

The previous review highlighted the existing literature as it relates to the research question: How does a combined approach of attribution retraining and incremental theory

of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? First, autonomous academic motivation was defined in terms of SDT and set forth as the focus of this study. Autonomous academic motivation was then contextualized among other noncognitive traits that have recently emerged in contrast to the cognitive theory that strongly guides educational policies today. A strong body of research was presented linking autonomous academic motivation to positive academic outcomes. Additionally, the decline of academic intrinsic motivation during the elementary school years was addressed and plausible reasons were offered. Next, intermediate elementary students emerged as an ideal age at which to intervene to affect autonomous academic motivation due to their developmental readiness. Also, the psychological factors that control for motivation according to SDT were explained. The student's needs for competence and relatedness are necessary to increase levels of motivation, but meeting the need for autonomy is the key to fostering internalization, or the reaching autonomous forms of motivation. Finally, fear of failure was depicted as a major oppositional construct that impedes the student from reaching optimal levels of autonomous academic motivation. Attribution retraining and incremental theory of intelligence interventions were set forth as ways to reduce fear of failure. It was suggested that a combination of the two interventions will more effectively decrease fear of failure and, therefore, increase autonomous academic motivation.

The next chapter will detail the research methods of the current study. The pre-experimental design using a combined treatment approach of attribution retraining and incremental theory of intelligence intervention to influence autonomous academic

motivation will be set forth along with rationale for embedding qualitative data collection within a quantitative research design. The setting and participants will be presented. Also, the data collection methods and instruments will be explained in detail.

CHAPTER THREE

Methods

Introduction

This chapter describes and provides rationale for the research paradigm used in the current study to answer the question: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? It includes the research design, the setting, the participants, and the methods that were used in this study. Also, in order to be transparent and uphold the study's validity, this chapter explains the ethical considerations involved in studying the participants, the role of the teacher-researcher, and the approach to data analysis. It concludes with a review of key ideas about the study's methods and a preview of chapter four.

A Mixed Methods Approach

The goal of this experimental study was to measure the effectiveness of a targeted intervention strategy in influencing levels of autonomous academic motivation. I used a mixed methods approach to an embedded pre-experimental design, which incorporated qualitative data into a traditionally quantitative pre-experimental design, in order to both measure the influence of the intervention and to gain insight from the participants as to how the intervention program could be improved upon in the future. The intent was to test the created intervention, gain insight from the participants' perspective, and discover

potential ways to more effectively increase autonomous academic motivation.

Creswell (2014) described a mixed method research paradigm as one that combines the use of quantitative and qualitative data in one study with the purpose of gaining a fuller understanding of the research results. He explained the rationale for a mixed methods design was that the researcher is able to utilize the strengths of each method, with the combination of quantitative and qualitative data providing information that creates a more complete picture of the situation. While quantitative data collection instruments often have pre-determined responses, are more easily implemented with large samples, and provide easily quantifiable results, qualitative data explores the participants' perspectives, can help explain the results attained, and may bring previously unknown issues to the researcher's attention. Especially in the case of research involving human participants, such as the current study, a mixed methods research design is ideal as it lends itself to measuring and explaining complex and multi-faceted situations.

Research Design

A pre-experimental design.

In order to measure how the combined attribution retraining and incremental theory of intelligence intervention affected levels of autonomous academic motivation, I conducted a quantitative pre-experiment with embedded qualitative data collection to provide insight into potential ways to improve the intervention. The one-group pretest-posttest design, a pre-experimental design described by Creswell (2014), first measured the dependent variable (pretest) prior to applying the treatment (intervention) and then again measured the dependent variable (posttest) to note changes. Two weeks before the start of the combined strategy intervention, a survey was

administered as a pretest to measure the participants' existing levels of autonomous academic motivation. The same survey was given again as a posttest two weeks following the completion of the intervention to measure changes in the participants' motivation levels. This quantitative design involved a single group, the experimental group, but did not involve a control group for comparison. The present study would provide a foundation and rationale for future, larger-scale true experimental design if the pretest-posttest comparisons indicated the intervention positively influenced autonomous academic motivation.

Successes in similar research design models. Similar pretest-posttest experimental designs have been used in previous research involving attribution retraining interventions and incremental theory of intelligence interventions. Haynes et al. (2006) used an experimental design to test the efficacy of an attribution retraining intervention on overly optimistic first year college students. Their research method involved a pretest that was a questionnaire designed to assess the independent variables (participants' perceptions of success and levels of optimism) and the dependent variables (participants' perceptions of control over situational outcomes and causal attributions in academic situations). Then, the participants in the experimental group received an attribution retraining intervention consisting of a single session with both direct instruction on shifting causal attributions from uncontrollable factors to controllable factors and self-reflection in the form of written responses. Finally, a posttest was administered to retest the dependent variables.

Likewise, Blackwell et al. (2007) used an experiment with a pretest and posttest

design to measure the effect of an incremental theory of intelligence intervention on middle school student performance. The pretest, as in the Haynes et al. study, measured the independent and the dependent variables. The assessment provided participants with, what the researchers termed, a motivational profile. Next, an eight-week intervention was administered to participants in the experimental group. The intervention included lessons about brain structure and function, the malleability of intelligence, and effective study strategies, as well as discussions about discouraging the use of stereotypes. The main focus was teaching that intelligence can be developed by the participants. At the end of the intervention, a summative assessment was administered to measure the participants' learning of the intervention program content. Three weeks following the intervention, a posttest was given that measured participants' implicit theories of intelligence (the dependent variable).

In both the study by Hayes et al and the study by Blackwell et al., participant course grades and standardized test performance were used as a measure of academic performance. Both experiments were successful in that the interventions led to positive changes in the dependent variables as measured from the pretest to the posttest and in the students' academic performance.

Defining a successful intervention. In the current study, the intervention, which instructed participants to attribute failures and successes to controllable factors as well as to view intelligence with an incremental self-theory, was developed with the intention of positively affecting autonomous academic motivation. The independent variables as set forth in the treatment intervention plan were participant failure and success attributions

and their implicit theories of intelligence. As described in the literature review, attributing successes and failures to controllable factors such as effort and effective use of strategies and believing that intelligence is malleable are means to alleviate fear of failure. As a fear of failure threatens the student's sense of autonomy, competence, and relatedness, it affects his or her level of autonomous academic motivation. The dependent variable, the factor I expected to manipulate, was autonomous academic motivation. A successful intervention would result in increased levels of autonomous academic motivation as measured from the pretest to the posttest survey results.

Embedding qualitative research methods. Qualitative research methods were embedded into the pre-experimental design in order to account for the participants' perspectives and capture ways to improve the intervention design. Creswell (2014) suggests the use of an embedded mixed methods design when "[testing] an intervention or a program in an applied setting (e.g., in a school)" (p. 228). The qualitative methods used included anecdotal records every intervention session, giving an open-ended questionnaire to all participants following the intervention, and interviewing a sample of the participants following the posttest. The anecdotal records provided a detailed account of the intervention sessions so that the activities, implementation, and researcher-participant interactions could be reviewed following the completion of the intervention. Additionally, at the close of the intervention, a summative assessment was administered to test participant learning regarding the content of the intervention sessions. Included in that assessment were three open ended items asking participants to describe what they liked and did not like about the intervention and what could be done to make the

intervention better. Similar questions were also used to interview a focus group with a sample of six randomly selected participants following the completion of the posttest. They were asked to share their experiences during the intervention, to reflect on what went well or what did not go well, and to recommend ways the intervention program could be improved.

Rationale for a mixed methods approach. The embedded mixed methods design provided the quantitative measurement tools to assess the efficacy of the intervention in influencing autonomous academic motivation, while the qualitative data gave insight into the effectiveness of the intervention. The combination of quantitative and qualitative research methods in this study offered a uniquely comprehensive understanding of the intervention's effectiveness as it applied to the current setting and participants.

Setting

This pre-experiment was set in an inner-city public elementary school within a fifth grade dual immersion classroom. The elementary school housed 27 classrooms: three pre-kindergarten classes and four classes of each kindergarten through fifth grade. The total enrollment for the 2015 - 2016 school year was 601 students, according to the Minnesota Department of Education 2015 records. The demographic makeup of the student population was 52.6% Hispanic, 25.3% Black, 16.3% Asian, 4% White, and 1.8% American Indian. Additionally, 14.6% of the students qualified for special education services, 70% were classified as English language learners, and 93% received free or reduced priced lunches. In 2015, the state's education department designated the school with priority status. This designation placed the school in the bottom five percent of Title

I schools across the state in terms of student achievement, student growth, and evidence of the achievement gap within the school as indicated by student performance on the state's standardized tests.

The fifth grade dual immersion classroom, in which the pre-experiment was conducted, was part of a strand program housed within the elementary school. The dual immersion program was made up of two classes of each pre-kindergarten through fifth grade. This design was referred to as a strand program because it existed as a special track within a traditional school. A portion, or strand, of the classrooms from pre-kindergarten through fifth grade were designated as dual immersion classes and students within the program progressed through that strand of classrooms during their elementary education experience.

The program's goal was bilingual education, which was realized by teaching in both English and Spanish. Instruction in pre-kindergarten and kindergarten dual immersion classrooms was fully in Spanish. The model gradually increased the use of English in the dual immersion classrooms from first through fifth grade, where 50% of the instruction was done in each English and Spanish.

While the dual immersion classrooms at all grade levels were predominantly populated with Hispanic students, the home languages of those students were either Spanish or English, meaning that not all students in the program were native Spanish speakers. Though a few students in the dual immersion classrooms identified as Black or White, the demographic makeup of dual immersion classrooms throughout the school was nearly entirely Hispanic and, therefore, did not reflect the diversity of the school in

general.

Participants

The participants in this study were the students in a single fifth grade dual immersion classroom. The classroom consisted of 20 students, eight females and twelve males, ranging in age from ten to eleven years old. Of these students, only one was non-Hispanic and that student was identified as Black. That same student and two more, who identified as Hispanic, designated English as their home language. The other 17 students were of Hispanic origin and Spanish was their designated home language. All of the participants had been in a dual immersion program since at least first grade, if not kindergarten or pre-kindergarten. In order to participate in the study, the parents of all students signed a letter of consent.

Methods

This mixed methods design was implemented over a period of 6 weeks. It included a pretest that was followed two weeks later by an intervention that lasted two weeks. Two weeks following the completion of the intervention, a posttest was administered and then a focus group was conducted with a small sample of the participants.

The pretest. Two weeks prior to the start of the intervention, a survey was administered as a pretest to measure the dependent variable, autonomous academic motivation, and the independent variables, causal attributions and implicit theories of intelligence. The survey consisted of a total of 21 close-ended items (see Appendix A) that were read to the participants as a group. Each item and its possible answer choices

were read and time was given to answer each item before the next item was read. In this way, all participants had the same pace in completing the survey. The entire process of completing the pretest survey lasted approximately twenty-five minutes.

The first twelve items were adapted from the Elementary School Motivation Scale (Guay, Marsh, & Dowson, 2005) and the Academic Motivation Scale (Stover, De la Iglesia, Boubeta, & Liporace, 2012) in order to measure autonomous academic motivation. The Elementary School Motivation Scale (Guay et al., 2005) was developed in order to measure the levels of intrinsic motivation, identified regulation, and external regulation in elementary students in grades one to three in the subject areas of reading, writing, and mathematics. The Academic Motivation Scale (as cited in Stover et al., 2012) was developed to measure intrinsic motivation, identified regulation, external regulation, and amotivation in high school and college students regarding a general motivation toward attending school. Questions from both of these scales were adapted to create a measure of autonomous academic motivation appropriate to the fifth grade participants in this study.

Each of the twelve items was rated on a four-point Lickert-type scale (never, sometimes, a lot of the time, always) rating how the statements related to the participant's reasons for attending school. There were four items indicating each intrinsic motivation (e.g. "because I enjoy learning new things"), identified regulation (e.g. "because going to school will allow me learn many useful things"), and controlled regulation (e.g. "because I like getting recognized for doing well in school"). Controlled regulation referred to both introjected and external regulations.

Six additional forced-choice items were included to measure the participant's causal attributions. As in a causal attribution study by Durrant (1993) with children between the ages of 8 and 13, a small number of hypothetical situations were adapted from the Intellectual Achievement Responsibility Questionnaire (Mannarini, 2008). Three of the six items represented situations with failure outcomes (e.g. "If you do badly on a test at school, it is because") and the other three represented the same situations but with a successful outcome (e.g. "If you do well on a test at school, it is because"). For each item, four choices of causal attributions were offered, two of which indicated attributions to controllable factors (i.e. effort or effective strategy use) and two of which indicated attributions to factors that were out of the participant's control (e.g. ability or task difficulty). Participants were asked to circle the one choice that best represented their feelings.

The final three items were adapted from the Implicit Theories of Intelligence Scale for Children (Dweck, 2000) to assess the participant's belief in either an incremental or entity theory of intelligence. The three items had participants rate the degree to which they agree with each statement using a simplified, four-point Lickert-type scale (strongly disagree, disagree, agree, strongly agree). The items were phrased so that agreement with each item indicated an entity theory as was suggested in the Implicit Theories of Intelligence Scale for Children (e.g. "You have a certain amount of intelligence and not much can be done to change it.").

The intervention. The intervention was conducted during ten 60-minute classroom sessions from September to October of the fifth grade year. The sessions were

conducted over a period of two weeks, with one session given daily during the class' regular literacy block. The regular classroom teacher taught all of the intervention sessions with all 20 participants as a single group. The students were told that they were participating in a brain-based learning program that would help prepare them for their transition to middle school the following year.

The main focus of the intervention was to promote an incremental theory of intelligence. Many of the intervention sessions were adapted from the intervention that was successfully implemented with seventh graders in the Blackwell et al. (2007) experiment. They developed a comprehensive intervention model based on previous interventions that were successful in altering implicit self-theories. The intervention sessions combined engaging reading material, hands-on activities, and classroom discussions to teach students about brain physiology, how learning enhances the brain, the harm in stereotyping, attribution retraining, and effective study strategies. Table 3.1 provides an overview of the focus and primary activities for each session, while detailed lesson plans for each session are included in Appendix B. As a part of the final session, participants completed a summative assessment that required them to recall information from all of the intervention sessions (see Appendix C).

Table 3.1 – Intervention Session Focuses and Activities

Session	Focus	Activity
One	Brain structure and function	Color code parts of brain and identify major functions of each part
Two	Neurons and the process of neurotransmission	Create neuron model and exemplify a neuron chain
Three	Introduce incremental theory of intelligence	Make text-to-self connections to the article "You Can Grow Your Intelligence"
Four	Exploring incremental versus entity theory of intelligence	The Dot by Peter Reynolds and subsequent comparison of growth versus fixed mindset using self-talk
Five	The harm of stereotypes	"Didn't Ask, Didn't Tell" scenario and student role play responses
Six	Attribution retraining day 1 – Study of famous failures	Video (Courage of Famous Failures) and helpful reactions to failure
Seven	Attribution retraining day 2 – Making controllable verses uncontrollable attributions	Tangram activity, "Reasons we succeed and fail" worksheet, and individual reflection on classwork
Eight	Building better study strategies	Jigsaw activity for reading and sharing "Better Study Strategies" handout
Nine	Learning makes you smarter	Class discussion of intervention topics and development of individual take away message
Ten	Final reflection project and summative assessment	Representation of individual take away message to share and display; close with summative assessment of intervention material

Two of the intervention sessions focused on attribution retraining strategies that were then embedded throughout the remaining sessions. In their successful attribution retraining experiment with college students, Haynes et al. (2006) implemented a treatment that began with causal search activation followed by attribution retraining induction and consolidation. In the present study, lessons six and seven were dedicated to

attribution retraining. Session six was the causal search activation in which participants learned about the failures of several well-known people (e.g. Michael Jordan did not make his high school varsity basketball team, Thomas Edison was told by a teacher that he was "too stupid to learn anything", and Dr. Seuss was originally turned down by 27 publishing companies) and considered how those people responded to failure. Participants then made personal connections to their own experiences of recovering from failure. Session seven was adapted from the method used by Haynes et al. in their attribution retraining treatment. It began with induction, where information was given in a handout about several types of attributions people make following failure or success experiences and examples were provided of making controllable factor attributions (e.g. effort) rather than an uncontrollable factor attributions (e.g. test difficulty). The session then continued with a consolidation activity in which the participants analyzed a piece of their own school work with teacher feedback and practiced making controllable factor attributions for the present outcome and a plan for future success. The final three sessions continued to encourage students to attribute failures and successes to controllable factors such as effort and the effective use of strategies.

The summative assessment. The final intervention session concluded with a ten question summative assessment about the intervention material (see Appendix C). The first seven questions were multiple choice items that required participants to recall facts learned during the first eight intervention sessions. The purpose was to evaluate how well the information was understood and retained. The final three items were open-ended and were used to elicit participant reactions to the intervention method. These items included,

"Describe what you liked about the intervention sessions," "Describe what you did not like about the intervention sessions," and "How could the intervention sessions be made better?" The purpose of the final three items was formative: to gather information from the participant perspective to be used to improve the intervention in the future.

The anecdotal records. Anecdotal records were kept for each individual intervention session to be reviewed following the completion of the intervention program. Following each intervention session, the researcher returned to the lesson plan to record in writing what happened during the implementation of the session and to write a reflection about the apparent efficacy of the lesson. The notes were examined later and general themes regarding the intervention were developed during the data analysis process.

The posttest. Two weeks following the final intervention session, participants completed a posttest. The posttest consisted of the same survey that was administered as a pretest. As in the pretest, the posttest survey was used to measure the dependent variable – autonomous academic motivation, as well as the independent variables – failure and success attributions and implicit theories of intelligence.

As with the pretest, the posttest was administered in a single, whole group session. The participants were read the items one at a time and allowed time to answer each one before advancing. In this manner all participants progressed through the items at the same rate. The posttest session lasted about twenty-five minutes.

The focus group. Following the posttest, a group of six randomly selected participants were interviewed about their experience with the intervention. All participant

names were written on craft sticks, separated according to gender, and placed in two receptacles. Then an equal number of males and females were chosen. Three male and three female participants met in the fifth grade classroom where the interventions took place and were asked to share what they felt was successful about the intervention and what could be improved. Participants were asked to describe their experience during the intervention sessions, what they liked, what they did not like, and what could be changed to make the intervention better. An intentional effort was made to have each participant respond to every question. Suggestions given during the summative assessment that all participants completed during the final intervention session served as an impetus to continue the flow of the discussion. The researcher took written notes during the focus group interview. The focus group session lasted approximately thirty minutes.

Ethical Considerations

In research involving human participants, especially children, the researcher was responsible for considering the ethical nature of their study. In an effort to be honest, to be forthcoming, and to show concern for the wellbeing of all participants, I followed a rigorous protocol to obtain the necessary permissions to conduct this research project. First, all survey and intervention materials along with a research proposal detailing the purpose and methods of this study was submitted to and approved by the school district's research board. The district's approval, a completed human subject application, and sample parent/guardian consent letters were also submitted to Hamline University's Graduate School of Education Internal Review Board. With the University's approval, I brought parent/guardian consent forms to each family in their designated home language

(see Appendices D and E). Participation in the study was optional and all consents were freely given. All participants returned signed parent/guardian consent forms prior to the start of the research project.

Concerns about Validity

The role of the teacher-researcher. In an action research project, such as this, the teacher played the dual role of facilitator and researcher. According to Mills (2014), action research was an investigation that a stakeholder, such as a teacher, undertook within their own setting, such as a classroom or a school. He characterized the teacher-researcher as "committed to taking action and effecting positive educational change," (p. 5) within their own context. Mills saw action research as an important part of teachers "improving both their own practice and student outcomes," (p. 22).

In the role of teacher-researcher, my primary function was that of a teacher. My intent for engaging in this research project was to find a way to positively affect student motivation. The pre-experiment design and the use of both quantitative and qualitative research methods were employed to end up with the best intervention possible in order to continue affecting my teaching practice and positive outcomes for my students in the future. My dual roles of teacher and researcher afforded this study an element of practicality that studies involving outside researchers lack. Being a stakeholder in this study, however, posed a threat to the study's validity. Although every effort was made to remain objective in my role as a researcher, the qualitative data was gathered and filtered through my human lens and, therefore, my internal biases may have factored into my interpretation of the results. Consequently, intentional steps were taken to ensure the

validity of this study.

Ensuring validity. Creswell (2014) stated that, in the case of backyard research, or that which took place in the researchers own work setting, methods to assure validity are necessary. Both Creswell and Mills (2014) agreed that triangulation, or using multiple methods of data collection to confirm the interpretation of results, was one way to increase the validity of a study. In this study, quantitative data was used to measure changes in student autonomous academic motivation and qualitative data, including anecdotal records, an open-ended questionnaire, and a focus group interview, were used to gain further insight into the intervention's efficacy. Creswell (2014) also recommended the researcher spend a prolonged amount of time in the setting and with the participants in order to more fully understand the nature of the setting in which the research was taking place. As the teacher, I spent more time than anyone in the classroom in which the pre-experiment was set and with the student group that served as the study's participants. Finally, according to Creswell, the inclusion of rich descriptions taken from the observations and of information that was discrepant from the themes observed when reporting the results added to the validity of the current study.

Data Analysis

The quantitative and qualitative data were analyzed using their separate and appropriate processes.

Autonomous academic motivation. Participant responses to the first twelve questions on the pretest and posttest provided a measure of their autonomous academic motivation. Each response was awarded a scale value according to the type of motivation

being addressed. Intrinsic motivation, the most autonomous form of motivation, was weighted more heavily than identified regulation in order to provide a distinction in the final score range between the two autonomous types of motivation. Intrinsic motivation items were awarded -2, -1, 2, and 4 points for responses of never, sometimes, a lot of the time, and always, respectively. Identified regulation items were awarded -2, -1, 1, and 2 points for each of the responses in the same order. Finally, controlled regulation items were reverse scored and, therefore, awarded 2, 1, -1, and -2 points for each of the responses in the same order. The participant's total indicated an overall autonomous academic motivation score. A score ranging from -24 to zero indicated a decreasingly controlled regulatory style, from one to 16 indicated an increasingly autonomous identified regulation style, and from 17 to 32 indicated an intrinsically motivated individual.

Causal attributions. The six items on the pretest and posttest used to measure the participant's causal attributions resulted in a score of controllable attribution style. Each item had four possible attribution choices, two of which were attributions to controllable factors and two of which were attributions to uncontrollable factors. Participant responses of attributions to a controllable factor were awarded a score of +1 whereas attributions to an uncontrollable factor were awarded a score of -1. The total score of controllable attribution style ranged from -6, indicating all attributions to uncontrollable factors, to +6, indicating all attributions to controllable factors. In addition to an overall score of controllable attribution style, participant responses to situations of success and to situations of failure were scored distinctively to note differing attribution styles given

different situational outcomes.

Implicit theory of intelligence. The final three questions on the pretest and posttest survey provided a participant profile as an incremental or entity theorist in their beliefs about intelligence. The responses to each item were scored 2, 1, -1, and -2 for answering strongly disagree, disagree, agree, or strongly disagree, respectively. A total score of 0-6 represented an increasingly strong belief in an incremental theory of intelligence. A total score of -6-0 represented a decreasingly strong belief in an entity theory of intelligence.

Qualitative data analysis. A content analysis was performed on the anecdotal records of the intervention sessions, the participant responses to the open-ended questions on the summative assessment, and the participant responses given during the focus group session and results were coded by hand. The qualitative data gathered was intended for formative use to improve the intervention method for future use. Accordingly, a simple coding system was developed to categorize data as ways to improve the intervention by adding to, removing from, or exchanging with the intervention method that was implemented. Once the data was coded and categorized, it was reviewed again for repeating themes that indicated the best ways for improving the intervention for use in the future.

Conclusion

In this chapter I reviewed in detail the data collection methods and intervention that were used in this study. I described the setting of the study and the participant group. Ethical considerations and concerns regarding validity were addressed. I also provided a

rationale for the use of a mixed methods approach to research in order to best address the question: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students?

Next, chapter four will present the results of the study. It will begin with a review of the researcher, setting and participants. Then, an explanation will be given for any data that was missing from the study. The chapter's main focus will be a detailed analysis of both the quantitative and qualitative data that were collected during this pre-experiment. The quantitative data from the pretest and posttest will be presented as it applies to each variable in the study. The qualitative data will be presented according to emergent themes. It also will provide an interpretation of what the results indicate.

CHAPTER FOUR

Results

Introduction

This chapter details the results of the data collected as outlined in chapter three and its relevance to answering the research question: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? The chapter begins with a review of the researcher, the setting, and the participants involved in the pre-experiment. Next, it compares the pretest and posttest survey results for the group overall and for the gender subgroups to determine, first, the change in the dependent variable of academic motivation and, then, the change in the independent variables of causal attributions and identity theory. An interpretation of the quantitative data synthesizes the understandings that can be gained about the research question from the results of the pretest and posttest. Also, the results of the qualitative data obtained through anecdotal records, participant responses to three open-ended questions about the intervention sessions, and a participant focus group session are presented as they apply to three broad themes that emerged from the data analysis process. Finally, the chapter concludes with a summary of the results and a preview of chapter five.

Researcher, Setting, and Participants

This pre-experiment was carried out by a classroom teacher in a general education

setting. The fifth grade classroom was part of a dual immersion strand program housed within an elementary school setting. Instruction was given in English and Spanish in reading, writing, and math within the classroom. All instruction related to the present pre-experiment was in English and was carried out during the class' regular reading block.

The participating class consisted of 20 students. Eight of those participants were girls and twelve were boys. Age was not used as a subgroup because only one male and one female identified themselves as eleven-year-olds, while the rest were ten-year-olds, so age would have been an identifying factor. Race was not considered as a subgroup, either, because 19 of the participants were identified by their parents as Hispanic, according to school registration forms, and one was identified as black.

Absent data. All of the data was collected by the classroom teacher during regular class times. The pretest was administered during the second week of school. One female participant did not join the class until the week that the intervention began and, while she was present during the intervention sessions and the posttest, it was not possible to obtain her responses to the pretest survey before the intervention lessons began. Therefore, that participant's data is not present in the pretest survey results, but has been included with the posttest survey results.

Quantitative Data: The Pretest and Posttest

The same 21-question survey was administered to the participant group two weeks prior to the start of the intervention as a pretest and again two weeks following the completion of the intervention as a posttest. The first twelve questions on the survey were derived from the Elementary School Motivation Scale (Guay et al., 2005) and the

Academic Motivation Scale (Stover et al., 2012) in order to measure autonomous academic motivation, or the extent to which the participant freely chooses to engage in activities conducive to learning. This was the dependent variable and, therefore, the goal of the intervention was to increase autonomous academic motivation through direct instruction in causal attributions and implicit theory of intelligence, the independent variables. Forced choice responses to six hypothetical situations were adapted from the Intellectual Achievement Responsibility Questionnaire (Mannarini, 2008) to measure causal attributions, or to what factors participants attribute their failures and successes. The final three items were adapted from the Implicit Theories of Intelligence Scale for Children (Dweck, 2000) to assess each participant's belief in either an incremental or entity theory of intelligence. The incremental theory of intelligence, also known as a growth mindset, states that intelligence is malleable and can be increased. On the other hand, the entity theory of intelligence, or a fixed mindset, states that intelligence is a fixed quantity.

Autonomous academic motivation. Participant responses to the first twelve questions on the pretest and posttest provided a measure of their autonomous academic motivation. Each response was awarded a scale value according to the type of motivation being addressed. The participant's total indicated an overall autonomous academic motivation score. A score ranging from -24 to zero indicated a decreasingly controlled regulatory style, from one to 16 indicated an increasingly autonomous identified regulation style, and from 17 to 32 indicated an intrinsically motivated individual.

Table 4.1: Autonomous Academic Motivation Pretest Scores

Gender	Academic Motivation Pretest Score
Boy	4
Boy	10
Boy	0
Boy	2
Boy	-8
Boy	6
Boy	10
Boy	8
Boy	-3
Boy	19
Boy	-5
Boy	12
Girl	9
Girl	13
Girl	1
Girl	11
Girl	16
Girl	6
Girl	-4
Boy Average	4.5833
Girl Average	7.42857
Total Average	5.63157

Pretest results. Table 4.1 (above) shows the participant group's pretest scores and averages in the area of academic motivation in random order and separated by gender. The pretest results indicated an average academic motivation score of 5.6, which is on the low end of the autonomous identified regulation style range. This indicated that the participant group began with some motivation to do academic work because they saw personal value in doing so.

The average academic motivation score for the boys on the pretest was 4.6, which

was lower than the average girls' score of 7.4, though both still fell within the autonomous identified regulation style range. The girls were, on average, more autonomously motivated than the boys to begin with. The scores ranged from a moderately controlled regulatory style (-8) to a mildly intrinsic motivation score (19). Four boys and one girl participant scored within the controlled regulation range. Thirteen participants, seven boys and six girls, scored within the autonomous identified regulation range. One boy participant scored within the intrinsic motivation range.

Table 4.2: Autonomous Academic Motivation Posttest Scores

Gender	Academic Motivation Posttest Score
Boy	12
Boy	-3
Boy	12
Boy	6
Boy	10
Boy	2
Boy	-7
Boy	-8
Boy	6
Boy	-1
Boy	-4
Boy	11
Girl	16
Girl	10
Girl	10
Girl	13
Girl	2
Girl	10
Girl	9
Girl	9
Boy Average	3
Girl Average	9.875
Total Average	5.75

Posttest results. Table 4.2 (above) shows the participant group's posttest scores and averages in the area of autonomous academic motivation in random order and separated by gender. The posttest results indicated an overall group average score of 5.8 in the area of academic motivation. This was an increase of two tenths from the pretest total average score. This would suggest a slight shift in the participant group's overall autonomous academic motivation level toward more autonomy, though the total average score still fell within the autonomous identified regulation style range.

The average score for boy participants on the posttest in the area of academic motivation was 3, which was a decrease of 1.6 points from the average boy score on the pretest. The boys' scores on the posttest ranged from a moderately controlled regulatory style (-8) up to a highly autonomous identified regulatory style (12). Five boys scored within the controlled regulatory style range on the posttest, which is one more than did so on the pretest. Seven boys scored within the autonomous identified regulatory style range, which matches the amount that did so on the pretest. While one boy scored within the intrinsic motivation range on the pretest, no one did so on the posttest. This shift indicated that the boy participants, on average, experienced less autonomous academic motivation at the time that the posttest was administered when compared with the pretest results. In other words, the boys in the participant group shifted toward a slightly higher level of controlled academic motivation. This was not the desired result.

The average score on the posttest in the area of academic motivation for the girls in the participant group was 9.9, which indicated a moderate level of autonomous identified regulation for those participants. This was an increase in the girls' average

academic motivation score of 2.5 points from the pretest. On the posttest, the girl participant scores ranged from a low (2) to high (16) levels of autonomous identified regulation. This shift indicated that the girl participants, on average, experienced greater autonomy in their academic motivation at the time that the posttest was administered when compared with the pretest results. This was the desired result.

Causal attributions. Questions 13 – 18 on the pre and posttest survey were used to measure causal attributions. Six hypothetical situations were adapted from the Intellectual Achievement Responsibility Questionnaire (Mannarini, 2008) and forced choice answers were used to measure how participants attribute the causes of the proposed failures and successes. For both success and failure situations, causal attributions to controllable factors are favorable because they imply that the student can affect the outcome in the future (Shelton et al., 1985). Each hypothetical situation presented four answer choices, two of which attributed the failure or success to factors within the participant's control and two of which attributed the failure or success to factors that were outside of the participant's control. The result was a score of the participant's controllable attribution style. The total score of controllable attribution style ranged from -6, indicating all attributions to uncontrollable factors, to +6, indicating all attributions to controllable factors. In addition to an overall score of controllable attribution style, participant responses to situations of success and to situations of failure were scored distinctively to note differing attribution styles given different situational outcomes.

Table 4.3: Causal Attributions Pretest Scores

Gender	Failure Attributions on Pretest	Success Attributions on Pretest	Attributions Total on Pretest
Boy	-1	1	0
Boy	-1	1	0
Boy	-3	-3	-6
Boy	-1	1	0
Boy	-3	1	-2
Boy	3	3	6
Boy	-3	-1	-4
Boy	3	2	5
Boy	-3	-3	-6
Boy	1	-1	0
Boy	-3	-3	-6
Boy	-1	1	0
Girl	-3	3	0
Girl	-3	-1	-4
Girl	1	-3	-2
Girl	1	1	2
Girl	-1	1	0
Girl	1	3	4
Girl	-1	1	0
Boy Average	-1	-0.083333	-1.08333
Girl Average	-0.714285	0.71428	0
Total Average	-0.89473	0.21052	-0.68421

Pretest results. Table 4.3 (above) shows the pretest results to the causal attribution questions in random order and separated by gender. On the pretest, the participant group's average total controllable attribution score was -0.7, which indicated that the participants tended to make uncontrollable attributions. The group's average controllable attribution score when only considering the attributions made in the failure situations was lower, -0.9. The average score when only considering the attributions made to the success situations was 0.2, which was higher than the total average. This

indicates that the participants made more attributions to controllable factors when presented with hypothetical success situations than when compared with making attributions in hypothetical failure situations on the pretest. In fact, 17 participants had controllable attribution scores in success situations that were equal to or higher than their controllable attribution scores in failure situations. Additionally, 13 participants had a positive attribution scores in success situations indicating more attributions to controllable factors than uncontrollable factors versus only six positive attribution scores in failure situations.

On the pretest, the boys had a total controllable attribution average score of -1.1, with an average score of -1 when making causal attributions in failure situations and an average score of -0.1 when making causal attributions in success situations. The girls had a total controllable attribution average score of 0, with an average score of -0.7 when making causal attributions in failure situations and an average score of 0.7 when making causal attributions in success situations. This showed that, on average, the girls attributed more of their hypothetical failures and successes to factors within their control than did the boys on the pretest.

Table 4.4: Causal Attributions Posttest Scores

Gender	Failure Attributions on Posttest	Success Attributions on Posttest	Attributions Total on Posttest
Boy	1	-1	0
Boy	3	3	6
Boy	1	1	2
Boy	3	3	6
Boy	-1	1	0
Boy	-1	1	0
Boy	-3	-1	-4
Boy	-1	-3	-4
Boy	3	3	6
Boy	1	-1	0
Boy	-1	1	0
Boy	1	1	2
Girl	-1	3	2
Girl	1	1	2
Girl	1	1	2
Girl	1	1	2
Girl	3	-1	2
Girl	1	3	4
Girl	3	1	4
Girl	1	1	2
Boy Average	0.5	0.6667	1.16667
Girl Average	1.25	1.25	2.5
Total Average	0.8	0.9	1.7

Posttest results. Table 4.4 (above) shows the results to the causal attribution questions from the posttest in random order and separated by gender. The participant group, as a whole, scored an average of 1.7 on all of the causal attribution questions combined. Not only did this indicate that the group made more attributions to controllable factors than to uncontrollable factors but the average score was 2.4 points higher on the posttest than on the pretest indicating an increase in the participant attributions to

controllable factors from the time that the pretest was administered to the time of the posttest. This suggested that the independent variable of causal attributions was manipulated as intended. The average controllable attribution score for the whole participant group when considering only the attributions made in failure situations was 0.8 compared to the average score of 0.9 when considering only the attributions made in success situations. This 1.7-point increase in the area of failure attributions was more substantial than the 0.7-point increase in the area of success attributions, though most important was that scores increased in both areas. Additionally, on the posttest 14 participants had a positive controllable attribution score when presented with failure situations versus only six on the pretest. This suggests that the most growth was gained in the area of failure attributions, which notably had been the weaker of the two on the pretest.

The boys had an average total controllable attribution score of 1.2 on the posttest. This was a 2.3-point increase from the boy's average total controllable attribution score on the pretest. The boys scored higher in both attributions to controllable factors in failure situations (0.5 was a 1.5-point increase) as well as in success situations (0.7 was a 0.8-point increase). The girls had an average total controllable attribution score of 2.5 on the posttest, a 2.5-point increase from the pretest score. The girls also increased their average score for attributions to controllable factors in failure situations (1.3 was a 2-point increase) and in success situations (1.3 was a 0.6-point increase). The fact that both groups increased their controllable attribution scores from the pretest to the posttest for both failure and success situations indicated that a greater amount of attributions were

made to controllable factors. That was the desired result.

Implicit theory of intelligence. The final three questions on the pretest and posttest survey provided a participant profile as an incremental or entity theorist in their beliefs about intelligence. A total score of 0-6 represented an increasingly strong belief in an incremental theory of intelligence. An incremental theorist believes that intelligence is malleable and, therefore, has the potential to grow. It is also commonly referred to as a growth mindset and is favorable in that it has been positively correlated with higher amounts of autonomous academic motivation (Bempechat et al., 1991; Yeager & Dweck, 2012). A total score of -6-0 represented a decreasingly strong belief in an entity theory of intelligence. An entity theorist believes that intelligence is a fixed quantity that is not really changeable; this is also commonly referred to as a fixed mindset.

Pretest results. Table 4.5 (below) displays the pretest scores for the identity theory questions in random order and separated by gender. The participant group had an average score of 0.5 on the pretest. This score is positive, though it is much closer to zero than it is to six, indicating a weak belief in an incremental theory of intelligence.

The boys had an average identity theory score of 0.4 on the pretest. Seven boys had scores that fell within the range of an incremental theorist (ranging from 1 to 4) and five more had scores that fell within the range of an entity theorist (ranging from -2 to -3). The girls had a slightly higher average identity theory score than the boys on the pretest with a score of 0.7. Three girls had scores that fell within the range of an incremental theorist (ranging from 1 to 6) and three more girls had scores that fell within the range of an entity theorist (ranging from -1 to -4). One girl had an identity theory

score of 0, indicating a lack of inclination toward either an incremental or an entity theory of intelligence.

Table 4.5: Identity Theory of Intelligence Pretest Scores

Gender	Identity Theory on Pretest
Boy	4
Boy	-3
Boy	3
Boy	-2
Boy	-2
Boy	1
Boy	-2
Boy	3
Boy	1
Boy	2
Boy	-3
Boy	3
Girl	-1
Girl	0
Girl	6
Girl	-4
Girl	4
Girl	1
Girl	-1
Boy Average	0.4166667
Girl Average	0.714285
Total Average	0.52631

Posttest results. Table 4.6 (below) displays the posttest data from the identity theory questions in random order and separated by gender. The participant group had an average identity theory score of 0.3 on the posttest, which was a decrease of two tenths from the group's average score on the pretest. This indicated a slight shift in the participant group, as a whole, in the level of belief in an incremental theory of

intelligence. In other words, the participant group, on average, still held a belief in an incremental theory of intelligence, but that belief was weaker than when the pretest was administered.

The boy's identity theory score on the posttest was -0.3, which indicated a decrease of seven tenths from the boy's pretest average score. Most alarming was that this decrease shifted the boy's average score from the range of an incremental theorist to the range of an entity theorist. Although the level of belief indicated by the score of -0.3 is weak, the shift was in the opposite direction of the desired result. Four boys had scores on the posttest that fell within the range of an incremental theorist (ranging from 1 to 6), this number was three less than the seven boys on the pretest who scored within the range of an incremental theorist. Seven more boys had scores on the posttest that fell within the range of an entity theorist (ranging from -1 to -5), two more than the five boys who scored within that range on the pretest. One boy had an identity theory score of 0 on the posttest, indicating a lack of inclination toward either an incremental or an entity theory of intelligence.

The girl's identity theory score on the posttest was 1.1, which indicated an increase of four tenths from the girl's pretest average score. This shift indicated, on average, an increase in the strength of the girl's belief in an incremental theory of intelligence. This was the desired result. Five girls had scores on the posttest that fell within the range of an incremental theorist (ranging from 1 to 5), which was two more than the three girls on the pretest who scored within the range of incremental theorist. Three more girls had scores on the posttest that fell within the range of an entity theorist

(ranging from -1 to -3), the same amount as on the pretest.

Table 4.6: Identity Theory of Intelligence Posttest Scores

Gender	Identity Theory on Posttest
Boy	-5
Boy	3
Boy	6
Boy	-1
Boy	-1
Boy	-2
Boy	5
Boy	0
Boy	-3
Boy	-5
Boy	-1
Boy	1
Girl	-3
Girl	-3
Girl	1
Girl	1
Girl	-1
Girl	4
Girl	5
Girl	5
Boy Average	-0.25
Girl Average	1.125
Total Average	0.3

Interpretation of quantitative data. Autonomous academic motivation was the dependent variable in this pre-experiment. The goal was to increase the participants' autonomous academic motivation indirectly by teaching a series of lessons about causal attributions and implicit theories of intelligence. Both of these independent variables, causal attributions and implicit theories of intelligence, have been linked to autonomous

academic motivation (Bempechat et al., 1991; Dweck, 1975; Sakaki and Murayama, 2013; Shelton et al., 1985; Yeager & Dweck, 2012).

The results from the pretest to the posttest did show an increase in the participant group's autonomous academic motivation. The research question was: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? The results would indicate that a combined approach of attribution retraining and incremental theory of intelligence intervention increase levels of autonomous academic motivation.

The increase in the group's average autonomous academic motivation score was slight and considering more of the data can further clarify an answer to the research question. There was an increase in the independent variable of causal attributions according to the group's average score from the pretest to the posttest. The group's average score in the independent variable of identity theory, however, decreased from the pretest to the posttest. The fact that only one of the independent variables was positively manipulated as planned provides a likely explanation for why dependent variable of autonomous academic motivation was only slightly increased. Looking at the data as separated by the two gender groups further supports this hypothesis.

Within the whole participant group, the boys' average score in one of the independent variables, causal attributions, increased. The boys' average score in the other independent variable, identity theory, decreased. Correspondingly, the boys' average score in the dependent variable, autonomous academic motivation, also decreased. This

would support the theory that identity theory does positively correlate to levels of autonomous academic motivation (Dweck, 1975; Yeager & Dweck, 2012). It was not possible to determine from the data collected if the increase in the boys' average score in the area of causal attributions influenced the group's average autonomous academic motivation score. It was possible, for example, that the increase in the one independent variable made the decrease in the dependent variable less severe, but the data was insufficient to be able to make such a claim.

Within the participant group, the girl's average scores increased in all areas from the pretest to the posttest. Their average score in both independent variables, causal attributions and identity theory, increased as was intended following the intervention lessons. Also as was intended, the dependent variable of autonomous academic motivation subsequently increased. The increase in the girls' average autonomous academic motivation score was more substantial than the total participant group's average, supporting the claim that both causal attributions and identity theory may work in collaboration to accelerate an increase in levels of autonomous academic motivation.

This difference between the results for the boys and the girls, on average, within the participant group was unexpected. The data did not offer insight into the potential causes of this seeming gender separation. The qualitative data did, however, offer insight into the effectiveness of the intervention sessions in teaching participants in an effort to manipulate the independent variables.

Qualitative Data

The qualitative data was captured in the form of anecdotal records, participant

responses to three open-ended questions on the summative assessment, and a focus group with six of the participants. First, following each intervention session, the researcher returned to the lesson plans to record in writing what happened during the implementation of the lesson and to write a reflection about the apparent efficacy of the lesson. Second, during the final intervention session, a summative assessment was administered to measure the participant understanding of the basic intervention concepts. The final three questions on that summative assessment were open-ended and asked participants to describe in writing what they liked about the intervention sessions, what they did not like, and how they would change any of the intervention sessions. Finally, following the posttest, a group of six randomly selected participants were interviewed about their experience with the intervention. Participants were asked to describe their experience during the intervention sessions, what they liked, what they did not like, and what could be changed to make the intervention better. The researcher took written notes during the focus group interview.

The qualitative data gathered was intended for formative use to improve the intervention method for future use. Accordingly, a simple coding system was developed to categorize data as ways to improve the intervention by adding to, removing from, or exchanging with the intervention method that was implemented. Once the data was coded and categorized, it was reviewed again for repeating themes that indicated the best ways for improving the intervention for use in the future. Using this system, three main themes were identified: simplification, hands-on engagement, and personal relevance. Each of these emergent themes will be explained next.

Simplification. The intervention presented a large amount of information over the course of the ten sessions. While the sessions proceeded in a sequential order and each connected to and built upon ideas presented in the previous sessions, the qualitative data indicated that the amount of new ideas and vocabulary contributed to the participants feeling confused at times. Simplification of the intervention sessions would diminish the amount of confusion.

What the data said. The anecdotal notes suggested that confusion often ensued in sessions that included reading passages with a lot of domain specific vocabulary and in lessons with multiple transitions between varying elements of the lesson. The first lesson, for example, presented the parts and functions of the brain. The participants read and took notes about an assigned part of the brain and shared using the jigsaw method. Even though the texts provided to participants were below their grade level reading level and important parts were pre-highlighted, the participants were unfamiliar with many of the words used to talk about the brain. Not only were the names of the six parts of the brain (e.g. parietal lobe, occipital lobe, cerebellum) new for all participants, but so were many of the words used to describe the functions of each part (e.g. life sustaining functions, perception, sensory input). The anecdotal notes following that lesson included the following, "Students needed support even with very scaffolded research materials." Lesson five, which introduced the concept of stereotypes and presented students with a scenario from the perspective of a young girl who had been racially stereotyped in school, also confused participants who lacked the vocabulary to understand what they read. The anecdotal notes following this lesson read, "[We] read the scenario twice and

[the] class still struggled a lot to understand. [We] had to work as a whole group to answer [the] questions." Lesson four, which presented the terms "growth mindset" and "fixed mindset," was confusing due to a high number of transitions within the session. First, participants had short partner conversations, then they listened to and discussed a short story, next they watched a video about mindsets, then applied the concepts from the video to the short story they had listened to, finally they worked as a class and then in small groups to learn to rephrase self-talk to be more positive. Too many transitions began to feel choppy and disconnected, as the anecdotal records showed: "[I] had [the participants] discuss and decide [which parts of the story represented the growth mindset and which represented the fixed mindset], which got long and students were confused."

The participant responses to the open-ended questions on the summative assessment and in the focus group session also identified that vocabulary and the presentation of many new topics created confusion. In a written response on the summative assessment, one participant stated, "I did not like people explaining the different parts of the brain because I did not understand," regarding the first session on the parts and functions of the brain. Regarding the intervention as a whole, one student wrote: "It was hard on some words, I didn't understand." The six participants in the focus group concurred that in lesson four about the growth mindset, "The video did not explain growth mindset well and [they were] still not sure [what the term meant]." A written participant response supported that there was still confusion surrounding the term growth mindset because the participant wrote, "I liked when we did what to say to yourself," in reference to rephrasing self-talk which was a way participants were taught to practice a

growth mindset. On the very next question, however, that same participant wrote, "I didn't like the growth mindset." The participants in the focus group also stated that they only "kind of understood [the] story" that was used to teach about stereotypes and they were "still confused about what [a] stereotype is." Simplifying the sessions may help to diminish some of the confusions previously described.

Recommendations. One idea to alleviate the confusion would be to simplify the sessions so that they all have the same guiding questions. One guiding question should address each independent variable to keep the focus on those two important concepts. Incremental theory of intelligence could be addressed with the question: "How can we grow our intelligence?" Controllable attributions could be addressed with the question: "Why should we not be afraid to make mistakes?" This would help in a few ways. Maintaining constant guiding questions throughout all ten intervention sessions would move participants through the sequence of lesson topics while always feeling connected to the two central ideas. Each topic would be presented with a focus on how it helps to answer the guiding questions, providing participants with a familiar context within which to place each topic. This would increase the connections between the topics, decrease the feelings of participants being inundated by many new ideas, and would limit the new vocabulary to what is necessary to help answer the guiding questions.

Another idea is to streamline sessions that present multiple components. Doing many activities, even when all of them pertained to one topic, created a sense of confusion. Each session could be simplified to one direct instruction activity, one guided practice activity, and one independent practice activity that each build upon one another

in succession to teach the session's topic. For example, session four was meant to explicitly teach the incremental theory of intelligence, but it was confusing and, therefore, less effective because it had too many activities throughout the guided practice portion of the lesson. Instead of using a short story, a group inference, and a video, a different short story could be used that more directly teaches about the growth mindset, eliminating the need for the other activities. Such a simplification would help participants focus on the important idea of the session, rather than the distraction that a multitude of activities created.

Hands on engagement. The intervention sessions were designed to be interactive as a means to stimulate participant engagement and interest in the information being taught. The most effective session components seemed to be those that involved participant movement or hands-on creation. Participant responses indicate that those activities were more favorable and the most memorable of the session activities. Involving more movement and hands-on activities would engage the participants in the session content and help them to remember important concepts.

What the data said. The anecdotal records indicated that hands-on engagement motivated participant interaction with the session content. In session two, for example, students created a model of a neuron to learn the basic parts and then played the "Pass the Squeeze" game to model how neuron chains transmit messages throughout the body. Regarding the game, the anecdotal records said: "The game was a hit and with reinforcing the receiving job of the dendrites and transmission job of axon terminals it supported understanding of how neuron's work in a chain to send messages…[The

participants] really liked this and did not want to stop playing." Furthermore, sessions that lacked hands-on activity felt long and the participants' engagement in the content dropped. In lesson six, the participants showed interest in a video about the little known failures of several famous people. Following the video, however, participant motivation dropped when they were asked to respond in writing as small groups to what they learned in the video. The anecdotal records referring to the guided practice part of this session said, "All groups needed coaching. [We] had to go over this multiple times." Similarly, in lesson seven, the guided practice included reading two scenarios on a worksheet and responding to them in writing. Again, participant engagement suffered: "They got completely stuck here." Movement or hands-on activities during the guided practice portion of both of these sessions could have elevated participant engagement.

The participant responses to the open-ended questions on the summative assessment and during the focus group also indicated that movement and hands-on activities were enjoyable and memorable. The participants in the focus group said they liked the pass the squeeze game from the second lesson because, "[they] tried to beat [the] time and see how neurons work fast." Those same participants commented that, "[they] liked writing the important messages," about the process of writing a key takeaway message during lesson nine. However, regarding the creation of a project to display their message in lesson ten they said that "[they] really liked the activity of cutting out letters." This showed that the participants prefer creative movement to typical writing tasks. An individual participant response to the open-ended question about what they liked about the lessons confirmed what was said in the focus group session: "[I

liked] making a neuron and words that you say [and] put them on the paper with the magazine and the squeeze [game].” Another participant wrote, “I liked the collages of positivity,” in regard to final project in lesson ten. More participants, still, wrote that the intervention sessions could be made better by “[having] fun stuff,” “[doing more] lessons with projects about what we learned,” and “using more models of the brain [and] more activities.”

Recommendations. The evident response to this theme is to ensure that as many sessions as possible have hands-on engagement and movement. Especially in sessions with necessary focuses on longer reading and writing activities, hands-on creative responses to that work can help to increase participant engagement. Replacing some of the more sedentary components of with movement would give participants a chance to process information while experiencing it in new and varied ways. This would speak to more learning styles and increase interest and understanding.

Personal relevance. The goal of the intervention sessions was to inspire participants to believe that they have the ability to grow their intelligence and to overcome failures. Beyond just convincing participants that intelligence is malleable and that failure is an important part of the learning process, participants have to see that these concepts apply to their own lives. Participants were challenged to apply the concepts from the intervention sessions to their own lives by writing personal reflections, personalized learning plans, and analyzing their own failures and successes. Looking back at the qualitative data indicated that creating personal relevance with the intervention session concepts was important, but participants struggled to apply some of

those concepts to their own lives.

What the data said. The anecdotal records indicated that participants struggled to apply some concepts to their own lives. Participants were more successful with plans to apply the intervention session concepts than with reflection on personal experiences. For example, in session four participants planned ways to rephrase several self-talk phrases to reinforce an incremental theory of intelligence. The anecdotal records written following that session read: "They did well in small groups with a little encouragement." In session six, though, when asked to brainstorm their personal reactions to or feelings about failure, the "[participants] needed [a] push to be honest. Some [were] trying to say what they thought I wanted to hear." This showed that participants were more focused on trying to produce what would be considered a right answer than reflecting on the personal relevance of the question. In session seven participants were asked to review math work that had been corrected to analyze their success or failure and reflect on the causes of that success or failure. The participant "responses [were] not specific and tailored to real life experiences. [In] some cases [participants] reverted to a fixed mindset." This indicated that participants were not connecting the session materials about causal attributions and incremental theory of intelligence to an actual situation in their own lives. The anecdotal records further noted: "Plan to continue work analysis throughout the year." Participants may have needed more time and practice to internalize new concepts and in order to create personal relevance.

Participant responses during the focus group session and on the open-ended questions on the summative assessment reinforced the importance of participants finding

personal relevance in the intervention session concepts. When participants were able to find personal connections to the important concepts, they developed the essential understandings that were the goal of the intervention. One essential understanding that the intervention intended to teach was that we can grow our intelligence by working through challenges. Participants in the focus group said, "[It was] fun to change things we say to ourselves from not wanting to, to wanting to do it. [That] helps me to not be negative, to think more positively. [We] still practice this." Individual participants wrote, "Now I know that I can practice more to get more intelligent," and, "I liked what to say to yourself because I have been doing better in math." The other essential understanding that the intervention intended to teach was that mistakes are a necessary part of learning. When asked about making causal attributions in lesson seven the focus group participants said that even though they "didn't like looking at [their] own work…[looking] at [their] work shows [they] need more practice." Participant responses on the summative assessment included, "It helped me understand that we should never give up," and, "I like the lessons because it teaches you about that never give up because you can do it." These responses indicated that participants were applying what was learned in the intervention sessions to their own lives; they had created personal relevance.

Two participants offered recommendations to improve the intervention sessions that may improve opportunities to create personal relevance. One participant wrote, "It might be better if it was longer." The other suggested, "It could be better by reviewing them a little during the year." Additional time and practice in applying these concepts may help participants develop more of a sense of personal relevance.

Recommendations. One recommendation is to extend the presentation of the intervention sessions over a period of five weeks. The ten sessions were presented consecutively over a period of two weeks. Spreading the sessions out over a longer period of time, as Blackwell et al. (2007) did in their successful incremental theory of intelligence intervention, may allow additional processing time that would allow participants the opportunity to internalize some concepts before new ones are presented. In the two-week implementation, new concepts were presented daily and participants seemed to be focused on learning and understanding the concepts, which may be why they were not yet ready to apply those concepts to real life situations. Extending the duration to five weeks would mean that two sessions would be administered in a week, instead of five. In addition to more time to process new concepts, additional time to implement the intervention would allow the participants to have more real life experiences during the time of implementation. Participants would see their real life experiences during those five weeks with the intervention session concepts fresh in their minds. This extended time would allow participants to make more personal connections and to practice applying the concepts over a longer period of time.

Another recommendation is to provide additional practice in applying these concepts to real life experiences. About half of the sessions involved an element of applying what was learned to the participants' personal experiences. Similar to hands-on engagement, an effort should be made to create personal relevance in as many sessions as possible. Additionally, skills like attributing failure to controllable factors and making a plan for next steps or maintaining a growth mindset in the face of persistent challenges

may not be mastered in a period of five weeks. These skills were very new and were contrary to the reactions most participants had naturally. While the intervention sessions provided an orientation and a basis for teaching these concepts, participants need extensive practice and reinforcement that extends beyond the frame of the intervention sessions. Implementing the intervention sessions at the beginning of the school year would position the classroom teacher to revisit these concepts throughout the whole year, providing participants with ample opportunity to practice these skills in the context of their real life experiences.

Conclusion

In this chapter, the quantitative data was presented as it pertained to answering the research question: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? An interpretation of the quantitative data then revealed that both causal attributions and identity theory may work in collaboration to accelerate an increase in levels of autonomous academic motivation. Next, the qualitative data was reviewed revealing three emergent themes: simplification, hands-on engagement, and personal relevance. For each theme, the supporting qualitative data was presented and recommendations were made for future implementation of the intervention sessions.

Next, chapter five, the final chapter in this capstone, will be a conclusion. It will present the possible implications of the current study by returning to the literature review and considering how this study contributes to the existing body of knowledge. The

limitations of this study are also recognized. It will make recommendations for next steps and for potential future research projects. Finally, it will include a reflection on the most important learning and understandings gained from the implementation of the current study.

CHAPTER FIVE

Conclusion

Introduction

In my first year of teaching I began to notice a lack of motivation in my students towards challenging academic work. Over years of teaching I watched a few highly motivated students make great academic gains while many other students did not. I puzzled at how to motivate more students in order to help them be more academically successful. In the fall of 2014 I decided to address my growing concern with research. After careful consideration and years of modifying my question regarding student motivation, I developed the following question to guide my research: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students?

This chapter presents the conclusion to this research project. It begins with the implications of the results of the current study as they fit within the context of the existing research. Then, the limitations of the study are presented along with next steps and ideas for future research projects. Finally, the chapter concludes with a reflection on the learning and insights I have gained while completing this research project.

Implications

The success of the intervention in increasing autonomous academic motivation,

especially for the girl's subgroup in which both the incremental theory of intelligence and controllable causal attributions were positively influenced, provides a rationale for direct instruction of implicit self-theories and attribution retraining in the intermediate elementary grades. As discussed in the literature review in chapter two, increasing autonomous academic motivation is a means for increasing academic success.

Revisiting the literature review. Over the past fifty years the amount of research in support of noncognitive factors, like autonomous academic motivation, has increased substantially. It is now widely recognized in the realm of education that noncognitive factors are more influential than cognitive ability in determining the student's potential for success (Character Education Partnership, 2008; Dev, 1997; Duckworth, 2007; Forgeard & Seligman, 2012; Heckman 2010; Segal, 2008). That is because no matter what it is called, an internal trait that, when present and active within the student, creates a willingness to put forth effort to engage in academic learning will lead that student to greater success. This matches the definition of autonomous academic motivation in this study. This link between autonomous academic motivation and student achievement has brought it to the forefront of conversations in education among academic researchers, school districts, school administrators, behavior specialists, teachers, and parents alike. If we want our students to reach their academic potential, we have to increase their autonomous academic motivation.

While much research exists supporting the link between noncognitive factors, like autonomous academic motivation, and academic success, less research has developed successful ways to increase that trait. Two studies that have been successful in

influencing autonomous academic motivation in older students were Blackwell et al. (2007) and Haynes et al (2006). Blackwell et al. (2007) were successful in altering implicit self-theories and teaching an incremental theory of intelligence using an eight-week intervention with middle school students. Participants in that study showed improved grades and were characterized by teachers as being more motivated in class, when compared to the students in a control group. Haynes et al. (2006) were successful in teaching freshmen college students about controllable versus uncontrollable attributions and applying it to their own experience. Participants made more controllable attributions and had greater academic success following attribution retraining than the control group that did not experience the intervention. These successful interventions lead to increases in their participants' levels of academic motivation and academic success, resulting in the identification of two viable ways to affect autonomous academic motivation.

Contributions of the current study. The current study was unique in that it combined two approaches to increasing autonomous academic motivation that had each been successful individually. Additionally, the current study was realistic in that it was developed and implemented by me, a general education teacher, in my own classroom.

The intervention implemented in this study combined teaching about and reinforcing an incremental theory of intelligence as well as attribution retraining which taught students to attribute successes and failures to controllable factors. Those two factors were the independent variables in this study. When both independent variables were positively manipulated, as they were with the girl's subgroup, autonomous academic motivation also increased. This demonstrates that the independent variables can

be taught in combination and that together, even within the short time period of the two-week intervention used in this study, they can positively influence autonomous academic motivation.

The intervention in this study was also designed and implemented in a realistic setting that would facilitate replication. The lessons, while designed to positively influence the independent variables and engage the participants, were created using a backwards design with the state literacy standards as their basis. The lessons were implemented within regular school hours during the class' allotted literacy block. All instruction was led by the general education classroom teacher, and at times the Special Education teacher or English as a Second Language teacher pushed in during their normal support times to work with students on their caseload. The intervention design and implementation was intended to be practical and adaptable to use in any intermediary elementary classroom in hopes that it will become a useful tool for many classrooms.

Limitations

The primary limitations of this study were a small sample size and lack of comparison with a control group. The sample was limited to the size of my current classroom, which was 20 students in total. All students returned a signed permission slip to participate, but as a general education classroom teacher I could only implement the intervention lessons with that single group. This also limited the study to a pre-experimental design, without a control group to make comparisons. A comparison group would have provided additional quantitative data that could have helped clarify the effect

of the intervention versus other possible influencing factors. Further research would be needed to address these limitations.

Recommendations

The current study, while limited, does provide a rationale to further study the question: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? Further research would ideally include a larger sample size, the use of a control group for comparison, and the modification of the intervention lessons according to the themes that emerged during the analysis of the qualitative data.

Increasing the sample size would increase the amount of data for comparison. It would also allow for the study of additional subgroups. The size and makeup of the current participant group only allowed for the separation and comparison of gender subgroups, which appeared significant because only the boy's subgroup decreased in one of the independent variables and in the dependent variable. Replication of the study with more participants could clarify if gender is a significant factor in the efficacy of the intervention. The study of additional subgroups like race or age could add more depth and understanding to how attribution retraining and teaching the incremental theory of intelligence combine to affect levels of autonomous academic motivation.

Utilizing a comparison group could isolate the specific effect the intervention has on levels of autonomous academic motivation versus other possible factors. A control group would help to clarify if changes in the independent and dependent variables are due to the intervention or not. For example, the results of the current study imply that the

intervention affected the gender subgroups differently. The use of a control group could confirm this or find that regardless of the intervention, gender predicts changes in students' controllable attributions, implicit self-theories, and autonomous academic motivation due to other factors.

Finally, the analysis of the qualitative data revealed three themes that could improve the intervention lessons for future use. The themes that emerged from the quantitative research were simplification, hands-on engagement, and personal relevance. Recommendations for modifying the intervention according to each theme were detailed in chapter four. Modifying the intervention lessons according to these themes could result in an intervention that is more effective at teaching the incremental theory of intelligence and making controllable attributions. It would, therefore, be more effective in increasing levels of autonomous academic motivation.

Reflection

As a researcher I gained invaluable insight in the nearly two years this project lasted from conception to completion. Not only did I learn a wealth of information about autonomous academic motivation, a topic as much of interest to me as it is important to the success of the students I teach, I learned how I am able to affect change. I witnessed a change within my students' willingness to take risks, to approach challenges with a positive attitude, and to persist when learning is not easy. Other teachers and many parents noted these qualities in this particular class, too. During the implementation period, other teachers on my team, behavior support staff, and administrators were interested in the outcome of the intervention and the potential to use the lessons in other

classrooms. I am anxious to share my results and the product of my labor for use in my own school and beyond.

I continued to search for ways to reinforce the incremental theory of intelligence and the use of controllable causal attributions throughout the school year. The intervention provided an excellent starting point from which to build-on all year. My purpose is still, as it was when I began this project, to build up levels of autonomous academic motivation that will carry my students to academic success wherever they may go when they leave my classroom. There is still a lot of work and learning to do in regard to understanding how to best increase levels of autonomous academic motivation, but I have created a tool that has given my students a start in the right direction. I am proud of that success. Additionally, I have already been updating the lesson plans for the intervention sessions based on what I learned from the qualitative data in preparation to use with next year's class.

Conclusion

At the beginning of my capstone journey, I set out to answer the question: How does a combined approach of attribution retraining and incremental theory of intelligence intervention affect levels of autonomous academic motivation in intermediate elementary students? This research project has helped to demonstrate that attribution retraining and incremental theory of intelligence interventions can be combined to increase levels of autonomous academic motivation in intermediate elementary students. It also resulted in the creation of a set of intervention lessons that help students address fear of failure in the classroom in order to increase their motivation. Those lessons are included in the

appendix so they may be shared and used. The amount I learned as a researcher in my own classroom also confirmed the value of backyard research.

There is not a single solution to students being successful in school. Students, parents, teachers, school staff, administrators, policy makers, and society at large all present factors in the realm of student success. Autonomous academic motivation stands out as important among those factors because it can travel with the student wherever he or she may go and can be applied to any academic situation. I have helped my students to motivate themselves to persist in learning, which means I have helped to empower them to learn more. As a teacher, that is my greatest accomplishment.

APPENDIX A

Pretest/Posttest Survey

Pretest/Posttest Survey

I am a: boy girl

How old are you? 9 10 11

*Circle **ONE** answer for each question to show how much you agree with the following statements about **WHY YOU GO TO SCHOOL**:*

1. Because I enjoy learning new things.

Never Sometimes A Lot of the Time Always

2. Because in life it's important to go to school.

Never Sometimes A Lot of the Time Always

3. Because I feel more important when I do well in school.

Never Sometimes A Lot of the Time Always

4. Because going to school might help me get a job that I like someday.

Never Sometimes A Lot of the Time Always

5. Because I like getting recognized for doing well in school.

Never Sometimes A Lot of the Time Always

6. Because going to school will allow me learn many useful things.

Never Sometimes A Lot of the Time Always

7. Because I feel good when I complete challenging schoolwork.

Never Sometimes A Lot of the Time Always

8. Because I enjoy learning more about topics that interest me.

Never Sometimes A Lot of the Time Always

9. Because I don't want to be a failure.

Never Sometimes A Lot of the Time Always

10. Because I get to do things that I like (such as writing a story, doing a science experiment, reading a book, or solving a math problem)

Never Sometimes A Lot of the Time Always

11. Because going to school helps me accomplish a personal goal of excellence.

Never Sometimes A Lot of the Time Always

12. Because I want to make my family or teachers proud.

Never Sometimes A Lot of the Time Always

*Circle the **ONE** answer to each question below that **MOST** describes how you feel.*

13. When your schoolwork is very hard to understand, it is because:
    a. You did not pay attention in class.
    b. You are not good at that subject.
    c. You did not take good notes.
    d. The teacher did not explain it very well.
14. If you do badly on a test in school, it is because
    a. You did not try very hard or double-check your work.
    b. You are not good at that subject.
    c. You did not study.
    d. The test was too hard.
15. If the teacher tells you that you need to try harder on an assignment, it is because
    a. You were not putting forth much effort.
    b. You are not good at that type of assignment.
    c. You did not use strategies taught in class.
    d. The teacher is in a bad mood.
16. When something at school is easy to understand, it is because:
    a. You paid attention in class.
    b. You are good at that subject.
    c. You took good notes.
    d. The teacher explained it very well.
17. If you do well on a test in school, it is because
    a. You tried hard or double-checked your work.
    b. You are good at that subject.
    c. You studied.
    d. The test was easy.
18. If the teacher tells you that you did very well on an assignment, it is because:
    a. You put forth a lot of effort.
    b. You are good at that type of assignment.
    c. You used the strategies taught in class.
    d. The teacher is in a good mood.

*Circle **ONE** answer for each statement to show how much you agree with it.*

19. You have a certain amount of intelligence and not much can be done to change it.

Strongly Disagree Disagree Agree Strongly Agree

20. Your intelligence is one thing you cannot really change.

Strongly Disagree Disagree Agree Strongly Agree

21. Although you may learn new things, you cannot change your basic intelligence.

Strongly Disagree Disagree Agree Strongly Agree

APPENDIX B

Intervention Lesson Plans

Lesson 1: Parts and Functions of the Brain

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.2.3.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
5.2.4.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
5.2.10.10 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4–5 text complexity band independently and proficiently.
5.6.8.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.</td></tr>
<tr><td>Understandings:
Students will understand that…
- The human brain is organized into 6 major parts (or spheres).
- Each part of the brain is responsible for controlling different functions of the human body.</td><td>Essential Questions:
- What does the human brain do?
- How is the human brain organized?</td></tr>
<tr><td>Students will know…
- The frontal lobe controls thoughts, movement, emotions, and short-term memory.
- The parietal lobe controls touch, taste, temperature and pain.
- The temporal lobe controls hearing and language reception and long-term memories.
- The occipital lobe controls vision and perception.
- The cerebellum controls fine motor movements, coordination, and balance.
- The brain stem controls sleeping, breathing, digestion of food, heart rate, and consciousness.</td><td>Students will be able to…
- Name the 6 major parts of the human brain.
- Locate the 6 major parts of the human brain on a diagram.
- List two or more functions that each part of the human brain controls.</td></tr>
</table>

Assessment:

Performance Tasks:	**Other Evidence:**
- Human brain diagram colored and labeled to show location of the 6 major parts. - Note sheet listing two or more functions of each of the 6 major parts.	- Student participation in small and large group discussions.

Learning Activities:

Intro/Hook (10 min): Show a picture of the human brain. Fill in the first two columns of a K-W-L chart as a whole group. Give students a chance to turn and talk and then share out first what they already know about the human brain and then what they want to learn about the human brain.

Direct Instruction (5 min): Divide students into groups of six that will be their "share" group. Within each "share" group, each student will be assigned to an "expert" group (either frontal lobe, parietal lobe, temporal lobe, occipital lobe, cerebellum, or brain stem/medulla). If necessary, "share" groups can be larger than six and then would have two experts in certain areas.
Explain the jigsaw activity in which students will go to their "expert" group where they will learn about their assigned part of the brain by reading printed articles and studying diagrams. There they need to locate and color their assigned part of the brain on their worksheet and list as many functions of that part of the brain as possible. Then they will return to their "share" group where each group member will take a turn teaching the group about their assigned area of the brain. Group members will learn from each other about the parts of the brain and will complete the worksheet with information about all parts of the brain.

Guided Practice (10 min): Assign each "expert" group a work area and provide them with material about their assigned part of the brain. Assign a color to each group. Circulate and assist each group in locating their part of the brain and identifying its functions correctly.

Connection to Independent Practice (2 min): Have students return with their partially completed worksheets to their "share" groups. Tell students that as experts, they are responsible for teaching the rest of the "share" group about their area of the brain. Also,

as learners, they are responsible for listening to each of the other experts in their group to learn about the other parts of the brain and complete the worksheet.

Independent Practice (15 min): Let groups be semi-autonomous in sharing their information. Encourage students to ask questions of experts to clarify or get needed information. Circulate and assist as needed to make sure all members color, label, note the functions of all parts of the brain.

Closing (5 min): Have students help fill in the "Learned" section of the K-W-L chart using a large copy of the diagram of the brain by having the class name the parts and two or more functions for which each part is responsible. Remind students that they can use the class example to correct or add to their own work as needed.

Special Considerations:

- Use heterogeneous "expert" groupings to pair students who need support in reading and/or writing with students who are stronger in those areas.
- Assign a partner in "share" groups to support students who need writing support. Or use pre written function notes that those students could glue in the appropriate place on their worksheet instead of writing.
- Provide research materials at a variety of reading levels. May include audio or video resources, if technology is available, especially to support low-level readers.

Materials:

- Picture of human brain
- K-W-L chart on chart paper or SmartBoard
- Student "share" group assignments and meeting spots
- Student "expert" group assignments and meeting spots
- Brain worksheet for each student
- Crayons, colored pencils, or markers for each student
- Research materials at varied reading levels for each part of the brain
- Large, unlabeled but colored diagram of the brain for "L" column of K-W-L chart

Lesson 2 – Neurons and the Process of Neurotransmission

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.2.3.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
5.2.4.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
5.6.8.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.</td></tr>
<tr><td>Understandings:
Students will understand that…
- Neurons are nerve cells that are responsible for sending and receiving messages between the brain and the rest of the body.
- Neurons form chains in order to transmit messages.</td><td>Essential Questions:
- How does the brain control the body?</td></tr>
<tr><td>Students will know…
- Neurons have four basic parts: dendrites receive messages, cell body contains the nucleus that acts as the brain, axon transports the message across the neuron, and the axon transmitters send the message to the next neuron or body part.
- The brain consists of billions and billions of neurons that send messages that is thinking.</td><td>Students will be able to…
- Locate and label the four basic parts of a neuron and explain their basic functions.
- Explain how neurons carry messages between the brain and the rest of the body by forming neuron chains.</td></tr>
</table>

Assessment:

<table>
<tr><td>Performance Tasks:
- Assembly and labeling of 2-D neuron model.</td><td>Other Evidence:
- Whole group discussions during direct instruction and closing.
- Student interaction during guided instruction.
- Summative assessment question #1 to be administered in lesson 10.</td></tr>
</table>

Learning Activities:

Intro/Hook (3 min): Display labeled parts of brain diagram that was completed by the class at the closing of lesson one. Ask the class, "What is the brain made of?" Give students a chance to turn and talk and list their ideas.
Explain that the brain is actually made up of 2 types specialized cells. One called neurons that are responsible for sending messages all over the body and the other called glial cells that hold everything else in place. Today we are focusing on the billions and billions of messenger cells…Neurons!

Direct Instruction (7 min): Show the class a completed neuron model like they will be creating. Show the video - 2 Minute Neuroscience: The Neuron. Have the class help you place the labels of the parts of the neutron on the model according to the video (replay parts if necessary) and explain the basic role of each part.
Students will then make a model like the example.

Guided Practice (8 min): Give each student a sheet of black construction paper and have them choose colored cutouts of each the cell body with dendrites, the nucleus, the axon, and the axon terminals. Have them glue the parts in place and label and write the function of each part in white colored pencil. Let them use the example and each other as needed.

Connection to Independent Practice (7 min): Explain that neurons cannot work alone. A message will only get to the necessary part of the body if the neurons form a chain and pass the message from one to the next until it gets to where it needs to go.
Have the class stand in a circle holding hands. There are many billions of neurons in the brain. Explain that in this activity, each student represents a neuron. Everyone's left hands will be their dendrites, or receivers. The right hands will be the axon transmitters, the senders. The teacher (or a designated student) will begin by squeezing their right hand to send a message to the next person. When that person receives the message (squeeze), they need to pass it down the chain to the next person by squeezing their hand. The message has reached its destination when it returns to the teacher (or person who started the squeeze). Have the class practice sending the squeeze message a couple of times, trying to get faster each time.

Independent Practice (5 min): Explain that neurons transmit messages very quickly. A message may pass along a chain of thousands of neurons within seconds. Many different messages may be passed along different neuron chains at the same time.
Have the class represent this by dividing into a few equal-sized groups (try to have 6 or more students per group). Each group will play the squeeze message game. Each group

needs to designate a person to start. Make it a small competition to see which neuron chain can send a message the fastest. Have all groups start at the same time and see who finishes fastest. Teams can repeat this activity a few times.

Closing (15 min): Show the video Brain Power: From Neurons to Networks. Review that nerve cells inside the brain are called neurons and they are responsible for sending messages (or thoughts) through our body by playing the iNeuron challenge "The Basics" as a whole group. Display the neuron models created by the class in a chain to remind students that thoughts are sent between the brain and the rest of the body along chains of neurons.

Special Considerations:

- Pre-select groups for independent practice to ensure they will work well together.
- Pair students who may struggle to assemble and label the neuron model with a partner who can help.

Materials:

- Completed parts of the brain diagram from closing in lesson 1
- Marker and chart paper or white board space to list student ideas in intro
- Completed example neuron model
- 2 Minute Neuroscience: The Neuron
- Pre-made labels to add to example
- For each student: black construction paper, prepared neuron parts (dendrites, nucleus, axon, and axon terminals)
- Glue
- White colored pencils
- Clock or stopwatch
- Brain Power: From Neurons to Networks
- Place to display class neuron chain (made with student created neuron models)
- iPad with iNeuron app to reflect on Smart Board

Lesson 3 – Growing Your Intelligence

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.2.3.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
5.2.4.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
5.2.10.10 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4–5 text complexity band independently and proficiently.
5.6.8.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly</td></tr>
<tr><td>Understandings:
Students will understand that…
- The human brain grows and gets stronger through being challenged and stimulated to think and solve problems.
- Time and practice is required to grow and strengthen the brain (to make it smarter).
- The more a brain is stimulated and challenged the better is gets at learning new information or processes.</td><td>Essential Questions:
- How does our brain learn and grow?
- What causes a person to be intelligent?</td></tr>
<tr><td>Students will know…
- Stimulating the brain with learning and challenges strengthens the brain and causes it to get bigger.
- Neural connections increase in number with brain stimulation.
- The amount of neural connections is directly related to thinking and problem solving.</td><td>Students will be able to…
- Relate personal experiences with the concept that the brain can grow and improve like a muscle through practice.
- Cite examples from the article or own lives that support the idea that intelligence is changeable.</td></tr>
</table>

Assessment:

Performance Tasks:	**Other Evidence:**
- "My Connections" task sheet	- Student partner and whole group discussion - Questions 2 and 3 on summative

	assessment in lesson 10

Learning Activities:

Intro/Hook (3 min.): Use the neuron chain displayed from lesson two to review what was learned about how neurons transmit messages between the brain and the rest of the body. Tell the group that, "Today we are going to continue to learn about neurons and what happens to our brains when we learn."

Direct Instruction (5 min.): Show the large example of the "My Connections" chart. Remind the class that when we make personal connections we compare what we are learning to something we have experienced in our own lives. Explain the columns on the charts using the example of a neuron chain passing a message between our brain and a part of the body and the pass the squeeze game we played in lesson two. In the first column, "Information from Text", write: Neurons form a chain to transmit messages between the brain and different parts of the body. In the second column, "My Connection", write: In the pass the squeeze game, we passed a squeeze from one person to the next until it reached the last person. In the third column, "What I Learned", think aloud how playing the squeeze game helped you understand neuron chains (e.g. When we played pass the squeeze I saw how the squeeze went from the first person to the second then the third and so on until it reached the last person, much like the way a message begins with a neuron in the brain and goes to the next and the next in a line until it reaches the last neuron in the body part where the message is being delivered.). Explain that as students read the article today, "You Can Grow Your Intelligence", they need to think about how what they are reading is similar to something they have experienced.

Guided Practice (10 min.): Read the first page of the article as a whole group shared reading. Pause half way down the first column after the phrase, "use it or lose it!" to practice making a connection and recording it on the chart. In the first column, "Information from Text", write down: muscles get larger and stronger with exercise and smaller and weaker when you don't exercise. Ask students to think of a connection they have to this. They can think of a time when they did some type of exercise for a period of time and got stronger in some way or a time when they were not active and got weaker. Use a think-pair-share and record one example in the second column ("My Connection") of a student's connection that was shared. Ask the class to think and explain how the example connection helps us to understand how exercise affects muscles. Record the

explanation in the third column, “What I Learned”. Then continue the shared reading to the end of the first page.

Connection to Independent Practice (2 min.): Pass out copies of the “You Can Grow Your Intelligence” article and “My Connections” task sheet to each student. Explain that students will read the rest of the article and are responsible for recording two personal connections they make to information from the text. Remind students to use their reading strategies to understand what they are reading and to record their connections to share in about 20 minutes.

Independent Practice (20 min.): Circulate and assist by checking in with students as they independently read. Help students verbalize their thinking when necessary and encourage them to continue reading and to record two connections.

Closing (10 min.): Have students gather with their “My Connections” task sheets. Ask students first to share their connections with a partner. Then, ask students to volunteer to share individually, but be prepared to call on students at random (or based on responses you noticed during independent practice) to get a variety of examples. Use student answers to highlight these key points from the article:

- Stimulating the brain with learning and challenges strengthens the brain and causes it to get bigger.
- Neural connections increase in number with brain stimulation.
- The amount of neural connections is directly related to thinking and problem solving.

Add a few student responses related to these key points to the large example “My Connections” chart and display it with the class created materials from lessons one and two.

Special Considerations:

- Although the article is appropriate for upper elementary school reading, it’s vocabulary may present a challenge to students in the class who are below grade level in reading. During independent work time, use strategies as necessary to enable all students to access the text and its content. Ideas include:
    - Buddy reading
    - Small group reading (3-4 students working together)
    - Guided reading with the teacher
    - Audio recording of teacher reading the text
    - Continue large group shared reading (if the majority of the class cannot access the text without help)

- Consider supports for students who need help writing to fill out the task sheet. A classroom assistant, the teacher, or a more advanced student may be able to help write what a student needing support verbalizes. Additionally, a partially filled out task sheet could have some key points already filled out in the first column to cut down on the amount of writing that needs to be done. Finally, the activity could be adapted by allowing students to draw their examples or create an audio recording of their responses.

Materials:

- Neuron chain display from lesson 2
- Class chart: “My Connections”
- markers
- “You Can Grow Your Intelligence” article projected for shared reading
- copies of “You Can Grow Your Intelligence” article for each student
- copies of “My Connections” task sheet for each student
- pencils
- prepared groups, pairs, recordings, or modified task materials for any adaptations needed during independent practice

Lesson 4: Exploring Incremental Versus Entity Theories of Intelligence

Overarching Goal & Objectives:

Standards:

5.1.2.2 Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.

5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

5.8.6.6 Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation.

Understandings:	**Essential Questions:**
Students will understand that… - Mindset is the belief that a person has about the changeability of their intelligence. - A person's mindset affects the amount of effort they put into learning. - We can influence our mindset by using positive and encouraging self-talk.	- What is mindset? - How can my mindset affect me? - How can I influence my mindset?
Students will know… - A person with a growth mindset believes that intelligence can grow with effort and practice. - A person with a fixed mindset believes that they have a certain amount of intelligence and it cannot be changed. - A growth mindset leads to increased amounts of effort and, therefore, greater potential for learning. - Our self-talk promotes a certain kind of mindset.	*Students will be able to…* - Define growth versus fixed mindset. - Explain the benefits of a growth mindset. - Give examples of positive self talk that supports a growth mindset.

Assessment:

Performance Tasks:	**Other Evidence:**
- Write portion of write-pair-share activity ("What is the most important message the author of The Dot wants us to learn?") - Rephrasing self-talk to support a growth mindset worksheet	- Partner and whole group discussions - Questions 6 and 7 on summative assessment in lesson 10

Learning Activities:

Intro/Hook (3 min.): Use the think-pair-share strategy to have students discuss their feelings when they begin or try something that is new to them. Use the same process to discuss how students feel when they are working on something that is difficult for them. Tell the class that you are going to read them a book about Vashti, a girl who has a lot of the same feelings they just described. She does not think she is good at drawing and we will see what happens in her art class.

Direct Instruction (2 min.): As they listen to the short story, students need to be paying attention for the theme of the story. Explain to students that characters in fiction books undergo struggles in order to teach us lessons that we can apply in our own lives. In literature, these important lessons are called themes. Tell them to pay attention to Vashti and what lessons we can learn from her experience so they are ready to write their thoughts at the conclusion of the story.

Guided Practice (15 min.): Read The Dot aloud to the class. The book is short, so you do not have to stop to talk about it until the end unless you want to. Create a quick class summary of the story and record it on a class chart. Have the students describe Vashti at the beginning of the story (e.g. In the beginning: Vashti thought she couldn't draw and she did not want to try. She had already given up). Next, have students describe Vashti at the end of the story (e.g. Now: Vashti was drawing more and helping another student begin drawing, too). Then, have students share what moment they think was the turning point in Vashti's attitude toward drawing (e.g. when she saw the teacher had framed and hung her artwork). Finally use a write-pair-share to have students discuss, "What is the most important message the author of The Dot wants us to learn?" Record several student answers on the chart paper beneath the brief summary. Collect the students' written answers to formatively assess their understanding of the book's theme.

Connection to Independent Practice (10 min.): Introduce the terms growth mindset and fixed mindset by labeling the "In the beginning" portion of the summary as *fixed mindset* and the "Now" portion as *growth mindset*. Show the video "Growth Mindset vs. Fixed Mindset" to help clarify more to the class the difference in the two mindsets. Have students look at the list of themes or lessons from the story The Dot and decide what kind of mindset supports that way of thinking (growth mindset). Explain that you and the class will be working from this point forward to support themselves and one another in developing a growth mindset. One of the most basic and most important ways to do this is to make sure the messages you tell yourself and one another support a growth mindset. Give the class the example using the word yet: "Instead of telling yourself, 'I can't,' say, 'I can't do that yet." Just that simple switching of words takes a task from being impossible to being something you are in the process of learning.

Independent Practice (10 min.): Hand out the rephrasing self-talk to support a growth mindset worksheet. Let students work in small groups together to finish rephrasing the fixed mindset messages so that they are, instead, supportive of a growth mindset. Assist groups as needed, but encourage students try. If they use fixed mindset messages as reasons they cannot do this activity, subtly reply with growth mindset messages. Give the groups 7-10 minutes to work. Even if they do not finish, remind them that this is new and they are practicing and they can learn from one another's ideas during the share time.

Closing (10 min.): Have groups share out suggestions for rephrasing each fixed mindset message on the worksheet. Record one or more growth mindset messages to use in place of each fixed mindset message on the class chart or projected copy of the worksheet. Encourage students to modify or add to their own worksheet as you go. If there are a few messages that the students are not yet sure how to rephrase, tell them that is ok, that this chart will be posted in the classroom and can be added to as the class learns more and practices using a growth mindset. Students should keep their copies close at hand to remind themselves of the importance of using positive self-talk to support a growth mindset.

Special Considerations:

- Use intentional partnering during the read aloud in order to support learners who might struggle with the vocabulary of The Dot or with reflecting on a theme.
- Use intentional grouping (or grouping strategies) to support learners who might struggle with rephrasing fixed mindset messages to support a growth mindset.
- For students who struggle severely with writing, consider having a writing buddy. The student can collaborate verbally in their group and the teacher can then make a copy of the writing buddy's completed worksheet for the student.

Materials:

- Copy of The Dot by Peter Reynolds
- Post-it and pencil for each student for write-pair-share
- Chart paper and marker for class summary and recording book's theme
- Labels "Fixed Mindset" and "Growth Mindset"
- Video: Growth Mindset vs. Fixed Mindset
- Rephrasing self-talk to support a growth mindset worksheet for each student
- Large class chart copy of rephrasing self-talk to support a growth mindset worksheet or projected copy

Lesson 5 The Harm in Stereotypes

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.1.1.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
5.1.2.2 Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.
5.3.1.4 Read with sufficient accuracy and fluency to support comprehension.
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.</td></tr>
<tr><td>Understandings:
Students will understand that…
- Stereotypes are broad judgments we make by placing others and ourselves into categories.
- Stereotypes have consequences that are often negative on people who use them and on those who are judged using stereotypes.
- Recognizing stereotypes is important to overcoming them.</td><td>Essential Questions:
- What is a stereotype?
- How do stereotypes affect individuals?
- How should we approach new people?</td></tr>
<tr><td>Students will know…
- A stereotype is a belief about an individual or a group based on the idea that everyone in a particular group will act the same way.
- Stereotypes are harmful because they judge an individual based on their being part of a certain group without considering their individual interests or characteristics.
- Stereotypes impede having a growth mindset because they limit the belief one has about what they can and cannot do.
- We should approach new people with curiosity, allowing them to share their strengths and interests instead of making assumptions about them.</td><td>Students will be able to…
- Evaluate the influence of stereotypes in given realistic situations.
- Alter the interactions between characters in the story to break down the stereotype.
- Relate stereotypes to their learning about growth mindset.</td></tr>
</table>

Assessment:

Performance Tasks:	**Other Evidence:**
- Evaluation of the influence of stereotypes on "Didn't Know Didn't Ask" worksheet. - Small group role-play about actions or choices characters in story could take to break down the stereotype.	- Student group and whole class discussion. - Questions 4 and 5 on summative assessment in lesson 10

Learning Activities:

Intro/Hook (8 min.): Divide students into small groups of 4-5. Give each student a copy of the "Guess Who" worksheet and project the pictures of the 12 students in the fictitious middle school class. Give the groups 5-8 minutes to match each statement to one of the students in the class. If you want, read each statement out loud then give the groups 30 seconds or so to match it to a student.

Direct Instruction (7 min.): Then, use a few of the student pictures and ask the class to share which statements they assigned to those students and why. Lead the class to understand that assuming someone likes or can or can't do something well because they are part of a particular group is called stereotyping. Write the definition of stereotype on the class chart (Stereotype: a belief about an individual or a group based on the idea that everyone in a particular group will act the same way).

Guided Practice (15 min.): Give each student a copy of the "Didn't Know Didn't Ask" worksheet. Project the excerpt and have student volunteers read it aloud while the rest of the class follows along on their own sheets. Use the turn and talk strategy to have students answer questions 1-4. In question 4 reiterate that stereotypes are harmful because they ignore an individual's strengths or interests. Also, stereotypes send a message of limits, which does not support a growth mindset. Both others stereotyping us and us stereotyping ourselves opposes our belief that we can learn anything with practice. Add these key points to the class chart.

Connection to Independent Practice (2 min.): Have students return to their original small groups. Assign all of the groups to complete question 5 together. They will come up with an idea for how one person at the school could have done something different to help the author. They will share their idea by role-playing and acting out their solution for the class.

Independent Practice (20 min.): Give groups about 10 minutes of work time. Circulate and assist groups. Encourage them to practice their role-play 2-3 times before they will present it to the class. Have each group present their role-play solution to the class. After each one, have the audience name what a character did to break down the stereotype.

Closing (3 min.): Review the key ideas on the class chart and add the final point: We should approach new people with curiosity, allowing them to share their strengths and interests instead of making assumptions about them.

Special Considerations:

- Pay special attention to groupings to allow for groups that will include ideas and opinions of all members. Also to have groups that will be able to present their solution as a role-play.
- May adjust the reading of the excerpt to be independent or group reading to challenge more advanced readers.
- Offer a writing buddy to students who struggle to write. In this case, the students would collaborate, the strong writer would record and the teacher would copy the collaborative responses and provide the struggling writer with a photocopy of the work.

Materials:

- Copies of "Guess Who" worksheet for each student
- Projection of fictitious middle school class
- Class chart labeled "Stereotyping: Key Ideas"
- Markers
- Copies of "Didn't Ask Didn't Know" worksheet for each student
- Space for groups to practice and present role-plays

Lesson 6: Attribution retraining day 1 – Study of famous failures

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.6.10.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
5.8.2.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.</td></tr>
<tr><td>Understandings:
Students will understand that…
- Failure is subjective and only ever final if a person gives up.
- We can respond to failure in a variety of ways that either help or do not help us to strive toward our goals.</td><td>Essential Questions:
- What is failure?
- How does failure affect us?</td></tr>
<tr><td>Students will know…
- Failure is not reaching the outcome you had hoped.
- You have not failed unless you have given up. You just may not have succeeded yet.
- You are in control of your response to each failure and whether you give up or keep working toward your goal.</td><td>Students will be able to…
- Recall helpful and unhelpful responses to failure
- Evaluate example situations to identify the possible responses following failure that led to the achievement of a goal
- Identify a personal experience of failure and analyze the helpful responses to failure that resulted in not giving up</td></tr>
</table>

Assessment:

Performance Tasks:	**Other Evidence:**
- Student responses in notebook	- Student and class conversations - Summative assessment question 6 given during lesson 10

Learning Activities:

Intro/Hook (3 min.): "Today we are going to talk about failure." Use a think-pair-share to brainstorm a definition for the word "failure" and write the co-created definition at the top of the class chart (e.g. not reaching the outcome you had hoped).

Direct Instruction (15 min.): Below the definition divide the chart into two halves (leave a few lines at the bottom that are not divided). The left side will be: Unhelpful Responses, and the right side will be: Helpful Responses **But don't label them yet. Ask the class to turn and talk about their reactions to or feelings about failure. Then have student volunteers share their responses. Most should end up on the left side at this point but if students give answers that would be considered "Helpful Responses," put them in the right column. Then add the label to the left side: Unhelpful Responses. "When failure makes us feel so sad or hopeless that we give up, that does not help us reach our goals. Instead, we are going to look at ways we can respond to failure experiences that can bring us closer to achieving our goals." Label the right side: Helpful Responses.
Introduce and watch the video "Famous Failures." Ask the students to pay attention to be able to share as many of the famous people and the ways in which they failed. Create a chart with as many of the famous failures as the class recalls (the video is short, so you can watch it a second time if need be). Divide the chart into three columns (famous person, failure, success). Make sure there are at least four famous failures from the video on the class chart. First fill out the famous person and their failure. Then come back to each one and, in the success column, record what the class shares that the person is known for today. Point out that despite some major setbacks (or failures) none of these people are remembered for those failures but rather for what they accomplished after those failures.

Guided Practice (10 min.): Divide the class into groups of 3-5 students. Assign each group one of the famous failures from the class chart. Use a think-ink-group-share to have students consider how their assigned person may have responded to failure. Have students think on their own for about 30 seconds, then give them 2-3 minutes to write their ideas in a notebook. Then give the groups 4-5 minutes to share and adjust their individual responses before finally sharing out with the whole class. (If need be, refer back to the unhelpful responses on the chart and point out how those responses tend to lead to giving up. None of the famous failure subjects gave up, so their reactions or responses to failure must be different). Record the ideas of each group about helpful responses to failure in the right column of the chart.

Connection to Independent Practice (2 min.): Explain that each of us encounters failures daily, most small but some large, and that every time we have to decide how we will respond to those failures. Give some examples like missing the bus, doing a math problem wrong, kicking the ball poorly during a game, not knowing a word while reading, or not being chosen for something we wanted. Reinforce that every time something like this happens, when something goes wrong, we choose whether we will give up, or respond in a helpful way that allows us to keep working toward our goals.

Independent Practice (10 min.): Tell the class that they will be making a connection with the idea of helpful responses by writing in their notebooks about at least one time when they did not give

up after a failure. Remind them that it may have been a small failure like one of the examples, or something else. They are going to write for 7-8 minutes in their notebook about that experience: What was the failure? How did they feel afterwards? What did they do afterwards? How did they not give up? If a student completes one account, they should use the rest of the time writing about another. Give 2-3 student volunteers the opportunity to read one account. Acknowledge or consider have the other students acknowledge or applaud each sharers courage in sharing and success in not giving up because of their failure. Add student responses to the "Helpful Response" column on the class chart.

Closing (5 min.): Label the bottom section of the class chart: "Why not give up?" Have the class think-ink-pair-share using their notebook and then record responses on the class chart. Point out that according to the definition of failure (not reaching the desired outcome), one can never really fail unless they decide to give up. Otherwise each failure is just a setback because you haven't succeeded…YET. Collect student notebooks with all responses from the lesson for formative assessment.

Special Considerations:

- Use sentence frames to give students the language to express their ideas and experiences:
    - Introduction: "Failure is…"
    - Direct Instruction: "When I fail I feel…," "When I think about failure, I think…," "After failing I…,"
    - Guided Practice: "After failing, this person…," "Instead of giving up, this person…," "Failure made this person…"
    - Independent Practice: "When I was ___ years old…," "I failed when…," "After failing I felt…," "After failing, next I…," "I did not give up because…," "Instead of giving up I…"
    - Closing: "We should not give up because…," "If we give up, then…"
- Purposefully group students to allow and encourage equal participation among group members
- For students who struggle to write (writing activities in this lesson are already short and focused):
    - Provide a sheet with the sentence frames as a fill-in-the-blank to reduce the amount of writing
    - Consider use of speech-to-text technology or video or audio recording technology so students can orally present and record their thinking.

Materials:

- Chart paper
- Markers
- Optional: Sentence frames on sentence strips

- Video: Famous Failures
- Optional: Pictures of people from “Famous Failures” video to hang on class chart
- Pre-determined student groups of 3-5
- Student writing notebooks
- Pencils

Lesson 7: Attribution Retraining Day 2 – Making Controllable vs. Uncontrollable Attributions

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.1.1.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
5.6.1.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</td></tr>
<tr><td>Understandings:
Students will understand that…
- We can attribute success and failure to factors that are within our control or those that are not within our control.
- It is preferable to make controllable attributions because they empower us to change future circumstances.</td><td>Essential Questions:
- How can we respond to failure?
- How can we respond to success?</td></tr>
<tr><td>Students will know…
- Uncontrollable attributions take away our power to change or influence a situation.
- Controllable attributions give us power change or influence a situation.
- We always have some control over our situation.</td><td>Students will be able to…
- Distinguish between controllable and uncontrollable reasons for success and for failure.
- Analyze a scenario and choose at least one controllable attribution for the success or failure.
- Apply attribution retraining to a personal experience of success or failure.</td></tr>
</table>

Assessment:

<table>
<tr><td>Performance Tasks:
- Responses to scenarios on “Reasons We Succeed or Fail” worksheet
- Responses to personal example of success or failure</td><td>Other Evidence:
- Answers to questions 3 and 6 on summative assessment given in lesson 10
- Student discussions</td></tr>
</table>

Learning Activities:

Intro/Hook (5 min.): Hand out packs of Tangram pieces to each student. Display a difficult Tangram puzzle for the class to try to complete. Give vague instructions for how to solve (e.g. you just put all the pieces together to make this shape. When you are done, you can do another one). Do not help much. Make excuses or be deliberately unhelpful. Maybe only help one small group of students and ignore the rest; or offer a few students copies you have of the puzzle so they have the advantage of lining up the pieces over the puzzle’s outline. Give the students about 5 minutes to work: until a few students you are helping have solved it or until frustrations seem

to be high. (If for some reason they get it very easily, that is ok because we are analyzing failure and success situations)

Direct Instruction (7 min): Ask the class to leave their Tangrams and gather on the carpet. Ask the group how they did (Did they solve it? Did they get close?). Then, use a turn-and-talk to have students discuss why they were successful or not. List the reasons they offer. Next, use a think-pair-share to discuss the question, "Which of these excuses are within your control?" If necessary, give an example using the listed student responses. Star or highlight the ones within the student's control according to their responses. Star or highlight any that they may have missed. Explain: "Even though some of the reasons that are not within your control may have affected the outcome, focusing on those takes away your ability to affect what happens next time. If you focus on reasons why you succeed or not that are within your control, then you give yourself the power to affect what happens next time." Give an example using the posted student responses.

Guided Practice (15 min): Have students return to their seats and put away the Tangrams. Hand out the "Reasons We Succeed and Fail" worksheet. Review as a group the lists of attributions. Have students explain, now, why attributions from the right column are favorable. Have student volunteers read the success and failure scenarios out loud. Give students in their table groups about 5-8 minutes to answer the questions about each scenario. Then have the class share responses. Focus on the connection between the given reasons within the students' control and what they can do going forward.

Connection to Independent Practice (2 min.): Now the class will be applying this skill to their own experiences. Explain that this is personal and sometimes difficult to look at the reality of why things turned out the way they did, especially when thinking about when we did not succeed. It is also very important to be truthful to oneself if you actually want to take control of what happens in the future.

Independent Practice (15 min): Pass out the student work analysis sheet and give each student samples of their work with feedback. Copy the analysis sheet double-sided so students can analyze two pieces of their work. This is an independent activity; offer to students privacy folders or the option to move away from each other. Circulate and assist. Push students to think about reasons within their control for the success or failure outcome and to focus on a plan for next steps.

Closing (5 min.): Ask 2-3 student volunteers to share their plans for next steps. Re-enforce the key idea that we want to focus on reasons that we succeed or fail that are within our control and that we always have SOME control that can help use influence future outcomes. Don't give up control over your future by blaming things that are out of your control for your successes and failures.

Special Considerations:

- Plan ahead of time which students you will or will not help in the intro activity and which puzzle will present a challenge to most students in the class.
- Plan ahead small groups for the "Reasons We Succeed and Fail" worksheet.
- For students who struggle severely with writing, consider a writing partner whose paper can be photocopied later for the "Reasons We Succeed and Fail" worksheet.
- For students who struggle severely with writing, consider alternative options for the self-analysis. Maybe text-to-speech software or audio recording options. Otherwise, plan to discuss their analysis of their work and assist in writing. Maybe only have them analyze one piece of work.

Materials:

- Tangrams for every student
- Difficult Tangram puzzle for display, a few paper copies or puzzle
- Chart paper
- Marker
- "Reasons We Succeed and Fail" worksheet for each student
- pencils
- Student work with feedback
- Analysis of student work sheet copied double-sided for each student

Reasons We Succeed and Fail

After we do really well on something or not so well on something, what we tell ourselves about why we were successful or not can determine if we keep trying or if we give up.

Reasons We Cannot Control

- I am awesome at this.
- I got lucky.
- The teacher likes me.
- I am not good at this.
- It was too hard.
- The teacher does not like me.
- The teacher did not do a good job of teaching that.

Reasons We Can Control

- I worked really hard on this.
- I took good notes.
- I studied.
- I double-checked my work.
- I paid attention in class.
- I tried what I learned in class.
- I did not try hard enough.
- I did not practice enough.
- I chose to play instead of study.
- I did not pay attention in class.
- I did not follow the examples.

Lesson 8: Building Better Study Strategies

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
5.8.2.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.</td></tr>
<tr><td>Understandings:
Students will understand that…
- How we learn best is unique to each individual.
- All learners can use strategies to intentionally improve their learning.</td><td>Essential Questions:
- How do we learn best?
- How can we increase our learning potential?</td></tr>
<tr><td>Students will know…
- Individual differences affect how each person learns best.
- Universal study strategies include paying attention in class, taking good notes, planning ahead, preparing a study area, chunking larger learning assignments, reciting what you learned, asking for help, and taking care of your basic needs first.</td><td>Students will be able to…
- Explain the importance of each of the 8 strategies.
- Apply study strategies to their own personal experience to create a study plan.</td></tr>
</table>

Assessment:

Performance Tasks:	**Other Evidence:**
- Successful Student Study Plan	- Small group study strategy posters - Student discussions

Learning Activities:

Intro/Hook (3 min.): Use a turn-and-talk to have students discuss how they get ready for a school test or project. Ask volunteers to share out their study plans.

Direct Instruction (5 min): Pass out copies of the "6 Steps to Smarter Studying" article to each student. Present an example study strategy (paying attention in class). Read aloud

the section and show students the example poster that represents the strategy. Show how key points from the article were used in the poster (not too much writing), how pictures or visuals can help explain the strategy, and how your own ideas about the strategy were incorporated into the poster.

Guided Practice (30 min): Divide students into 7 small groups and give each group one strategy to study and for which to create a poster. Give groups about 15 minutes to read and create their poster. Circulate and assist. Groups will have two minutes to explain their strategy using their poster to the class. Hang posters after they are presented in a visible location within the classroom.

Connection to Independent Practice (2 min.): Explain that students will be creating their own study plan for being a successful student. Pass out the worksheet and review the areas of focus and remind students how they are the same as the ones just presented.

Independent Practice (10 min.): Circulate and assist as students complete the "Successful Student Study Plan."

Closing (5 min.): Have student volunteers share out from select areas of their study plans. Collect study plans to make a copy to share with parents and return originals to students to keep to implement.

Special Considerations:

- Pre-determined groups for guided practice should be heterogeneous to allow for students with stronger literacy skills to support those without.
- Study plan does not require large amounts of writing, but may consider a writing partner to support students who struggle with writing.

Materials:

- 6 Steps to Smarter Studying, student copies of article
- example study strategy poster
- Paper for study strategy posters
- Markers
- Successful student study plan
- Pencils

Lesson 9: Learning makes you smarter

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.6.8.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.</td></tr>
<tr><td>Understandings:
Students will understand that…
- Engaging in the process of learning is what makes us better learners.
- We become smarter by challenging ourselves and learning from our mistakes.</td><td>Essential Questions:
- How can we grow our intelligence?
- Why should we not be afraid to make mistakes?</td></tr>
<tr><td>Students will know…
- We can grow our intelligence.
- We can strengthen our brains by working through challenges.
- Mistakes are a necessary part of learning.</td><td>Students will be able to…
- Summarize the previous intervention lessons using their own words to illustrate one of the key understandings.
- Participate in a large group discussion by sharing their learning in writing and orally.</td></tr>
</table>

Assessment:

Performance Tasks:	**Other Evidence:**
- Written key take away idea.	- Student participation in large and small group discussions. - Student written reflection.

Learning Activities:

Intro/Hook (3 min.): Classroom gallery walk of learning from intervention lessons so far.

Direct Instruction (5 min): Review example of written learning reflection in writing notebook. Present guiding questions and prompts as a starting point for beginning written reflection.

Guided Practice (30 min):

10 minutes – Students work independently to write an individual reflection on their learning and understanding of the guiding questions (How to we grow our intelligence? Why should we not be scared to make mistakes?).

10 minutes – Students share in partnerships or small groups of 3-4 students. As groups share and discuss their ideas and understandings of the guiding questions based on their individual reflections, encourage students to add to and change what they have written so far.
10 minutes – Class comes together for a whole group discussion of their understanding of how to best answer the guiding questions. Students should refer to their writing, but also be encouraged to actively listen and respond to one another. Ideally, all voices should be heard during the discussion, while trying to maintain a flow of conversation rather than individual student shares of their reflections. Conversation and collaboration prompts are helpful here.

Connection to Independent Practice (2 min.): Share example of key takeaway sentence or phrase (e.g. "It won't always be easy but with planning and hard work, I can learn anything."). Explain that the goal is for students to express the most important thing they have learned in relation to answering the guiding questions in their own words. It should be short (focused on just one key idea).

Independent Practice (10 min.): Students practice crafting their key takeaway sentence or phrase. Encourage them to try a few different ideas and edit or revise them. Students should star (or select) one that they want to use for their final project.

Closing (5 min.): Review or read the "What students will learn…" together. Remind students that they have learned a lot, but that those key ideas are most important to hold on to, and now they have created a personal quote to help them do so. In the next lesson they will display and share that quote with others.

Special Considerations:

- Students who may need writing support:
    - aid in reflection by writing sentence starters for them
    - use assistive technology supports (word prediction or text to speech)
    - provide alternate way to reflect through digital recording

Materials:

- Displayed classwork and/or artifacts from previous lessons
- Example written reflection on chart paper
- Guiding questions, writing prompts, lesson key ideas on chart paper
- Student notebooks and pencils
- Conversations/collaborations prompts
- Example of key takeaway message

Lesson 10: Final Reflection Project and Summative Assessment

Overarching Goal & Objectives:

<table>
<tr><td colspan="2">Standards:
5.6.8.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
5.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.</td></tr>
<tr><td>Understandings:
Students will understand that…
- Engaging in the process of learning is what makes us better learners.
- We become smarter by challenging ourselves and learning from our mistakes.</td><td>Essential Questions:
- How can we grow our intelligence?
- Why should we not be afraid to make mistakes?</td></tr>
<tr><td>Students will know…
- Intelligence is malleable.
- We can strengthen our brains by working through challenges.
- Mistakes are a necessary part of learning.</td><td>Students will be able to…
- Summarize the previous intervention lessons using their own words to illustrate one of the key understandings.
- Participate in a large group discussion by sharing their learning in writing and orally.</td></tr>
</table>

Assessment:

Performance Tasks:	**Other Evidence:**
- Student key takeaway message displayed artistically	-

Planning Ahead: The main goal of this lesson is to display student work in a fun and creative way that they will want to share. My class used magazine text to create their key takeaway messages and glued them onto cardstock. Many other ideas are possible or you can give students options and let them choose how they prefer to display their own key takeaway message. Most importantly, consider the materials you have available. It the technology is available, you may even consider digital presentation options. Also, it is great to display and share the student creations as much as possible, so plan for how to do so in advance. This not only reminds students of the messages they see, but elevates the importance of the messages they created.

Learning Activities:

Intro/Hook (1 min.): Show key idea chart from previous lesson and remind students of the discussion and personal key takeaway messages they created.

Direct Instruction (5 min): Show students a model of how they are going to display their personal key takeaway message (I liked to call it their quote or motto) and explain the steps for doing so.

Connection to Independent Practice (1 min.): Have students prepare and organize their materials

Independent Practice (20 min.): Give students time to create their display. Assist, encourage, and reinforce students working.

Closing (10 min.): Gather as a group and have each student show and read their key takeaway message.

Summative Assessment (15 min): Pass out the summative assessments for students to complete to demonstrate their understanding of the lesson materials used in lessons 1-8. Read the questions and answer choices out loud to assist students that may struggle with reading be able to answer based on what they learned in those lessons. The final three questions are optional if you want to use them to continue to improve the lessons for future use; otherwise, questions 1-7 cover the lesson materials.

Special Considerations:

- Have a plan for providing support or extra time for completion for students who may need it.

Materials:

- Student notebook with key takeaway message
- Model of key takeaway message displayed
- Materials for students to display their key takeaway message (vary depending on project, see planning ahead)
- Copies of summative assessment
- pencils

APPENDIX C

Summative Assessment of Intervention Material

Summative Assessment of Intervention Material

Name: _____ Date: _____

Circle the letter of answers that is correct. Only one answer is correct for each problem, so read all answer choices and choose the one that is the best answer.

1.) The billions of nerve cells inside the brain that allow us to think and solve problems are called:

a.) cortexes

b.) neurons

c.) synapses

d.) ligaments

2.) Like other muscles in the body, the brain can grow and get smarter by:

a.) resting

b.) doing the same tasks again and again

c.) lifting weights

d.) practicing challenging tasks

3.) Students who are excellent readers or great math problem solvers:

a.) probably started practicing these skills from a young age

b.) were born with more intelligence than other students

c.) have a lot of help with their homework

d.) do not need to practice because they are already smart

4.) A stereotype is:

a.) an accurate description of a group of people

b.) a way to describe most people in a group

c.) something that only has to do with racial groups

d.) a general belief that all people in a group have certain characteristics

5.) Stereotypes are harmful because:

a.) they are based on assumptions rather than facts

b.) they cause us to think things about other people that may not be true

c.) they can lead to prejudiced feelings against other people

d.) all of the above

6.) If you do not know how to solve a certain kind of math problem, you should:

a.) give up, you are just not good at math

b.) copy the answers of someone who is smart in math

c.) take careful notes in class, practice extra problems, and ask the teacher for help

d.) blame the teacher for not teaching very well

7.) Who is in charge of your learning and brain development?

a.) the teachers at your school

b.) you

c.) the adults at your home

d.) the doctor

8.) Describe what you liked about the intervention sessions:

9.) Describe what you did not like about the intervention sessions:

10.) How could the intervention sessions be made better?

APPENDIX D

Parent/Guardian Consent Letter

Parent/Guardian Consent Letter

September 8, 2015

Dear Parent or Guardian,

As you know, I am your child's 5th grade teacher. I am also a graduate student working on an advanced degree in education at Hamline University. An important part of my degree is a research project. The purpose of this letter is to get your permission for your child to participate in my project.

The purpose of my project is to study student levels of motivation in school following an intervention that teaches students to confront and successfully cope with fear of failure. My main goal is to improve student motivation in school and, therefore, their academic achievement. Students will attempt activities where errors or failure is expected as a means to reflect on and practice positive reactions to failure. The idea is that by reducing the anxiety students have about failure they will be encouraged to try harder even when learning is difficult. Because research and writing are dynamic processes, the possibility remains that this project's focus will continue to develop as the research unfolds.

All students in the class will participate in ten sessions during our normal literacy classes in September and October that consist of reading, writing, and discussing topics related to brain development, stereotypes, and effective ways to deal with failure. With your permission, your child would answer a short questionnaire about school motivation before the start of the intervention sessions and again after the final session is completed and reflect on the effectiveness of the intervention. No additional homework or activities outside of our class or the regular school schedule will be required for participation.

I may include samples of student answers from the questionnaires or classroom discussions in my final paper. The identity of all participants will be kept confidential. I will report the study results either as group statistics or as anonymous student contributions. No names will be used. Your child is free to withdraw from this project at any time without negative consequence.

I have received approval for my study from the Graduate School of Education at Hamline University and from the (school district). Approval to conduct this research project has also been given by the principal at (school name), (principal's name). My study will be described in my final paper, called a capstone. It is public scholarship and the abstract and final product will be catalogued in Hamline's Bush Library Digital Commons, a searchable electronic repository. I may also publish or use my findings in scholarly ways in the future. In all cases, your child's identity will be kept confidential.

Please sign and return the attached permission form by September 11. If you have any questions, please call me at school (phone number) between 8:30 am and 4:00 pm or

email me at anytime (email address). Thank you for your cooperation.

Sincerely,

Mrs. Whitney Ramirez
(school name)
(school address)

September 2015

Dear Mrs. Ramirez,

I have received and read your letter about conducting research on fifth grade student motivation. I understand that your purpose is to study student levels of motivation in school following an intervention directed at reducing anxiety related to fear of failure. The main goal of your project is to improve student motivation and academic achievement in school.

I give permission for my child, _____, to participate in the research project that is part of your graduate degree program. I understand that all results will be confidential and anonymous and that my child may stop taking part at any time without negative consequences.

Signed,

_____ Date: _____
(Parent/Guardian)

APPENDIX E

Carta de Permiso de los Padres/Tutores

Carta de Permiso de los Padres/Tutores

8 de septiembre, 2015

Queridos padres de familia o tutores,

Como saben, yo soy la maestra de quinto grado de su estudiante. También estoy estudiando para avanzar mi carrera en la educación en la Universidad Hamline. Una parte importante de esta carrera avanzada es un proyecto de investigación. El propósito de esta carta es obtener su permiso para que su estudiante participa en mi proyecto.

El propósito de mi proyecto es estudiar los niveles de la motivación estudiantil después de una intervención que les enseña a los estudiantes a enfrentar y sobrepasar su miedo de fallar. Mi meta principal es mejorar la motivación estudiantil y, por eso, su éxito académico. Los estudiantes participarán en actividades en cual se espera fallar para poder reflexionar en y practicar las reacciones positivas a los fallos. La idea es que en disminuir la anxiedad que los estudiantes tienen acerca de fallar estarán más animados a esforzarse cuando el aprendizaje es dificil. Como las investigaciones y la escritura son actividades dinámicas, hay posibilidades que el enfoque se desarrolla más mientras progresa el proyecto.

Todos los estudiantes en la clase participará en diez seciones durante las clases normales de la literacía en septiembre y octubre que constirán en leer, escribir, y hablar acerca del desarrollo del cerebro, los estereotipos, y las maneras efectivas de reaccionar a una falla. Con su permiso, su estudiante contestaría un cuestionario corto acerca de la motivación en la escuela antes del comienzo de la intervención y otra vez después de la sesión final y reflexionaría en la eficacia de la intervención. No tarea extra ni actividades afuera de la clase o el horario regular de la escuela serán necesarios para participar.

Es posible que incluiré ejemplos de las respuestas de los estudiantes del cuestionario o de las discusiones de la clase en mi proyecto final. Las identidades de todos los participantes serán confidenciales. Reportaré los resultados de la investigación como estadísticos del grupo o como contribuciones de estudiantes anónimos. No usaré los nombres. Su estudiante tiene la libertad de salir del proyecto en cualquier momento sin ningúna consecuencia negativa.

Recibí los permisos necesarios para mi proyecto del Colegio de la Educación en la Universidad Hamline y también del distrito de (nombre del districto). También la directora de la escuela (nombre de la escuela), (nombre de la directora), ha dado su permiso para implentar este proyecto. Describiré mi proyecto en mi papel final, llamado un capstone. El capstone es un hecho público y se colocará en los Digital Commons de la biblioteca Bush de la Universidad Hamline, un repositorio digital. También yo podría publicar o usar los resultados de mi proyecto de una manera profesional en el futuro. En cualquier caso, la identidad de su estudiante se mantendrá confidencial.

Por favor firmen y devuelvan el permiso adjuntado antes del 11 de septiembre. Si tienen preguntas, por favor llámenme en la escuela (número de teléfono) entre las 8:30 am y las 4:00 pm o envíenme un correo electrónico en cualquier momento (correo electrónico). Gracias por su cooperación.

Sinceremente,
Sra. Whitney Ramirez
(nombre de la escuela)
(dirección de la escuela)

septiembre 2015

Querida Sra. Ramirez,

Recibí y leí la carta acerca de su proyecto de investigación sobre la motivación estudiantil en quinto grado. Entiendo que su propósito es estudiar los niveles de la motivación de los estudiantes en la escuela después de una intervención dirigida a disminuir la anxiedad relacionada con el miedo de fallar. La meta principal del proyecto es mejorar la motivación de los estudiantes y su éxito académico en la escuela.

Doy permiso para mi estudiante, _____, participar en el proyecto de la investigación que es una parte de su programa de la maestría. Entiendo que todos los resultados serán confidenciales y anónimos y que mi estudiante puede dejar de participar en cualquier momento sin consecuencias negativas.

Firmado,

_____ Fecha: _____
(Padre de familia/Tutor)

APPENDIX F

Tables of Pretest and Posttest Results

Tables of Pretest and Posttest Results

Pretest Survey Results

* Results listed in random order and separated by gender

Gender	Academic Motivation	Failure Attributions	Success Attributions	Attributions Total	Identity Theory
Boy	4	-1	1	0	4
Boy	10	-1	1	0	-3
Boy	0	-3	-3	-6	3
Boy	2	-1	1	0	-2
Boy	-8	-3	1	-2	-2
Boy	6	3	3	6	1
Boy	10	-3	-1	-4	-2
Boy	8	3	2	5	3
Boy	-3	-3	-3	-6	1
Boy	19	1	-1	0	2
Boy	-5	-3	-3	-6	-3
Boy	12	-1	1	0	3
Girl	9	-3	3	0	-1
Girl	13	-3	-1	-4	0
Girl	1	1	-3	-2	6
Girl	11	1	1	2	-4
Girl	16	-1	1	0	4
Girl	6	1	3	4	1
Girl	-4	-1	1	0	-1
Boy Average	4.5833	-1	-0.083333	-1.08333	0.4166667
Girl Average	7.42857	-0.714285	0.71428	0	0.714285
Total Average	5.63157	-0.89473	0.21052	-0.68421	0.52631

Posttest Survey Results

* Results listed in random order and separated by gender

Gender	Academic Motivation	Failure Attributions	Success Attributions	Attributions Total	Identity Theory
Boy	12	1	-1	0	-5
Boy	-3	3	3	6	3
Boy	12	1	1	2	6
Boy	6	3	3	6	-1
Boy	10	-1	1	0	-1
Boy	2	-1	1	0	-2
Boy	-7	-3	-1	-4	5
Boy	-8	-1	-3	-4	0
Boy	6	3	3	6	-3
Boy	-1	1	-1	0	-5
Boy	-4	-1	1	0	-1
Boy	11	1	1	2	1
Girl	16	-1	3	2	-3
Girl	10	1	1	2	-3
Girl	10	1	1	2	1
Girl	13	1	1	2	1
Girl	2	3	-1	2	-1
Girl	10	1	3	4	4
Girl	9	3	1	4	5
Girl	9	1	1	2	5
Boy Average	3	0.5	0.6667	1.16667	-0.25
Girl Average	9.875	1.25	1.25	2.5	1.125
Total Average	5.75	0.8	0.9	1.7	0.3

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