The Effects of Affirmations on

Middle School Students with Difficulties in Math

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Abstract

The power of positivity has fueled progress for humanity since the beginning of time and continues to push students to reach their potential. Students who succeed in school are more flexible and use productive strategies to deal with stress (Hogan et al., 2010). Students with learning disabilities are three times more likely to drop out of high school compared to the average student (Ravipati, 2017). This and similar studies highlight the problem facing students who need to work much longer and harder to complete the same curriculum that mainstream students are able to obtain with moderate effort. Successful students with learning disabilities must have additional stamina and strategies to keep themselves from giving up academically. The impact of positive self-esteem on academic potential is significant (Gurung et al., 2019). The purpose of this study was to learn whether choosing a daily affirmation before doing math homework would positively affect the students' math quiz scores over one trimester. Quiz scores on Algebra I concepts were compared between those who received positive affirmations in the current school year in the second trimester with scores of students from the previous year's class during the second trimester who did not receive positive affirmations. The results of the study presented in this paper indicated that students in the control group earned significantly higher quiz scores; as such, the null hypothesis was not rejected. The impact of the Covid-19 virus and school closure likely affected the current year's scores.

CHAPTER I

INTRODUCTION

Science and mathematics education for students in the United States is critical to the continued technological success and medical advancement in the country. Careers in science, technology, engineering, and math require students take advanced classes where skill and stamina are key to mastering complicated, detail-oriented tasks. Often, students in lower socio-economic areas and minorities give up on pursuing careers in these areas because of negative experiences in their early education (Goyer et al, 2017). Lack of emotional regulation and growth mindset prevents students from being able to succeed in the hard sciences and frequently results in these students having limited job options. Math phobia and resistance to courses that require scientific readings and exact calculations generally precludes them from getting jobs in sectors that are high-paying and upwardly mobile (Lai et al., 2015).

The researcher has worked with minority students as a middle school resource teacher for several years. During that time, she has observed students with limited natural ability succeed when they begin to believe that mastery is within their reach. When a teacher is able to teach and practice habits of self-affirmation and growth mindset with students throughout months and sometimes years, these habits can become part of the students' self-consciousness and begin to be reflected within the students' self-talk. According to Chouinard et al. (2007), the personality of the teacher affects the teacher's ability to build the relationships with students needed for helping them build a growth mindset. The researcher wanted to learn if a specific self-affirmation activity would have a measurable impact on students' mastery of Grade 8 Algebra concepts.

Statement of Problem

The purpose of this study was to determine whether reading a self-affirmation before completing math homework would increase test scores of middle school students with learning difficulties.

Hypothesis

The null hypothesis was that students who read a daily affirmation will not earn higher math scores than those who do not.

Operational Definitions

Affirmation: For the purpose of this study, affirmation is the manner by which people try to reestablish a sense of moral and adaptive confidence or self-integrity when it comes under threat, sometimes doing so by strengthening it in another area (Goyer et al., 2017).

Self-confidence: For the purpose of this study, self-confidence is the belief or view a person has about him/herself. This includes a person's ability in both academic and non-academic tasks (Maclellan, 2014). A student's self-confidence or lack thereof contributes to his/her level of perseverance.

Self-regulation: For purpose of this study, self-regulation refers to methods students use to generate and suppress thoughts, behavior and emotions when they are trying to learn a new skill (Berkeley & Larsen, 2018).

Emotional intelligence: Emotional intelligence refers to the capability of individuals to control their emotions effectively so that their outer behavior communicates what is being felt internally in

a manner that will help the individual person achieve their goals (Djambazova-Popordanoska, 2016).

Math Skill: For the purposes of this study math skill refers to eighth grade Algebra I concepts.

The independent variable was that each student chose a daily affirmation for him or herself before doing the daily math homework assignment. Ten different affirmations were available from which students could choose each day.

The dependent variable was the students' scores on weekly math quizzes on Algebra I concepts.

CHAPTER II

REVIEW OF THE LITERATURE

This literature review explores the relationship between resiliency and its effects on middle and high school students who experience difficulties in learning mathematics. Part one of the review describes the components of self-esteem. The relationship among self-esteem, self-regulation, self-affirmation, and self-control is explained in part two. The connection between self-esteem and self-control is explained in part two. Part three explores the effect of learning challenges on students' math self-concept. The impact of self-affirmations and students' achievement in math is discussed in part four. The final section addresses theories regarding growth mindset and fixed mindset.

Components of Self-Esteem

There are many components that result in positive self-esteem. Researchers such as Battistutta et al., 2018) discuss the components of self-esteem and its relationship to student achievement. Self-esteem, or self-concept refers to how capable a student perceives himself or herself to be in any area that takes practice and effort. An example of this would be a student who says, "I am good at math." Such a statement implies that the perception of a student as to whether he or she is good or not good at something is static; the perception does not change and often includes the student comparing himself or herself to others. For example, students who master the multiplication tables frequently perceive themselves as strong math students, even if they struggle with abstract thinking. Their ability to learn algebra may be stronger than their ability to solve equations because they think of themselves as "good" math students since their early elementary years when math automaticity was the key to success in math (Battistutta, 2018).

Self-efficacy is the belief that ability is not static but can change over time with hard work and the proper instruction. A student may say, “I can do this even if it is hard,” or “I can solve these problems if I take my time.” Both self-esteem and self-efficacy impact a student’s level of resilience (Claro et al., 2016). Resilience allows students to approach a challenge and realize that with grit, or determination, they can change their academic abilities over time. Having a positive experience and feeling competency in a specific skill in or outside of school can have continuing effects because of the gradual building of positive consequences they initiate (Goyer et al., 2017). It is the habits and perspective that encourage them to complete homework assignments and to review their mistakes on tests to ensure that they do not repeat those mistakes. Goyer et al. (2017) advise that these positive perceptions and behaviors can be reinforced by using self-affirmation among other techniques to get positive outcomes.

Relationship among Self-Esteem, Emotional Regulation and Self-Affirmation

Emotions impact student learning and have a significant positive or negative effect on a student’s achievement (Djambazova-Popordanoska, 2016). Students need both cognitive skills and emotional intelligence to succeed in higher education. Since the early 2000’s, hundreds of articles and studies related to the connection between emotion regulation and children’s health, cognitive ability and school success have been conducted. Among these studies are those providing data indicating that minority students often are victims of negative stereotyping regarding academic capability (Sherman, 2013). Many minority students begin to believe that their poverty or ethnicity may cause teachers to view them as less academically capable. This perception may become a self-fulfilling prophecy as the students’ negative views of themselves as less capable learners absorb cognitive energy that would otherwise be used to master academic skills. (Goyer et al., 2017).

Emotion regulation is the ability to manage and respond to an emotional experience. It includes a student's ability to focus, control behavior and manage strong feelings so that the student can reach his or her goals (Berkeley & Larsen, 2018). Self-control is needed to curb unexpected reactions in situations that trigger strong emotions. Emotional regulation is a key indicator of future social and academic success and impacts daily interactions between and among students and educators. Children with strong emotional regulation can recover more easily from social and academic disappointments and this allows their brains to be more available for learning and consistent effort to improve (Djambazova-Popordanoska, 2016).

Two types of educational goals, mastery goals and performance goals, impact students' self-esteem and emotional regulation. A mastery goal focuses on learning a specific skill and putting effort into being able to integrate the new skill in the best possible way for the individual student. A performance goal is when levels are compared to those of their peers (Chouinard et al., 2007). This kind of academic measurement often leads to academic avoidance and disruptive behavior because a weaker math student is constantly comparing himself or herself to peers instead of focusing on personal mastery goals (Peklaj et al., 2011). An example of academic avoidance or disruptive behavior would be the student who refuses to work with his or her assigned partner on a project, spends his time and energy arguing with the teacher and loses the time to understand the project and learn the academic skills involved.

Exercises in self-affirmation, such as three minutes writing about an important personal value, increase students' ability to curb impulsivity and focus on positive ways to communicate. Such self-affirmation bolsters students' self-esteem and gives them the ability to be generous with others (Lindsay & Creswell, 2014).

Impact of Learning Challenges on Math Self-Esteem

Self-esteem and emotional regulation are key to succeeding academically and in life after school (Seale et al., 2013). Students with learning challenges face an uphill battle to master the basics in reading, writing, and math. In addition, they need to avoid the anxiety and depression that often affect students who need more time and multiple modalities to master new concepts (Kim et al., 2015).

The Expectancy-Value Theory described by Chouinard et al. (2007) suggests that there are major components to math success. The first is student expectations. This includes students' prior math experiences which will inform their expectations of themselves in math class. A student who has a history of success in math has an advantage when compared with a student who is unsure of his or her mathematical ability (Chouinard et al., 2007). The second part of the equation is value and determining what the perceived value of learning math is for the student. The value of math to the individual student will be affected by his or her peers as well as family members. In students with learning difficulties, the expectancy and value of math can be in conflict.

When previous math-related experience has revealed academic weakness but parents articulate that mathematics achievement is critical for life success, students may experience anxiety. Anxiety can dominate brain space and energy so that the student has a limited amount of focus and stamina (Bertrams et al., 2013). In an article about self-regulation in early adolescence, Nakanishi et al. (2019) assert that mastering concepts in mathematics requires both intellectual capability and emotional stamina. The term math anxiety is particular to math where students have to find a solution to a problem where there is only one correct answer. He explains that math anxiety is defined as stress that impedes the process of using numbers and solving math problems

in the classroom and in real life. The anxiety causes students to score lower on math standardized assessments but when the anxiety is addressed, their scores rise, even without additional math practice or special education techniques. Ashcraft (2002) reflects that the low scores are often a result of emotional difficulty rather than an academic deficiency. Ramirez, Shaw, and Maloney (2018) outlines five causes for math anxiety. The first, most obvious one, is poor math skills. However, the other factors of genetic disposition, socio environmental factors, home experiences in math, and negative math class experiences are psychological and need to be addressed as such.

Building self-efficacy and resilience are crucial to overcoming a student's past negative experience with math. In the nation's schools, both time and exercises that promote brain health are limited as increased emphasis is placed on testing. Students with learning challenges also face vulnerability in social situations as they struggle to fully assimilate language and often are unable to interpret what they read or process information as quickly as their peers (Seale et al., 2013). Students who are diagnosed with dyslexia at a young age are more likely to retain their emotional resilience if they get the interventions they need and are able to explain to teachers and peers what dyslexia is and how they compensate for reading difficulties. Students who do not get appropriate specialized support in the early grades face mounting stress, embarrassment, and confusion (Battistutta et al., 2018). They begin to lose hope and are less likely to take smart risks and ask for help. Gover et al. (2017) explain that one way to address this issue is to teach these students in early grades about habits and strategies which they can use again later on when facing setbacks.

Impact of Self-Affirmations and Achievement in Math

Self-Affirmation Theory presents the concept that people try to create and keep a positive self-image of who they are. They tend to believe that they are as good and capable as those around

them. When people's experiences or environment contradict these beliefs, it generally causes them to become defensive and to avoid challenge because they do not want to further damage their internal positive beliefs about themselves (Lokhande, 2019). Many students who struggle in math are not confident of their ability to learn new concepts. Self-Affirmation Theory suggests that one way to alleviate the negative impact this lack of confidence has during math assessments is to have students write about values that are personally important to them immediately before the test. Lokhande (2019) suggests that focusing on personally important values can-reinforce students' positive views of themselves in the wider world of society. Lokhande states that studies have indicated that engaging in this activity before a test, enabled students to minimize or eliminate self-defeating thoughts and insecurities.

Sometimes students' view of their academic ability is more negative than their actual ability. Maarten (2014) suggests that students' self-confidence can be enhanced by helping the student understand the way other people view the student's ability since it is hard to develop an objective picture oneself. Information that negates these positive perceptions cause people to be defensive or to ignore the new information. When individuals have enough evidence that they are valued and ethical, they are more likely to be open to receiving information about changes that they need to make to be even more successful (Morgan & Harris, 2015). Studies such as those reported by Armitage and Rowe (2017) suggest that self-affirming allows a person to accept negative feedback in a less angry way, raises the likelihood that the person will want to change based on the message, and increases the chance of the behavior actually changing.

Maclellan (2014) asserts that students with math anxiety or poor self-confidence about their math ability may make limited progress because of judgements they made about their academic incompetency, often in elementary school. They are resistant to putting in consistent effort because

they believe it will not change their baseline ability. It is the teacher's responsibility to help each student narrow the gap between what the teacher believes the students are capable of and the actual level of their math skills (Chouinard et al., 2007). The concept of growth mindset, described below, and belief that brains change over time with effort is key to shifting a student's view of himself or herself as a learner.

Morgan and Harris (2015) assert that being able to boost a person's sense of self, and self-confidence is key even after the individual's K-12 education has been completed. These researchers explain that there is evidence that reveals positive effects of self-affirmations in such situations as for workers following a company's downsizing action and people receiving health warnings. In both cases, those who had done a self-affirming activity had lower stress levels than the control groups who received the same stressful news. Those who had done a self-affirming activity were more likely to react in a positive, productive way (Sherman, 2013).

Growth Mindset vs. Fixed Mindset

A growth mindset is a concept suggesting that people's destiny is not inevitable and that each individual has the power to create changes in the brain that will allow them to overcome academic and behavioral challenges. A growth mindset is crucial to attaining a healthy self-esteem and emotional regulation. Students who understand that the human brain is able to change and be strengthened over time, are more likely to try hard, and ultimately succeed academically (Burnette et al., 2018). This powerful concept is key to the success of students with learning difficulties who may begin with less ability than their peers, but are able to increase their potential with hard work and help from their teachers.

Growth mindset is often characterized as the 'Power of Yet.' For example, students may say, "I can't read chapter books...yet. I can't ride a bike...yet." It leaves open the possibility for progress and mastery even if it will involve much effort. A growth mindset can mitigate the impact of poverty on students' academic trajectory. The opposite of a growth mindset is a fixed mindset. A fixed mindset is the situation in which a student believes that he or she cannot improve or succeed beyond where the student currently is performing. Many students with learning difficulties believe that their behavior has no impact on what they are able to learn in school and that the responsibility for their learning lies with parents, teachers, or others. These students are resistant to taking personal responsibility for increasing their academic skills and are quick to blame others. However, a growth mindset can offset the impact of poverty and anti-intellectual culture that is affecting many of the nation's students (Burnette et al., 2018). Teaching students from early years about growth vs fixed mindset can help them reach their real potential (Berkeley & Larsen, 2018).

Summary

Three major indicators of student academic success in math are innate ability, emotional regulation and growth mindset. Strong skill levels in these areas are able to lessen the impact of poverty and family dysfunction (Claro et al., 2016). When students are taught that they are in control of their behavior and attitude and that these impact their academic achievement, test scores rise (Maclellan, 2014). Self-affirmation is one way to reinforce positive self-esteem and thereby increase self-regulation and belief in growth mindset (Hayes et al., 2019).

CHAPTER III

METHODS

The purpose of this study was to examine the effects of self-affirmation on student performance and to learn if a student's level of frustration tolerance and academic resiliency increased after reading a positive belief about themselves. Specifically, the affirmations were read right before starting math homework to see if the affirmation gave the students the additional support needed to master the skills in Algebra I.

Participants

The participants in the study included six grade eight students who comprised a structured study hall class in which they received support with writing and math assignments to help them keep up in class, although specific skill remediation was not provided. The participants included three boys and three girls who were students in a private religious school in Rockville, Maryland. The student body in this school comes from a wide range of socio-economic levels and neighborhoods in the area. In this structured study skills class, 50% of the students came from single parent homes and 50% had parents who emigrated from the Middle East. The students were in a basic level eighth grade math class (the lowest of four levels), and they struggled to master basic algebraic principles. Of the six students, five had been tested by Montgomery County Public Schools (MCPS) and been found to have some learning disability and/or ADHD.

The students in the control group were one year ahead of those who had the self-affirmation intervention. They were chosen as the control group because they took the same math course with the same teacher during the 2018-2019 school year when they were in Grade 8. They also were part of a Resource class although their teacher was not the same as the teacher the

students had during the prior year. These six students, four girls and two boys, were in the same school as students in the treatment group and also came from diverse backgrounds, although none had immigrant parents. One was part of a single-parent family and one was a racial minority. Forty percent of the control group participants had diagnoses for some learning disability, and one was diagnosed with a mood disorder. One-third of the students were diagnosed by MCPS, while the others had been diagnosed by private evaluators.

Design

The study was originally designed to follow a group of struggling math students for six weeks to determine if daily affirmations would impact their mastery of Algebra I skills. In the original design, each day, each student would choose from a selected variety of self-affirmations printed on colored cards. The student would take the card and keep it next to him or her while completing the daily math homework assignment. The researcher wondered if the affirmation would increase the students' willingness to check their answers and to write their calculation legibly. She wished to learn if these habits would impact their assessment quiz scores. The plan was to compare the quiz scores of students in the experimental group with the scores of students with learning difficulties who took the same math course the previous year who comprised the control group.

Unfortunately, the study could not be implemented as planned because of school closure in March due to Covid19. The students were given a choice of self-affirmations on colored cards to choose from before starting math homework on the days during the week before the school closed. They then took a math assessment which was graded and compared to the math assessment scores of students who also took the structured study hall class and had the same math teacher during the

previous school year. However, this procedure yielded only one week of data when six weeks of data were originally planned and would have provided a more definitive outcome. Once school sessions began to be offered online, the students were impacted by their family environments and fear about the situation generally. Some students had more effective technology and were able to hear and see the teacher consistently. Others had weak Wi-Fi signals which further impeded their learning. However, students commented that learning online was better because there were no social distractions and less calling out since the teacher was able to mute students until she called on them. The quiz grades earned after the school closure were not significantly different from the one reported in the study, but there are numerous possible reasons for this that will be explored in Chapter V.

Materials

The self-affirmation cards from which the students chose were created by Kristen's Kaboodle on Teachers Pay Teachers (Tulsian, 2019). Self-affirmation is the manner by which people try to reestablish a sense of moral and adaptive competence or self-integrity when it comes under threat sometimes by strengthening it in another area (Goyer et al., 2017). Students chose from the following affirmations as created by Kristen's Kaboodle (Tulsian, 2019):

- My brain is like a muscle. When I exercise it, it gets stronger.
- I take care of my brain by getting enough sleep, eating healthy foods and drinking plenty of water.
- With effort and determination, I can succeed.
- I view challenges as opportunity for growth.
- Success comes to me when I work hard.
- When something is difficult for me, I have the determination to see it through.

- The harder I try, the more connections I make in my brain.
- I am capable of doing difficult things.

The math assessment was a teacher-created test so there is no data on its reliability or validity. It contained 15 questions about linear equations in which students could get partial credit for showing their work. Each page had five or six problems typed clearly so that the problems were easy to read and there was plenty of space for the students to work. One difficulty the students had was understanding the vocabulary words in the directions. It is likely that their scores would have been higher if there had been a sample of each problem to accompany the directions. The students' scores were compared to scores from the prior year's students who were also in the structured study hall class and had taken the same math course with the same teacher. Scores on the Algebra I math quiz were measured as the percentage of problems correct on the assessment.

Procedure

Students were given eight affirmation statement options daily on colored, laminated cards from which students could choose over a period of one week. The affirmation cards were hanging on a clothesline against the back wall of the classroom. Students chose the affirmation they wanted and kept the card at their seat next to them during the time they worked on homework from math class with the Resource teacher's help. The students worked on the math problems on their homework, often asking the Resource teacher for help finding the mistake in their calculations or to help them determine the next step of a multi-step problem. The scores for homework problems were not measured for the current study. The students then took the first weekly math assessment on an introduction to slope-intercept form at the end of the week. The assessment scores then were compared to the scores students had earned during the prior year at the same time in the same class with the same math teacher but without the affirmations. This teacher had over twenty years of

experience teaching middle and high school math. She is highly organized and has a calm demeanor. She believes that all students can succeed but that it takes some students much more time and practice to master the skills in Algebra I. The students have respect for the teacher but frequently express frustration regarding the rapid pace of the class. They have stated that they feel as if the focus of the class is on getting through the curriculum rather than teaching at the slower pace they need.

CHAPTER IV

RESULTS

The purpose of this study was to determine the effects of positive affirmations on middle students with difficulties learning concepts in Algebra I. The study used a control group of students who did not have any treatment applied, with an experimental group of students who received daily affirmation before each homework assignment. Data were gathered from both groups. An independent samples *t*-test was used to determine if the treatment effect was significant. A significance level of .05 was used.

Descriptive Statistics

Shown in the table below are the control and experimental group descriptive statistics. The data indicate that the group without affirmations scored higher than the experimental group. See Table 1.

Table 1

Descriptive Statistics

	M	*N*	*SD*	*SEM*
Control Group	92.40%	5	15.9%	7.2%
Experimental Group	68.97%	6	16.0%	6.5%

Inferential Statistic

An independent samples *t*-test was used to determine the significance of the effect. The null hypothesis was that the means of the two groups would be the same, implying that the mean of the test scores would be the same both with and without treatment. The alternative hypothesis was that the mean of the test scores would be higher for the students who received the treatment. The analysis indicated that there was a statistically significant difference in math scores between students receiving affirmations and those who did not with a large effect size, $t(9) = 2.42$, $p < .05$, $d = 1.46$. See Table 1 for descriptive statistics. The mean difference between the two groups was 23.43%, with a weighted average standard error of 9.7%. Although, there was statistically significant difference between both groups, the difference was not in the expected direction. See Figure 1. Therefore, it can be concluded that the means were not the same, and that the mean score of the experimental group was significantly lower than that of the control group.

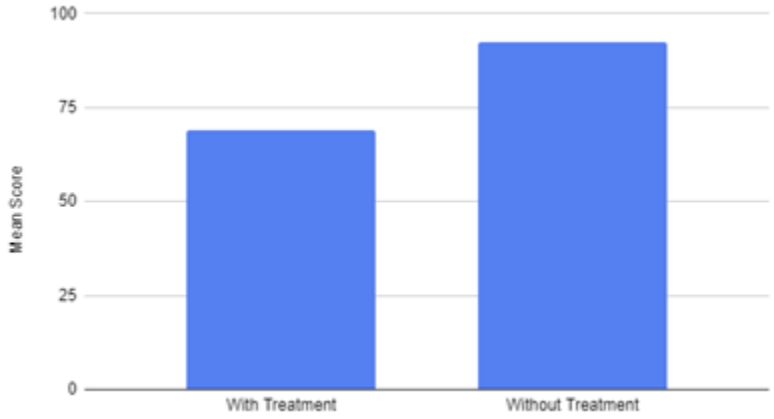

Figure 1. Mean math scores between students who did and did not receive positive affirmations.

CHAPTER V

DISCUSSION

The purpose of this study was to examine the effects of daily self-affirmations on student assessment scores. Specifically, the students chose a self-affirmation card each day and kept it next to them while they completed math homework from their Algebra I class. The data from the study revealed that assessment scores of students in the experimental group were lower than those of students in the control group, indicating that there are factors affecting student achievement that could not be mitigated by self-affirmations alone.

Implications of Results

The results of the study were unexpected. In the current study the daily affirmations were positively received by the students. Social validity of the study was further supported by the fact that students who received the affirmations were more willing to check that their homework problem answers were correct. This suggests that mitigating circumstances may have played a role in the scores of students in the treatment group being lower than those of students in the control group. The researcher suggests that the intervention may have had a more positive impact on the achievement of students in the treatment group if it had been done in conjunction with slowing the pace of math instruction for these students. The students in the treatment group were willing to complete the math homework and asked for help which indicates that they were engaged in learning and were not trying to rush through their homework assignments. The researcher observed that affirmations appeared to enhance the positive atmosphere within the classroom and enabled students to express vulnerability through statements such as, “Can you see if this is right?” and “I don’t know where I messed up.”

Threats to Validity

The data suggest that students who chose the self-affirmations before completing daily math homework did not earn higher scores on an assessment. There are many possible reasons for this result, the most obvious of which is the increasing anxiety and chaos students experienced in the days before the school closed due the health threat posed by Corona virus. The first week of the study coincided with daily reports of rising death tolls from the virus and conversations at home and in school about the societal changes that likely would result. Socio-economic factors may have led to students being preoccupied with worrying about how their parents would get food if they were laid off from their employment.

Even without concerns about the virus, there are more typical threats to the validity of the study. The duration of the study was too brief to provide meaningful results. In addition, in previous years students enrolled in grade eight in this school had the added pressure of acceptance by the feeder high school which during the current school year was enrolling all middle school applicants. Finally, 70% of the students in the study were student athletes. The school policy is that although student behavior must be satisfactory to remain a player on a team, grades are not a condition to remain on a team.

Comparisons to Previous Research

Previous research has found correlation between self-affirmation and increased academic mastery. Goyer et al. (2017) state that hope and a sense of control can improve the outcomes for students who are socio-economically disadvantaged. Lindsay and Creswell (2014) assert that self-affirmation increases self-compassion which is critical to having stamina and grit to try again after failure. Studies such as those reported by Hayes et al. (2019) suggest that students who write down

their own values and what is important to them on a regular basis will increase their grade point average (GPA). Hayes et al. maintain that self-affirming what one stands for and what one values enables students to understand that they are important and worthwhile. This positive thinking lowers anxiety and allows the brain to devote itself to learning new skills (Hayes et al., 2019). Similar results were found in studies that involved adults facing layoffs and students with dyslexia (Battistutta et al., 2018). The very brief duration of this study and the societal events surrounding it are factors that not only threaten the validity of the study but also likely cause it to be inconsistent with prior research.

Implications for Future Research

Students currently are facing a real-life trauma with the shutdown of society during Covid-19. It is anticipated that there will be great need for effective interventions to help students overcome what they have experienced during the current unprecedented time in the nation and world and focus on academics. Challenging times that involve serious illness, job loss, and general instability interfere with students' ability to focus on academics, and strategies to help and support students with the focus will be needed. This study suggests that offering self-affirmation needs to be consistent over an extended time. It also suggests that small interventions such as implementing self-affirmation as used in this study are able to help students be more open to completing challenging assignments by asking the teacher for assistance. Research cited above supports this conclusion and suggests ways that other small self-esteem boosters can reduce stress and anxiety levels of students and others.

Conclusion

This study suggests that the effectiveness of interventions is dependent on the environment being stable, safe, and conducive to learning. Students need the basis of Maslow's Hierarchy of Needs, including physiological needs and safety needs, to be available for learning. The study shows that the intervention of affirmations is not effective by itself but might be if used in conjunction with other types of emotional and academic support. As educators learn more about the impact of the Covid-19 virus pandemic on student learning, multiple interventions likely will be needed to support ongoing academic achievement.

References

Armitage, C. & Rowe, R. (2017). Evidence that self-affirmation reduces relational aggression: A proof of concept trial. *Psychology of Violence*, *7*(4), 489-497.

Ashcraft, M. (2002). Personal, educational and cognitive consequences. *Current Directions in Psychological Science*, *11*(5), 181-185.

Battistutta, L., Commissaire, E., & Steffgen, G. (2018). Impact of the time of diagnosis on the perceived competence of adolescents with dyslexia. *Learning Disability Quarterly*, *41*(3), 170–178.

Berkeley, S., & Larsen, A. (2018). Fostering self-regulation of students with learning disabilities: Insights from 30 years of reading comprehension intervention research. *Learning Disabilities Research & Practice (Wiley-Blackwell)*, *33*(2), 75–86.

Bertrams, A., Englert, C., & Dickhauer, O. (2013). Role of self-control strength in the relation between anxiety and cognitive performance. *Emotion*, *13*(4), 668-680.

Burnette, J. L., Russell, M., Hoyt, C., Orvidas, K., & Widman, L. (2018). An online growth mindset intervention in a sample of rural adolescent girls. *British Journal of Educational Psychology*, *88*(3), 428–445.

Chouinard, R., Karsenti, T., & Normand, R. (2007). Relations among competence beliefs, utility value, achievement goals, and effort in mathematics. British *Journal of Educational Psychology*, *77*(3), 501-517.

Claro, S., Paunesku, D., & Dweck, C. S. (2016). Growth mindset tempers the effects of poverty on academic achievement. *Proceedings of the National Academy of Sciences of the United States of America*, *113*(31), 8664–8668.

Djambazova-Popordanoska, S. (2016). Implications of emotion regulation on young children's emotional wellbeing and educational achievement. *Educational Review*, *68*(4), 497–515.

Goyer, J., Garcia, J. Purdie-Vaughns, V., Binning, K. (2017). Self-Affirmation facilitates minority middle schoolers' progress along college trajectories. *Proceedings of the National Academy of Sciences of the United States of America*, *114*(29), 7594-7599.

Gurung, U., Sampath, H., Soohinda, G., & Dutta, S. (2019). Self-esteem as a protective factor against adolescent psychopathology in the face of stressful life events. *Journal of Indian Association for Child & Adolescent Mental Health*, *15*(2), 34–54.

Hayes, L., Zinner, L., Wise, J., & Carton, J. (2019). The effects of self-affirmation intervention on grades in middle school and first-year college students. *Journal of Articles in Support of the Null Hypothesis*, *16*(1), 57-76.

Hogan, M. J., Parker, J., Wiener, J., Watters, C., Wood, L. M., & Oke, A. (2010). Academic success in adolescence: Relationships among verbal IQ, social support and emotional intelligence. *Australian Journal of Psychology*, *62*(1), 30–41.

Kim, C., Park, S.W., Cozart, J., & Lee, H. (2015). From motivation to engagement: The role of effort regulation of virtual high school students in mathematics courses. *Journal of Educational Technology & Society*, *18*(4) 261-272.

Lai, Y., Zhu, Z., Chen, Y. & Li, Y. (2015). Effects of mathematics anxiety and mathematical metacognition on word problem solving in children with and without mathematical learning difficulties. *PloS ONE*, *10*(6). e0130570

Lindsay, E., & Creswell, J. (2014). Helping the self help others: Self-affirmation increases self-compassion and pro-social behaviors. *Frontiers in Psychology*, *5*(421), 1-7.

Lokhande, M., Muller, T. (2019). Double jeopardy- Double remedy? The effectiveness of self-affirmation for improving doubly disadvantaged students' mathematical performance. *Journal of School Psychology*, 75(58-73).

Maarten, P. (2014). Enjoying mathematics or feeling competent in mathematics? Reciprocal effects on mathematics achievement and perceived math effort expenditure. *British Journal of Educational Psychology*, *84*(1), 152-174.

Maclellan, E. (2014). How might teachers enable learner self-confidence? A review study. *Educational Review*, *66*(1), 59-74.

Morgan, J. & Harris, P. (2015). Evidence that brief self-affirming implementation intentions can reduce work-related anxiety in downsize survivors. *Anxiety, Stress, & Coping*, *28*(5), 563-575.

Nakanishi, M., Yamasaki, S., Endo, K., Ando, S., Morimoto, Y., Fujikawa, S., Kanata, S., Takahashi, Y., Furukawa, T., Richards, M., Hiraiwa-Hasegawa, M., Kasai, & Nishida, A. (2019). The association between role model presence and self-regulation in early adolescence: A cross-sectional study. *Public Library of Science*, *14*(9), 1-10.

Ramirez, G., Shaw, S. & Maloney, E. (2018). Math anxiety: Past research, promising interventions, and a new interpretation framework. *Educational Psychologist*, *53*(3), 145–164.

Ravipati, S., (2017). Report: Students with Learning and Attention Issues are Three Times More Likely to Drop Out. *The Journal and Campus Technology*. https://thejournal.com/Articles/2017/05/17/Students-with-Learning-and-Attention-Issues-Three-Times-More-Likely-to-Drop-Out.aspx?Page=2

Seale, J., Nind, M., & Simmons, B. (2013). Transforming positive risk-taking practices: The possibilities of creativity and resilience in learning disability contexts. *Scandinavian Journal of Disability Research*, *15*(3), 233–248.

Sherman, D. (2013). Self-Affirmation: Understanding the effects. *Social and Personality Psychology Compass*, *7*(11), 834-845.

Tulsian, K. (2019). *Growth mindset posters: Positive affirmations bulletin board*. Retrieved from https://www.teacherspayteachers.com/Product/Growth-Mindset-Posters-Positive-Affirmations-Bulletin-Board-3242609