

The Relationship between A Self-Regulation Breathing Technique and Eleventh and Twelfth
Grade Students' Academic Achievement

Dissertation Manuscript

Submitted to Northcentral University

School of Education

in Partial Fulfillment of the

Requirements for the Degree of

DOCTOR OF PHILOSOPHY

by

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San Diego, California

June 2019

Dedication

I am grateful for God for piloting me through this experience. I want to thank Dr. Vance, Dr. Aiken, Dr. Collins, Dr. Shriner, and Dr. Gardineer for their guidance throughout this process. I also want to thank my three children, Jeffrey, Kayla, and Chloe. A special thanks goes to Laurel Zilch, Bonnie Strohl, Debra Mellilo, and Virginia Skinner for supporting me during this endeavor.

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Chapter 1: Introduction

The rate of mental illness is on the rise in the United States, especially for adolescents (Center for Behavioral Health Statistics and Quality, 2016). In 2019, one out of five adolescents suffered from a mental illness (Mental Disorders - Teen Mental Health, 2019). Mental illnesses have varying degrees ranging from very complex to mild ("NIMH - Mental Illness", 2019). Furthermore, they are classified by many different conditions ("NIMH -Mental Illness", 2019). One condition is anxiety. Anxiety is one of the most common psychological disorders among school-aged children and adolescents (Sellakumar, 2015).

Under the category of general anxiety disorders is test anxiety (Gibson, 2014). Test anxiety is defined as a performance anxiety (Gibson, 2014). Approximately 10 percent to 40 percent of students experience test anxiety (Gibson, 2014; Von der Embse, Barterian, & Segool, 2013). At some point, most individuals experience test anxiety (Gibson, 2014). Children and adolescents who experience anxiety often have poor social skills, low self-esteem, perceptions of social rejections, difficulty forming friendships, school avoidance, decreased problem-solving abilities, and lower academic achievement (Sellakumar, 2015).

Gibson (2014) defined test anxiety as an overwhelming and abnormal sense of fear or emotional state that has both psychological and behavioral components. Test anxiety occurs prior to and during testing and is experienced by all cultures and races (Gibson, 2014). Throughout the United States, secondary students are expected to meet proficiency on high-stakes assessments in order to receive a high school diploma (Gibson, 2014; Hickox, 2015; Morgan, 2016). These high-stakes assessments induced significant pressure because they play a critical role in each student's future (Sung, Chao, & Tseng, 2016). High-stakes assessments are also known as exit exams or exit assessments (Gibson, 2014). Test anxiety hinders academic achievement on exit

assessments (Sellakumar, 2015). Students' inability to pass the high-stakes reading assessment decreases students' chances to graduate with a high school diploma (Bas, 2016). To help handle test anxiety, students need to learn skills that will prepare them to handle their emotions (Zietsma & Toubiana, 2018). Being prepared to handle emotions is sometimes known as emotional preparedness (Nunes da Fonseca & de Melo Tavares, 2014). Frydenberg, Liang, and Muller (2017) postulated that students must be taught emotional skills in order to flourish in society. Emotional skills can be defined as the ability to monitor, regulate, and self-generate emotions (Zietsma & Toubiana, 2018). Adolescents need interventions that create the mind/body connection which reduce mental illnesses (Center for Behavioral Health Statistics and Quality, 2015; Child and Adolescent Mental Health, 2017; McEwen, 2016). A paradigmatic shift needs to occur to assist to help adolescents in America to learn to self-regulate emotions (McCraty, 2016).

Test-anxious students experienced a sense of fear, which inhibits their ability to think clearly (Gibson, 2014). In turn, students struggled with academic achievement during assessments (Gibson, 2014). Students who experienced test anxiety score lower academically than those who do not (Gibson, 2014). Failure to pass one high-stake assessment could prevent the student from receiving a high school diploma (Hickox, 2015). Pressure to pass these high-stakes assessments has increased dropout rates in high schools (Hickox, 2015).

Students who do not graduate with a diploma or who dropout from high school have little opportunities in society (Hickox, 2015; National Center for Education Statistics, 2015). They are more likely to have health issues and less likely to find a job than students who do graduate from high school (National Center for Education Statistics, 2015; Rumberger, 2013). They also are more likely to be involved in criminal behavior, take drugs, and develop mental health issues

(Reingle Gonzalez, Salas-Wright, Connell, & Businelle, 2016). These implications negatively impact the health and wellbeing of the global society (Reingle Gonzalez et al., 2016).

Test anxiety is a human emotion experienced by secondary students in high school (Sung et al., 2016). Jerath, Crawford, Barnes, and Harden (2015) reported that human emotions are formulated in the brain. Each emotion causes different neurotransmitter signals (Jerath et al., 2015). Humans can self-regulate emotions (Dispenza, 2105, Lipton, 2016). Lipton (2016) confirmed all neuropathways are malleable. Therefore, through shifting the thought or emotion to a healthier one via neurological energy units, signals are sent throughout the mind and body creating new neurological pathways (Chopra, 2015; Dispenza, 2105, Lipton, 2016).

Based on limitations from a previous study and the detrimental societal outcomes from test anxiety, further research is needed (Sung et al., 2016). Bergen-Cico, Razza, and Timmins (2015) conducted a self-regulation study with sixth grade students. The experimental group had 72 students in it, and the control group had 70 students (Bergen-Cico et al. 2015). Data illustrated a positive correlation to mindful yoga, academic achievement, and improvement in health (Bergen-Cico et al. 2015). However, there were a few limitations in the study. Because two teachers were used in this study, the different personalities could have confounded the outcomes of the groups (Bergen-Cico et al. 2015). Bergen-Cico, et al. (2015) concluded that future studies should use academic assessments to measure the impact of self-regulation instead self-reporting measures. To bridge this research, this study had one teacher instructing both the intervention group and the control group to help reduce the possible confounds caused by different personalities and teaching styles. Furthermore, this study used an academic assessment to measure the impact of self-regulation on students.

In addition, previous studies emphasized the importance of implementing a school-wide program that teaches test anxiety interventions (Sung et al., 2016; Von der Embse et al., 2013). To do this successfully, administrators and teachers need to fully support the test anxiety intervention program (McCraty, 2007). McCraty (2007) indicated that having the faculty and staff's buy-in assisted with strengthening the outcome. If the staff does not agree with the intervention, the students may not be motivated to learn and apply it (McCraty, 2007).

Another study conducted by Koelsch, Jacobs, Menninghaus, Liebal, Klann-Delius, von Scheve and Gebauer (2015) focused on examining the cognitive behavior of test anxiety. Koelsch, et al. (2015) validated the need for more studies which examines the emotional and neurological components to test anxiety. Fear and other emotions are generated by neurons that transmit through neurological pathways through the central nervous system (Koelsh et al., 2015). HeartMath Research Institute (2015) confirmed that future studies need to implement test anxiety strategies that focus on manipulating the neurons. Based on the evidence, it was necessary to fill the gap in previous studies' research addressing test anxious adolescents (Hopefenbeck, 2017; Koelsh et al., 2015; McCraty, 2016).

Statement of the Problem

The problem addressed in this study was that eleventh and twelfth grade students often experience test anxiety impeding their academic achievement on online high-stakes reading assessments required to graduate (Sellakumar, 2015). These students were not being offered techniques to address this anxiety (Cho et al., 2016; Gibson, 2014). Test anxiety inhibits students' emotional working memory, which impacts their assessment performance (Azam, Fashler, Changoor, Azargive, & Ritvo, 2015; Gibson; 2014). Researchers have found that students who had high levels of test anxiety scored lower on computer-based assessments (Bas,

2016; Cho et al., 2016; Gibson, 2014). Hopefenbeck (2017) postulated that as high-stakes assessments continue to increase, there is a need for educators to address the students' physical and psychological wellbeing in order for students to reach their academic potential.

Test anxiety impairs both the physical and psychological wellbeing of a person (Jerath et al., 2015). Common physical symptoms that occur are sweating, palpitations, restlessness, dyspnea, and tremors (Gibson, 2014). When anxiety is experienced, neurological signals are sent throughout the nervous system (Jerath et al., 2015). These signals influence the heart rhythms and negatively impact all bodily systems (HeartMath, 2015). Not only are heart rhythms altered, the stress negatively affects the dopamine neurons located in the brain, which also hinders both outcomes for learning and overall wellbeing (Pignatelli et al., 2017). Test anxious students often have negative thoughts, forget things, and experience a sense of fear (Gibson, 2014). When students experience an abnormal sense of fear and anxiety during a test, they often perform lower academically on assessments (Gibson, 2014). Mellin (2016) confirmed students can be taught to train their emotions using a self-regulation activity that rewires the old negative neurological circuitries. Through self-regulation, students can create new positive neurological pathways, which positively impact a person's emotional and cognitive decision making which may help them improve on academic tests (Mellin, 2016).

Purpose of the Study

The purpose of this quantitative descriptive study was to determine the extent of the relationship between the Quick Coherence Technique (QCT) and eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment. The QCT is a self-regulation technique that synchronizes emotions and brings about psychophysiological coherence (HeartMath, 2018). Psychophysiological coherence is when the nervous system is

synchronized (Bradley et al, 2007). The synchronization assists with improving task performance, emotional stability, and cognition (Bradley et al, 2007).

The targeted population for this study was eleventh and twelfth grade students, located in Florida, who had not met the required reading proficiency level for state graduation. The study had two groups. One group participated in the QCT, the self-regulation technique, for 20 days and the other group did partake in the self-regulation technique. During this time the same scientifically based reading and test strategies were provided to both groups. Scientifically based reading practices are specific programs that provide a systematic and explicit instruction of selected reading strategies that are evidently effective (Koch & Spörer, 2017). The independent variable for this study was the QCT. All students took the same online practice reading ACT pre-test and post-test, which were accessed on the USA Testprep, an online technology platform (U.S.A. Test Prep, 2018). The students' academic achievement pre-test and post-test online high-stakes practice reading ACT scores were utilized as the dependent variable.

Nature of the Study

The study used a Quantitative descriptive method to understand the extent of the relationship between the QCT and eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment. A descriptive design was utilized for this study which identified the central tendency (mean, median, mode) and variance (range, standard deviation) using the pre-test and post-test data. The disaggregated data was put in Microsoft Excel to compute the descriptive statistics. Participants were chosen because they did not meet proficiency on the state's high-stake reading assessment required to graduate (White et al., 2014).

Research Question

This quantitative descriptive study determined an easy, quick, and monumental shift that supports students' emotional needs through implementing the QCT, a self-regulation technique, which brings about psychophysiological coherence and evaluated the impact on eleventh and twelfth grade students' academic achievement.

RQ1. What was the extent of the relationship between the Quick Coherence Technique (QCT) and eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment?

To address the research question of this study, objective measurement was desired. The quantitative descriptive study summarized pre-test and post-test results into data sets to determine if the QCT impacted the eleventh and twelfth grade students' academic achievement. The central tendency and variance were identified between the two groups using the pre-test and post-test data.

Significance

This study was unique because it incorporated a self-regulation technique to address test anxiety for high school students. The study could potentially assist in initiating a paradigmatic change strengthening eleventh and twelfth grade students, at the study's site, providing the opportunity to learn to self-regulate their test anxiety when faced with online high-stakes reading assessments. As their ability to regulate and control their anxiety improves, the students' academic achievement on online high-stakes assessment could potentially increase, in turn improving graduation rates. The findings could potentially create a revolution for schools to begin to help students of all ages learn to monitor and generate specific emotions which could improve academic achievement by teaching a simple, quick, and non-evasive self-regulating

technique. To conclude, this study could potentially provide a solution to assist with test anxiety which would improve both physical and emotional wellness for students and increase graduation rates and employment rates, while diminishing criminal behavior, the use of drugs, and mental illnesses throughout America and internationally (Reingle Gonzalez et al., 2016).

Definition of Key Terms

Assessment. Assessment is used to collect, analyze, and interpret how learners understand and perform relative to educational goals (Shute & Rahimi, 2017).

Coherence. Coherence indicates psychophysiological systems have the capability to adjust and self-regulate with the potential to create a positive relationship (McCraty & Zayas, 2014).

Neuroplasticity. Neuroplasticity is the ability to remodel the brain (Demarin, Morovic, and Bene, 2014).

Psychophysiological Coherence. The Psychophysiological Coherence balances the intercommunication of the neurons throughout the entire body while synchronizing cognition, emotions, and the physical body and is reflected through heart-rate variability (HeartMath, 2017).

Quick Coherence Technique (QCT). The QCT is a simple technique that releases stress and strengthens heart rate variability while bringing psychophysical coherence to the mind and body (HeartMath, 2018). The process begins with focusing on the heart and then imagining breathing and in and out of the heart area. As one breathes, it is important to associate a positive feeling of gratitude, compassion, or joy with the inhale and exhale. Once you've shifted to a positive feeling or attitude, try to sustain the attitude by continuing your Heart Focus, Heart-Focused Breathing, and Heart Feeling (HeartMath, 2018).

Self-Regulation. Self-regulation is a person's ability to be aware, monitor, and regulate the mind and body through conscious actions (McCraty & Zayas, 2014).

Test Anxiety. Test anxiety is divided into emotionality and worry and is emotionally characterized by rapid heartbeat, muscle stiffness, and stomachache (Sung et al., 2016).

Summary

This proposed study may result in contributing to a potential solution to a problem that interferes with eleventh and twelfth grade students' academic achievement on online high-stakes reading assessments required to graduate. The QCT could potentially assist eleventh and twelfth grade students at the school site to learn to self-regulate, reduce their test anxiety, and increase their academic achievement. Reingle Gonzalez et al. (2016) postulated test anxiety can prevent students from graduating with a high school diploma. Students, who do not receive a high school diploma struggle with finding employment, have more mental illnesses, and criminal behavior (Reingle Gonzalez et al., 2016). Furthermore, students who do not receive a high school diploma have shorter life expectancy (Reingle Gonzalez et al., 2016).

This study could contribute to theoretical research because it could further validate the self-regulation theory and could enhance the trajectory of research in this field; however, most importantly, it could improve students' academic achievement just by educating adolescents with a non-invasive quick and easy self-regulating technique that can be conducted by any pupil.

Chapter 2: Literature Review

The purpose of this quantitative descriptive study was to determine the extent of the relationship between the Quick Coherence Technique (QCT) and eleventh and twelfth grade students' academic achievement on online high-stakes reading assessments required to graduate. Throughout the United States, secondary students are expected to meet proficiency on high-stakes assessments to receive high school diplomas (Gibson, 2014; Hickox, 2015; Morgan, 2016). These high-stakes assessments induce significant pressure because they play a critical role in each student's future (Putwain & Pescod, 2018; Sung et al., 2016). This significant pressure causes adolescents to experience test anxiety. Test anxiety hinders academic achievement on high-stakes assessments, which decreases students' chances to graduate with high school diplomas (Bas, 2016). Not passing the high-stakes reading assessment required to graduate significantly impacts a students' future; providing them with little opportunity in society (Gibson, 2014; Hickox, 2015; Morgan, 2016, Hickox, 2015; National Center for Education Statistics, 2015; Sellakumar, 2015). Even more troubling is that students who do not receive a diploma are more likely to have health issues, experience joblessness, conduct more criminal behavior, take drugs, and may develop mental health issues (Reingle Gonzalez et al., 2016). This objective of this literature review was to explore the following topics related to test anxiety and adolescents: self-regulation theory, history of self-regulation, history of high-stakes assessments, history of emotions, history of anxiety, emotional instability of adolescents, adolescent mental illness in America, adolescents' brain, neuroscience and emotions, neuroplasticity, test anxiety for adolescents, need for test anxiety interventions, and self-regulation. Furthermore, gaps in research were identified in the literature review justifying the necessity to conduct this study.

Documentation

The databases utilized for this study were Northcentral University's Roadrunner and ProQuest Dissertations & Theses at Northcentral University, Google Scholar, which was linked to Florida Atlantic University's library and Northcentral University's library, What Works Clearinghouse, Florida Atlantic University's Psych.net, a database, and Google. The cue words which will be used for this study are self-regulation theory, history of self-regulation, history of high-stakes assessments test anxiety, history of emotion, history of anxiety, adolescents inability to self-regulate their emotions, adolescence mental illnesses, psychophysical impacts of test anxiety, adolescent mental illness in America, adolescents' brain development, neuroscience and emotions, neuroplasticity, and test anxiety. In a Google search in 0.52 seconds, 101,000,000 results appeared for the self-regulatory theory (SRT), which was the theoretical framework used for this study.

Theoretical Framework

The theoretical framework was based on self-regulation theory (SRT). The SRT concentrates on the ability to become aware of one's thoughts and feelings and self-correct them through self-regulation (Rosanbalm & Murray, 2018). The ontogeny of self-regulation begins with the origin of psychic structure, the connection with the inner-self (Ciolacu, 2014; Schore, 2016). Descartes, the seventeenth-century philosopher, identified the nonphysical mind in the body as the invisible ghost in a machine (inner-self) (Lipton, 2016). Neuroscience research has disinterred that the psychic structure consists of both the conscious and subconscious mind (Lipton, 2016).

The conscious and subconscious are interdependent and can be called the dynamic duo (Dietrich & Haider, 2017; Erickson, 2018; Lipton, 2016; Sitzmann & Bell, 2017). The

subconscious mind does not operate on observations; instead, it responds to instincts and life's responses through stimulus and response (Erikson, 2018). For example, when adolescents experience test anxiety, it may be hard to focus and concentrate (Gibson, 2014). The subconscious mind has the most powerful processes known (Lipton, 2016). The subconscious mind runs about 95% of one's life experiences and is a million times more powerful than the conscious mind (Lipton, 2016; Pradeep, 2015). The subconscious responds to 40 million nerve pulses per second (Lipton, 2016). The conscious mind is much slower and responds to 40 nerve impulses per second (Lipton, 2016). Although people might think they make their everyday choices, the subconscious is on autopilot and severely influences them (Erickson, 2018; Sitzmann & Bell, 2017). Smith and Lane (2016) and Siegel (2015) postulated the subconscious dictates one's life behaviors that were acquired from family, friends, and community up until age six. These engrained programs can create a sense of limiting or powerless beliefs (Lipton, 2016). The subconscious will play the same behavior response to life's signals over and over not recognizing time (Sitzmann & Bell, 2017). For example, if a student experienced test anxiety in the past, just the thought of having to take a test could stimulate the subconscious to respond (Putwain & Pescod, 2018). The subconscious is just responding to the signals being sent (Lipton, 2016). The subconscious thrives on habits (Lipton, 2016; Sitzmann & Bell, 2017). The subconscious has no identity and no emotions (Erickson, 2018, Lipton, 2016; Sitzmann & Bell, 2017).

The conscious mind has many facets involving one's identity and emotions (Lipton, 2016). Personal identity exists in one's consciousness and not in the brain (Boeker, 2017). One's conscious mind can leave the present moment seeing the future or revisiting the past (Lipton, 2016). Lipton (2016) asserted the conscious mind solves problems, generates wishes and

aspirations, and conjures the creative side. Both negative and positive emotions are created in the conscious mind, unlike the unconscious where a stimulus and response occur (Lipton, 2016). The conscious mind can be changed. McCraty (2016) confirmed that through self-regulation, humans have the ability to control their thoughts and emotions. Through self-regulation, adolescents can begin to reduce their test anxiety (McCraty, 2016).

Self-regulation is taking ownership and responsibility for one's emotions and thoughts and is composed of three steps (Bandura, 1991). The first step in self-regulation is becoming aware of one's emotion or thought (Newell & Shanks, 2014). The next step is to become aware of the emotion and to determine whether it is healthy or not (Newell & Shanks, 2014). The final step in self-regulation is self-correction and activating a new feeling (Newell & Shanks, 2014). Self-correcting and self-generating healthier feelings not only feels better, but also harmonizes the psychological and physical states, such as, reducing heart rate and perspiration while increasing one's ability to focus and make effective decisions (Bętkowska-Korpała & Olszewska, 2016). Self-regulation of emotions shifts the maladaptive neuron circuitry creating positive changes throughout all body systems (Sitzmann & Bell, 2017). Lipton (2016) and Smith and Lane (2016) confirmed that thinking positive is not the end cure to all mental and physical illnesses, but it helps shift the energy in the psychological and physical systems which will reduce stress and anxiety and improve wellbeing. Self-regulation can assist adolescents to learn to reduce their test anxiety (McCraty, 2016).

The self-regulation theory focuses on intentionally self-regulating one's emotions (McCraty, 2016). People may allow their emotions to take control of their thoughts and actions; self-regulation enables people to become cognitively aware, take control of their emotions, while altering their unhealthy thoughts (McCraty, 2016). Through self-awareness practice, an inner

awareness begins to build (Ciolacu, 2014; Newell & Shanks, 2014). If taught to form a habit to emotional self-regulate during the intense situations, the body celebrates, and less detrimental reactions will take place (Ciolacu, 2014). When emotional self-regulation becomes a habit, one manages to detach from old rituals, such as reacting when experiencing stress from testing (Ciolacu, 2014). People have been known to excel in stressful circumstances when emotional self-regulation becomes a habit (Ciolacu, 2014). Bergen-Cico, Razza, and Timmins (2015) concluded self-regulation creates positive monumental changes in life and the ability to react to life's experiences. Self-regulation begins with having an inner awareness (McCraty, 2016).

Without inner awareness, it is difficult to differentiate and change the emotion (Ciolacu, 2014; McCraty, 2016; Newell & Shanks, 2014; Sitzmann & Bell, 2017). Many times, people want to change; however, change is challenging and uncomfortable because it is attempting to break a habit (Ciolacu, 2014; Nussbaum, 2015). Especially in a challenging circumstance, such as test anxiety, the pressure one experiences often blinds the person's ability to create a cognitive solution (Ciolacu, 2014). The inability to create a cognitive solution creates a more problematic situation and self-sabotage occurs (Ciolacu, 2014). Creating an inner awareness slows down one's initial reaction to the circumstance and provides an opportunity to reflect and choose a more appropriate outcome (McCraty, 2016).

Alternative theories. One theory which was considered for this study was the quartet theory. The quartet theory of human emotions centers on how emotions occur and intercommunicate throughout the body (Koelsch, Jacobs, Menninghaus, Liebal, Klann-Delius, von Scheve, & Gebauer, 2015). The theory relates to the premise of this study because test anxiety causes an overwhelming and abnormal sense of fear (Gibson, 2014). Anxiety causes a lack of synchronization in the neurological circuitry creating an imbalance throughout the bodily

systems (McCraty, 2016, Mellin, 2015). When adolescents experience test anxiety, there is a lack of synchronization occurring in their neurological circuitry (McCraty, 2016). Throughout the body, neurons intercommunicate with the four emotional core systems which are called the affect systems (Koelsch et al., 2015). These affect systems impact heart activity, breathing, attention, memory, physiological arousal and produce actions (Koelsch et al., 2015). Neurons transmit in each of the affect systems and create an emotional percept (perception) (Koelsch et al., 2015). This theory discussed how anxiety comes to fruition; however, it lacks the need to regulate the signals. Self-regulation theory (SRT) aligns with the proposed study because the theory focuses on becoming cognitively aware of one's emotions and consciously generating new healthier feelings that positively impact the mind and body (McCraty, 2016).

Another theory which was evaluated for this study was the emotional plasticity theory (EPT). The emotional plasticity theory accentuates the malleability or ability to change the neurological pathways in the brain (Mellin, 2014; Mellin, 2016). Koelsch et al. (2015) and McEwen (2016) posited that neurons transmit and create an emotional percept. From emotional precepts, language and cognition are created (Koelsch et al., 2015). The theory identifies the ability to retrain the brain through intentional practices (Mellin, 2015; Mellin, 2016). The emotional plasticity theory correlates to this study; however, limited research exists about this theory. Much research has been conducted using the self-regulation theory (McCraty, 2016).

History of Self-Regulation Theory

The first known cognitive psychologist and scientist to discuss the self-regulation theory was Bandura in 1969 (Clark & Zimmerman, 2014). The behavior and cognitive theories were the two most prominent theories being used at this time (Clark & Zimmerman, 2014). Bandura merged the behavior and cognitive components to form the self-regulation theory (Clark &

Zimmerman, 2014). The underlying reason for blending the two theories was due to the belief that humans influenced a cycle between three factors (Clark & Zimmerman, 2014). These three factors involved one's behavior, personal attitude, and environmental surroundings (Benight & Delahanty, 2017). The three factors had equal power; not one was stronger than the other (Clark & Zimmerman, 2014). Benight and Delahanty (2017) asserted that Bandura also identified that self-efficacy played a critical role in the person's self-regulation results. Self-efficacy is an individual's innate belief to achieve a set goal (Ahmad, Sharoni, Abdul Rahman, Minhat, Shariff-Ghazali, & Azman Ong, 2018). In time, the theory was expanded (Clark & Zimmerman, 2014).

Zimmerman, a psychologist, elaborated beyond Bandura's theory (adding how specific strategies advanced individual's learning processes, such as self-observation, self-evaluation, self-reaction, and self-efficacy (Clark & Zimmerman, 2014). Zimmerman reinforced that a person's self-efficacy level was an indication of how well the self-regulation strategy worked (Clark & Zimmerman, 2014). Through self-regulated learning, students could positively transform their learning, optimizing their control of emotions and behavior (Conover & Daiute, 2017; Silkenbeumer, Schiller, & Kärtner, 2018). Tseng, Liu, and Nix (2017) confirmed that the benefits of self-regulated learning declared that those who self-regulate often depend less on others and are more apt to initiate their knowledge and skill.

The process of self-regulation theory. Bandura first identified the process to self-regulate (Bergen-Cico et al., 2015). Bandura posited that through self-observation, judgment, and self-response one can control their behavior through a process called self-regulation (Bergen-Cico et al., 2015; Clark, & Zimmerman, 2014) Schunk and Greene (2018) reiterated these ideas in their research on self-regulation. Bandura (1991) confirmed self-observation as a process of

reflection on one's thoughts and feelings. Reflection on one's thoughts and feelings is also referred to as introspection (Clark, & Zimmerman, 2014). During self-regulation, it is important to have introspection or inner awareness (Clark, & Zimmerman, 2014). Once one has an inner awareness, the next step can occur which is judgment (Clark, & Zimmerman, 2014). Judgment is a reflection period where one compares thoughts and feelings to the circumstances, goals, or personal standards, judging the thoughts or feelings (Ilgen & Brydges, 2017). Based on one's judgment, the response that is generated may be rewarding or punishing (Clark, & Zimmerman, 2014). Whether the signals are rewards or punishments, the psychological and physical components of the body respond, and physical symptoms occur (McCraty, 2016). To self-regulate feelings, it is essential to gain inner awareness (McCraty, 2016).

Through inner awareness, one can become cognitively aware of the emotional judgment placed on the circumstance and can create the ability to change the normal or habitual reaction (McCraty, 2016). This inner awareness leads to the final step in self-regulation, which is self-response. Self-response occurs after inner awareness has transpired (Newell & Shanks, 2014). Self-response is consciously shifting the emotions and thoughts which alters the psychological and physical systems (McCraty, 2016). However, without knowing how to self-regulate, one tends to be in an emotional reactionary state (Newell & Shanks, 2014). This emotional reactionary state can lead to a fear of failing tests, also known as test anxiety (McCraty, 2016). Fear is a primary emotion which is coupled with test anxiety (Counsell & Wright, 2018). Test anxiety may create students to limiting their cognitive processing and even increasing their heart palpitations (McCraty, 2016). Test anxiety is commonly experienced on high-stakes assessments (Sellakumar, 2015).

History of High-Stakes Assessments

High-stakes assessments can be defined as any test used to make important decisions impacting stakeholders, such as students, teachers, and school districts (Moran, 2017). For example, high school students must pass a reading and math high-stakes assessment to receive a diploma and graduate (Caves & Balestra, 2016). This pressure can create test anxiety, impeding students' academic achievement while decreasing their chances to receive a high school diploma and graduate (Bas, 2016).

The first known standardized test was for a Chinese civil service position where participants had to demonstrate proficiency in music, archery, horsemanship, writing, arithmetic, and rites and ceremonies of public and social life (Huddleston & Rockwell, 2015). The conversational dialogue was used to assess students' understanding (Nettles, 2019). During this time, the standardized assessment was strictly qualitative (Huddleston & Rockwell, 2015).

In the 1800s, there was a shift from qualitative to quantitative assessments (Huddleston & Rockwell, 2015). The transition from qualitative to quantitative assessments started with a requirement of written essays in 1845 (Huddleston & Rockwell, 2015). The high-stakes assessments were more objective and used numerical data to assess students' abilities according to the standards for which they were being tested (Huddleston & Rockwell, 2015). This pressure on students to receive a specific college entrance score has been known to create test anxiety inhibiting students' academic achievement (Masoud, Hamid Taher, & Mohammad Reza, 2016).

Besides pressure to get a specific score on a high-stakes assessment to get into college, school budgets were determined by the number of students passing course examinations (Klenowski & Wyatt-Smith, 2012; Lavigne, 2014). The pressure to receive school funding was passed from administrators to teachers who had to analyze and utilized data collected from their

students' performance (Knudsen, 2016). Not only were budgets impacted, in England, teachers' salaries were affected by their students' pass rates with the implementation of The Revised Code in 1862 (Knudsen, 2016). Teachers who did not have a high passing rate would receive a lower salary which was called payment-by-results (Knudsen, 2016).

Intelligence testing. The trend for assessing students with quantitative assessments continued in 1905, when the two French psychologists, Binet and Simon, created the first standardized IQ and achievement tests (McCredie, 2017). The thirty-question standardized test determined which students were able to succeed in a school in France (McCredie, 2017). Intelligence tests were used to sort students into ability groups (Huddleston & Rockwell, 2015). High schools used intelligence tests to track students into college-bound or vocation bound courses (Huddleston & Rockwell, 2015). Von der Embse, Jester, Roy, & Post (2018) conducted a study and the data illustrated that test anxiety negatively impacted IQ scores. Through thoughts of failure or the consequences about failure, test anxiety can be triggered (Putwain & Pescod, 2018).

Although test anxiety existed, between 1908 until 1916, Thorndike, another psychologist, and students at Columbia University developed additional standardized achievement tests in arithmetic, handwriting, spelling, drawing, and language (Kaestle, 2013). The handwriting standardized assessment was considered the first norm-referenced test and impacted the development of future standardized assessments (Huddleston & Rockwell, 2015). These assessments began being used in other areas besides schools, such as the military (Huddleston & Rockwell, 2015). Because the assessments were being used in schools and the military, examinees would experience test anxiety because they recognized that their performance on the assessment could negatively impact their future (Sellakumar, 2015).

As the United States entered World War I, two standardized tests were administered to sort the millions of recruits (Huddleston & Rockwell, 2015). In 1917, the Stanford-Binet Ability Test and the Kansas Silent Reading Test were created and used to measure intelligence in the form of an intelligence quotient (IQ) (Huddleston & Rockwell, 2015). The standardized assessments were believed to be bias-free and reliable instruments (Huddleston & Rockwell, 2015). From this point forward, the military, public schools, and industries began using standardized assessments because they were easy to administer and grade (Huddleston & Rockwell, 2015). For the first time, the standardized tests were used to eliminate teachers and provide objectiveness for promotion or retention (Huddleston & Rockwell, 2015). More consequences were placed on various stakeholders due to students' performances on high-stakes assessments (Gonzalez, Peters, Orange, & Grigsby, 2017).

In the 1950s and 1960s, high-stakes assessments were re-examined (Kaestle, 2013). In 1958 Congress passed the National Defense Education Act and then in 1965, the Elementary and Secondary Education Act (ESEA) was passed (Huddleston & Rockwell, 2015). Money was funded to improve American schools and post-secondary education (Huddleston & Rockwell, 2015). The ESEA required the expansion of standardized testing (Casalaspí, 2017). Based on the ESEA, there was a movement to increase the standards for student achievement. Around 1974, legislation was passed in 36 states, with Florida being one of them (Huddleston & Rockwell, 2015). The laws were passed to ensure high school students were proficient in reading and writing when they graduated (Huddleston & Rockwell, 2015). This pressure to pass created test anxiety and hindered academic achievement on the high-stakes assessments which decreased students' chances to graduate with high school diplomas (Bas, 2016).

A nation at risk: the imperative for education reform. Although the laws were passed to strengthen accountability and student achievement, the status of education in the United States was still declining (Huddleston & Rockwell, 2015). In 1983, the Commission on Excellence in Education published *A Nation at Risk: The Imperative for Education Reform* which reported the condition of American schools and universities (McGlynn, 2016). Terrel Bell, the Secretary of Education, for President Reagan, reported the picture of American schools was bleak because of the steady decline of SAT scores (Huddleston & Rockwell, 2015). This conclusion was also drawn based on low high school standardized tests scores (Huddleston & Rockwell, 2015). The commissioner expressed to the public the need to start using standardized tests and return to teaching the basics (Huddleston & Rockwell, 2015). Due to the report, it was recommended that salary, promotion, tenure, and retention decisions should be tied to an effective evaluation system (Lavigne, 2014). This evaluation system led to increased pressure on various stakeholders (Hawley & Whitman, 2019).

Furthermore, the American President Ronald Reagan's National Commission on Excellence in Education in 1983 published “*A Nation at Risk: The Imperative for Education Reform*” (Huddleston & Rockwell, 2015). Politicians were influenced to increase educational policies and the growth of standardized testing (Huddleston & Rockwell, 2015). By 1988, 45 states and the District of Columbia used statewide tests to assess student achievement (Huddleston & Rockwell, 2015; McGlynn, 2016). The ESEA was amended several times and each time tighter accountability was enforced (Heise, 2017). To improve students’ performance, teachers, administrators, and school districts needed to be held accountable for students’ achievement (Hawley & Whitman, 2019). Tighter accountability was put in place which increased pressure on students to meet proficiency (Heise, 2017). Consequences were provided

to students not meeting proficiency on the high-stakes assessments, such as retention and not receiving a diploma upon graduation (Bas, 2016). In addition, students who did not meet proficiency on the reading and mathematics high-stakes assessments were often placed in remedial classes in reading and mathematics and therefore, lacked the core requirements needed to graduate (Eren, Depew, & Barnes, 2017).

On January 8, 2002, President Bush revised ESEA as No Child Left Behind (NCLB) (Clough & Montgomery, 2015; Heise, 2017). Prior to this change, only students in schools receiving Title I funding were held accountable for educational achievement (Huddleston & Rockwell, 2015; Morgan, 2016). Title I, Part A, supports families who qualify for free or reduced lunch at schools with the goal to bridge some of the barriers and help the students meet the state academic standards (Title I, 2015). However, due to the NCLB amendment, all students in schools receiving federal funding were accountable for their performance (Heise, 2017). The goal was to hold everyone accountable for learning; an evolution was occurring to ensure no child would be left behind (Darling-Hammond, Wilhoit & Pittenger, 2014; Von der Embse et al., 2013). Prior to this time, some schools were using standardized tests in specific grades. Due to NCLB, all schools were required, by law, to have standardized tests in place by 2006 (Huddleston & Rockwell, 2015). As the continued accountability increase, so did the pressure to pass (Darling-Hammond et al., 2014). This pressure inflicted students to experience test anxiety and to underperform on the assessment (Gibson, 2014).

The laws mandating high-stakes assessments for all students brought about public concern (Huddleston & Rockwell, 2015). High-stakes assessments became a controversial topic (Huddleston & Rockwell, 2015). A growing concern was expanding throughout the United States because many high school students were not graduating with appropriate skills to be

successful in a career or even in college (Stair, Hock, Warner, Levy & Conrad, 2017). The United States was beginning to enter an educational crisis (Huddleston & Rockwell, 2015). To solve this crisis, the United States Department of Education developed a set of educational standards for grades K-12 in English/language arts and math known as the Common Core Standards (Clough & Montgomery, 2015; Huddleston & Rockwell, 2015; Morgan, 2016; Stair et al., 2017).

Common core and high-stakes assessments. Forty-three states, two territories, and the District of Columbia all adopted the Common Core Standards –College and Career Readiness Standards (Heise, 2017; Preparing America's students for success, 2018). Two high-stakes assessments were created which aligned Common Core College and Career Standards and were differently designed from the traditional high-stakes assessments (Liebttag, 2013). Florida chose not to adopt the Common Core College and Career Ready Standards (CCSS) (Common Core Standards Initiative; 2018). Instead, the state developed state standards which aligned with the CCSS (FLDOE, 2018). Florida also set accountability guidelines for all students to ensure they were college and career ready by the time they graduated (FLDOE, 2018). Even with the college and career standards put in place in the United States, based on test scores, many twelfth graders were still not indicating they were college ready (Finn, Kahlenberg, & Kress, 2015).

Finn, Kahlenberg, and Kress (2015) reported that half the twelfth graders in the United States were not college ready. The achievement scores on the high-stakes assessments may not show their true academic potential if students are experiencing test anxiety and thus are not able to pass the high-stakes assessments required to graduate (McCraty, 2016). This inability to meet proficiency on the high-stakes assessments impedes their chances to receive a high school

diploma (Gibson, 2014). Without a high school diploma, students' futures can be bleak (Clark & Martorell, 2014).

Future impacted without a high school diploma. Students' futures are very constrained without having a high school diploma (Clark & Martorell, 2014; Hickox, 2015). In the United States, the high school diploma is the most commonly held credential (Clark & Martorell, 2014). Based on state laws, some districts may provide students a certificate of completion for meeting all the requirements except passing the required exit exams (Hickox, 2015). The certificate of completion does not have the same credence as a high school diploma (Hickox, 2015). When students do not receive a high school diploma, it inhibits their ability to obtain a job (Hickox, 2015). Many employers won't even screen applicants that do not have a high school diploma (Bas, 2016). In 2013, students lacking a high school diploma average's annual income were \$23,763 compared to students with a high school diploma which was \$33,852 (Georgia Partnership for Excellence in Education, 2013). Besides challenges with obtaining a job and income discrepancies, students who do not receive a high school diploma have experienced restricted opportunities to enter college (Clark & Martorell, 2014).

The inability to earn a high school diploma creates a lack of opportunities for young adults to advance (Hickox, 2015). Four-year colleges require students to have a high school diploma (Clark & Martorell, 2014). Without a diploma, students will be ineligible for financial aid (Clark & Martorell, 2014). There are a few community colleges which will admit student without a high school diploma or General Equivalency Diploma GED; however, students have to pass a test demonstrating college-level proficiencies (Clark & Martorell, 2014). If students experience test anxiety on assessments, this may hinder their chances of passing the college-level proficiency tests (Putwain & Pescod, 2018). Not having a diploma limits students' ability to

enter college (Putwain & Pescod, 2018). Besides not being able to get into college or even a job because of not being able to receive a high school diploma, students' who perform lower on high-stakes assessments struggle with their mental wellbeing (Putwain & Pescod, 2018).

In the United States, all states have high-stakes assessments that students must demonstrate proficiency to graduate with a high school diploma (Huddleston & Rockwell, 2015). With this demand comes pressure on the students (Gibson, 2014). Wang (2016) posited that suicide rates of young adults between ages 15 and 24 have increased. Wang's (2016) research demonstrated a positive correlation between suicidal tendency and test scores. Students who performed higher had a lower suicidal tendency (Wang, 2016). The conclusion of the data indicated that high-stake testing posed a suicidal risk for some individuals due to the pressures (Wang, 2016). Wang (2016) suggested that more frequent testing and a reduction of the stakes of the tests could potentially reduce the suicide risks imposed on students. Furthermore, it was suggested that mental health assessments could be conducted to intervene and assist students (Wang, 2016). The present study could potentially assist young adults between 17 and 21 teaching them the Quick Coherence Technique. In turn, the young adults could begin to self-regulate their test anxiety and could potentially improve their academic achievement on high-stakes assessments. Improving their academic achievement on the high-stakes assessments could potentially reduce their suicidal tendencies. Not only do high-stakes assessments impact the students taking the tests, they also impact many other stakeholders (Murray & Howe, 2017).

Impact on various stakeholders. High-stakes assessments are used an educational ranking gauge in various settings impacting numerous stakeholders (Moran, 2017; Murray & Howe, 2017). For centuries, assessments have been used as an evaluation tool to assure high quality education throughout the world (Angrist, Hull, Pathak, & Walters, 2015; Skedsmo &

Huber, 2018). Educational outcomes are used to drive educational policies and reform (Giménez, Thieme, Prior, & Tortosa-Ausina, 2017). There is a growing trend to compare performance and education systems in different countries and regions (Giménez et al., 2017). International standardized assessment achievement outcomes are used to rank countries (Giménez et al., 2017). Besides using high-stakes assessments to compare countries internationally, they are used nationally as well (Giménez et al., 2017). Although testing has increased, American students' scores have declined when ranked with other countries (Maranto, 2015).

Nationally, a state's accountability measures may slightly vary (Murray & Howe, 2017). However, often the accountability measures include graduation rates, ACT/SAT participation and scores, standardized student achievement test scores, learning gains, and attendance (Murray & Howe, 2017). High-stakes assessments are also referred to as high school exit exams (HSEE) (Hemelt & Marcotte, 2013). This data from the high-stakes assessments or HSEE are combined, and the schools receive an A through F grade (Adams, Forsyth, Ware, & Mwavita, 2016). The district grade is determined by averaging all the schools (Murray & Howe, 2017). The grading systems for high-stake assessments' scores impacted pay for performance (PFP), market accountability systems, and teachers' evaluations (Murray & Howe, 2017).

Based on the school grades and high-stakes assessment scores, districts, schools, and teachers are rewarded or punished (Jones & Hartney, 2017). The state closely monitors the districts and schools' grades (FLDOE, 2018). A school who receives an "F" could potentially be taken over by the State Department of Education Board if improvement does not occur within three years (Murray & Howe, 2017). If a school gets an "F", the market accountability system may decline. For example, families may be less enticed to move into a school district that has higher ratings (Murray & Howe, 2017). Furthermore, if the school received a low performing

grade, schools would not receive as much funding, and teachers would not receive the pay for performance (Murray & Howe, 2017). Due to these pressures, schools and teachers feel forced to teach to the test (Caves & Balestra, 2016; Morgan, 2016). In addition, teachers' evaluations are negatively impacted if their students perform poorly on high-stakes assessments (Von der Embse et al., 2016). If students are not performing up to their potential due to test anxiety, it impedes the teacher's and school's evaluation (Von der Embse et al., 2016). Von der Embse et al. (2016) postulated that the policies create an increased pressure to teach to the test since teachers' evaluation has been linked to students' achievement (Morgan, 2016; Von der Embse et al., 2016). Teachers may focus on only the high performing students who have a chance to pass leaving the struggling students behind (Caves & Balestra, 2016). Students who feel they cannot pass may drop out (Caves & Balestra, 2016; Morgan 2016). The inability to help all students creates an enormous amount of pressure on teachers and this impacts their job satisfaction and mental wellbeing (Morgan, 2016).

Due to the pressure high-stakes accountability, teachers' stress is an epidemic throughout the United States (Von der Embse et al., 2016). Teacher stress is defined as negative experiences to cope with job-related stressors (Von der Embse et al., 2016). This increased stress on teachers had led to an increase in job dissatisfaction (Von der Embse et al., 2016). Although the accountability policy has had some positive outcomes, such as clarification of job expectations, the pressure has produced counterproductive instructional practices and lower student achievement (Von der Embse et al., 2016). This increased pressure placed on teachers caused them to focus on test-related content and event (Gebril & Eid, 2017). Gerbil and Eid (2017) conducted a quantitative and qualitative study with 200 teachers and results concluded that some teachers might be involved in unethical test preparation activities. Teachers often experience job

dissatisfaction due to the pressures created from high-stakes assessments (Von der Embse et al., 2016).

Impact on subgroups. Due to the implementation of High School Exit Examination (HSEE), graduation completion probability declined in low-socioeconomic districts, disadvantaged populations, while graduation rates slightly increased in affluent school districts (Caves & Balestra, 2016). HSEE prevents the lower performing students from graduating (Hemelt & Marcotte, 2013). The high-stakes accountability is negatively impacting America's education and increasing poverty rates (Caves & Balestra, 2016; Morgan, 2016).

Understanding the evolution of emotions. The role of performance and emotions, specifically anxiety, has long been a subject of interest (Von der Embse et al., 2018). James, psychologist-philosopher, in 1884, debated about whether emotions initiated in the mind or in the body (McCraty, 2016). James posited that physiological signals, a racing heart, sweaty palms, and tense muscles, create the emotions felt (McCraty, 2016). James concluded that bodily changes create emotions and through different perceptions of what's occurring physically, emotions can change (McCraty, 2016). Walter Cannon, in the 1920s, questioned James' viewpoint and counterpointed that emotions initiated in the brain (Dror, 2013). Cannon indicated that emotions initiate in the brain and send signals creating physical sensations in the body (Dror, 2013).

In 1935, Lashley, neuropsychologist, identified several neurological pathways where emotions are generated (McCraty, 2016). In 1937, Papez, a professor of neuroanatomy at Cornell University, created the Limbic Theory (Bhattacharyya, 2017). Papez postulated that emotions did not come from a single system; instead, their neurological circuits carried the signals creating the emotions (McCraty, 2016). A Canadian psychologist, Hebb, conjectured that neurons are

malleable and can be altered (Maurer, 2016; McCraty, 2016). Research verified that neurons are malleable and can be changed decades later (Maurer, 2016; McCraty, 2016). In 1950, MacLean, chief of laboratory for brain evolution and behavior at the National Institute of Mental Health, furthered the theory indicating the brain had interacting neurological circuitry where emotional processing took place (McCraty, 2016). Because neurological circuitry is malleable, twelfth graders can use QCT to potentially alter their neurological circuitries inflicting test anxiety and improve their academic achievement on high-stakes assessments.

History of Anxiety

Anxiety is an emotion (Crocq, 2015). Anxiety is defined as an anticipated future threat and has existed for centuries (Crocq, 2015). Often adolescents experience test anxiety, which is a fear of an examination or fear of not completing a task (Sellakumar, 2015). Anxiety can be classified as one of man's basic feelings (G, 2018). The Greek medical texts called the Hippocratic Corpus (c 460 BC to c 370 AD) identified anxiety as a phobia and labeled it as a medical disorder (Crocq, 2015). Aristotle (384-322 BCE) differentiated personalities with different levels of anxiousness and anxiousness disorders (Horwitz, 2013). Cicero and Seneca, Latin Stoic philosophical writers, wrote about anxiety (Crocq, 2015). In 106 BC to 43 BC, Cicero's *Tusculum Disputations* (TD) described anxiety (worry) as disorders (Crocq, 2015). Anxiety was described as a disorder of worry which caused conflicting views and affliction within (Crocq, 2015). Greek and Latin literature also defined anxiety as a medical disease (Mattern, 2015). Epicurius' disciple, Lucretius, wrote poetry, describing how anxiety torments the mind (Crocq, 2015). Anxiety comes from the Latin substantive *angor* and a cognate is *angustus* (narrow) (Crocq, 2015). In Biblical Hebrew (Job 7:10) Job expresses anxiousness as not connecting to God's spirit (Crocq, 2015). A professor of psychiatry in Paris, who died in

Auschwitz in 1943, declared *anxiete* has both psychological and cognitive aspects of worry (Croqc, 2015). The illness of anxiety seemed to disappear between classical antiquity and modern psychiatry, although people still had anxiety during this time (Croqc, 2015). The diagnosis of anxiety returned in 1621 (Croqc, 2015). Burton, author of *The Anatomy of Melancholy*, published in 1621 included concepts about anxiety (Coqc, 2105). Clinical diagnosis of anxiety attacks was published in the 18th century (Croqc, 2015). Boissier de Sauvages (1706-1767), published A French medical nosology (casual classification of disease) identifying anxiety as a disorder (Croqc, 2015).

In the 19th and 20th century anxiety was attributed to numerous disorders (Croqc, 2015). In 1921, Kraeplein described anxiety as an inner tension (Steinberg, Carius & Fontenelle, 2017). Janet, in 1959, posited that anxiety could be triggered by the subconscious (Evrard, Pratte & Cardaña, 2018). Janet's terms describing anxiety disorders are still used to this day (Evrard et al., 2018). In 1952, psychoneurotic diseases were attributed to anxiety (Croqc, 2015). Research has identified that neurological circuitry identifies the different levels of anxiety (stress, panic, obsessions) (Croqc, 2015). Certain brain regions involve anxiety and the different disorders (Horwitz, 2013). The amygdala, prefrontal cortex, hippocampus, and the neurochemicals, such as GABA, epinephrine, dopamine, and serotonin are devoted to the recognize fear (Horwitz, 2013). Prior to the nineteenth century, all medical treatment was preventative and holistic (Horwitz, 2013). Horwitz (2013) confirmed since then the most common treatment for anxiety has been drugs.

Life without self-regulation. Emotional pain is one of the most common disorders in American culture (Schulz & Hay, 2016). McEwen emphasized anxiety and frustration are often associated with stress (McEwen, 2016). There is a lack of knowing how to manage emotions

throughout the world (McCraty, 2016). Due to this lack of knowing how to manage one's emotions, mental health disorders have increased especially for adolescents in the United States (Beland & Kim, 2016; Membride, 2016; Mental Illness, 2017; National Center for Health Statistics, 2014; Suicide Statistics, 2016). Sellakumar (2015) posited that anxiety is high for adolescents in high school. Test anxiety is associated with creating anxiety (Gibson, 2014). In the United States, 17% of youth experience an emotional, mental, or behavior disorder and one in every four to five youth meet the criteria for mental disorder (Prevalence, 2016). The Center for Behavioral Health Statistics and Quality (2016) reported that in 2015, 3.0 million adolescents were identified with a mental health disorder. The health disorders can start from test anxiety. Students have been known to take cognitive enhancements to cope with test anxiety (Sattler & Wiegel, 2013).

Cognitive Enhancements and Test Anxiety. Students who experience test anxiety have been known to take cognitive enhancements (Sattler & Wiegel, 2013). A cognitive enhancement is a prescription drug or caffeine enhancer drink taken by healthy individuals (Ranke, Bagusat, Rust, Engel, & Lieb, 2014; Sattler & Wiegel, 2013). It is prescribed or purchased to assist with learning, such as memory, attention, and being alert (Ranke et al., 2014; Sattler & Wiegel, 2013). Taking cognitive enhancers to assist with exams raises ethical concerns, such as creating an unfair advance (Dubljević, Sattler, & Racine, 2014). It also poses creates potential health complications, such as addiction, headaches, and hypertension, when students take stimulants for non-medical purposes (Sattler & Wiegel, 2013). In 2010, 11,000 university students were sampled, and 4.56% of the students used prescription drugs to assist with academic achievement (Sattler & Wiegel, 2013). The results found that the students with the greater risk of failure were more willing to take the cognitive enhancements even knowing the negative side effects (Sattler

& Wiegel, 2013). The findings from the study should be used to assist with drug preventions, policy, and educational strategies (Sattler & Wiegel, 2013).

Another study conducted by Butt, Dalsgaard, Torp-Pedersen, Køber, Gislason, Kruuse, and Fosbøl (2017) concluded that healthy students who used beta-blockers, which reduced test anxiety, had an increased risk of psychiatric outcomes. Beta-blockers relieve exam-related anxiety; such as increased heart rate, perspirations, and dry mouth (Butt et al., 2017). However, the negative outcomes from the beta-blockers outweighed the cognitive benefits (Butt et al., 2017). Suicide was attempted by 16 of the students who used beta-blockers (Butt et al., 2017). Five students committed suicide (Butt et al., 2017). Further findings illustrated that first-time beta-blockers were highest among high school students, aged 18-19 (Butt et al., 2017). Students who used beta-blockers to assist with exams had an increased risk of later using antidepressants and attempting suicide (Butt et al., 2017). Finally, the majority of beta-blocker users were at a higher risk for a long-term psychiatric illness (Butt et al., 2017). Prescriptions are prescribed to assist with the mental disorders or psychiatric illnesses (Horwitz, 2013). Often, substance abuse occurs with the use of prescriptions (SAMHSA, 2018).

The need for self-regulation to be taught in schools. Beland and Kim (2016) agreed that students struggle with handling their emotions. The ability to manage stress influences one's quality of life (McCraty, 2014). Students are not being taught how to self-regulate (Vohs & Baumeiste, 2016). Without consciously self-regulating, negative impulsive reactions occur (McCraty, 2016). Children and adolescents who experience test anxiety often have challenges with solving problems and avoid school (Sellakumar, 2015). Evidence from the past two decades demonstrates this detrimental trend for the adolescents in America. Between 1994 and 2009,

there have been 157 documented high school shootings, 104 are categorized as homicidal, and 53 are suicidal incidents (Beland & Kim, 2016).

The definition of a mental illness is having a mental, behavior, or emotional disorder (Mental Illness, 2017). Cheng and McCarthy (2018) confirmed that 72% of the population experiences anxiety daily in their personal and profession. Mental wellness is inhibited for students who experience test anxiety (Isgör, 2016). Mental illness was identified that 49% of adolescents had mental illnesses. Of the 49.5% of adolescents, an estimated 22.2% had a severe impairment (Mental Illness, 2017). Anxiety disorders are linked to an increased suicide risk, increase in mental health services, and hospitalization (Titone, Freed, O'Garro-Moore, Gepty, Stange & Alloy, 2018).

Suicide statistics (2016) confirmed in 2016; suicide was the 10th leading cause of death in America claiming over 45,000 lives. Student who have taken beta-blockers to reduce test anxiety have been known to attempt suicide and five students have committed suicide (Butt et al., 2017). The loss of losing someone to suicide is unfathomable forever impacting the family, friends, and community (Kölves, Ross, Hawgood, Spence, & De Leo, 2017). Suicide rates have steadily increased from 2007 to 2016 (Suicide Statistics, 2016). Adults aged 15 to 24, in 2016 had a 13.15% suicide rate (Suicide Statistics, 2016). This data does not include the adolescents who attempted suicide and failed (Suicide Statistics, 2016). Financially, suicide costs American \$69 billion annually (Suicide Statistics, 2016). Although this seems lofty, no amount of money can bring back a young adult who committed suicide (Suicide Statistics, 2016). Adolescents are continuously exposed to pressures (Fuhrman, Knoll, & Blakemore, 2015).

Legislative law (ESEA) requires high school students to meet proficiency on reading and math high-stakes assessments in order to graduate (FLDOE, 2016). Seventy years of data which

was collected about test anxiety illustrated the negative correlation to test anxiety and test scores (Von der Embse et al., 2018). McEwen (2016) postulated interventions to reduce stress and aim to assist the psychological and physical systems are in dire need. There is a need for more research for interventions to reduce adolescents' suicide in the America (Child and Adolescent Mental Health, 2017). Jerath, et al. (2015) and McEwen (2016) affirmed drugs cannot serve as an intervention because they only reduce the symptom temporarily and have detrimental side effects. Intervention needs to be brain-body connections (McEwen, 2016). The QCT, self-regulation strategy interconnects and balances the psychological and physical components within the body (McCraty, 2016). Adolescence is a challenging time (Fuhrman et al., 2015). During this period, adolescents experience tremendous pressure from their peers, family, teachers, and stress they put on themselves (Fuhrman et al., 2015). Besides all of this, adolescents' brains are in a critical stage a development (Fuhrman et al., 2015).

Adolescents' Brain Development. Adolescents' ages range from 10 to 24 years of ages (Azzopardi, Patton, Sawyer, & Wickremarathne, 2018). During this stage, adolescents experience vast pressures, such as passing the high-stakes assessment required to graduate which impacts their future (Sellakumar, 2015). Adolescents that do not meet proficiency on the high-stake assessments needed to graduate often struggle academically, socially, and emotionally (Sellakumar, 2015). The test anxiety inhibits their cognitive ability to perform well on tests (McCraty, 2016). Adolescents' brains encounter extensive change during this stage (Fuhrmann, Knoll, & Blakemore, 2015).

Adolescents' brains are in an extensive growth development period that starts at puberty in the early teenage years and ends at a point when individuality is attained; typically, around the age of 25 (Fuhrmann et al, 2015). The neurological parts are exceptionally plastic during this

period (Fuhrmann et al., 2015). Neurobiological studies confirmed that the specific periods of growth are instrumental to the development of the nervous system, such as the adolescent period (Cracco, Goossens, & Braet, 2017; Schore, 2016).

The adolescent period is a sensitive period and adolescents are quite susceptible to vast influences, including and not limited to environment, social stress, and cognitive training (Bergen-Cico, et al. 2015; Fuhrmann, et al, 2015). During this stage of development adolescents heighten their impulsiveness and risk-taking (Albert, Chein & Steinberg, 2013; Cico et al., 2015). Adolescent sensitivity is amplified (Mueller Cromheeke, Siugzdaite, & Boehler, 2017). Adolescents who self-regulate often are experience with higher academic achievement and improved decision making (Bergen-Cico et al., 2015; Cracco et al., 2017). Bergen-Cico et al. (2015) concluded that deficiencies in self-regulation lead to an extensive amount of health and behavioral problems. Due to continue growth, adolescent brain development, particularly, the neurological pathways are more apt to be imbalanced (Mueller et al., 2017).

Due to the imbalance, prioritizing processing is critical (Mueller et al., 2017). Mueller et al, (2017) proclaimed that this emotional sensitivity leads to impulsive decision making and sometimes even a lack of working memory. Once adulthood is reached, the cognitive regulation is stronger (Mueller et al., 2017). To assist adolescents with this imbalance, it would benefit to teach them how to manage emotions and have cognitive control (Mueller et al., 2017).

Adolescents are predisposed to the plasticity of neurological circulatory (Fuhrmann, et al, 2015). The QCT potentially could assist in altering the maladaptive neurological circuitry, generated by the fear of testing. In addition, the QCT could potentially strengthen adolescents' cognitive regulation and assist with improving scores on high-stakes assessments required to graduate in high school.

Test anxiety has been correlated to adolescents later experiencing depression (Lowe, 2014). A study analyzing the neurological makeup in the adolescents' brains between the ages of 12 and 18 was conducted (Whittle, Lichter, Dennison, Vijayakumar, Schwartz, Byrne, & Allen, 2014). Neuroimaging took place during an early age (age 12) and mid-adolescence (age 16) examining the onset of depressive disorders (Whittle, et al., 2014). Out of the 86 participants, 30 participants experienced an episode of a depressive disorder (Whittle, et al., 2014).

During the depressive state, neuroimaging identified a volumetric negative change in the brain's neurological pathways (Whittle, et al., 2014). Whittle et al. (2014) postulated due to this volumetric negative change, there is a need for health care and education to use these findings to assist adolescents through clearly define and effective intervention with interventions to assist adolescences. Furthermore, Whittle, et al. (2014) posited that more studies are needed to understand the underlying adolescents' depression and possible prevention of adolescents' depression. Self-regulation of emotions could potentially intervene and reduce depressive episodes. The QCT is a technique that practices shifting emotions to healthier ones (McCraty, 2016). Recent research has discovered the correlation between neuroscience and emotions (Nussbaum, 2015).

Neuroscience and Emotion

Emotions are created via neurons intercommunicating to one another (Nussbaum, 2015). These 100 billion neurons interlink in the brain and have 10,000 connections (Dispenza, 2015; Jahn, 2016; Lipton, 2016; Siegel, 2017). Lipton (2016) confirmed that neurons send the signals to create emotions. Through neurological circuitry, on-going communication is going back and forth to the cognitive and emotions systems (McCraty, 2016). More neural connections communicate directly from the emotional processing areas to the cognitive centers (Ciolacu,

2014; McCraty, 2016). This stronger communication with the emotional systems explains how emotions overpower the cognitive ability at times and frequently bypass the mind's linear ability to reason (McCraty, 2016). Test anxiety is an example of when emotions overpower the cognitive ability (Gibson, 2014).

Every emotion is generated by chemistry in the brain (Jerath et al., 2015; Schulz, & Hay, 2016). The chemistry is sent through different neurotransmitter signals (Jerath et al., 2015). The chemicals are created by neurons communicating with one another (Jahn, 2016). One neuron talks and the other one listens (Jahn, 2016). The chemicals simulate feeling and thoughts, along with behavior and psychological responses (Vohs & Baumeiste, 2016). Through one's perceptions, emotions can be referred to as valence, positive or negative (Smith & Lane, 2015). There are eight primary emotions (Burton, 2016). Primary emotions are instinctive responses (Burton, 2016). For example, the fear experienced in test anxiety is a primary emotion. A primary reaction to emotions is not typically self-regulated (Vohs & Baumeiste, 2016). Goetz and Hall (2013) confirmed when emotions are experienced, bodily process are experienced, such as test anxiety, one's heart rate could increase. The neurological circuitries are malleable and can be altered through self-regulation (McCraty, 2016).

Neuroplasticity. Neuroplasticity is the plasticity or malleability of the neurological signals (Scaffer, 2016). Through self-regulation, neurological circuitry can be altered, and new patterns can be generated (Dispenza, 2015; Lipton, 2016; McEwen, 2016; Schulz & Hays, 2016; Smith & Lane, 2015). Neuroplasticity can occur at any age (Nussbaum, 2015; Shaffer, 2016). Thoughts and feelings can be negative or positive (Lipton, 2016; Vohs & Baumeiste, 2016). The brain does not know the difference (Lipton, 2016; Siegel 2017). It just sends the signals differently based on the emotion or thought through different types of circuitries (Jerath et al.,

2015; Lipton, 2016; Siegel 2017). By using the QCT, adolescents can alter the maladaptive neurological circuitry and generate healthier neurological pathways (McCraty, 2016).

There are two circuitries within the brain which are the allostatic and homeostatic circuitry (Mellin, 2016). The allostatic circuitry creates unsynchronized neurological circuitry and negatively impacts one's health (Jerath et al., 2015). On the other hand, the homeostatic circuitry creates synchronicity throughout the body creating wellbeing and a healthy environment (Mellin, 2016). If the allostatic wiring is not corrected, the allostatic neurological pathways could continue to aggravate and extend an unhealthy mental and physical state (Mellin, 2016; Pignatelli, Umanah, Ribeiro, Chen, Karuppagounder, Yau, & Bonci, 2017). Test anxiety generates unhealthy neurological circuitry to the brain creating a lack of synchronization throughout the body (McCraty, 2016).

Unsynchronized neurological circuitry. Human perception plays a role in psychological and physical wellbeing (Shaffer, 2016). Negative perceptions (anxiety or stress) create a lapse in cognitive skills over time (Shaffer, 2016). During stress, anxiety, and depression depolarization occurs throughout the neurological circuitry (Jerath et al, 2015). Stress and anxiety cause a widespread excitation activity in the neurons, hormones, and throughout the mind and body which causes increased heart rate, respiration rate, blood pressure, skin conductance, and muscle tension (Jerath et al., 2015). For example, during test anxiety, adolescents may experience the feeling of being stressed. This stress sends signals throughout the body creating physical symptoms, such as sweaty palms, lack of cognition, and a raised heartrate (McCraty, 2016).

During stress and anxiety, cells' membranes depolarize creating a disequilibrium state through the psychological and physical systems (Jerath et al., 2015). Chronic stress and anxiety

lead to an increase of neurological activity, particularly hyperactivity in the amygdala (Jerath et al., 2015). The amygdala is in the limbic system and handles the neurological transmitters which create the emotional reactions (McCraty, 2016). The amygdala is where the response to fight or flight occurs (Jerath et al., 2015). When anxiety or stress occurs; there is a lack of synchronization between the emotion and cognitive systems (McCraty, 2016; Mellin, 2016). Test anxiety creates a lack of synchronization throughout the body (McCraty, 2016). McEwen (2016) postulated that the mind precedes the body in making humans the architect of the brain's neurological circuitry. The QCT assist with altering maladaptive neurological pathways shifting the energy creating synchronization throughout the mind and body (McCraty, 2016).

Power to synchronize neurological circuitry. The emotional, neurological circuitries are the most malleable (Mellin, 2016; Scaffer, 2016). Humans can control and change their emotions through self-regulation (McCraty, 2016). Through self-regulation, maladaptive emotional, neurological circuitry can be altered (Conover & Daiute, 2017; Dispenza, 2015; McCraty, & Zayas, 2014; Mellin, 2015; Mellin, 2016; Siegel, 2017). By intentional switching to a healthier feeling, overtime, a dominant neurological pathway will be generated which sends signals throughout the mind and body (Dispenza, 2015; Lipton, 2016, McCraty, & Zayas, 2014; Mellin, 2015; Siegel, 2017; Smith & Lane, 2015). Positive alteration in the neurological circuitry promotes improvements in extensive health indices (Dispenza, 2015; Lipton, 2016; Mellin, 2015; Siegel, 2017; Smith & Lane, 2015). Practicing positive emotional self-regulation alters maladaptive neurological circuitry in the adolescents' brains sending healthier signals throughout creating psychophysiological coherence (McCraty, 2016; Mellin, 2016; Smith & Lane, 2015). The neurological circuitries are sending signals all the time (Lipton, 2016).

These neurological signals communicate with the organs and 60 to 70 trillion cells in the body (Dispenza, 2015; Lipton, 2016; McEwen, 2016). Through thought and emotion, the body physically responds (Barrett, Lewis, & Haviland-Jones, 2018; Dispenza, 2015; Jerath et al., 2015; Lipton, 2016; McEwen, 2016; Siegel, 2017). Every mood impacts the chemistry in the brain, and the body physically responds negatively or positively (Schulz, & Hay, 2016). When anxiety, stress, sadness occurs, the neural circulatory is not in balance, and this gives rise to uncomfortable feelings (McCraty, 2016). Once a reaction occurs, the same response could continue to have if one lacks self-regulation (McCraty, 2016). In 2017, Pignatelli et al. conducted a study and found that maladaptive neuron synaptic pathways continued to trigger emotional responses with just a stress cue signal (Okubo & Ogawa, 2013). These findings link to this study because after the first emotional response of having test anxiety, an anxious feeling could be triggered by any test.

Test Anxiety

Test anxiety is a universal phenomenon (Heiser et al., 2015; Sung et al., 2016). Test anxiety is multidimensional inhibiting the psychological, physiological, cognitive, and behavior abilities of the test taker (Gibson, 2014). Throughout the world, one of the most common psychological disorders amongst school-aged children and adolescents is anxiety (Sellakumar, 2015). Von der Embse et al., (2013) reported that test anxiety begins as early as seven years old. Approximately, 20% to 40% of students experience test anxiety (Cho, Ryu, Noh, & Lee, 2016). At some point, most individuals will experience test anxiety (Gibson, 2014). Mild test anxiety can create positive energy, increase preparation, and focus on tests (Gibson, 2014). However, when test anxiety builds, negative energy causes a detrimental impact and undermines the students' ability to perform (Gibson, 2014).

Test anxiety can be triggered from thoughts and consequences about failure (Putwain & Pescod, 2018). Test anxiety can also be triggered by distracting thoughts that are not even associated with the test, such as argument with a parent or friend, creating the inability to focus on the test (Putwain & Pescod, 2018). During this anxiousness state, the neurological pathways generate a powerful influence on attention, memory, and higher-order processing, creating an imbalance mentally and physically throughout the body (McCraty, 2016). This negative imbalance can arouse undesirable physical symptoms, such as heart palpitations and perspiration (McCraty, 2016).

Von der Embse et al. (2018) conducted research spanning over 70 years regarding test anxiety. A negative relationship with important educational outcomes, such as students' academic achievement was concluded from the research (Von der Embse et al., 2018). Test anxiety is a major cause for underachievement (Gibson, 2014). Test anxiety is associated with poor wellbeing (Putwain & Pescod, 2018).

Test anxiety can be categorized as state anxiety (Sellakumar, 2015). State anxiety is temporary, low stress, found in non-threatening circumstances, and impacts the autonomic nervous system (Bloch, Aviram, Segev, Nitzan, Levkovitz, Braw, & Mimouni Bloch, 2017). Fear of failure, fear of an examination, and fear of not completing a task are examples of state anxiety (Sellakumar, 2015). In state anxiety, once the circumstance has ended, the feeling typically comes to an end (G, 2018).

Test anxiety occurs due to a variety of factors including but not limited to, pressures from their course load, parents, teachers, and peers encompass the adolescents during their high school years (Sellakumar, 2015). Children and adolescents who experience anxiety often have poor social skills, low self-esteem, perceptions of social rejections, difficulty forming friendships,

school avoidance, decreased problem-solving abilities, and lower academic achievement (Sellakumar, 2015). Test anxiety is associated with high-stakes assessments (Heiser et al., 2015). Anxiety is prevalent in adolescents because of the academic pressures which are tied to their future opportunities (Sellakumar, 2015).

There is a causal relationship between academic performance and students' anxiety (McCraty, 2016; Sellakumar, 2015; Putwain & Pescod, 2018). Test anxiety hinders academic achievement and it also initiates other physical illnesses (Sellakumar, 2015). Not passing the state's requirements to graduate negatively impact students' future by interfering with obtaining a job, attending a college, and the opportunity to go into the military (Sellakumar, 2015). Adolescents must pass several high-stakes assessments to receive a high school diploma (FLDOE, 2018).

Test anxiety studies. Tests anxiety for adolescents has increased due to the important role of high-stake assessments in high schools and educational decision making (Lowe, 2014; Von der Embse et al., 2013). Lowe (2014) conducted a study in the U.S. with adolescents in grade 6 to 12 taking standardized assessments. The results of this study also indicated that test anxiety was associated with low self-esteem, anxiety and depression, grade retention, and possibly truancy and early school dropout (Lowe, 2014). A study conducted with ninth graders in Taiwan investigated test anxiety and academic achievement and found a positive correlation between test anxiety and academic achievement (Sung, et al., 2016). The data also concluded that the lower achievement group reporting to have more test anxiety (Sung, et al., 2016). Isgör (2016) continued research and conducted a study with 251 high school students, ages between 14 and 19, and found there was a negative relationship between exam anxiety and psychological wellbeing of the students.

Further research, conducted in Sweden with 1129 students in 2017, validated the lower performing students had a higher degree of test anxiety (Hopfenbeck, 2017). Adolescents are not the only students who experience test anxiety (Gibson, 2014). Test anxiety is experienced by all ages and all cultures (Heiser et al, 2015; Sung et al., 2016). A study was conducted examining third graders' fear of high-stakes assessments (Counsell & Wright, 2018).

This phenomenological study was conducted with third graders in Florida inquiring about their thoughts on the Florida Comprehensive Achievement Test (FCAT), a high-stakes assessment (Counsell & Wright, 2018). Third graders are typically 8 or 9 years old (Standard American International School Grade Listing, 2018). The third graders expressed being fearful of the FCAT indicating they experienced nervousness, anxiety, and stress (Counsell & Wright, 2018). Counsell and Wright (2018) posited students wrote comments, such as so nervous, very scared, and even expressing that they were a nervous wreck. The high-stakes assessment still exists for third graders; however, it is called the Florida State Assessment (FSA) (FLDOE, 2018). The accountability holds true for the FSA, as it did for the FCAT, if third graders do not meet proficiency, they are selected to be retained (FLDOE, 2018). Accountability will continue to be held through the Elementary and Secondary Education Act (ESEA) requiring students to demonstrate proficiency on high-stakes assessments; therefore, there is a need to provide students with interventions which assist with test anxiety (Von der Embse et al., 2013).

Need for interventions for test anxiety. Based on the Elementary and Secondary Education Act (ESEA), which is a federal law, high-stakes assessments will continue to be used throughout the United States (Von der Embse et al., 2013). Students take county and state-mandated tests 10 times a semester (Lazarín, 2014). Because test anxiety is prevalent with children and adolescents, schools need to start providing methods to help students learn to

become emotionally prepared for test to assist with reducing test anxiety (Von der Embse et al., 2013). Due to the continued pressure of high-stakes assessments, there has been an interest to reduce test anxiety using interventions (Von der Embse et al., 2013). Students' learning will improve when schools begin to address the universal phenomena of test anxiety (Gibson, 2014).

Limited research has been conducted in the United States on test anxiety interventions in elementary, middle, and high schools (Von der Embse et al., 2013). These results provide a need for middle and high schools to provide interventions to assist adolescents for test anxiety (Lowe, 2014). Test anxiety interventions have occurred for high-risk students; however, there is a gap in literature for the effectiveness of school-based interventions (Putwain & Pescod, 2018).

Furthermore, another study conducted in 2018, concluded the need for test anxiety interventions designed for school-age populations (Putwain & Pescod, 2018; Von der Embse et al., 2013).

More research is needed to know how to best treat test anxiety (Von der Embse et al., 2013).

Putwain and Pescod (2018) recommended that the future studies designed for school ages populations should incorporate training the facilitator about the intervention's psychological background to provide an overall understanding of how to properly train students to begin to reduce test anxiety. These treatments can be used to treat generalized anxiety disorder (Von der Embse et al., 2013). Because high-stakes assessments will continue to be used throughout the United States; it is time for education to address the students' wellbeing for the student to reach their academic potential and provide interventions for test anxiety (Hopefenbeck, 2017).

Beyond academics, the need to teach students to manage emotions. Schools in the United States have focused directly on educating students academically (Rosanbalm & Murray, 2018). When students struggle with emotional instability, it is challenging to focus and learn in school settings (McCraty, 2016). For example, when students experience test anxiety, their

cognitive ability is repressed and it is challenging to focus on the test (McCraty, 2016). High-stakes assessments undermine children's personal development (Counsell & Wright, 2018).

Schools are attempting to prepare students to be college and career ready; however, the fixation has been on teaching academic subjects and measuring students' academic performance (Ferguson, Phillips, Rowley, & Friedlander, 2015; McGynn, 2016). Schools have neglected that children need to grow socially and emotionally (Counsell & Wright, 2018). The heart of education reform for students needs to go beyond examining how students can reach their academic potential and assist with students' wellbeing (Hopfenbeck, 2017). There is a correlation between students' wellbeing and academic achievement (Hopfenbeck, 2017). Test anxiety hinders their wellbeing (Isgör, 2016). There is a need for a better balance of educational goals, beginning with educating students on how to manage their emotions (Ferguson et al. 2015). Schools need to encapsulate multiple goals to help prepare students for success in school and life; schools need to include emotions and conscientiousness to assist with students' future and growth (Ferguson et al. 2015). Growing research demonstrates the link between emotional self-regulation and increased cognitive performance (McCraty, 2016). Teaching the QCT to eleventh and twelfth graders could potentially assist with reducing test anxiety and increasing academic achievement on high-stakes assessments.

Self-Regulation. Self-regulation is the ability to monitor, interpret, control, and change the emotions through self-activation (McCraty, 2016). Up until the present, schools nurtured students' academic potential by continuously providing more and more academic strategies and skills (Counsell & Wright, 2018). At the same time, schools have failed to provide strategies to assist with teaching students how to self-regulate their emotions (McCraty, 2016). For example, when a student experiences test anxiety, one experiences the emotion called anxiety (Von der

Embse et al., 2018). Test anxiety weakens students' psychological, physical wellbeing, and the ability to perform well on tests (Gibson, 2015).

Emotions are what guide students' ability to learn (McCraty, 2016). McCraty (2016) acknowledged when challenges arise, people who self-regulate their emotions, can learn to calm themselves, and are more apt to bounce back and even prevent unnecessary stress reaction (anxiety, sadness, lack of patience). Self-regulation of emotions allows an opportunity to delineate between emotions (Vohs & Baumeiste, 2016). Self-regulation may be used to manage emotions. Intentionally redirecting emotions has been known as emotional self-regulation (Eck, Warren, & Flory, 2017). By conducting self-regulation, emotions can be controlled and manipulated (McCraty, 2016). The primary emotion may not stop immediately; however, it will decrease the intensity of it (Lipton, 2016). Utilizing emotional self-regulation interventions will help de-intensify the primary emotions (Vohs & Baumeiste, 2016). Emotional self-regulation can commence at any time and is an on-going process and not a one-time fix (Vohs & Baumeiste, 2016). Habituation may be altered through emotional self-regulation, which is a self-management technique (Goetz & Hall, 2013; McCraty, 2016; Vohs & Baumeiste, 2016).

Self-regulation can profoundly positively impact wellbeing (Bętkowska-Korpała & Olszewska, 2016; McCraty, 2016; Rosanbalm & Murray, 2018). Self-regulation creates synchronization within the body and shifts the physiology into a more coherent state (Bętkowska-Korpała & Olszewska, 2016). Students' ability to self-regulate, anticipate the feelings before the activity, is correlated to how well they perform (Schunk & Greene, 2018).

Furthermore, self-regulations make humans less vulnerable to the depletion of internal reserves (McCraty, 2016). When internal reserves are depleted, it impacts the mind and body, such as poor communication and poor behavioral choices (McCraty, 2016). For example, when

there an internal depletion, one may not be able to focus on the test nor want to finish the it and be quick to react and choose any answer to get the test done. Positive self-regulation will improve coherence (McCraty, 2016; McCraty & Zayas, 2014; Mellin, 2015).

Psychophysiological coherence is harmony and stability within living systems (McCraty, 2016). Psychophysiological coherence occurs naturally; however, maintaining psychophysiological coherence is not natural, it takes practice (McCraty, 2016).

Psychophysiological coherence balances the intercommunication of the neurons throughout the entire body while synchronizing cognition, emotions, and the physical body (HeartMath, 2017; McCraty & Zayas, 2014). Schunk and Greene (2018) posited learning to self-regulate and generate psychophysiological coherence with the body, which only takes minutes, creates positive change and helps people navigate through life's circumstances, whether simple or complex.

There is a need to provide interventions for test anxiety (Vohs & Baumeiste, 2016). Pharmaceutical approaches have more detrimental effects than the emotional illnesses with adverse side effects, such as addiction and even suicide (Nourt et al., 2015). Self-regulation generates natural chemicals that enable rewiring of circuitry in the subconscious that could have been encoded at an early age (McCraty, 2016; Mellin, 2016). Instead of fighting stress and anxiety, self-regulation training and practice can emotionally prepare children and adults of all ages, incomes, and races to know how to cognitively monitor their emotions, and in turn, increase their wellbeing (Schafer, 2016). The ability to learning how to look inward and self-activate homeostatic circuitry will empower individuals to create psychophysiological coherence any time it is needed (McCraty, 2014). When the circuitry is improved; one's health is improved

(McCraty, 2016; Mellin, 2016). Creating coherence, a harmonized state, is essential because it is linked to cognitive, social, and physical performance (McCraty, 2016).

Self-regulation studies. Several self-regulation studies have been conducted (McCraty, 2016). A self-regulation study was conducted with 6th-grade students who were randomly placed in groups in English Language Arts classroom and data confirmed a positive correlation between mindful yoga, academic performance, and improvement in health (Bergen-Cico et al., 2015). Students in the self-regulation group reported they were able to focus more, even with distractions, and their efficiency with planning improved (Bergen-Cico et al., 2015). Learning self-regulation assisted with focusing even during distractions. Bergen-Cico et al. (2015) concluded future studies should use academic assessments to measure the impact of self-regulation, instead self-reporting measures.

Jerath et al. (2015) conducted another self-regulation study using deep breathing to monitor the effect on anxiety. Slow, deep respiration assists with bringing cardiorespiratory synchronization (Jerath et al., 2015). Cardiorespiratory synchronization is the communication or interaction between the heart and respiratory systems (Jerath et al., 2015). Relaxation techniques targeting the mind and body, altering the brain's neurological transmitters may assist with bringing a homeostasis environment or synchronization state, and assist with long-term change (Jerath et al., 2015). These processes re-pattern the brain's neurological circuitry creating a harmonious state and a healthier psychological and physical state (McCraty, 2016). The findings indicated that slow deep breathing has been proven to bring a homeostatic state to the psychological and physical systems (Jerath et al., 2015). Vohs and Baumeiste (2016) conducted a study and found the experimental group that practiced emotional self-regulation demonstrated a

faster ability to defer negative emotions while using computers and also reported using self-regulation in their daily lives.

Limited research exists about how a set of emotional regulation strategies impacts psychological health benefits (Vohs & Baumeiste, 2016). More research is needed not only to demonstrate the impacts of emotional self-regulation, but to teach how and when to use the emotional regulated strategy (Vohs & Baumeiste, 2016). Currently, there is limited research using the intervention of self-regulation with adolescents with control groups using a typical classroom setting (Bergen-Cico, Razza, & Timmins, 2015). Bergen-Cico et al. (2015) conferred the need for greater standardization of practices and a more careful treatment with fidelity (Bergen-Cico., 2015). Furthermore, this research opens an opportunity to continue to unravel the paradigm about emotional plasticity (Vohs & Baumeiste, 2016). To assist in bridging this research gap, this study will teach standardized emotional self-regulation in a typical classroom setting focusing on shifting the emotions from an anxious perception to healthier ones.

Self-regulating the breath and wellness. Without thinking about it all humans and animals breathe (Sellakumar, 2015). The autonomic nervous system controls the breath (Levine, 2015). In each normal breath, there are approximately 15 inspirations and 15 expirations per minute (Sellakumar, 2015). There is an inter-relationship between breathing and emotions (Jerath et al., 2015). Heighten emotions triggered the state autonomic nervous system creating physiological responses (increase heart rate, gastro-intestinal issues, increase blood pressure, are just a few) (Sellakumar, 2015).

Controlling the breath, also known as pranayama, has numerous benefits (Levine, 2015). A person can positively enhance their life by conducting pranayama breathing (Levine, 2015). Levine (2015) confirmed that scientific research is showing that self-regulating the breath lowers

stress levels and improves both physical and mental wellbeing. At any time, one can self-regulate the breath to help reduce anxiousness and increase overall wellbeing creating a synchronicity within (McCraty, 2016). By mindfully taking 5 to 6 breaths per minute, one can positively change one's overall wellbeing (Levine, 2015). Slow deep breaths provide fresh oxygen to be supplied to brain cells and the facilitation of optimum blood supply and circulate of blood (Sellakumar, 2015). Slow deep breathing reduces anxiety and creates a synchronicity between the physiologic and psychological systems (Sellakumar, 2015). Repeated practice of slow deep breathing exercises improves concentration, relaxes muscles, increases emotional control, and improves the ability to manage undesirable habitual emotional responses (Sellakumar, 2015). Slow deep breathing has proven to reduce anxiety in adolescents and improve academic performance (Sellakumar, 2015).

Summary

Many adolescents struggle with test anxiety on high-stakes assessments (Sellakumar, 2015). The pressure to pass high-stakes assessment is intense because their futures rely on their academic assessment scores (Alismail & McGuire, 2015). This pressure creates test anxiety and impairs their academic achievement on high-stakes assessments, which decreases students' chances to graduate with a high school diploma (Bas, 2016). Students who do not graduate with a high school diploma have limited opportunities in life (Gibson, 2014; Hickox, 2015; Morgan, 2016, Hickox, 2015; Sellakumar, 2015; National Center for Education Statistics, 2015).

Furthermore, without a high school diploma, these young adults experience more health issues, joblessness, conduct more criminal behavior, take drugs, and may develop mental health issues (Reingle Gonzalez et al., 2016). The most effective way to influence optimal cognitive performance is to conduct daily emotional self-regulation (McCraty, 2016). If taught daily self-

regulation, adolescents could potentially increase their academic achievement scores and graduate enabling to live a healthier and happier life.

Chapter 3: Research Method

The problem addressed in this study was eleventh and twelfth grade students often experience test anxiety impeding their academic achievement on online high-stakes reading assessments required to graduate (Sellakumar, 2015). These students were not offered techniques to address this anxiety (Cho et al., 2016; Gibson, 2014). One particular emotion secondary students struggle with was test anxiety (Gibson, 2014). Test anxiety hinders academic achievement on high-stakes assessments and decreases students' chances to graduate with a high school diploma (Bas, 2016). Gibson (2014) defined test anxiety as an overwhelming and abnormal sense of fear or emotional state having both psychological and behavioral components. Ample research exists validating the need for secondary students to learn how to self-regulate their emotions (Bergen-Cico et al., 2015; McCraty, 2016). However, few self-regulation techniques have been implemented and conducted with secondary students in Florida with the same classroom teacher conducting the intervention (McCraty, 2016). The purpose of this quantitative descriptive study was to determine to what extent was the relationship between the Quick Coherence Technique (QCT) on eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment.

The following research question guided this study:

RQ1. What was the extent of the relationship between the Quick Coherence Technique (QCT) and eleventh and twelfth grade students' academic achievement on an online high-stakes reading assessment?

This chapter provided an overview of the research methodology, as well as identified the study's population and the sample. In addition, it included the materials and instrumentation

which were used in this study. This chapter provided an overview of the data collection methods and operational variables and outlines the assumptions, limitations, delimitations, and provided a detailed explanation of the ethical assurances.

Research Methodology and Design

This study used a quantitative descriptive methodology. A quantitative descriptive methodology was the most appropriate method for this study because numerical outcomes were compared, using the same pre-test and post-test instrument, for both Group 1 and Group 2 for eleventh and twelfth graders. After the pre-test was taken by all participants, one group was taught the Quick Coherence Technique (QCT) while the other group did not receive the QCT. The QCT is a self-regulation technique which regulates emotions and brings about psychophysiological coherence which reduces anxiety (HeartMath, 2018).

There was one independent variable and one dependent variable within this study. The independent variable was the QCT, practiced by one group. The dependent variable was the students' academic achievement pre-test and post-test data from the online practice reading American College Test (ACT) taken on the USA Testprep, which is an online technology platform. The same online reading assessment was utilized for both the pre-test and post-test. A coin was tossed to identify Group 1 and Group 2 and to distinguish which group conducted the QCT and which group did not conduct the self-regulation technique.

A quantitative descriptive design was best suited for this study because it compared pre-test and post-test data for both the Group 1 and Group 2. Pre-test and post-test designs tend to have strong internal validity (Experimental Research, 2018). Furthermore, this study used a descriptive statistical design which assisted with organizing the numerical data into data sets and logically displaying the data into tables and figures in order to efficiently display the data in

meaningful ways (Vetter, 2017). A quantitative descriptive method was appropriate because the data in the study was numeric and was not represented in words, pictures, or objects (Vetter, 2017).

The descriptive statistics used for this study were measures of central tendency and measures of variation (Vetter, 2017). The measures of central tendency used in this study were the mean, median, and mode. The measures of variation used in this study were range and standard deviation. The disaggregated data for all participants' pre-test and post-tests scores were put in Microsoft Excel to analyze data. In addition, tables and figures were used to illustrate the aggregated data.

Qualitative research was not an effective research method for this study for a variety of reasons. Qualitative research methods provide an opportunity to describe the lived experiences or phenomena by observing data (Cruz & Tantia, 2017). Multiple interpretations could misconstrue the objective of this study. In addition, qualitative research methods tend to provide a philosophical perspective to aiming to explore and describe giving credence to multiple ways of knowing which would not meet the criteria to authenticate the intent of the study (Cruz & Tantia, 2017; Wu, Thompson, Aroian, McQuaid, & Deatrck, 2016). Due to the numerical nature of the study, the quantitative data reduced bias and errors and in turn enhanced the validity of the study.

Population

The population for this study was eleventh and twelfth grade students in one high school, located in Florida, who had not met proficiency on the tenth grade online high-stakes reading assessment requirement to graduate. In the spring of 2018, 406 out of the 1,071 eleventh and twelfth grade students continued to not meet proficiency on the online high-stakes reading assessment required to graduate (FLDOE, 2018). Furthermore, 132 out of the 406 students were

twelfth grade students (FLDOE, 2018). Based on Florida's statutes, twelfth grade students who do not meet proficiency on the Florida's high-stakes reading requirement cannot receive a diploma to graduate (FLDOE, 2018). Not meeting proficiency on the online high-stakes reading assessment is a growing trend (Ed Stats, 2018). From 2014 to 2018, the school's site percentage increased from 40.6 percent to 44.8 percent of students who did not meet proficiency on the online high-stakes reading assessment required to graduate (Ed Stats, 2018).

If students do not meet reading proficiency on the state's reading requirement by the graduation date, they cannot graduate with their cohort with a high school diploma. For both the district and school site, the graduation rates have declined (Ed Stats, 2018). From 2014 until 2017, the district's graduation rates decreased 5.0 percent going from 88.9 percent to 83.9 percent (Ed Stats, 2018). Furthermore, from 2013 to 2017, the school graduation rate decreased 5.6 percent going from 90.9 percent to 85.3 percent (Ed Stats, 2018).

To provide a snapshot of the school, 2,239 students matriculated in 2017- 2018 (FLDOE, 2017). Specifically, there were 1,621 females and 1,178 males (FLDOE, 2017). The demographics at the school consisted of 1,437 Whites, 594 Hispanics, 102 Blacks, 63 Multiracial and 34 Asians (FLDOE, 2017). At the school site, identified English Language Learners comprised of 201 students. Furthermore, 310 students were identified as disabled, and 1,929 of the students were non-disabled (FLDOE, 2017). There were 747 economically disadvantaged students and 1,492 students were identified as non-economically disadvantaged (FLDOE, 2017). The median income for Central County was \$51,593, and the poverty rate was 12.1 percent (DATAUSA: Central County, 2015).

Sample

The sample was eleventh and twelfth grade students who were intentionally placed in Intensive Reading classes because they did not meet proficiency on the state's reading assessment requirement to graduate. According to the Assistant Principal (Skinner, 2018), in the past five years, the average class size for Intensive Reading classes has been 26 students. Similarly, in the past five years, the class sizes ranged from 24 to 28 students. Based on this historical data, there were approximately 52 eleventh and twelfth grade students who could have participated in this study. This study had 28 eleventh and twelfth grade students who were taught by the same teacher and were in two separate Intensive Reading classes. Each class met at their assigned time daily for 50 minutes.

A bilingual recruitment letter was sent home about the study. The participants and the legal authorized representative were given sufficient time, which was 48 hours, to consider their decisions asking that all consent forms be returned by Friday. Furthermore, the participants were given the opportunity to withdraw at any time during the study.

Categorical Value. Categorical values were assigned to both groups. The participants in both groups received a categorical value. The students in Group 1 students were labeled Student 1G1, Student 2G1, etc. while participants in Group 2 categorical were labeled Student 1G2, Student 2G2, etc. Furthermore, the online high-stakes practice reading ACT scores from the USA Testprep, an online technology platform, were categorized as interval data (Creswell & Creswell, 2018). Interval variables were used to generate the difference between values and the standard deviation which will occur in this study (Creswell & Creswell, 2018).

Materials/Instrumentation

There were two instruments used in this study. The first instrument was an online high-stakes practice reading American College Test (ACT) taken on the USA Testprep which is an online web-based technology platform (U.S.A. Test Prep, 2019). The same online high-stakes practice reading ACT pre-test and post-test were taken on the USA Testprep online web-based technology platform (U.S.A. Test Prep, 2019).

The second instrument was the Quick Coherence Technique (QCT). The QCT is a self-regulation technique that was developed by HeartMath Institute to teach students a natural way to potentially reduce test anxiety (HeartMath, 2018). Since 1991, HeartMath Institute (2018) has researched reliable scientifically based tools assisting people to interconnect their hearts and minds and enhance the connections with others while building brighter futures.

After the pre-test, which was administered to both groups, Group 1 participated in QCT consecutively for 20 school days. The students listened to the QCT audio recording each day. The QCT audio recording was four minutes and 16 seconds long (QCT for Ages 12-18, 2018). A script of the QCT audio was provided to the participating teacher. To ensure instructional time was not delayed, the standard coursework was immediately commenced directly after the audio recording was played. Both groups received the same scientifically based reading and testing strategies for 20 days. Scientifically based reading practices are specific programs that provide a systematic and explicit instruction of selected reading strategies that are evidently effective (Koch & Spörer, 2017).

Reliability and Validity

On-going routine analyses are conducted to ensure the ACT program is valid and reliable and continues to be psychometrically aligned (ACT, 2017). ACT commits to abiding to The

Standards for Educational and Psychological Testing and the Code of Fair Testing Practices in Education (ACT, 2017). In 2015-2016, the reading reliability median score was 0.87, which was a strong correlation to reliability (ACT, 2017, p.148). Reliability coefficients range from zero to one and demonstrate the consistency of test scores (ACT, 2017). Reliability coefficients close to one indicate strong reliability while coefficients near zero demonstrate a gap in consistency of scores (ACT, 2017). The ACT has proven valid nationally, state, and district wide (ACT, 2017). For states, like Florida, who have adopted the ACT as a concordant reading assessment, ACT continues to ensure the assessment is both reliable and valid by conducting on-going statistical assessments (ACT, 2017). The online high-stakes practice reading ACT was equivalent to the National Reading ACT (USATestprep, 2019). The test was created on the USATestprep online technology platform which utilized an algorithm randomly pulling 40 questions from test bank which was composed of items aligned to the National ACT Reading standard (USATestprep, 2019).

The second instrument for this study was the Quick Coherence Technique (QCT). HeartMath Institute (2018) confirmed the QCT has measured both valid and reliability using the EmWave Pro. Based on numerous studies conducted at HeartMath Institute, the research consistently found using QCT balanced lives and improved wellbeing (Whited, Larkin, & Whited, 2014). Furthermore, the QCT balanced heart rate variability and improved classroom behaviors and academic achievement of students (Whited et al., 2014).

Operational Definitions of Variables

The variables were the online high-stakes practice reading ACT pre-test and the Quick Coherence Technique. The online test was comprised of reading passages and 40 questions

which aligned with the National ACT Assessment (ACT, 2017). Each question was worth 2.5 points. Therefore, the highest test score possible was 100 percentage points.

The QCT, the self-regulation technique, was the other predictor variable. The QCT generates a coherence state in the psychological (mental and emotional) and physiological (bodily) processes and assists with reducing test anxiety (McCraty, 2016). Furthermore, the QCT is a simple, natural technique that improves classroom behaviors and academic achievement of students (Whited et al., 2014).

The ACT post-test was the criterion variable. The mean, median, and mode were identified by conducting a group comparison with both pre-test and post-test data. In addition, using the data from both groups, Microsoft Excel was used to identify the range and standard deviation. The aggregated data was displayed in tables and figures.

Data Collection and Analysis

Prior to any data collection, the school district, school site, USA Testprep, and HeartMath Institute signed approval letters to conduct the study. The letters were provided to Northcentral University's (NCU) Institutional Review Board (IRB). After NCU's IRB approval, the process and data for this study commenced.

The volunteering teacher received a one-hour training about ACT and QCT administration and a training binder. The information was provided about how to administer the ACT using the USA Testprep. A coin was tossed to identify which group conducted the QCT and which group did not conduct the QCT.

Next, the volunteering teacher learned about the QCT. There were three steps to conducting the QCT. The first step was to shift the attention to focus on the heart (QCT for Ages 12-18, 2018). The second step was to breathe slowly as though one was breathing in and out of

the heart (QCT for Ages 12-18, 2018). The final step was to create a heart feeling (QCT for Ages 12-18, 2018). To create a heart feeling, the students focused on a calming experience or event when one felt good inside (QCT for Ages 12-18, 2018). To conclude, the researcher reinforced to the volunteering teacher to play the audio recording to the QCT group for 20 consecutive school days and to conduct normal classroom instruction with the No QCT group. The data was analyzed after the study concluded.

Assumptions

One key assumption for this study was the students experienced test anxiety, which impeded their ability to pass the high-stake reading tests during their tenth, eleventh, and twelfth grade years. This assumption was supported by multiple studies (Gibson, 2014; Heiser et al., 2015; Sellakumar, 2015; (Sung et al., 2016; Von der Embse, Barterian, & Segool, 2013). The data from the studies showed test anxiety was a universal phenomenon which impedes academic achievement (Gibson, 2014; Heiser et al., 2015; Sellakumar, 2015; Sung et al., 2016; Von der Embse, Barterian, & Segool, 2013). It was assumed that students would practice the QCT as they encounter stress or anxiety and students' lifestyles will remain the same (similar diet and similar activities). It was also assumed no major life events would occur during this period. Another assumption was that students would have access to the internet and be able to access the USA Testprep online practice reading high-stakes assessment during the pre-test and post-test days, and all the laptops worked. Finally, it was assumed that the Intensive Reading Teacher utilized and followed the Intensive twelfth Grade Reading Plan which had scientific reading and test strategies with fidelity throughout the study with both groups.

Limitations

Some limitations of this quantitative descriptive study were potential threats to internal validity: recall bias, and experimenter's expectancy bias. Recall bias could occur if the teacher and/or students did not recall how to conduct the QCT. To assist in eliminating the recall bias, the teacher was thoroughly trained. To reduce recall bias with the students, the QCT audio recording emphasized the benefits of the QCT and it had students practice the technique together.

In addition, there was a size constraint to the study due to class size requirements. Numerous studies have been conducted validating that QCT assists with reducing test anxiety and increasing optimal performance; however, studies have not been conducted using the QCT in Florida with the same teacher and two different groups (Bergen-Cico et al., 2015). Furthermore, to minimize experimenter's bias, this study used quantitative data to determine results.

Another constraint in this study was limited time. Other studies have called for longer length studies (McCraty, 2016). Although there were limitations within this study, due to this viable research design, these confounds were nominal (Cruz & Tantia, 2017). This study assisted in providing replicable data as long as the same teacher is used for both groups and will assist in validating other studies conducted at HeartMath Institute (HeartMath, 2018).

Delimitations

There were boundaries due to the scope of the study. This proposed study did not include all secondary students and secondary students who were not retaking the test. The study did not examine secondary students throughout the state due to time and financial restraints. A pre-and post-test anxiety survey was not administered within this study. Finally, the researcher was employed at the school site during the study.

Ethical Assurances

Contact, data, or discussion of the study was not conducted until the Northcentral University IRB approved the application. Next, site permission was obtained from the school district, school site, HeartMath Institute, and USA Testprep. Furthermore, the researcher utilized the Informed Consent Forms, Assent Template for Children Ages 13-17, and Parent Consent Form for this study (NCU, 2016). The teacher involved in the study read and signed the Confidentiality and Anonymity Form to ensure the privacy of all information obtained (NCU, 2016). The Federal Regulations for the IRB, known as the Common Rule, regarding the protection of human rights was strictly followed (NCU, 2016). As the data was used for research purposes, the researcher ensured the FERPA Privacy Rules to protect information provided by human subjects by de-identifying all participants, all data was password protected, and data will be destroyed seven years after the study concludes (NCU, 2016). The data was not examined until after the study was complete.

Summary

Education on how to monitor, regulate, and self-generate emotions is needed throughout schools, particularly with adolescent students who are taking online reading high-stakes assessments and are at risk for failing to graduate with a high school diploma (Von der Embse, Barterian, & Segool, 2013). These high-stakes assessments induce significant pressure because they are a critical role in each student's future (Sung et al., 2016). Students who exhibit test anxiety might not pass the high-stakes assessment which hinders their chances to graduate with a high school diploma (Bas, 2016). Using descriptive statistics, the data will be analyzed to determine to what extent is the relationship between the QCT and eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment.

High-stakes assessments are used throughout the world; therefore, the results of this study could enhance the instructional program of a school by beginning to teach students a simple, quick, and non-invasive self-regulatory technique for online reading high-stakes assessments. The results could reduce adolescents' test anxiety and could improve their academic achievement scores on online high-stakes reading assessments. The implications of this study could potentially assist more students to graduate with a high school diploma. Reingle Gonzalez, Salas-Wright, Connell, and Businelle (2016) confirmed that students who graduate from high school with a diploma are less likely to have mental illnesses, partake in criminal behavior, and be unemployed. The study's implications could potentially teach adolescents to begin to self-regulate and monitor their emotions creating the ability to learn how to reduce their own test anxiety which in turn could improve their academic achievement scores. This study could potentially positively alter adolescents' future by enabling them to graduate with a diploma. Students who graduate with a high school diploma are healthier and have more possibilities than those who do not (National Center for Education Statistics, 2015; Reingle et al., 2016). Therefore, this simple emotional self-regulation technique not only could potentially reduce test anxiety, it may improve academic achievement and increase high school graduation rates. It could also potentially impact the betterment for all humankind by creating healthier citizens with more opportunities for better futures throughout the global society (McCraty, 2016).

Chapter 4: Findings

The purpose of this quantitative descriptive study was to determine the extent of the relationship between the Quick Coherence Technique (QCT) and the academic achievement of eleventh and twelfth grade students on an online high-stakes reading assessment. The data set included a sample size of 28 eleventh and twelfth grade students located in Florida. The students were in two separate Intensive Reading classes who had not met the state reading requirement to graduate. One teacher taught both classes.

A quantitative descriptive study was conducted using the same pre-test and post-test instrument. The students were divided into two groups: the students in Group 1, the QCT group, received the QCT, a self-regulation technique; while the students in Group 2, the No QCT group, did not receive the self-regulation technique. The central tendency (mean, median, mode) and variance (range, standard deviation) using the pre-test and post-test data from an online high-stakes practice reading assessment were identified. There was one independent variable and one dependent variable within this study. The independent variable was the QCT. The dependent variable was the academic achievement scores on the online practice reading ACT pre-test and post-test taken on the USA Testprep an online web-based technology platform.

The QCT was conducted by associating a positive feeling of gratitude, compassion, or joy as the subject (student) breathes (HeartMath, 2018). The QCT is a self-regulation breathing technique that regulates emotions and assists with focus and optimal performance (HeartMath, 2018). Because test anxiety inhibits students' cognitive ability to perform well on tests, the QCT may assist with improving students' academic achievement on high-stakes assessments.

At the onset of the study, 32 participants submitted consent forms (16 in the QCT group and 16 in the No QCT group). Although 32 participants took the pre-test, only 28 participants completed the post-test. In the QCT group, 13 students participated. The number reduced to 13 students because one student moved, and two students were absent for the post-test. There were 15 students who did not receive the self-regulation technique in the No QCT group. This number went from 16 to 15 because one student was absent for the post-test.

This chapter presents the findings of this study. The chapter begins with an analysis of the validity and reliability of the data. This is followed by a review of the findings based on the research question. Finally, the chapter provides an evaluation of the findings and concludes with a summary.

Validity and Reliability of the Data

Validity is how accurate the measurement is for the instrument (Privitera, 2016). The first instrument used in this study was a practice reading ACT test taken on USA Testprep, an online technology platform. The online high-stakes practice reading ACT pre-test and post-test data was the dependent variable and this instrument was used to collect the data. It was a test-retest instrument. The identical test was given for the pre-test and for the post-test. The instrument was valid because the same methods of measures were used for both tests. The online test was comprised of reading passages and 40 questions which aligned with the National ACT Assessment (ACT, 2017). Each question was worth 2.5 percentage points. The test was based out of 100 percentage points.

Reliability is achieved through repeating the research process and achieving the same or similar results (Wienclaw, 2017). For this study, to ensure reliability for both the pre-test and post-test, the manual was read verbatim and at the same time was provided to the 28 students.

The reliability for the practice reading ACT test was strong because the procedures for administering the test-retest instrument could take place and similar results could be obtained.

The second instrument for this study was the Quick Coherence Technique (QCT). HeartMath Institute (2018) confirmed the QCT had measured both valid and reliability using the EmWave Pro. The QCT is a self-regulation breathing technique that regulates emotions and brings about psychophysiological coherence (HeartMath, 2018). Psychophysiological coherence is when the nervous system is synchronized (Bradley et al, 2007). The synchronization assists with improving task performance, emotional stability, and cognition (Bradley et al, 2007). The QCT also balances heart rate variability, improves classroom behaviors, and academic achievement of students (Whited et al., 2014).

The results of this study demonstrated that after the 20-day period of the students practicing the QCT, a positive relationship was found between the QCT and student academic achievement. Taking student attendance was not required in this study and it was not identified if a student missed a day of practicing the QCT due to being absent. It would have benefitted this study to have taken daily attendance and provided additional insight about the relationship between the QCT and student academic achievement

Results

The overall results illustrated a positive relationship between the QCT and eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment. The QCT is a self-regulation breathing technique that was used in this study. By using the QCT, adolescents have been known to alter their maladaptive neurological circuitry and generate healthier neuropathways (McCarty, 2016). In this study, the 13 students who conducted the QCT increased their academic achievement from the pre-test to the post-test. The

highest possible score on test was a 100 percentage points. The markers used to identify this were the pre-test and post-test scores from online high-stakes practice ACT test. The students could have altered any negative maladaptive neurological circuitry when they conducted the QCT which assisted with helping them improve their academic achievement scores from the pre-test to the post-test. The No QCT group (which did not participate in the self-regulation technique) had 15 students, and only 11 students made academic gains. Furthermore, three students' academic achievement scores declined, and one student's scores showed no growth from the pre-test to the post-test.

The study sample consisted of 28 eleventh and twelfth grade students who had not met proficiency on the state's reading requirement to graduate in Florida. The students' ages range was from 17 to 19 years of age. Table 1 displays the demographics of the sample.

Table 1

Demographics of Sample

<u>Demographic</u>	<u>QCT</u>		<u>NO-QCT</u>	
	<u># of Participants</u>	<u>Percentage</u>	<u># of Participants</u>	<u>Percentage</u>
Male	10	77%	11	73%
Female	3	23%	4	26%
11 th	1	7%	15	100%
12 th	12	92%	0	0%

Note. Sample Size, n = 13, n = 15.

Research question

The research question for this study was:

RQ1. What is the extent of the relationship between the Quick Coherence Technique (QCT) and eleventh and twelfth grade students' academic achievement on an online high-stakes reading assessment?

The results revealed there was a positive relationship between the QCT and eleventh and twelfth grade students' academic achievement on an online high-stakes reading assessment. Descriptive statistics were conducted using the 28 students' data. Table 2 depicts the overall pre-test and post-test descriptive statistics results.

Table 2

Overall Pre-Test and Post-Test Descriptive Statistics

	Pre-Test	Post-Test	Difference
Mean	24.5%	34.5%	9.9
Median	21.5%	31.5%	7.5
Mode	20%	30%	3, 7
Minimum	13%	13%	-20
Maximum	50%	58%	35
Range	37	45	55
Standard Deviation	9.9%	11.3%	12.2

Note. Sample Size, n = 28, n = 28, n = 28.

Descriptive statistics were conducted identifying the central tendency (mean, median, mode) and variance (range, standard deviation) using the 28 students' pre-test and post-test data on an online high-stakes reading assessment to provide an overall perspective of the results. The highest possible score on test was a 100 percentage points. The minimum score on the pre-test was 13 percent and the maximum score was 50 percent. The mean for the pre-test was 24.5

percent and the mode was 20 percent. The range for the pre-test was 37 percentage points while the standard deviation or the spread of distribution was 9.9 percentage points.

After the pre-test was administered, the QCT group listened and practiced the self-regulating breathing technique for 20 days. During this time the same scientifically based reading and test strategies were provided to both groups. Scientifically based reading practices are specific programs that provide a systematic and explicit instruction of selected reading strategies that are evidently effective (Koch & Spörer, 2017). On the 20th day, the post-test was administered. For the post-test, the overall minimum score was 13 percent and the maximum score was 58 percent. The average score on the post-test was 34.5 percent and the mode was 30 percent. The standard deviation was 11.3 percentage points and range was 45 percentage points. It is important to note that according to Quality Counts (2018) and Grading Scales Methodology (2018) scores below 60 percent are considered failing. No student in either group scored higher than 58 percent on the pre-test or the post-test. Therefore, all 28 students failed both tests.

Descriptive statistics were also conducted for the QCT group. The central tendency and variances were found for the pre-test, post-test, and the differences in their scores. There were 13 students in this group which consisted of 12 twelfth graders and 1 eleventh grader. Table 3 illustrates the QCT group's descriptive statistics results.

Table 3

QCT Pre-Test and Post-Test Descriptive Statistics

Statistic	Pre-Test	Post-Test	Difference
Mean	21.5%	30.4%	8.9
Median	20%	30%	7
Mode	15%	35%	3
Minimum	15%	18%	3
Maximum	45%	48%	25
Range	30	30	22
Standard Deviation	8.1%	8.1%	6.4

Note. Sample Size, n = 13, n = 13, n = 13.

The QCT group's pretest minimum score was 15 percent and maximum score was 45 percent. The QCT group's pre-test mean was 21.5 percent and the mode was 15 percent. The pre-test range was 30 percentage points and the standard deviation was 8.1 percentage points. For the post-test, the minimum score was 18 percent and the maximum was score was 48 percent. The mode was 35 percent. On average, the QCT students scored 8.9 percentage points higher on the post-test. The spread of distribution for the post-test was 8.1 percentage points which was the same at the pre-test.

All 13 students who conducted the QCT, the self-regulation technique made academic gains. The QCT brings psychophysical coherence to the mind and body and assists with optimal performance, emotional stability, and cognition (HeartMath, 2018). Because all students who used the QCT made academic gains from pre-test to the post-test, a conclusion was drawn

identifying a positive relationship between the QCT and students' academic achievement. Figure 1 provides a visual of the QCT group's gains from the pre-test to the post-test.

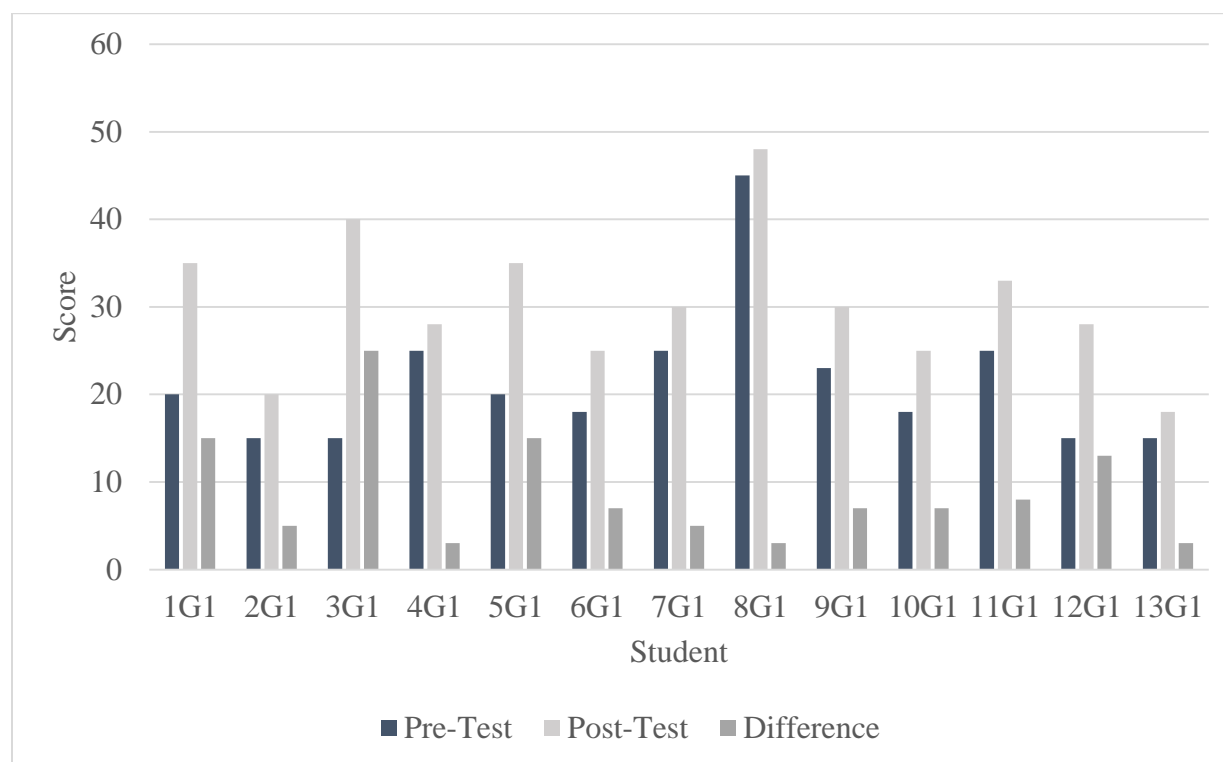


Figure 1. QCT group pre-test and post test scores

All 13 students in the QCT group demonstrated academic gains from the pre-test to the post-test. The QCT group's minimum gain was three percentage points and the maximum was 25 percentage points. Although no student passed the pre-test or the post-test, every student demonstrated academic gains from the pre-test to the post-test. Because of this increase, the findings in this study indicated a positive relationship between the QCT and student academic achievement.

The No QCT group consisted of 15 students who were all in eleventh grade. This group took the pre-test and post-test and was not exposed to the self-regulation breathing technique. Table 4 depicts the descriptive statistics conducted for the No QCT group.

Table 4

Descriptive Statistics for No QCT Group

Descriptive Statistic	Pre-Test	Post-Test	Difference
Mean	27.2%	38.0%	10.8
Median	25%	33%	12
Mode	20%	30%	27
Minimum	13%	13%	-20
Maximum	50%	58%	35
Range	37	45	55
Standard Deviation	10.8%	12.7%	15.8

Note. Sample Size, n = 15, n = 15, n = 15.

In the No QCT group, the minimum score for the pre-test was 13 percent and the maximum score was 50 percent. The No QCT group's mean for the pre-test was 27.2 percent and the mode was 20 percent. The range for the No QCT group pre-test was 37 percentage points and the standard deviation was 10.8 percentage points. The No QCT group's post-test minimum score was 13 percent and the maximum score was 58 percent. The range for the post-test was 45 percentage points. On average, the No QCT group scored 10.8 percentage points higher than the post-test. The No QCT group's mean was 1.9 percent higher than the QCT group out of a 100 point spread; which was minimal. However, unlike the QCT group, only 11 students out of the 15 made academic gains from the pre-test to the post-test. Furthermore, out of the 15 students, one student exhibited no growth and three students' scores declined from the pre-test to the post-test. Figure 2 is a visual of the No QCT group's data.

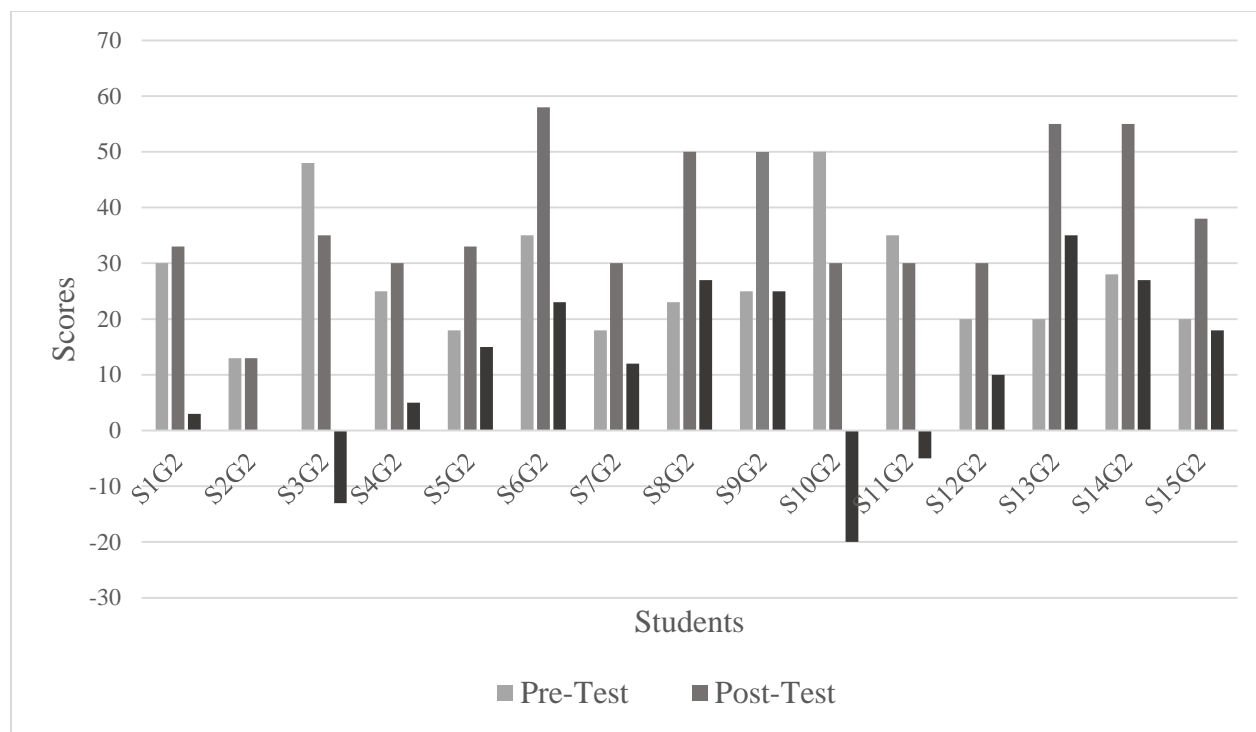


Figure 2. *The No QCT group pre-test and post-test scores.*

The 15 students in the No QCT group did not participate in the self-regulation technique. The categorical label for the No QCT group was represented by G2 and the students were labeled: Student1G2, Student2G2, etc. The categorical label in Figure 2 was modified from Student to S in order to make the x-axis to be reader friendly. Similar to the QCT group, no student in this group passed the pre-test or the post-test. However, only 11 out of the 15 students made academic gains from the pre-test to the post-test. One student's score remained the same and three students' scores actually declined from the pre-test to the post-test. For example, S2G2 demonstrated no academic gains while S3G2 decreased 13 percentage points from the pre-test the post-test. S10G2's scores declined 20 percentage points and S11G2's academic scores decreased five percentage points from the pre-test to the post-test.

Evaluation of the Findings

The findings of this study based on the data illustrated a positive relationship between the QCT and eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment. All 13 students in the QCT group increased their academic achievement from the pre-test to the post-test. However, in the No QCT group, out of the 15 students, three students' academic achievement scores declined and one student showed no growth from pre-test to the post-test.

The theoretical framework for this study was based on the self-regulation theory (SRT) which focuses on consciously self-correcting a maladaptive thought or feeling through self-regulation (Rosanbalm & Murray, 2018). Self-regulation techniques have been known to positively impact academic ability and health in students (Bergen-Cico et al., 2015; Jerath et al., 2015; McCraty, 2016; Vohs and Baumeiste, 2016). The QCT is an emotional self-regulation breathing method that regulates emotions and brings about psychophysiological coherence (HeartMath, 2018). The self-regulation breathing technique, the QCT, used in this study aligned with the self-regulation theory and improved students' achievement. Therefore, this study assisted with strengthening the self-regulation theory.

A study presented in the literature review aligned with the present study because the findings demonstrated that sixth graders who conducted self-regulation increased their academic achievement (Bergen-Cico et al., 2015). Findings from another self-regulation study discussed in the literature review found that slow deep breathing created a homeostatic state to the psychological and physical systems (Jerath et al., 2015). In addition, another self-regulation study's findings within the literature review identified that when older students practiced emotional self-regulation they were able to faster defer negative emotions (Vohs & Baumeiste,

2016). The results from the studies connect to the present study as the students in the QCT group may have been able to defer their negative emotions and create a homeostatic state to their psychological and physical systems which assisted them to improve their academic achievement on the post-test.

Summary

The findings in this study support a positive relationship between the QCT and eleventh and twelfth grade students' academic achievement on an online high-stakes reading assessment. Within in 20 day, the 13 students in the QCT group demonstrated academic gains from the pre-test to the post-test. From the pre-test to the post-test, the QCT's group minimum gain was three percentage points and the maximum was 25 percentage points. Out of the 15 students in the No QCT group, three students' scores actually decreased, one student's scores remained the same. The other 11 students' scores improved from the pre-test to the post-test. Furthermore, for the pre-test and post-test, all 28 students did not achieve a passing score. This study's findings provide an opportunity for similar studies to take place based on the implications, recommendations, and conclusions.

Chapter 5: Implications, Recommendations, and Conclusions

The problem addressed in this study was that eleventh and twelfth grade students often experience test anxiety impeding their academic achievement on online high-stakes reading assessments required to graduate (Sellakumar, 2015). The purpose of this quantitative descriptive study was to determine the extent of the relationship between the Quick Coherence Technique (QCT) and eleventh and twelfth grade students' academic achievement on an online high-stakes practice reading assessment. Understanding the relationship between the QCT and eleventh and twelfth grade students' academic achievement helped determine if the QCT can be used with students who are at risk to not graduate with a high school diploma. The QCT can be used to help eleventh and twelfth grade students improve their academic performance on the high-stakes reading assessment required to graduate. The QCT is a simple, natural, self-regulation technique that balances heart rate variability and improves classroom behaviors and academic achievement of students (Whited et al., 2014).

The data from this study included 28 out of 406 eleventh and twelfth grade students who needed to pass the Florida state reading requirement. The 28 students in the study were divided into two groups: 13 students in the QCT group who were taught and used the self-regulation technique and 15 students in the No QCT group who did not learn the self-regulation technique. Before the implementation of the QCT, both groups took an online practice reading high-stakes assessment. Next, the QCT group practiced the self-regulation technique for 20 days. During this 20-day period, one teacher provided both groups the same scientifically-based reading and testing strategies. Scientifically-based reading practices are specific programs that provide a systematic and explicit instruction of selected reading strategies that are evidently effective (Koch & Spörer, 2017). On the 20th day, the 28 students took the same test again, also known as

the post-test. The central tendency and variance were identified for the two groups using the data collected from the pre-test and post-test. The individual scores were summarized into data sets and used to understand the relationship between the QCT and eleventh and twelfth grade students' academic achievement. Based on the results, a positive relationship was found between the QCT and eleventh and twelfth grade students' academic achievement on the online high-stakes practice reading assessment.

The first limitation in the study was that the results were determined by only 28 eleventh and twelfth grade students. The 28 students were a small percentage of the 406 students and may not truly represent all eleventh and twelfth grade students who were at risk to not graduate with a high school diploma. The second limitation was based on the assumption that the 28 students could not meet proficiency on the state reading requirement due to test anxiety. There may have been various reasons why the students were struggling to meet proficiency on the state reading requirement, such as, but not limited to, lack of self-esteem, personal issues with family and peers, or an inability to read at grade level.

This chapter begins with the implications of the study and a description of what logical conclusions can be drawn from the analyzed data. The focus of this chapter is the implications of the findings from this study. The chapter continues with recommendations for practice and for future research and concludes with a summary.

Implications

The four direct implications from this study were based on the positive relationship found between the QCT and eleventh and twelfth grade students' academic achievement which include (1) self-regulation theory appeared to apply to this group of eleventh and twelfth grade test takers, (2) QCT could potentially improve eleventh and twelfth grade students' academic

achievement who are at risk to not graduate with a high school diploma, (3) school-wide test anxiety intervention programs implementing the QCT in schools could improve student academic achievement, and (4) high school students may be able to improve scores naturally through using the QCT instead of using prescription drugs or caffeine enhancers.

The first implication from this study was the self-regulation theory appears to apply to this group of eleventh and twelfth grade test takers. The self-regulation theory focuses on intentionally self-regulating emotions (McCraty, 2016). Self-regulation involves deliberately altering one's emotions which improves attention and assists with increasing academic achievement on tests (Mellin, 2016). In this study, the QCT audio recording directed the students to shift their emotions to a positive thought, such as gratitude, compassion, or joy with each inhale and exhale. The students who conducted the QCT made academic gains. Potentially these students, through practicing the QCT could have learned to shift their feelings to positive emotions which helped the students perform better on the tests. Therefore, based on the sample of students in this study, the finding appears to support the self-regulation theory.

The second implication from this study is the QCT technique could potentially improve eleventh and twelfth grade students' academic scores who are at risk of not graduating with a high school diploma. High schools generally have overarching goals to prepare students to be college and career ready by teaching academic strategies to improve achievement (Ferguson et al. 2015; McGlynn, 2016). Teachers and administrators could consider using an alternative approach, such as the QCT to educate students on how to manage their emotions and improve their achievement on assessments. In this study, the 13 students who conducted the self-regulation technique improved academically. The three students who did not conduct the self-regulation technique scores declined from the pre-test to the post-test. Teaching the QCT

technique to eleventh and twelfth grade students who are at risk of not graduating with a high school diploma could potentially increase the test scores. In turn, the students may perform high enough to pass the state reading requirement and graduate with a high school diploma.

The third implication is that schools could implement a school-wide text anxiety intervention program using the QCT which could improve student academic achievement. In the United States, all states have high-stakes assessments which require students to meet a specific level of proficiency (Huddleston & Rockwell, 2015). Test anxiety weakens students' psychological, physical well-being, and the ability to perform well on tests (Gibson, 2015). If students are anxious, students may not be able to perform to their true potential. Because test anxiety is prevalent with children and adolescents, there is a need for schools to start providing test anxiety interventions (Von der Embse et al., 2013). To address this need for test anxiety interventions, it would be advantageous to teach the QCT as a school-wide test anxiety intervention program which would empower all school-age students to utilize this strategy during testing situations.

The fourth implication is high school students could use the QCT technique to improve scores naturally without using prescription drugs or caffeine enhancers to assist with reducing test anxiousness and improving academic achievement. Students who experience test anxiety have been known to take cognitive enhancements to assist with focusing (Sattler & Wiegel, 2013). A cognitive enhancement is a prescription drug (beta-blocker) or caffeine enhancer drink taken by healthy individuals (Ranke, Bagusat, Rust, Engel, & Lieb, 2014; Sattler & Wiegel, 2013). Further evidence within the literature review indicated that first-time beta-blockers were the highest among high school students, aged 18-19 (Butt et al., 2017). The students' ages in this study ranged from 17 to 19 years of age. Students who used beta-blockers to assist with exams

had an increased risk of later using antidepressants and attempting suicide (Butt et al., 2017). In this study, the high school students who used the QCT scores improved from the pre-test to the post-test. High school students could practice the QCT technique and improve scores by using a natural method instead of using prescription drugs or caffeine enhancers to improve academic achievement.

Recommendations for Practice

The first recommendation for practice is to garner the support of stakeholders before implementing the QCT in a study or in a school-wide test-anxiety intervention program. McCraty (2007) indicated that having the faculty and staff buy-in will assist with strengthening the outcome. However, if the staff does not agree and support the intervention, the students may not be motivated to learn and apply it (McCraty, 2007). For this study, both the administrator and volunteering teacher agreed for the study to take place; however, agreeing to the study and supporting the study are two separate entities. It would have benefited this study to conduct the training in group setting with the administrators and teachers to initiate a shared buy-in and support the implementation for QCT in the classroom. Instead, everything was conducted on an individual bases and no shared buy-in was achieved. The teacher and administrators did not discuss the study. Unknowingly, the teacher may have felt unsupported while conducting this study because the administrators were not involved in the process. Furthermore, without knowing the data, the teacher did not think the QCT benefited this group of test-takers because they did not appear to be engaged while listening the QCT audio recording. Furthermore, it was not required in this study; however, it would benefit the students if the teacher modeled and conducted the QCT with the students in subsequent studies. Therefore, for future practice, it would be beneficial to provide professional development to administrators, staff, and students

about the detrimental impacts of test anxiety, the QCT and its benefits, and to provide an opportunity to explicitly practice the QCT together. The training should include the successful findings from this study. For the QCT to be effective in schools, it is recommended to have all stakeholders support its use before implementing the self-regulation technique. It is also recommended that the teacher models and conducts the QCT with the students.

The second recommendation for practice is to use a QCT video instead of using an audio recording in subsequent studies or for implementation of the QCT. For this study, students listened to the QCT audio recording which guided students to practice the QCT. Although student academic achievement increased in the QCT group, the teacher suggested using a QCT video to strengthen student engagement. Visual and kinesthetic learning are preferred methods of learning and assist with strengthening student engagement (Alkooheji & Al-Hattami, 2018). Having students conduct the self-regulation technique as they watch the video could potentially assist with strengthening engagement. Thus, watching the QCT video may strengthen student engagement, thus leading to even more academic gains.

The third recommendation would be to create a school-wide test anxiety intervention program using the QCT to potentially assist with reducing test anxiety and increase student academic achievement. Test anxiety is a universal phenomenon (Heiser, Simidian, Albert, Garrusto, Catucci, Faustino, McCarten, & Caci, 2015; Sung et al., 2016). Test anxiety inhibits the cognitive ability of students to perform well on tests (McCraty, 2016). Because high-stakes assessments will continue to increase, it is imperative for educators to address the physical and psychological well-being of the students in order for the students to reach their academic potential (Hopefenbeck, 2017). Therefore, test anxiety interventions are in dire need for school-age populations (Putwain & Pescod, 2018; Von der Embse et al., 2013). In this study, three

students out of the 15 students who did not receive the self-regulation breathing technique scores declined from the pre-test to the post-test. While all 13 students in the QCT group made academic gains. If students are taught the QCT in schools, student academic achievement could potentially increase and more students may begin to graduate.

Recommendations for Future Research

The first recommendation for future research would be to replicate this study in a high school setting with a larger sample size. In the spring of 2018, 406 out of the 1,071 eleventh and twelfth graders continued to not meet proficiency on the online high-stakes reading assessment required to graduate (FLDOE, 2018). These 406 eleventh and twelfth grade students still needed to pass in August. However, by February, when this study was conducted, many of the students had passed the state reading requirement. Therefore, to yield a larger sample size, subsequent research should be conducted at the beginning of the school year.

The second recommendation for future research is to conduct student interviews in order to understand if and to what extent students are experiencing test anxiousness before and during tests. Interviewing the students could assist with understanding the different test anxiety levels, and this would provide a clearer understanding of the relationship between the QCT and student academic achievement. This study could have benefitted from knowing the test anxiety levels of the students.

The third recommendation for future research is to require that attendance be taken each day while the QCT is administered. Although this study was successful, it cannot be determined how many days each student practiced the QCT because it was not required to take attendance each day. In future studies, it would be beneficial to take attendance each day during the

implementation of the QCT. This would strengthen the reliability of the independent variable in this study which was the QCT.

Conclusions

This quantitative descriptive study provided an opportunity to examine the relationship between the QCT and the academic achievement of eleventh and twelfth grade students on an online high-stakes practice reading assessment as a way to close the gap of the limited research between self-regulation techniques and student academic achievement. The results identified a positive relationship between the QCT and eleventh and twelfth grade students' academic achievement. These students were at risk of not graduating with a high school diploma because they could not meet proficiency on the state reading assessment.

The results of this study offer a possible solution to assist eleventh and twelfth grade students to improve their academic achievement on online high-stakes reading assessments required to graduate. In this study, the 13 students who practiced the QCT could continue to use the QCT and potentially improve their achievement scores on the high-stake reading assessment meeting proficiency and earning a high school diploma. Having high school diplomas would create more opportunities and positively impact their futures. Students who do not have a high school diploma have little opportunities in life (Reingle Gonzalez et al., 2016). Furthermore, students who do not have a high school diploma are known to have more mental illnesses, are more inclined to take drugs, tend to conduct more criminal behavior, and have a shorter life expectancy (Reingle Gonzalez et al., 2016). Therefore, by implementing the QCT, a simple and free self-regulation technique, it could not only assist in improving student academic achievement; it could positively alter students' futures. In turn, by more students graduating with

a high school diploma, it could reduce the chances of obtaining a mental illness, using drugs or conducting criminal behaviors. These factors would positively impact global society.

Furthermore, this study's success substantiates and provides a foundation to continue to enhance the trajectory of research about the self-regulation theory, test anxiety, and the relationship between self-regulation and student academic achievement. Subsequent studies could replicate this study implementing the QCT with a larger sample of eleventh and twelfth grade students. Additional studies could also utilize various student populations, such as but not limited to, elementary and middle school students who have not met proficiency on the state reading assessments to further understand the relationship between the QCT and student academic achievement.

Most importantly, this study's results contribute to the field of education in both research and practice by demonstrating a positive relationship between the QCT and student academic achievement for this group of test-takers. The findings assist in reducing the gap in literature with interventions to improve student academic achievement on high-stakes assessment required to graduate. Future research could use the findings to enhance the understanding of the relationship between the QCT and academic achievement. Equally important, schools could apply these findings and initiate a paradigmatic change in education by teaching the QCT, a natural, free, and simple technique, which could potentially increase student academic achievement as it did for this group of test-takers and could positive alter students' lives not just for a day but for a lifetime.

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Appendices

Appendix A – ACT Pre-Post Test

11/16/2018

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Your Classroom Partner

ACT Reading Practice Test 1 - Answer Sheet

Bonobos: Amazing Apes
 Trilby Greene

¹Deep in the rain forests of central Africa, a chorus of high-pitched shrieks rings out from the cawing treetops. Though they sound like strange birds, these singers don't have feathers or wings. They are a rare and interesting breed of apes called bonobos.


Bonobo Distribution in the Wild

²Bonobos are often mistaken for chimpanzees. In fact, scientists didn't even know bonobos existed until the early twentieth century, and they didn't study bonobos in the

wild until the 1970s. This is because bonobos are very hard to find. They only exist naturally in the area of Africa known as the Congo Basin. Fewer than 150 bonobos live in zoos around the world. About half of these animals live in zoos across America.

³One thing that makes bonobos so special is that they share many traits with humans. They look and act surprisingly like humans do. In fact, they share about 98 percent of their genes with human beings. This is not true of any other animal in the world. Bonobos are much smarter than other apes. They can also walk on two feet more easily than any other ape can—even in the treetops.

⁴Also like humans, bonobos are very emotional animals. They make different faces to show a friendly greeting, fear or distress, defeat, excitement, and play. They even pout when they are unhappy. If bonobos are in danger, they gather in the treetops to shout and wave sticks at their enemies. In captivity, they have been known to display such social behaviors as adopting orphans, assisting the elderly, and helping newcomers learn the ropes. Bonobos have even learned to respond to human language.

⁵Bonobos live in communities of 25 to 100 apes. Each community breaks into smaller groups. These groups then travel during the day to look for food. Unlike in chimpanzee groups, female bonobos rule the roost. Bonobo societies are known to be peaceful. This is partly because they eat so many types of food that they don't have to compete with other animals for their meals. Bonobos mostly eat fruit, but they also eat nuts, bark, twigs, leaves, flowers, roots, and stems. Sometimes bonobos eat caterpillars or worms. Their high-protein diet prevents them from having to eat meat unless it's necessary.

⁶Though bonobos don't have many natural enemies, the number of bonobos in the wild has rapidly decreased. One reason is that political troubles have forced many people in the Congo to leave their villages. These people then make their homes in the rain forest. This limits the land where bonobos can live. Political problems have also stopped government efforts to create safe areas for bonobos. This leaves the apes unprotected from hunters and other human disturbances. It's a good thing, then, that other groups are trying to help bonobos. The Bonobo Conservation Initiative (BCI) is a group of scientists and concerned individuals who help bonobos. The BCI works to set up protected areas for bonobos, to teach the world about their situation, and to encourage others to help save bonobos from disappearing from the wild.

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1) According to the passage, which statement does NOT accurately describe the differences between bonobos and chimpanzees?

- A) Bonobos share more genes with humans than chimpanzees do.
- B) Bonobos are in more danger of becoming extinct than chimpanzees.
- C) In bonobo groups, males are the leaders unlike chimpanzee groups.**
- D) Humans have been studying bonobos for a shorter amount of time than chimpanzees.

Explanation:

In bonobo groups, males are the lead unlike in chimpanzee groups is not an accurate difference between bonobos and chimpanzees. The passage clearly states that bonobos groups are led by the female, which differs from chimpanzee groups.

2) According to the passage bonobo societies are peaceful because of their

- A) diverse diet.**
- B) endangered habitat.
- C) sophisticated genes.
- D) emotional capabilities.

Explanation:

Bonobo societies are peaceful partly because of their **diverse diet**. Bonobos have little competition with each other since they eat a wide variety of foods. The passage specifically discusses this in paragraph 5.

3) What effect is achieved by the author's inclusion of the details in this paragraph?

- A) It makes the reader more prone to view the bonobos with awe and wonder.
- B) It makes the reader find the activities of the bonobos familiar and relatable.**
- C) It makes the reader feel sorry for the bonobos.
- D) It convinces the reader that the bonobos should be saved from extinction.

Explanation:

The correct answer is **it makes the reader find the activities of the bonobos familiar and relatable**. This paragraph displays the various ways that the bonobos' activities are similar to those of humans.

W. E. B. Du Bois

Jon Reese

¹ An outstanding critic, editor, scholar, author, and civil rights leader, W. E. B. Du Bois is certainly among the most influential blacks of the twentieth century. Born in Great Barrington, Massachusetts on February 23, 1868, Du Bois received a bachelor's degree from Fisk University and went on to earn a second bachelor's, as well as a Ph.D., from Harvard. He was for a time professor of Latin and Greek at Wilberforce and the University of Pennsylvania, and also served as a professor of economics and history at Atlanta University.

² One of the founders of the National Association for the Advancement of Colored People (NAACP) in 1909, Du Bois served as that organization's director of publications and editor of *Crisis* magazine until 1934. In 1944, he returned from Atlanta University to become head of the NAACP's special research department, a post he held until 1948. Dr. Du Bois emigrated to Africa in 1961, and became editor-in-chief of the *Encyclopedia Africana*, an enormous publishing venture which had been planned by Kwame Nkrumah, since then deposed as president of Ghana. Du Bois died in Ghana on August 27, 1963, at the age of 95.

³ Du Bois wrote numerous books, and it is this enormous literary output on such a wide variety of themes which offers the most convincing testimony to Du Bois's lifetime position that it was vital for blacks to cultivate their own **aesthetic and cultural values** even as they made valuable strides toward social emancipation. In this he was opposed by Booker T. Washington, who felt that black people should concentrate on developing technical and mechanical skills before all else.

⁴ Du Bois was one of the first male civil rights leaders to recognize the problems of gender discrimination. He was among the first men to understand the unique problems of black women, and to value their contributions. He supported the women's suffrage movement and strove to integrate this mostly white struggle for the right to participate in elections. He encouraged many black female writers, artists, poets, and novelists, featuring their works in *Crisis* and sometimes providing personal financial assistance to them. Several of his novels feature women as prominently as men, an unusual approach for any author of his day. Du Bois spent his life working not just for the equality of all men, but for the equality of all people.

4) What can you infer about Du Bois from this passage?

- A) **He saw great value in the power of the written word.**
- B) He took a religious view on the role of women in society.
- C) He was willing to rely on foreign governments to help the U.S.
- D) He was unaware of the economic situation of most black Americans.

Explanation:

He saw great value in the power of the written word is the correct choice since that statement is supported by the fact that he wrote numerous books and edited a magazine.

5) According to this passage, Dr. Du Bois supported the women's suffrage movement. What does *suffrage* mean?

- A) **the right to vote in any election**
- B) the right to avoid pain and suffering
- C) the right to veto a law that discriminates
- D) the right to avoid being controlled by a man

Explanation:

The right to vote in any election is the correct answer.

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- 6) In light of paragraph 4, what can be inferred about the common perception of women during the late 1800's and early 1900's?
- A) Women were integral to the fight to free the slaves.
 - B) Women were valued for their roles as mothers and wives.
 - C) Women were chosen as leaders because of their superior skills.
 - D) **Women were thought of as weak because of the traditional attitudes.**

Explanation:

The common perception during this time is that **women were thought of as weak because of the traditional attitudes.** Dubois recognized the discrimination of the majority and encouraged women to become more than their traditional role.

Jane Eyre (#2)

Charlotte Brontë

¹ Five o'clock had hardly struck on the morning of the 19th of January, when Bessie brought a candle into my closet and found me already up and nearly dressed. I had risen half-an-hour before her entrance, and had washed my face, and put on my clothes by the light of a half-moon just setting, whose rays streamed through the narrow window near my crib. I was to leave Gateshead that day by a coach which passed the lodge-gates at six a.m. Bessie was the only person yet risen; she had lit a fire in the nursery, where she now proceeded to make my breakfast. Few children can eat when excited with the thoughts of a journey; nor could I. Bessie, having pressed me in vain to take a few spoonfuls of the boiled milk and bread she had prepared for me, wrapped up some biscuits in a paper and put them into my bag; then she helped me on with my pelisse and bonnet, and wrapping herself in a shawl, she and I left the nursery. As we passed Mrs. Reed's bedroom, she said, "Will you go in and bid Missis good-bye?"

² "No, Bessie: she came to my crib last night when you were gone down to supper, and said I need not disturb her in the morning, or my cousins either; and she told me to remember that she had always been my best friend, and to speak of her and be grateful to her accordingly."

³ "What did you say, Miss?"

⁴ "Nothing: I covered my face with the bedclothes, and turned from her to the wall."

⁵ "That was wrong, Miss Jane."

⁶ "It was quite right, Bessie. Your Missis has not been my friend: she has been my foe."

⁷ "O Miss Jane! don't say so!"

⁸ "Good-bye to Gateshead!" cried I, as we passed through the hail and went out at the front door.

⁹ The moon was set, and it was very dark; Bessie carried a lantern, whose light glanced on wet steps and gravel road sodden by a recent thaw. Raw and chill was the winter morning: my teeth chattered as I hastened down the drive. There was a light in the porter's lodge: when we reached it, we found the porter's wife just kindling her fire: my trunk, which had been carried down the evening before, stood corded at the door. It wanted but a few minutes of six, and shortly after that hour had struck, the distant roll of wheels announced the coming coach; I went to the door and watched its lamps approach rapidly through the gloom.

¹⁰ "Is she going by herself?" asked the porter's wife.

¹¹ "Yes."

¹² "And how far is it?"

¹³ "Fifty miles."

¹⁴ "What a long way! I wonder Mrs. Reed is not afraid to trust her so far alone."

¹⁵ The coach drew up; there it was at the gates with its four horses and its top laden with passengers: the guard and coachman loudly urged haste; my trunk was hoisted up; I was taken from Bessie's neck, to which I clung with kisses.

¹⁶ "Be sure and take good care of her," cried she to the guard, as he lifted me into the inside.

¹⁷ "Ay, ay!" was the answer: the door was slapped to, a voice exclaimed "All right," and on we drove. Thus was I severed from Bessie and Gateshead; thus whirled away to unknown, and, as I then deemed, remote and mysterious regions.

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7) What did Mrs. Reed say to Jane the previous night?

- A) She told Jane to have a nice trip.
- B) She told Jane to be sure and write her on occasion.
- C) **She told Jane not to disturb her or her cousins in the morning.**
- D) She told Jane to remember that she had always been Jane's worst enemy.

Explanation:

She told Jane not to disturb her or her cousins in the morning is the correct answer. Jane says this to Bessie.

8) What is the date of Jane's departure?

- A) January 17
- B) January 18
- C) **January 19**
- D) January 20

Explanation:

January 19 is the correct answer. This is stated in first sentence of the passage.

9) At approximately what time did the coach arrive at the porter's lodge?

- A) **shortly after 6**
- B) shortly after 4
- C) shortly before 5
- D) shortly before 7

Explanation:

Shortly after 6 is the correct answer. The passage states that shortly after the hour of six had struck, the distant roll of wheels announced the coach's arrival.

10) At what time did Jane rise?

- A) **4:30**
- B) 5:00
- C) 5:30
- D) 6:00

Explanation:

4:30 is the correct answer. The passage states that Jane had arisen a half-hour before Bessie's arrival to her room. Bessie arrived at five o'clock.

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11)

Excerpt from *Boy to His Dog*
 Florence Wilmington

¹ Jerome is pacing in his bedroom. The bedroom walls are decorated with posters of famous soccer players, and a trophy case sits to the left of the bed. There is a desk with a chair directly across from the bed. A pile of books sits on the desk. A small window is behind the bed. Jerome's Border Collie, Roscoe, sits on the bed and looks at Jerome. Roscoe's head is cocked to one side as he listens to Jerome speak.

Why is the description of Jerome's room in section one significant?

- A) *It reveals that Jerome is a soccer fan.*
 B) It establishes the mood of the monologue.
 C) It illustrates Jerome's hopes for future.
 D) It shows the audience that Jerome loves animals.

Explanation:

The description of Jerome's room in paragraph 1 is significant because **it reveals that Jerome is a soccer fan.** At the beginning of the monologue, the author explains that there are soccer posters all over Jerome's walls. This shows that he is a fan of the sport.

Ain't I A Woman?
 Sojourner Truth (1797-1883)

¹ Well, children, where there is so much racket there must be something out of kilter. I think that 'twixt the negroes of the South and the women at the North, all talking about rights, the white men will be in a fix pretty soon. But what's all this here talking about?

² That man over there says that women need to be helped into carriages, and lifted over ditches, and to have the best place everywhere. Nobody ever helps me into carriages, or over mud-puddles, or gives me any best place! And ain't I a woman? Look at me! Look at my arm! I have ploughed and planted, and gathered into barns, and no man could head me! And ain't I a woman? I could work as much and eat as much as a man - when I could get it - and bear the lash as well! And ain't I a woman? I have borne thirteen children, and seen most all sold off to slavery, and when I cried out with my mother's grief, none but Jesus heard me! And ain't I a woman?

³ Then they talk about this thing in the head; what's this they call it? [member of audience whispers, "intellect"] That's it, honey. What's that got to do with women's rights or negroes' rights? If my cup won't hold but a pint, and your's holds a quart, wouldn't you be mean not to let me have my little half-measure full?

⁴ Then that little man in black there, he says women can't have as much rights as men, 'cause Christ wasn't a woman. Where did your Christ come from? Where did your Christ come from? From God and a woman! Man had nothing to do with Him.

⁵ If the first woman God ever made was strong enough to turn the world upside down all alone, these women together ought to be able to turn it back, and get it right side up again! And now they is asking to do it, the men better let them.

⁶ Obligated to you for hearing me, and now old Sojourner ain't got nothing more to say.

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12) The author uses which rhetorical device to prove her point that women are as good as men?

- A) alliteration
- B) allusion
- C) dialogue
- D) **repetition**

Explanation:

Repetition is correct. The author repeats the question "Ain't I a woman?" over and over throughout the passage to prove her point that women are equal to men and to refute the other speaker's point that women must be sheltered and protected.

13) Which of these BEST identifies part of Sojourner Truth's point of view?

- A) **She values common sense.**
- B) She values high education.
- C) She is frustrated by the women of the North.
- D) She is frustrated by the 'negroes' of the South.

Explanation:

She values common sense. But what's all this here talking about? and *Ain't I a woman?* to point out the lack of common sense or illogical nature of her audience's arguments.

14) Which device or technique does the author employ in paragraph 2 with her repetition of the phrase "Ain't I a woman?"

- A) alliteration
- B) onomatopoeia
- C) personification
- D) **rhetorical question**

Explanation:

Rhetorical question is correct. The author repeatedly asks the same question, not expecting an actual answer from her audience, but to cause them to think about the fact that she is claiming that women are as capable as men, and therefore should be given equal rights.

15) One way that Sojourner Truth reacts to arguments against women's rights is

- A) by giving examples of her hard life as a slave.
- B) by repeatedly asking the question "Ain't I a woman?"
- C) by identifying one problem between the South and the North.
- D) **by addressing stereotypes of women as weak and mentally deficient.**

Explanation:

By addressing stereotypes of women as weak and mentally deficient is the correct answer. Sojourner Truth mentions specific examples of how women are treated.

16) Sojourner Truth's position as a former slave

- A) renders her views on voting rights more surprising.
- B) makes her views on the role of women less believable.
- C) **adds to the power of her argument for women's suffrage.**
- D) stands in marked contrast to her views on women's rights.

Explanation:

Incorporating her history **adds to the power** of her argument for women's suffrage. Her past life makes her audience listen all the more closely and with more open minds.

Asthma Information from the CDC

What Asthma Is

1 Asthma is a disease that affects your lungs. It is the most common long-term disease of children. It causes repeated episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing.

<https://www.usatestprep.com/states/states.php#tab-2>

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² We know that family history contributes to susceptibility, but in most cases we don't know what causes asthma to develop, and we don't know how to cure asthma. You can control your asthma by knowing the warning signs of an attack, avoiding things that trigger an attack, and following the advice of your doctor.

Effects of Asthma

³ In 2001, 20.3 million Americans had asthma, and 1.2 million had had an asthma attack in the previous year. If a person has a parent with asthma, he or she is three to six times more likely to develop asthma than is a person who does not have a parent with asthma.

How Asthma Is Diagnosed

⁴ Asthma can be difficult to diagnose, especially in children under 5 years old. Regular physical exams that include checks of lung function and for allergies can help make the right diagnosis.

⁵ A health-care provider trying to diagnose asthma will ask you questions about coughing, especially coughing at night, and whether breathing problems are worse after physical activity or during a particular time of year. Providers also ask about other symptoms, such as chest tightness, wheezing, and colds that last more than 10 days.

⁶ Also, a provider will ask about your family history of asthma, allergy and other breathing problems, and your home environment. He or she also will ask about lost school or work days and limits on your activity.

⁷ Testing of lung function, called spirometry, is another way to diagnose asthma. A spirometer is a piece of equipment that measures the largest amount of air you can exhale after taking a very deep breath. Airflow can be measured before and after you use an asthma medication.

What An Asthma Attack Is

⁸ Airways are the paths that carry air to the lungs. As the air moves through the lungs, the airways become smaller, like branches of a tree. During an attack, the sides of the airways in your lungs become inflamed and swollen. Muscles around the airways tighten, and less air passes in and out of the lungs. Excess mucus forms in the airways, clogging them even more. The attack, also called an episode, can include coughing, chest tightness, wheezing, and trouble breathing.

Causes Of An Asthma Attack

⁹ Environmental exposures, such as house dust mites and environmental tobacco smoke, are important triggers of an attack.

How Asthma Is Treated

¹⁰ You can control your asthma and avoid an attack by taking your medicine as prescribed and avoiding the triggers that can cause an attack. It's just as important that you remove the triggers in your environment that you know make your asthma worse.

¹¹ Medicine for asthma is different for each person. It can be inhaled or taken as a pill and comes in two types—quick-relief and long-term control. Quick-relief medicines control the symptoms of an asthma attack. If you are using your quick-relief medicines more and more you should visit your health-care provider to change your asthma management plan. Long-term control medicines make you have fewer and milder attacks, but they don't help you if you're having an attack.

Important Asthma Triggers - Environmental Tobacco Smoke, Also Known As Secondhand Smoke

¹⁴ Parents, friends, and relatives of children with asthma should try to stop smoking. Until they can successfully quit, they should smoke only outdoors, not in the home or in the family car. They should

not allow others to smoke in the home, and should make sure the child's school is smoke-free.

Dust Mites

15 Mattress covers and pillow case covers provide a barrier between house dust mites and the person with asthma. Down-filled pillows, quilts, or comforters should not be used and stuffed animals and clutter should be removed from bedrooms.

Outdoor Air Pollution

16 Pollution caused by industrial emissions and automobile exhaust can cause an asthma episode. In large cities that have air pollution problems the number of emergency department visits for asthma episodes goes up when the air quality is very poor.

Pets

18 Furry pets may trigger an attack. The simplest solution to this situation is to find another home for the pet. However, some pet owners may be too attached to their pets or unable to locate a safe new home for the animal. Any animal causing an allergic reaction should not be allowed in the bedroom. Pets should be kept outside as much as possible and bathed weekly. People with asthma are not allergic to their pet's fur, so trimming the pet's fur will not help your asthma. Frequent vacuuming will reduce the presence of the allergen. If the room has a hard surface floor, it should be damp mopped weekly.

Mold

19 When mold is inhaled, it can cause asthma attacks. Eliminating mold throughout the home can help control asthma attacks. Keep humidity levels between 35% and 50%. In hot, humid climates, this may require the use of air conditioning and/or dehumidifiers. Fixing water leaks and cleaning up any mold in the home can also help.

17) Which source would provide the MOST bias-free information about second hand smoke as a trigger of asthma?

- A) an advertisement by an air-purifying systems corporation
- B) an editorial by an asthma sufferer pushing for a ban on public smoking
- C) a pamphlet from a tobacco company about the dangers of secondhand smoke
- D) **a brochure from the respiratory information council at Johns Hopkins University**

Explanation:

A brochure from the respiratory information council at Johns Hopkins University would provide the most bias-free information on asthma and secondhand smoke. As a research hospital, Johns Hopkins would provide factual information that is not produced in an effort to benefit financially.

18) According to this article, why is this information about asthma significant to today's culture?

- A) Furry pets may trigger an asthma attack.
- B) Medicine for asthma is different for each person.
- C) Airways are the paths that carry air to the lungs.
- D) **It is the most common long-term disease of children.**

Explanation:

This information about asthma is significant to today's culture because **it is the most common long-term disease of children**. It is important that people are aware of a disease that is so prevalent among children.

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19) Which sentence functions as a counterargument in section 19?

- A) If the room has a hard surface floor, it should be damp mopped weekly.
 B) The simplest solution to this situation is to find another home for the pet.
 C) Parents, friends, and relatives of children with asthma should try to stop smoking.
 D) **However, some pet owners may be too attached to their pets or unable to locate a safe new home for the animal.**

Explanation:

However, some pet owners may be too attached to their pets or unable to locate a safe new home for the animal. This is the counterargument. The main argument is that it is easiest to find another home for the pet. The counterargument considers another side to the debate when it considers the attachment and responsibility to a family pet.

Thermometer Pills Can Save Young Lives

Tracy Wilson

¹ Over the past ten years more than two dozen athletes have died from the medical condition known as heatstroke. Heatstroke occurs when the body's internal temperature becomes so elevated that its cooling system begins shutting down. Who is most at risk? Surprisingly, it is younger athletes. They often either do not recognize or ignore the warning signs until it's too late. To make matters worse, children's bodies are much less efficient than adults at cooling themselves. A promising new product hopes to end the all too common heatstroke trend. It is called a thermometer pill.

² While it doesn't look much different than the average vitamin capsule, the work it does inside the body is truly amazing. Once ingested these capsules send an internal body temperature reading to a portable device that is like a Palm Pilot. A coach or professional trainer monitors the device during practices or events held when temperatures and heat indexes are particularly high. If an athlete's body temperature reaches a dangerous level, the monitor immediately transmits an alert. The player is then rushed indoors and placed in an ice bath to rapidly decrease his or her body temperature. This is important, since internal organs can begin shutting down at 105 degrees Fahrenheit.

³ While these tiny lifesavers have proven to be effective, they are quite expensive. On average the cost is \$50.00 per pill. However, many parents of young athletes say that it is a small price to pay for the peace of mind it gives them on a hot, sultry day.

20) Which rhetorical strategy is used in the first paragraph?

- A) description
 B) division/classification
 C) **exemplification**
 D) narration

Explanation:

exemplification is the correct answer. Exemplification provides examples—facts, statistics, cases in point, personal experiences, interview quotations—that add to help achieve the purpose of the author.

21) To strengthen the argument for using thermometer pills, the author points out that a person who becomes dangerously overheated faces

- A) scarlet fever.
 B) severe hypothermia.
 C) an increase in pulse rate.
 D) **organ failure that can lead to death.**

Explanation:

Organ failure that can lead to death is the correct answer. While the article explicitly states that organ failure is associated with severe overheating or heatstroke, readers should conclude that if vital organs shut down, death is certainly a possibility.

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22) Which statement best describes why the writer seems supportive of this product?

- A) It contains vitamins.
 B) It is a portable device.
 C) It is cutting-edge technology.
 D) **It could prevent the senseless deaths of young athletes.**

Explanation:

It could prevent the senseless deaths of young athletes. While the other answer choices are facts, the writer seems most compelled by the products ability to save lives.

The System of Dr. Tarr and Prof. Fether

Edgar Allan Poe

¹ DURING THE AUTUMN OF 18--, while on a tour through the extreme southern provinces of France, my route led me within a few miles of a certain Maison de Sante or private mad-house, about which I had heard much in Paris from my medical friends. As I had never visited a place of the kind, I thought the opportunity too good to be lost; and so proposed to my travelling companion (a gentleman with whom I had made casual acquaintance a few days before) that we should turn aside, for an hour or so, and look through the establishment. To this he objected-- pleading haste in the first place, and, in the second, a very usual horror at the sight of a lunatic. He begged me, however, not to let any mere courtesy towards himself interfere with the gratification of my curiosity, and said that he would ride on leisurely so that I might overtake him during the day, or, at all events, during the next. As he bade me good-bye, I bethought me that there might be some difficulty in obtaining access to the premises, and mentioned my fears on this point. He replied that, in fact, unless I had personal knowledge of the superintendent, Monsieur Maillard, or some credential in the way of a letter, a difficulty might be found to exist, as the regulations of these private mad-houses were more rigid than the public hospital laws. For himself, he added, he had, some years since, made the acquaintance of Maillard, and would so far assist me as to ride up to the door and introduce me; although his feelings on the subject of lunacy would not permit of his entering the house.

² I thanked him, and, turning from the main road, we entered a grass-grown by-path, which, in half an hour, nearly lost itself in a dense forest, clothing the base of a mountain. Through this dank and gloomy wood we rode some two miles, when the Maison de Sante came in view. It was a fantastic chateau, much dilapidated, and indeed scarcely tenable through age and neglect. Its aspect inspired me with absolute dread, and, checking my horse, I half-resolved to turn back. I soon, however, grew ashamed of my weakness, and proceeded.

³ As we rode up to the gate-way, I noticed it slightly open, and the visage of a man peering through. In an instant afterward, this man came forth, accosted my companion by name, shook him cordially by the hand, and begged him to alight. It was Monsieur Maillard himself. He was a portly, fine-looking gentleman of the old school, with a polished manner, and a certain air of gravity which was very impressive.

⁴ My friend, having presented me, mentioned my desire to inspect the establishment, and received Monsieur Maillard's assurance that he would show me all attention, now took leave, and I saw him no more.

⁵ When he had gone, the superintendent ushered me into a small and exceedingly neat parlor, containing, among other indications of refined taste, many books, drawings, pots of flowers, and musical instruments. A cheerful fire blazed upon the hearth. At a piano, singing an aria from Bellini, sat a young and very beautiful woman, who, at my entrance, paused in her song, and received me with graceful courtesy. Her voice was low, and her whole manner subdued, I thought, too, that I perceived the marks of sorrow in her countenance, which was excessively, although to my taste, not unpleasantly, pale. She was attired in deep mourning, and excited in my bosom a feeling of mingled respect, interest, and admiration.

⁶ I had heard, at Paris, that the institution of Monsieur Maillard's was managed upon what is vulgarly termed the "system of soothing"-- that all punishments were avoided-- that even confinement was seldom resorted to-- that the patients, while secretly watched, were left much apparent liberty, and that most of them were permitted to roam about the house and grounds in the ordinary apparel of persons in sight mind.

⁷ Keeping these impressions in view, I was cautious in what I said before the young lady; for I could not be sure that she was sane; and, in fact, there was a certain restless brilliancy about her eyes which half led me to imagine she was not. I confined my remarks, therefore, to general topics, and to such as I thought would not be displeasing or exciting even to a lunatic. She replied in a perfectly rational manner to all that I said; and even her original observations were marked with the soundest good sense, but a long acquaintance with the metaphysics of mania, had taught me to put no faith in such evidence of sanity, and I continued to practice, throughout our interview, the caution with which I commenced it.

⁸ Presently a smart footman in livery brought in a tray with fruit, wine, and other refreshments, of which I partook, the lady

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soon afterward leaving the room. As she departed I turned my eyes in an inquiring manner toward my host.

9 "No," he said, "oh, no—a member of my family—my niece, and a most accomplished woman."

10 "I beg a thousand pardons for the suspicion," I replied, "but of course you will know how to excuse me. The excellent administration of your affairs here is well understood in Paris, and I thought it just possible, you know—"

11 "Yes, yes—say no more— or rather it is myself who should thank you for the commendable prudence you have displayed. We seldom find so much of forethought in young men; and, more than once, some unhappy contre-temps has occurred in consequence of thoughtlessness on the part of our visitors. While my former system was in operation, and my patients were permitted the privilege of roaming to and fro at will, they were often aroused to a dangerous frenzy by injudicious persons who called to inspect the house. Hence I was obliged to enforce a rigid system of exclusion; and none obtained access to the premises upon whose discretion I could not rely."

12 "While your former system was in operation!" I said, repeating his words— "do I understand you, then, to say that the soothing system of which I have heard so much is no longer in force?"

13 "It is now," he replied, "several weeks since we have concluded to renounce it forever."

23)

I perceived the traces of sorrow in her countenance, which was excessively, although to my taste, not unpleasingly, pale.

Which sentence **MOST** accurately and concisely restates the information in the sentence from paragraph 5?

- A) Her sorrow could be traced back to excessive paleness.
- B) **Her face was full of sorrow, but pale as she was, she was somewhat attractive to me.**
- C) Her face was excessively full of such sorrow, but to my taste she was pale and unpleasing to look at.
- D) I was one of the few who could perceive the sorrow she hid from others, yet I could tell it was excessive sorrow because her paleness gave that away.

Explanation:

He is slightly allured by the unquestionable grief etched in her face. Therefore, while **her face was full of sorrow, she was somewhat attractive to him, pale as she was.**

24)

My friend, having presented me, mentioned my desire to inspect the establishment, and received Monsieur Maillard's assurance that he would show me all attention, now took leave, and I saw him no more.

Which **BEST** summarizes this sentence?

- A) My friend, Monsieur Maillard, introduced me and said he was about to leave.
- B) **My friend introduced me to Monsieur Maillard, told him I wanted a tour of the house, then left.**
- C) My friend was able to present me to Monsieur Maillard because he had to leave and I saw him no more.
- D) My friend told Monsieur Maillard that I was here to officially inspect the place to see if he had insurance, then left.

Explanation:

Three key things happen in this sentence: a) the narrator gets his friend to introduce him to Monsieur Maillard, b) the friend gets Monsieur Maillard to agree to show the narrator inside, and c) the friend leaves. The following sentence states all three key points: **My friend introduced me to Monsieur Maillard, told him I wanted a tour of the house, then left.**

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25) After reading paragraph 6, consider which sentence **BEST** summarizes the speaker's thoughts in this paragraph.

- A) *Monsieur Maillard ran his institution with liberal, loose rules, allowing mental patients to roam in virtual freedom in the normal clothes of the day.*
- B) Patients, while they were secretly being watched, were, however, given the liberty to wear what they wanted, but were punished if they even questioned being confined.
- C) Monsieur Maillard himself was considered mentally unstable as evidenced by his cruel punishments, confining his patients to the house or grounds and allowing them the freedom to wear other people's ordinary clothing.
- D) The institution's 'system of soothing' was a system whereby the confinement of such patients admitted to Monsieur Maillard's grounds were eventually granted their liberty and allowed to leave the institution.

Explanation:

Because **Monsieur Maillard ran his institution with liberal, loose rules**, the speaker seems to question his judgment on how to deal with patients.

The Peachtree Road Race: A Race Like No Other

David M. Martner

¹ A common golfer cannot play in the Masters or British Open with the world's best-known golfers, nor can the average tennis player play against the world's best at Wimbledon. No teenager just learning to drive can bank the turns with professional drivers at the Daytona 500. However, in the sport of road racing, common people and novice joggers can lace up and be in the same race as the world-class runners competing to win it all. The Peachtree Road Race in Atlanta, GA is the world's largest 10K, boasting 55,000 runners who line up for blocks at 7:30am to run down Atlanta's most famous street. Only a handful, however, really have a legitimate chance to win the prestigious crystal peach and the \$15,000 first place prize that comes with it. The Peachtree Road Race is unique as a road race in three distinctive ways: it is run on the 4th of July, it has a rich tradition, and it is the most competitive 10K in the world.

² One thing that makes the Peachtree Road Race special is that it takes place each year on Independence Day. (1) American flags are waved down Peachtree Street, and nearly everywhere red, white, and blue is seen. Many runners choose to wear stars-and-stripes as a part of their racing outfit, but no one is allowed to wear costumes in this serious race. That means no Statues of Liberty are officially allowed running down the road, as with other large festive races such as the Bay-to-Breakers 12K in San Francisco. (2) Because the Peachtree is run on a holiday, most people have the day off. (3) They either run the race or cheer on the runners from either side of the street. There are tens of thousands of spectators all along the course.

³ Not only is the race special because it takes place on a special day, but it also has a rich, over three-decade tradition. While the Boston Marathon can declare it is the oldest road race in America, few 10Ks can claim they've been around longer than the Peachtree Road Race. (4) The race began modestly in 1970. (5) There were only 110 people in the race. By 1980, just ten years later, the race had grown from 110 runners to over 20,000 people and had nearly outgrown the four-lane street. One thing the Peachtree Road Race is known for is the colorful, artful t-shirts. (6) Given only to those who finish the challenging course, the t-shirt is a big reason why so many of the 55,000 run the race. Another long-standing tradition is the Fröhel-designed crystal peach to the top ten men instead of a trophy. Another fixture each year is the competitive wheelchair race that precedes the footrace and lures the fastest wheelchair racers in the world. The winners complete the race in about 18-19 minutes. Of course, the wheelchair competitors are not the only ones who compete at a world-class level.

⁴ For its entire existence, the Peachtree Road Race has boasted Olympic-level victors. Olympic marathoner Jeff Galloway won the (7) opening race in 1970 when traffic was not even blocked off for the race, and runners had to run in the far right-hand lane. Other American Olympians like Frank Shorter, Don Kardong, Craig Virgin, and Ed Eyestone each got his crystal peach. Despite not offering prize money for the first decade, (8) the race somehow got the best American runners the country had to offer. Yet, with the addition of prize money that rivaled any 10K prize purse in the world, elite international runners began toting the line. Runners from Africa, Europe, and South America all began to make Peachtree a tradition of their own. Since the mid-80's, Kenyans have dominated the men's side, while the women's winners have come from all parts of the globe: New Zealand, Norway, Germany, South Africa, the U.S., and only recently Kenya.

⁵ It is easy to see why the Peachtree Road Race has become a popular tradition for both the competitive world-class athlete and the weekend jogger alike. (9) A footrace down one of the most well-known streets in the South on the 4th of July is alone enough to make a runner want to become part of the tradition. Add to that mix—the amazing crowd cheering loudly for the entire race, the prestigious t-shirt, and the ability to run in the same race as those on running magazine covers—and you have the recipe for the world's best 10K road race.

- 26) Identify the question that is NOT answered in section one.
- A) What makes the Peachtree Road Race so unique?
 - B) What is the distance of the Peachtree Road Race?
 - C) **What is the monetary value of the crystal peach?**
 - D) What is the prize for first place winners of this race?

Explanation:

The question that is NOT answered by reading section one is **What is the monetary value of the crystal peach?** The \$15,000 prize is separate from the crystal peach.

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27) Which statement is considered the thesis of the essay?

- A) The main thing that makes the Peachtree Road Race more special than any other road race is that it takes place each year on Independence Day.
- B) The Peachtree Road Race in Atlanta, GA is the world's largest 10K, boasting 55,000 runners who line up for blocks at 7:30am to run down Peachtree Street.
- C) A common golfer cannot play in the Masters or British Open with the world's best-known golfers, nor can the average tennis player play against the world's best at Wimbledon.
- D) ***The Peachtree Road Race is unique as a 10K road race in three distinctive ways: it is run on the 4th of July, it has a rich tradition, and it is the most competitive 10K in the world.***

Explanation:

The structure of the opening paragraph is to first get the reader's attention, then work toward the thesis at the end. This is known as the "funnel technique." The thesis is the last sentence of the first paragraph: **The Peachtree Road Race is unique as a 10K road race in three distinctive ways...**

28) Which of these statements BEST summarizes the main idea of paragraph 2?

- A) Spectators and runners both make the race special.
- B) The race is different from other races run on holidays.
- C) People dress patriotically to celebrate Independence Day.
- D) ***The Peachtree is special because it is run on an important holiday.***

Explanation:

Because one of the three major ideas of the thesis is that **The Peachtree is special because it is run on an important holiday**, the reader should see that this is the paragraph that develops that idea.

The Narrative of the Life of Frederick Douglass
Frederick Douglass

Chapter I

¹ I was born in Tuckahoe, near Hillsborough, and about twelve miles from Easton, in Talbot county, Maryland. I have no accurate knowledge of my age, never having seen any authentic record containing it. By far the larger part of the slaves know as little of their ages as horses know of theirs, and it is the wish of most masters within my knowledge to keep their slaves thus ignorant. I do not remember to have ever met a slave who could tell of his birthday. They seldom come nearer to it than planting-time, harvest-time, cherry-time, spring-time, or fall-time. A want of information concerning my own was a source of unhappiness to me even during childhood. The white children could tell their ages. I could not tell why I ought to be deprived of the same privilege. I was not allowed to make any inquiries of my master concerning it. He deemed all such inquiries on the part of a slave improper and impertinent, and evidence of a restless spirit. The nearest estimate I can give makes me now between twenty-seven and twenty-eight years of age. I come to this, from hearing my master say, some time during 1853, I was about seventeen years old.

² My mother was named Harriet Bailey. She was the daughter of Isaac and Betsey Bailey, both colored, and quite dark. My mother was of a darker complexion than either my grandmother or grandfather.

³ My father was a white man. He was admitted to be such by all I ever heard speak of my parentage. The opinion was also whispered that my master was my father; but of the correctness of this opinion, I know nothing; the means of knowing was withheld from me. My mother and I were separated when I was but an infant--before I knew her as my mother. It is a common custom, in the part of Maryland from which I ran away, to part children from their mothers at a very early age. Frequently, before the child has reached its twelfth month, its mother is taken from it, and hired out on some farm, a considerable distance off, and the child is placed under the care of an old woman, too old for field labor. For what this separation is done, I do not know, unless it be to hinder the development of the child's affection toward its mother, and to blunt and destroy the natural affection of the mother for the child. This is the inevitable result.

⁴ I never saw my mother, to know her as such, more than four or five times in my life; and each of these times was very short in duration, and at night. She was hired by a Mr. Stewart, who lived about twelve miles from my home. She made her journeys to see me in the night, traveling the whole distance on foot, after the performance of her day's work. She was a field hand, and a whipping is the penalty of not being in the field at sunrise, unless a slave has special permission from his or her master to the contrary--a permission which they seldom get, and one that gives to him that gives it the proud name of being a kind master.

29) Given the extreme difficulties Douglass' mother experienced just to visit him four or five times at night for a very short while, what can we conclude about his mother's feelings toward him?

- A) Douglass' mother did not have much affection for her son since they were separated early in Douglass' life.
- B) Douglass' mother was separated from him early in life, but visiting each other was never too difficult.
- C) **Douglass' mother loved her son very much, worked hard, and took terrible risks to see him.**
- D) Douglass' mother forgot about her son because she saw him only occasionally.

Explanation:

Because Douglass' mother would walk twelve miles after a long day in the fields to see her son (and risk not getting back that same night with enough energy to make it to work at dawn the next day and risk whipping), we can conclude that **Douglass' mother loved her son very much, worked hard, and took terrible risks to see him.**

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30) Based on paragraph 1, the reader can infer or predict that the speaker will

- A) **continue to question and be aware of his situation.**
- B) accept his situation and be a good worker.
- C) learn to read and write.
- D) become the head slave.

Explanation:

The correct answer is **continue to question and be aware of his situation**. Paragraph 1 shows the reader that the speaker is aware and interested in all aspects of his situation. There is no implication that he might learn to read and write or that he will become head slave.

31) Which is the BEST estimate of the year in which Douglass wrote these words?

- A) 1817
- B) 1822
- C) 1835
- D) **1846**

Explanation:

Since Douglass says he is now 27 or 28, and that his master said he was 17 or 18 in 1835, the best guess is **1846**.

Searching for the Blue Poison Dart Frog

Kyle Ellington

The sweltering mid-afternoon sun beat down on us while we climbed through the lush, untamed vegetation of the forest. Our guide masterfully chopped at the thickest undergrowth and foliage as we made our way further away from our encampment. The air around was viscous and damp, and a cacophony of insect songs ringed in my ears. We were in the rainforests of South America searching for the elusive *Dendrobates azureus*, which is better known as its common name, the Blue Poison Dart Frog. Humans are interested in this creature—which is a vulnerable species and is scarce in the wild—because of its magnificent coloring and its lethal poison.

While they are gorgeous animals, these frogs pack a perilous punch. The vivid blue coloring is a forewarning for predators to stay away from the frogs. Because their skin is covered with glands that secrete small amounts of toxins, Blue Poison Dart Frogs are capable of paralyzing or even killing their predators. These toxins are used to protect the frog, not to capture their prey; *Dendrobates azureus* use their long, sticky tongues to retrieve their meals.

Dendrobates azureus are dangerous in the wild; however, they lose their toxicity when they are in captivity. These lustrous creatures gain their poison from the insects—particularly ants—that they eat in the wild. When they live in captivity their diet usually consists of insects like fruit flies and crickets. Because these insects do not contain the correct chemicals, captive frogs cannot produce toxins.

During the miles of walking, the stifling heat became almost intolerable, yet we continued through the foreboding wilds. Our search for the *Dendrobates azureus* was like a treasure hunt promising wealth beyond the imagination. While before my trip, I would have considered myself a lover of nature, my time in South America instilled in me a different type of love, and even fear of nature. I realized that the dangers of nature were just as plentiful as its wonders.

As I stumbled next to a stream to inspect the aquatic life, I spied a blue speck sitting unobtrusively on a moss-covered rock. Rubbing at my eyes to be sure I wasn't hallucinating, I beckoned for the rest of the group to hasten over to the stream. As we neared the rock, we beamed in jubilation—it was the *Dendrobates azureus*.

The minuscule creature, which was only about 3 centimeters long, observed us as we approached. The frog's distinctive coloring was even more flamboyant than I had anticipated. A luminous shade of sky blue and large black dots covered the frog's back; furthermore, the light color deepened into azure and navy as it traveled down its sides and extremities. It was the most stunning creature I had ever observed. The scientists in the group hurriedly scrawled notes in their folders, and those who'd had the foresight to bring cameras snapped a few photographs. We gradually backed away from the frog and allowed it to seek refuge under a rock.

As we trekked back through the brush and the trees, I thought about my long, arduous journey and the tiny *Dendrobates azureus* I had traveled so far to find. The primal, guttural sounds of rainforest surrounded me, and sweat and grime covered my forehead; however, when I viewed the panorama of natural colors around me, I knew I had made the right decision.

32) The information in this passage is organized according to which structure?

- A) cause-effect
- B) **chronological**
- C) comparison-contrast
- D) order of importance

Explanation:

Chronological is the correct answer. The author is telling about a personal experience. The details are arranged in the order in which they happened.

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33) What is the narrator's main purpose in this passage?

- A) to tell readers an humorous story about a blue frog
 B) to teach readers about biodiversity in South America
 C) **to describe an adventure into the forest to find a frog**
 D) to persuade readers to search for their own exotic frog

Explanation:

The narrator's main purpose is **to describe an adventure into the forest to find a frog**. The passage describes the author's experience and the effect of that experience on his outlook.

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Sacramento Valley Transportation

Sacramento History Online

¹ In the traditions of Sacramento Valley Native Americans, mysterious figures were transported over water in a raft to create the world. One dove from the raft into the water and came up with dirt. From that soil the world was formed.

² The transportation by a raft is symbolic of the role of transportation in the evolution of local history. Paleo-Indians arrived about 12,000 years ago. The rich natural resources made the Sacramento Valley a "Garden of Eden." Permanent villages were established about 8,000 years ago. Native Americans walked and traveled the rivers and waterways with rafts. The later arriving Spanish entered the Valley by horse, British and American trappers entered by horse and on foot. Settlers from the Midwest and east coast arrived in wagon trains. Gold seekers walked over land along side wagons or by sea on sailing ships and later steamboats. By the late 1840's dreams of a transcontinental railroad were debated. In 1845 the "friends of a Rail Road to California" met in Boston to hear a proposal for a railroad from St. Louis to San Francisco. But the shorter transcontinental crossing at the Isthmus of Panama by a railroad would occur first in 1855. Meanwhile, the connection between San Francisco and Sacramento was improved by an expanding, fast, and efficient steamboat service. In 1856 the Sacramento Valley Railroad opened officially for service between Sacramento and Folsom.

³ Just as transportation improved travel, it also accelerated the economic development of California. In 1849, California gold fields were referred to as the "Extremity of Civilization" and in the next decade because of transportation, California began to impact the economy of the United States and eventually the world.

⁴ Passengers were moved by stagecoach. By 1854, many of the stage operators were merged by James Birch into one California Stage Company. Birch's stage line controlled eighty percent of the stagecoach traffic over 3,000 miles of routes connecting the western portion of the United States. In 1856, Birch lobbied Congress to establish a national wagon road. He presented Congress with a petition from Northern California with 75,000 signatures. As one of the largest petitions yet received by Congress, they responded by establishing three wagon roads to the Pacific Coast and appropriating \$600,000 for a twice-weekly overland mail service from St. Louis to San Francisco.

⁵ The Sacramento region used great power in the decade of the 1850s, in spite of its small resident population, when compared to San Francisco. The largest portion of the state's population lived in the "Sacramento District." Sacramento representatives strongly influenced the State's Constitutional Convention, landed the permanent State Capital, and elected the State's first governor. Sacramento's influence was in large part due to its growth in commerce, particularly that portion related to transportation such as railroads and steamboats, as well as wholesale merchants who supplied retailers throughout California and Nevada. Those large-scale merchants of Sacramento saw their success tied to better wagon roads and railroads.

⁶ Great wealth was to be gained by a wagon toll road over the Sierra Nevada Mountains to Virginia City and even greater fortunes in a transcontinental railroad. The railroad would offer enormous opportunities for California and the Sacramento region to grow. The potential bounty of Sacramento Valley agriculture was to be realized with faster and more efficient transportation. Sacramento merchants would organize and build the western half of that railroad.

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7 In the 1890s the first commercial automobiles began to arrive in Sacramento. By 1905, twenty-seven automobiles were registered in Sacramento County. By 1910, seven hundred more were registered, and by July 1911, in what can only be called "Auto Frenzy," Sacramentans were buying seventy-five autos per day. Automobiles alone could not make a significant difference. A network of paved roads was essential. Three bridges had to cross the American River between Sacramento and Fair Oaks. Perhaps the best symbol of this growing network would be the completion of the Yolo Causeway in 1916.

8 For the Sacramento Valley, airplanes and other airships including balloons were a novelty until 1917. With the nation gearing up for W.W. I, the Government awarded a \$3,000,000 contract to build "Jenny" bi-wing military airplanes in North Sacramento. For the rest of that century, Sacramento would look to aviation as a vital source of economic sustenance.

9 As urban areas developed, streetcar systems evolved, first pulled by horses and later using electricity. For those in urban areas, it was the first experience at the freedom of cheap efficient public transportation. Urban transportation led to interurban systems that would ultimately evolve into an electric passenger railroad system, linking the Bay area with Sacramento and smaller Valley communities all the way to Chico.

10 The development of the Sacramento region is so intertwined with transportation that the region's history would be incomplete without serious attention given to the impact of wagon trains, steamboats, railroads, and automobiles.

35) What is the M&N method of organization of ideas in this passage?

- A) spatial
- B) chronological**
- C) cause and effect
- D) least to most important

Explanation:

The correct answer is **chronological**. The passage begins with early examples and ends with examples from the twentieth century.

36) How does the author use organization of ideas to achieve his purpose?

- A) He lists different types of transportation that have affected the growth of the region in random order.
- B) He traces the development of Native American myths and legends and their impact on the Sacramento region.
- C) He introduces each type of transportation according to its importance and impact on the Sacramento Valley.**
- D) He arranges his information in a chronological sequence to show that transportation has had great impact on the Sacramento Valley.

Explanation:

He introduces each type of transportation according to its importance and impact on the Sacramento Valley. The author begins with an ancient Native American story, then traces the history of transportation as it has impacted the Sacramento region.

37) Which sentence, if inserted as the topic sentence of paragraph 2, would be the **MOST** effective opening sentence?

- A) Native Americans arrived in Sacramento a long, long time ago.
- B) Various peoples have arrived at Sacramento Valley taking equally various means of travel to get there.**
- C) Another Sacramento Valley Native American folk story is how the world was balanced on the back of an enormous turtle shell.
- D) Despite what has been traditionally known as the Rapid Transit System, the history of the Sacramento Valley is steeped in a heritage that includes all people.

Explanation:

Native Americans arrived by foot; both the Spanish and English by horse and by foot; settlers by wagon; and gold seekers by foot, wagon, ship or steamboat. Because the paragraph is essentially about different modes of travel from different groups throughout history, it is important to select a topic sentence that will embrace this diverse, cultural sweep of travel. **Various peoples have arrived at Sacramento Valley taking equally various means of travel to get there.**

The Good, the Bad, and the Ugly: Questioning the "Greatness" of William Shakespeare

D'libert Terrell

I. Introduction:

A William Shakespeare is almost universally proclaimed to be "the greatest poet who ever lived." And of course it is true that Shakespeare is an incredible writer—38 five-act plays (all written in iambic pentameter), 154 perfect sonnets, and two epic poems—but sometimes, in our desire to celebrate our greatest artists, we have a tendency to forget that these almost god-like people were first and foremost human beings too. They too struggled, often failed, and made mistakes. We shouldn't shy away from discussing our literary heroes' flaws. If nothing else, the knowledge of their failures help us appreciate what success and greatness these authors did achieve. Often our hero-worship keeps us from truly seeing the complexity of a great author. Thus, I would argue, nothing would be better for high school students than to take Shakespeare down a peg or two.

II. A General Overview of Shakespeare's Entire Career:

Throughout high school, students are exposed only to Shakespeare's greatest and most successful plays, so students naturally assume that everything Shakespeare wrote was perfect. What students don't realize is that Shakespeare definitely had "off days" as a playwright. Shakespeare began his career writing dreadful almost unreadable tragedies and histories. It wasn't until after completing his early play, *Richard III*, that Shakespeare began his ascent to greatness and composed his most perfect comedies and (the crown of all his work) the great tragedies. Soon after writing his tragedy *King Lear*, Shakespeare began to write his last or "late" plays. These plays show a clear falling off from the great tragedies. In fact, they are so different from Shakespeare's great plays that critics commonly call them the "problem plays." In other words, unbeknownst to most students, Shakespeare's career, rather than being an instant attainment of perfection, follows a basic success-story arc—beginning in struggle, attaining a high point of greatness, and then weakening right at the end.

III. Starting Out Rough: Shakespeare's Early Plays:

Shakespeare's early plays were marked by a crude—almost vulgar—style that is so far from what we think of as "Shakespeare" that most people have never even heard of the plays, much less seen them performed. His early tragedy *Titus Andronicus* is as bloody (and stupid) as any gore horror movie now seen at the Cineplex. His early history plays (like *Henry IV Parts 1, 2, and 3*) are most aptly called "ant-fests" by critic Harold Bloom and would put any modern audience straight to sleep. Shakespeare's early comedies (like *The Comedy of Errors*) aren't bad, really, but they are silly, derivative of other Roman playwrights' work, and often more than a little obscene.

IV. The Peak of His Career—As Great as It Gets:

Shortly after his blockbuster success with the early history/tragedy *Richard III*, Shakespeare wrote his greatest plays, the ones everyone knows, at least by title: *Julius Caesar*, *Hamlet*, *Othello*, *Macbeth*, and *King Lear*. But great as these plays are, they too often have weak spots. *Hamlet*, as any director will tell you, is far too long—the longest play Shakespeare wrote and is full of digressions and long topical speeches that are incomprehensible to anyone but a person of Shakespeare's day and age. *Julius Caesar* loses all its plot momentum in the third act after its title character is killed. Pick any traditionally "great" Shakespeare play, and you'll run across some stumbling block to its greatness somewhere.

V. A Falling Off: The Late Plays

Sometime after composing *King Lear*, Shakespeare's poetic powers began to weaken. He grew tired of all the genres he'd triumphed over—comedy, history, and tragedy—and tried to experiment with new forms of theatre. Some critics call them "tragicomedies"; others "romances," and still others just call them "problem plays" because they are, for lack of a better word, just plain "weird." These plays are so strange that most people don't even recognize the titles as something Shakespeare wrote. *Timon of Athens*, *Pericles*, *Cymbeline*, *Coriolanus*, and others.

VI. Conclusion: A Modest Proposal

It seems strange to advocate teaching Shakespeare's "bad" or "weak" plays, but studying a play that isn't entirely successful from one of our greatest playwrights can be a very valuable experience. Of course students should still read the "great" plays, but sometimes just knowing something is "great" makes it automatically boring and difficult to truly appreciate. A more balanced approach to Shakespeare, a humanizing approach, could help students truly appreciate what makes the playwright so well-known. Too often students say that *Hamlet* is famous simply because "Shakespeare wrote it." Wouldn't it be better for students to take Shakespeare off his cultural pedestal and recognize the play as great because of its successful content? Perhaps teaching a bad Shakespeare play or two would make the famous plays' greatness truly understood and deserved.

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38) Based on the tone and content of this passage, what conclusion can be drawn about the author of this passage?

- A) The author has never really understood the appeal of Shakespeare.
- B) The author knows very little about Shakespeare's life and works and thus has no authority as a speaker.
- C) The author clearly hates and detests Shakespeare and wishes that his plays weren't taught to high school students.
- D) **The author loves teaching Shakespeare, but wants to soften some of the "worship" of Shakespeare that goes on in English classrooms.**

Explanation:

Based on the content and tone of this passage, the reader can conclude that **The author loves teaching Shakespeare, but wants to soften some of the "worship" of Shakespeare that goes on in English classrooms.** The main argument of the essay is that reading "bad" Shakespeare can actually be a quite good experience for teaching students how amazing Shakespeare really is.

39) This article's organization of information is best described as

- A) Putting plays in the order of their length of composition.
- B) Listing Shakespeare's plays in their order of importance.
- C) Examining what caused Shakespeare's greatness in reputation.
- D) **Giving a brief overview of Shakespeare's playwriting career.**

Explanation:

The article moves through each section of Shakespeare's playwriting career in the order in which it occurred, **giving a brief overview of Shakespeare's playwriting career.**

40) How is the information in this article organized?

- A) Definitions for each genre Shakespeare wrote in are presented alphabetically.
- B) **Shakespeare's playwriting career is presented in the order in which it occurred.**
- C) Descriptions of five of Shakespeare's greatest plays listed in order of importance.
- D) A list of all the reasons that Shakespeare's plays are not studied successfully in schools.

Explanation:

The correct answer is **Shakespeare's playwriting career is presented in the order in which it occurred.** The whole article presents an overview of Shakespeare's rough start, sudden greatness, and falling off of poetic power in the order in which it occurred.