Bryant University

HONORS THESIS

Multidimensional Resilience in Honors Students at Bryant University

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ABSTRACT

College level honors programs are continuously working towards improvement of their programs and working towards improving the college experience for their students. Apart from recognition and developing a positive reputation for the university, the goals for these selective academic programs include better serving their students from both academic and professional perspectives, as well encouraging and increasing program completion retention rates. There are various ways of testing students to assess their mindset and personal drive as well as gauge the possibility of students graduating with successful completion of their Capstone project or thesis in their senior year. To better understand how retention can be predicted among a university's top performers, this research presents a study of the concept of resilience in Bryant University's honors students. A statistical analysis was conducted of survey results supplemented by qualitative research information along with a survey of alumni honors students. The results of this research will help to guide the future actions of the honors program at Bryant University in its efforts to attain higher retention rates of its students.

INTRODUCTION

Academic achievement in honors students at universities and colleges across the country can generally be attributed to a strong work ethic, intelligence, and a degree of resilience or ability to still be successful in the face of challenging circumstances. This research stemmed from the idea that students who are typically more successful both academically and vocationally, exhibit some level of resilience that they have either built up over time, learned from their environment, or were born with the innate qualities to overcome significant challenges. This research sought to identify as well as understand the differences between these three sources of resilience in honors students, in order to get a stronger perspective of the Honors Program at Bryant University. The purpose of the study was to diagnose the faults or weaknesses of the Honors Program that were possibly contributing to the extremely low retention rate and small graduating class size, and be able to propose possible solutions. Bryant University has a retention rate of 19-36% on average, as reported by the current director of the program. Most schools do not make public their program drop-out rates. Nationally ranked programs are ranked based on merit rankings such as average GPA of students, SAT and ACT scores, class sizes, course offerings, undergraduate research opportunities as well as National Merit qualifying scores. The primary investigative research question that guided this study was "can resilience predict retention for students in Bryant University's Honors Program"?

LITERATURE REVIEW

The concept of resilience has evolved over the last hundred years and has become more complex over time. Not only have more dimensions been added to encompass all that resilience represents, but it has increasingly become more subjective to measure and study. The definition of resilience has changed and been added to as more research develops about its application to individuals. Researchers are constantly rewriting what it means to be resilient and developing new ways of describing resiliency in human beings. Along with this development of terminology and definitions, there are also great strides being made in figuring out how to measure resiliency. From this we see the development of the Grit Test as a way to measure how gritty individuals are, as well as the locus of control test to measure whether an individual has an internal or external locus of control. Additionally, we see the development of tests that measure one's personality in an effort to diagnose whether they are considered a hardy individual or not. And finally, there are questionnaires being derived to gauge the impact that family, friends and community leaders had on an individual's level of resiliency as they continue to age. Both longitudinal studies and point-in-time studies have been completed in an effort to continue to develop the concept of resiliency and its application in everyday life.

Definition of Resilience

In one of the most extensive reviews of its kind completed by Antonio Pangallo, Lara Zibarras, Rachel Lewis and Paul Flaxman in 2014, all the literature about resilience was reviewed using the following databases: EBSCOHost, CINAHL Plus, MEDLine, PsycARTICLES, PsycINFO, Psychology and Behavioral Sciences Collection, and Scopus. All the measures reviewed conceptualized resilience as either a process, trait, state or outcome. They found that, "proponents of process models focus on the internal and external resources used to foster positive adaptation to adversity" (Pangallo et al, 2014, p. 6). This means that those who conceptualized and measured resilience as a process, examined the internal qualities that contributed to resilience as well as the external factors in the

environment that contributed to the ability to adapt to adversity. Additionally, "adopters of trait models operationalize resilience as a set of internal characteristics" (Pangallo et al, 2014, p. 8). This means that those who conceptualized and measured resilience as a personal trait or characteristic focused on resilience as being a set of personal characteristics that enabled the individual to adapt to adversity. Furthermore, "proponents of state approaches have argued that resilience is a lower order construct of Psychological Capital and propose that positive psychology constructs (hope, optimism, and self-efficacy) are pathways to resilience" (Pangallo et al, 2014, p. 9). This tells us that those who approach the conceptualization and measurement of resilience as a physical state of being believe that positivity, being hopeful, optimistic and believing in oneself is the way to being a resilient individual. Finally, this study reports that "resilience as an outcome variable refers to the ability to "bounce back" from physical and psychological stressors" (Pangallo et al, 2014, p. 11). This means that those who conceptualize and measure resilience as a result of a situation believe that being resilient is simply an automatic reaction that some people have to physical and psychological challenges.

While most studies of resilience done on the human population are self-report tests, their re-test reliability of the resilience tests was high. In addition, "the most common themes related to person variables in descending order were adaptability, self-efficacy, active coping, positive emotions, mastery and hardiness" (Pangallo et al, 2014, p. 13). Adaptability was the most closely linked to what made an individual resilient. This was because individuals who demonstrated resilience in all four categories of studies including the conceptualization of resilience as internal and external resources, personal traits, a state of being and resilience as an outcome, demonstrated some degree of adaptability. Self-efficacy was ranked next as being the most closely related to resilience based on the fact that those who were the best able to adapt to adversity were those individuals who believed in their ability to do so. Finally, active coping and position emotions were ranked third as being related to resilience meaning that those who were optimistic and able to cope with the challenges they faced, ended up demonstrating a degree of resilience in the face of adversity.

Vulnerable but Invincible Children

In 1955, researcher Emmy Werner and Ruth Smith began their longitudinal study of 63 children born on the island of Kauai in that year. Their study was published in the book: *Vulnerable but Invincible: A Study of Resilient Children*. Werner and Smith followed the children from the first grade up through high school and then periodically checked in with the participants every ten years until the participants were in their 40's. All children in the study were recognized for the adversity that they faced in their lives on a daily basis. This adversity included chronic poverty, stress, parents who had not graduated high school, and home lives that included abuse of alcohol or drugs and mental illness. Most of these children had severe issues of their own by the time they were 10 years old. The researchers followed the lives of these children by periodically checking in up until they were 40. Approximately one third of these children managed to do very well with their lives despite growing up in such adverse conditions. These children were referred to as "vulnerable but invincible". This meant that these kids were extremely vulnerable to following the wrong path, getting caught up in bad habits or following the ways of their parents based on the environment that they grew up in as well as the lack of opportunities that they were presented with. However, because of resilience that they were able to build up over time, despite the adversity they faced, they were able to grow up to be successful adults.

It was determined in this study that those who were able to adapt better in their adult lives despite adversity and difficult circumstances when they were adolescents, were the ones that had access to "protective factors". These protective factors include: reasoning ability, emotional support outside of the family, internal locus of control, autonomy, sociability, and ability to seize opportunities. The most important protective factors were identified as emotional support outside of the family, autonomy and sociability. These factors enabled individuals who were facing adversity in their homes, to seek out the support they needed from their communities in order to build up resiliency. What this tells us is that there a direct link between protective factors and resilience tendencies that children are able to develop.

This tells us that adaptability and ability to cope with adversity can be learned from community leaders, school officials, or other important figures of authority in a child's life.

Conceptualization of Grit

Some of these protective factors play directly into the "grit"[1] studies that were later conducted by Angela Duckworth and A.L. Quinn decades later during the years of 2005 and 2006. Duckworth and Quinn defined grit as "perseverance and passion for long-term goals" and as "working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress" (Duckworth & Quinn, 2010). Having a strong internal locus of control, in other words, believing that one's actions directly impact their successes and failures, is directly correlated to persevering and working towards long-term goals. This in turn relates to autonomy, where taking responsibility for oneself and being independently successful is critically important in overcoming adversity and continuing to work for the future. Obviously, being able to identify and then seize opportunity, working through challenges and building a support network outside of one's family, is relatable to maintaining effort and interest in order to get the job done. In essence, to be "gritty" as defined by Duckworth and Quinn, is positively correlated to having access to the same "protective factors" as defined by Werner and Smith (1982) and later Garmezy (1974).

The study done by Angela Duckworth and A.L. Quinn in 2005 strove to answer what makes some individuals more successful than others. Their study looked at a variety of dimensions that play a part in making person "gritty". One of the first dimensions that Duckworth and Quinn (2010) looked at was talent and achievement. It's been concluded by many researchers over time that intelligence is the best predictor of achievement. The correlations between IQ and the various outcomes can be as high as $r = .6$, suggesting that IQ may account for up to one third of the variance in some measures of success (Neisser et al, 1996). However, in 1947

[1] There is a difference between the term "grit" used in these studies and the slang term GRIT. GRIT stands for Gut, Resolve, Instinct, and Toughness. In this definition of "grit" used here as well as the version of this word that will be used in this paper is an individual's passion for long term goals and resolve to accomplish those goals in the face of adversity or challenges.

a four-year long longitudinal study of mentally gifted children done by researchers Terman and Oden, concluded that IQ, or someone's level of intelligence does not always guarantee success. Furthermore, in 1994, researchers Ericsson and Charness suggested that individuals in activities such as chess, sports, music and the visual arts, over 10 years of daily "deliberate practice" set apart expert performers from less proficient peers. In addition, 20 years of dedicated practice was an even more reliable predictor of world-class achievement. The conclusion was that "inborn ability is less important than commonly thought" (Ericsson & Charness, 1994, p. 774).

Another dimension that was examined by Duckworth and Quinn's study was personality and achievement. Empirical data suggested that "any given personality trait accounts for less than 2% variance in achievement and so compared to IQ, personality would seem inconsequential" (Paunonen & Ashton, 2001, p. 87). But, while the Big Five personality traits – openness, conscientiousness, extraversion, agreeableness and neuroticism can typically describe the human personality, there are limitations to the measurement tool used to measure these traits. Duckworth's study looks at the Big Five personality traits and uses it to develop the Grit Scale, but recognizes the limitations of five adjectives that may not describe all gritty personalities. In addition, "individuals high in need for achievement pursue goals that are neither too easy nor too hard, individuals high in grit deliberately set for themselves extremely long-term objectives and do not swerve from them – even in the absence of positive feedback" (McClelland, Koestner, &Weinberger, 1992, p. 64). This means that there is a distinct differences between those high in need for achievement and high in grit.

Development of the Grit Scale came from four main criteria: evidence of psychometric soundness, face validity for adolescents and adults pursuing different types of goals in a variety of domains, low likelihood of ceiling effects in high-achieving populations, and a precise fit with the construct of grit. This means that the questions of the test can be applied to both adolescents and adults who are involved in or pursuing a variety of vocations. Additionally, ceiling effects refer to the level at which an independent variable no longer has an effect on a dependent variable, or the level above which variance in an independent

variable is no longer measured or estimated. There were 6 different studies done and multiple methods used to identify and measure grit in different age groups.

The first study done by Duckworth and Quinn in 2005 was a cross-sectional study "for which the major purpose was to develop and validate a self-report measure of grit in a large sample of adults aged 25 or older. The predictive validity of grit was assessed by its association with higher levels of lifetime schooling among individuals of identical age" (Duckworth et al, 2007, p. 6). One of the major questions that was to be answered by this study was "does grit grow with age?" It was determined that although personality traits are typically stable over someone's lifetime, the Big Five trait conscientiousness, and stability of vocational interests, both increase over the life span. So, it was expected that older adults be higher in grit than younger individuals.

The researchers employed a website, authentichappiness.org where visitors were invited to help validate the Grit Scale. Visitors were asked to indicate their age and their level of completed education. Information was collected from 1,545 participants aged 25 or older with the median age being 45. The Grit Scale was developed by generating a pool of 27 constructs that described grit. Duckworth et al (2007) discovered the following:

> We wanted to capture the attitudes and behaviors characteristic of the high-achieving individuals described to us in early, exploratory interviews with lawyers, businesspeople, academics and other professionals. We intentionally wrote items that would be face valid for both adults and adolescents. We included items that tapped the ability to sustain effort in the face of adversity (Duckworth et al, 2007, p. 7).

This means that through many interviews done in the beginning of research with highly successful and hardworking people, researchers were able to put together concepts and words that described what it meant to be high achieving the face of adversity. In addition to this, Duckworth and Quinn wanted the questionnaire to be used by both adolescents and adults to obtain realistic results. Items were rated on a 5 point scale, from 1 = not at all like me to 5 =

very much like me. Through narrowing down of language and looking for high internal consistency, a 12-item scale was developed as a measure of grit. It was concluded from study 1 that level of education translated to a higher level of grit when age was held constant. Furthermore, when level of education was held constant, it was observed that level of grit increased with age.

A few possibilities came about from the conclusion of Duckworth's first study. First of all, it was concluded that an individual's personality as they mature may be genetically programmed and may be a result of hereditary characteristics. Secondly, it was concluded that the association between age and grit may be a result of "cohort effects" (Duckworth et al, 2007, p. 10). This means that each successive generation of Americans may be less gritty than the generation before, based on social and cultural effects. While these conclusions are valuable, it must be remembered that "all information in Study 1 were self-reported and because grit was not compared with other traits, we cannot rule out the possibility that observed positive associations were the consequence of social desirability bias" (Duckworth et al, 2007, p. 10).

A second study by Duckworth and Quinn in 2006 had the purpose of testing to see whether the relationship between age and educational attainment would hold when conscientiousness and other Big Five traits were controlled for in their statistical analysis. In the words of Duckworth, "does grit provide incremental predictive validity over and beyond Big Five traits"? (Duckworth et al, 2007, p. 10). In 2006, the online study was revised to include "the number of times I changed careers" and completed the Big Five Inventory. 706 participants aged 25 or older completed this study. Only 16 participants reported their highest education level as either "high school" or "some high school" and so these individuals were excluded from the study, leaving 690 participants. As was predicted, grit related to conscientiousness more than to neuroticism, agreeableness, extraversion and openness to experience. Therefore, "the incremental predictive validity of grit for education and age over and beyond conscientiousness and other Big Five traits was supported" (Duckworth et al, 2007, p. 10).

A third study completed by Duckworth and Quinn was done in 2006 to establish a connection between cumulative GPA and grit among undergraduates at an elite university. They wanted to determine if grit was statistically independent from intelligence measures such as GPAs and SAT scores. Participants included 139 undergraduate students, 96 females, 43 males, majoring in psychology at the University of Pennsylvania. The average SAT score was 1415 (on a 1600 scale). Participants were invited through an email invitation sent to approximately 350 psychology majors in fall of 2002. The email highlighted the fact that participation in the survey was completely voluntary as well as confidential. The email provided a link to a website where participants would complete the 12-item Grit Scale as well as provide additional information such as a cumulative GPA, SAT scores, gender, as well as anticipated year of graduation. The purpose of the reported SAT scores was to measure general mental ability of the participants.

The conclusion of the third study stated that, "gritty students outperformed their less gritty peers: Grit scores were associated with higher GPAs, a relationship that was even stronger when SAT scores were held constant…SAT scores were also related to GPA". This means that students who scored higher on the Grit Scale general had higher GPAs. It was also determined that there was a link between SAT scores and GPAs meaning the higher the SAT score, the higher the GPA was predicted to be. Additionally, "grit was associated with lower SAT scores, suggesting that among elite undergraduates, smarter students may be slightly less gritty than their peers" (Duckworth et al, 2007, p. 13). Essentially, "among relatively intelligent individuals, those who are less bright than their peers compensate by working harder and with more determination" (Duckworth et al, 2007, p. 13).

The fourth study conducted by Duckworth and Quinn was done in 2004, studying 1,218 freshmen cadets, 16% women and 84% men, with the average age of 19 years old, at the United States Military Academy with the purpose of using grit to predict retention during the first summer before the freshmen began their four years at West Point. It was expected that measures of grit would better predict retention than measures of self-control would. The procedure was that "participants completed questionnaires during a routine institutional group

testing activity on the 2nd and 3rd days after arrival to West Point in June 2004. 6 measurements were used in this study: Grit Scale, Brief Self-Control Scale (BSCS), Whole Candidate Score, Summer Retention, Academic GPA, and Military Performance Score (MPS)" (Duckworth et al, 2007 p. 13). The Grit Scale was the same 12-item scale that had been used in previous studies.

It was determined that "grit was not related to Whole Candidate Score nor any of its components: SAT scores, high school class rank, Leadership Potential Score and Physical Aptitude Exam. As predicted, grit was related to self-control" (Duckworth et al, 2007, p. 13). In addition, "grit predicted completion of the rigorous summer training program better than any other predictor…however grit was not the best predictor of cumulative first-year academic GPA and MPS among cadets who remained at West Point" (Duckworth et al, 2007, p. 14). These findings are consistent with Gallon's 1985 conclusion that "there is a qualitative difference between minor and major accomplishments" meaning that retention in the program would be considered a major accomplishment while maintaining an above-average GPA would be considered a minor accomplishment. Thus, grit score predicts the major accomplishments but may not predict the minor ones.

The fifth study conducted by Duckworth and Quinn was essentially an extension of Study 4 where it tested whether "grit had incremental predictive validity for summer attrition over and beyond the Big Five conscientiousness" (Duckworth et al, 2007). The method used was similar to the previous study in that cadets were asked to complete a questionnaire. Cadets completed the Grit Scale and the 9-item Conscientiousness subscale of the Big Five Inventory. The results were that the Whole Candidate Score was directly related to conscientiousness but not to grit. In addition, "summer retention was predicted better by grit than by conscientiousness or Whole Candidate Score" (Duckworth et al, 2007).

The sixth study conducted by Duckworth and Quinn was a longitudinal study involving participants in the 2005 Scripps National Spelling Bee. The researchers wanted to investigate the importance of grit in both vocational and avocational activities. There were a total of 273

finalists in the spelling bee, and 175 agreed to participate in the study by returning the self-report parent and child questionnaires in April and May of 2006. Participants were 7-15 years old, with the average age being 13.20. 48% of the participants were girls and 52% were boys. There were 79 volunteers who took the verbal IQ measurement over the phone and 66 who were able to take the IQ test before the competition. The remaining 13 verbal IQ tests were administered in the two weeks following the competition. There were no systematic differences in the variables between participants who completed the verbal IQ measure and those who did not. The measures used included the Grit Scale, the BSCS and the Similarities subtest of the Wechsler Intelligence Scale for Children – III. In addition, participants were asked to report how many hours per day they studied for the spelling bee finals on weekdays and then how many hours per day they studied on weekends. Finally, the score of the participant in the final round and the total number of times a child had participated in the final competition were used as measures.

The findings of Study 6 followed results that were previously predicted by Duckworth et al (2006). Grit turned out to be an accurate predictor of advancement to higher rounds in competition. Or, "finalists with grit scores a standard deviation above the mean for the same aged finalists were 41% more likely to advance to further round" (Duckworth et al, 2007, p. 17). Other findings concluded that a child's verbal IQ was a strong predictor of how well they would do in the final round. More gritty students studied longer than their less gritty peers. In conclusion, Study 6 "suggests that gritty children work harder and longer than their less gritty peers and, as a consequence, perform better, [and] an enduring personality characteristic we call grit is driving the observed correlations with success outcomes rather than the other way around"(Duckworth et al, 2007, p. 18).

Overall, our exploration of the grit studies showed connections between grit and intelligence, grit and retention in physically and mentally demanding situations, grit and personality constructs, as well as a connection between grit and success in avocational pursuits. (See Appendix A for summary of implications from grit studies.)

Resilience Theory

Resilience theory is most commonly associated with clinical psychologist Norman Garmezy and his study of schizophrenic patients in 1974. He recognized distinct differences in some patients versus others. Some of the patients were able to adapt better to their disease than others and could function better than others. All treatments being equal, Garmezy (1974) wondered why some were clearly better off than others. Furthermore, he studied children whose parents had schizophrenia and saw "protective factors" that helped the children overcome the adversity they faced having ill parents. In the late 1970s, Garmezy and other researchers including Ann Masten and Auke Tellegen, were able to identify these protective factors through a longitudinal study known as Project Competence (Masten, Hubbard, Gest, Tellegen, Garmezy, & Ramirez, 1999). The Project Competence Longitudinal Study (PCLS) helped to establish for the first time measures and methods of measuring resilience in individuals, as well as provide working definitions for concepts such as resilience, competence and protective factors.

The beginnings of PCLS and resilience theory originated from the study of children who were at risk for mental illness. Early research was done on children who were believed to be negatively impacted by environmental factors or genetic vulnerabilities which put them at risk for mental health issues in the future. The original term used to define children who showed signs of resilience was "invulnerable". This term was later retracted when the idea that the children were simply unaffected by horrible things was decidedly not realistic. It was soon discovered that resilience was not as cut and dry as had been originally proposed; resilience was observed as something that developed and changed over time, adapting to developmental changes in a person's life. Sometimes, even if a child did not exhibit signs of resilience right away, later on that child could develop resilience that resulted in healthy functioning.

Masten et al (1999) recognized that deciding if a person was "doing well" was subjective in its own right and therefore difficult to measure. In the PCLS, the question of whether a person was doing well in life or not was answered in a conceptual context and then through empirical

data. The focus conceptually was on developmental tasks which "refer to the accomplishments expected within a given society or culture in historical context for people during different age periods over the life course" (Masten et al, 1999, p. 8). Simple developmental tasks were identified as learning to walk, read, and speak and so on. Empirically, these developmental tasks were measured in three different domains (for school-age children): academic achievement, peer relations and conduct. Over time, additional domains were added that supported the theory of resilience developing over time and encompassing many other external factors than previously thought. Twenty years after the study had originally begun, the criteria for competence was drastically changed as the researchers came up with what it meant to be "doing well" as a young adult. Through a study of 42 interviews, the subjects were asked to think of someone they knew that was their age that they thought of as "doing well" in life and then answer questions about that person. This was then done again 10 years later when the subjects were in their 30s. It was concluded that "families and communities invest in developmental task success [because] they believe from generations of observation and cumulative cultural wisdom that these accomplishments facilitate as well as signify the development of tools needed for future success in that context" (Masten et al, 1999, p.11).

The PCLS was one of the first studies to identify resilience as an adaptation because of the concept of risk.

> In the absence of any unusual risk or challenge posed for development or adaptive function, people who were doing well in life might be called examples of competence or success but they would not be examples of resilience, because to establish resilience there must be evidence there is or has been some kind of significant threat in the lives of the individuals in question (Masten et al, 1999, p. 12)

Furthermore, "risk" was defined as "an elevated probability of an undesirable outcome". In the PCLS, risk was in form of accidental happenings, life experiences with negative

consequences, childhood trauma, events and conditions that affected a child's friends and family directly, as well as financial trouble and natural disasters.

Researchers distinguished between experiences that were "out of the child's control" and those that were due to the child's behavior. Protective and "promotive" factors or functions were identified by the PCLS that originated directly from parents or the living environment. However, as the original pool of subjects developed over time, it was discovered that "over the course of development, friendships, for example, embody different capabilities and the functional capacity of friends to help or protect each other would be expected to change. Nonetheless, there do appear to be very powerful adaptive systems that play a considerable role in resilience across many different situations" (Masten et al, 1999, p. 13). In essence, original protective factors such as a support system would originate from parents of the children, but over time, these factors or functions would be increasingly important in other relationships as the children developed. The list of factors associated with resilience was nicknamed "The Short List" by Masten (2001) and it was proposed that these factors are the main ones both culturally and biologically promote and protect the development of human beings. (See Table 2.2)

The PCLS design did not begin as a longitudinal study and instead was designed to be a cross-sectional assessments study. It started out by studying two urban schools that the superintendent identified as being representative of diversity. In 1977 and 1978, parents with a child in third to sixth grade were asked to complete the original Life Events Questionnaire (LEQ). Teachers were asked to rate each child's classroom behavior, and peers were asked to complete the Revised Class Play. Families who completed the LEQ were asked to participate in the core study that led to the PCLS. When the longitudinal study was initiated, the subject pool was 205 children, 91 boys, 114 girls and 26 sibling pairs. As initial data was analyzed, researchers were compelled to follow the growth and development of the children, and thus the longitudinal study was initiated. Time 1 (ages 7-13) was the first initial study. Time 2 (ages 14-19) was initiated 7 years later with 88% of the original 205 participating. This led to an in-person interview at Time 3 (ages 17 to 23), 3 years later in which 98% of the children

(now young adults) participated. During this time, many of the interviews were made electronically over the phone, but researchers made every effort to do face-to-face interviews, even if it meant waiting for the participant to return from being incarcerated, in the military or return home from college. Time 4 (ages 27-33) was 10 years later with another follow-up assessment by mail or telephone, with 90% of the subjects participating.

A multiple-method, multiple-informant approach was taken throughout the PCLS. Researchers reported that they measured the participant's ability to adapt to their environments and cope with difficult situations by measuring their ability to develop into successful adults. In addition to this, their family life, the intelligence of their parents or who raised them, as well as the participant's ability to solve complex problems with creative solutions, delay gratification and interact with others positively and effectively, was also recorded and measured.

The initial instrument used the Life Events Questionnaire, was adapted from a measure for adults by Coddington in 1972. Self-report and parent report versions of the LEQ were later created and a Life Chart for the parent interview (with a time line) helped parents to provide a comprehensive account of major adversities over the participant's life to date. Researchers wanted to combine all comprehensive data into one measurement which led to the Life Chart and Rating Scale approach (Gest, Reed, & Masten, 1999).

The major findings from this twenty year study include: meaningful patterns of competence, resilience and maladaptation can be identified. Through empirical data, in-person interviews and life patterns observed in times of high or low adversity, Masten et al (1999) were able to identify patterns or resilience based on a number of factors. It was found that people who manifest resilience have more adaptive capacity. Researchers found that it was the combination of extremely high adversity and lack of opportunities or limitation of access to resources, in the form of parenting quality and cognitive function that led to participants not being able to adapt to change and cope with difficult situations in a way that allowed them to be successful.

Additionally, the PCLS found evidence of "late bloomers" and "turnaround cases". In the transition to adulthood, some of the subjects were able to shift from maladaptation to resilience. Specific cases from this study showed that individuals who did not show resiliency in the beginning of the study, developed resiliency by going down one of many different pathways, including removing themselves from troubled situations, developing healthy romantic relationships, or finding and seizing a new educational or career opportunity. Interestingly enough, it was noted that most of these cases were women. These turnaround cases also showed that this group showed higher instances of conscientiousness as children, demonstrating that there may have been earlier signs of capacity for self-control that were overlooked in their adolescent years, but later on aided in their development for self-direction as adults (Masten & Tellegen, 2012 p. 15).

A study done by Kirsi Peltonen, Samir Qouta and Raija-Leena Punamacki (2014) looked at resilience in children who were faced with the adversities that accompany war. A large number of studies have been done on this idea that ties into the idea of "protective factors" as proposed by Masten and Garmezy in the 1970s. "Reviews confirm the significant role of children's optimal cognitive-emotional processes, family's supportive and loving practices, as well as school and societal resources in protecting children's mental health from war-related factors" (Peltonen et al, 2014, p. 2). In 2012, Masten and Tellegen suggested that in war conditions, fundamental adapting abilities that are critical in maintaining resiliency include the child's problem solving skills, ability to connect with others socially, belief systems, and support from parents, siblings and peers emotionally.

Resilience as defined by Luthar, Cicchetti and Becker in 2000 referred to "children who had been exposed to severe trauma, but showed absence of psychopathology" (Luthar et al, 2000). The measurements included the 13-item Children's Revised Impact of Event Scale (CRIES). Children were asked to indicate on a scale of 0 to 4, (0 = not at all, 4 = often) how often they had each symptom in the last 2 weeks. In addition, there was a measurement of war trauma which consisted of 31 events that captured the Palestinian children's typical experiences

during war against Gaza. Results of these tests showed that one third of children could be identified as resilient in the Palestinian sample. The results showed peer relations and friendship quality was the main predictor of childhood resilience. Additionally, "friendships were especially associated to boy's resilience…boys can benefit from high quality friendships and develop resilience, partly because of these important peer relations. Among girls, the buffering effect of friendships was also evident but only when there was relatively low exposure to war-related traumatic events" (Peltonen et al, 2014, p. 5).

Locus of Control

An internal locus of control means the individual believes that they play a significant role in their successes and failures and that not much is left up to chance. A person with an external locus of control believes that many things are out of one's control and what is going to happen is going to happen and there is nothing anyone can do to change it.

In 1977, researcher Carl Anderson investigated the link between locus of control, coping mechanisms and what level of performance and success resulted in 90 entrepreneurs. The 3 year long longitudinal study started in an area in Pennsylvania that had been devastated by flooding from Hurricane Agnes. Approximately 430 businesses were affected by the flooding and 102 owners of these small businesses were chosen to be interviewed for this study. Out of the 102 chosen, 90 full responses were received.

Conclusions of this study confirmed the findings of earlier studies that "externals perceive higher stress than internals in a given situation and internals and that externals respond with much more defensiveness and much less task-oriented coping behavior than internals" (Anderson, 1977, p. 2). This means that people with an external locus of control are typically more stressed out in challenging or difficult situations because they are perceiving the challenges to be out of their control and therefore experience more stress. Secondly, in order to cope with this, externals are less likely to take proactive action to deal with the challenges if they believe that they have no impact on their situation. Furthermore, it was found that

those with an internal locus of control are more task-driven and organized when dealing with challenges and believe in their abilities to change their situations.

A final conclusion of this study found that entrepreneurs that had an internal locus of control were more likely to be successful. It would found that their task-organization, motivation to move forward and meet challenges and determination to enhance their current situation, all contributed to overall success that externals did not have. Furthermore, this study concludes that training externals to have an internal locus of control can be beneficial to the success of their business and career and can help to change their financial and career-oriented positions. This means that if individuals can change their perceptions of the world as being able to be manipulated instead of out of their control, the changes that can then be made can be extremely beneficial in both the long term and short term and in various facets.

Hardy Personality

Another important determinant of psychological resilience researchers have discovered is the idea of the "hardy personality." The concept of hardiness was first introduced to the field by Suzanne Kobasa in 1979. It is a personality construct comprised of three different parts: commitment, control and challenge. Commitment referred to sense of self, direction and place in life, control referred to personal agency and an internal locus of control, and challenge referred to looking at change as expected and normal and working through challenges instead of being stressed out by them. Kobasa's study followed upper and lower level managers for three years to see how they responded to different stressors in the workplace. Her results found that the three components of hardiness were key factors in maintaining their health under high levels of stress (Kobasa, 1979). "Hardy" individuals were found to fewer illnesses during the same period of time. Similar results were found in later investigations by Kobasa and her associates (Kobasa, Maddi & Courington, 1981; Kobasa, Maddi, Puccetti & Zola, 1985; Maddi & Kobasa, 1984).

In a study completed by Kenneth D. Allred and Timothy W. Smith in 1989 found a connection between hardy personality and the ability to deal positively with environmental

stressors. Additionally, "hardy subjects were more likely than non-hardy subjects to perceive reported life events as positive and under their complete control" (Allred & Smith, 1989, p. 3) This ties in with the internal locus of control and suggests that those with a hardy personality also tend to have an internal locus of control, meaning that they take responsibility for the events that happen to them as well as their outcomes. An internal rather than external locus of control (Rotter, 1966) was found in a 1972 study conducted by Houston and confirmed in a 1978 study repeated by Manuck, Harvey, Lechleiter and Neal, to "be associated with increased heart rate, and systolic blood pressure responses to laboratory stressors…presumably this was because internally oriented persons attempt to cope actively with the stressors…which in turn result in higher HR or SPB" (Funk and Houston, 1987; Manuck et al, 1978).

Furthermore, this study looked at the link between hardy personality, (also referred to as a Type A personality) and coronary heart disease. It was hypothesized that those who reported having a hardy personality, were less likely to develop coronary heart disease than those who were reported as being less hardy. This was due to the individual's ability to positively cope with stress and accept responsibility for the stressors that were present in their lives. This then allowed the individual to discover the source of the stress and derive creative solutions to eliminate or decrease the impact of that stressor. This was linked to the occurrence of stress-induced diseases, and an individual's ability to maintain a healthy level of stress in their lives.

The study completed by Allred and Smith focused on 84 undergraduate male students at Utah University. Researchers wanted to measure the physiological and cognitive responses of the participants to situations that they perceived as stressful in order to measure their level of hardiness. Researchers used physiological measures of stress including heart rate (HR), systolic blood pressure (SBP) and finger pulse volume (FPV). Cognitively, hardiness was measured using the 36-Item Revised Hardiness scale as derived by Kobasa in 1982. It was predicted that subjects high in hardiness would perceive stressors more positively than those low in hardiness, and would display lower heart rates, systolic blood pressure and finger pulse volume, all of which are responses to perceived threats.

The results of this study were similar to that of the earlier study conducted by Funk and Houston in 1972 and repeated by Manuck et al in 1978 with respect to the physiological responses of the subjects. The undergraduate males who were higher in hardiness showed higher heart rates and systolic blood pressure in response to perceived threats. It was concluded that this was because they were anticipating and actively coping with the threat and their bodies reacted as such. Cognitively, those who were higher in hardiness, scored higher on the 36-Item Hardiness Scale than their less hardy counterparts. This study demonstrates a connection between physical resilience and hardy personality. It shows the link between being able to adapt to physical stressors in one's environment and their personality constructs. It concludes that the hardy personality and its characteristics can be a buffer against physical stressors.

Resilience Research Summary

In summary, the research on resilience pointed to several conclusions. The first finding was that the concept of psychological resiliency is continuously being developed and refined. The second finding was that resiliency in childhood is critical for children to develop in order to be successful later on in life. This resiliency comes from family members, friends, community leaders, or through recognition of their own self-worth. A child's ability to build resiliency aids in developing healthy coping mechanisms that enable the child to face adversity as they mature. The third finding was that resiliency is a vital piece of another concept, grit. To be gritty is to have developed resiliency either physically or mentally, and to have the ability to overcome challenges and adversity in stressful situations. It is suggested that both grit and resiliency can be inheritable traits as well as learned skills. The fourth finding suggested that an internal locus of control, or personal responsibility for life events, is related to being resilient. Individuals who understand that they have a part to play in events that happen to them and their outcomes, are generally more resilient than those who believe they have no hand in the results of their choices. The fifth finding suggested that a hardy personality is a key component of being resilient. This research demonstrates that mental resiliency to environmental stressors as well as physiological resiliency is derived from having a hardy personality and that those who are identified as having a hardy personality are typically more resilient in the face of adversity than less hardy individuals.

INVESTIGATIVE RESEARCH QUESTIONS

Several investigative research questions were developed to guide this research on resiliency of Honors Students at Bryant University. The overarching question that drove the research was: can measures of resiliency predict retention in the Honors Program at Bryant University? Based on research, it is predicted that measures of resiliency can predict retention in the honors program. From this question, several other questions were derived pertaining to each individual measure of resiliency that was used. Questions included: can grit score predict grade point average (GPA)? It is predicted that grit score and GPA will be positively correlated and a high grit score can predict a high GPA, and the inverse of that will also be true. Another question was, can grit score predict retention? It is predicted that a student with a higher grit score will be more likely to remain in the honors program. Another question to be answered was, can locus of control predict retention? In other words, does an internal locus of control versus an external locus of control predict whether or not that student will stay in the honors program? Additionally, a link was hypothesized to be apparent between a student's reported resilience questionnaire score and their staying in the honors program. Furthermore, it was predicted that evidence of a hardy personality can translate to retention in the honors program. Finally, we predicted that a combination of all four measurements used into one resilience score could be used to predict whether or not students would stay in the honors program. (See Appendix O for summary of research question findings.)

METHODOLOGY

The methodology used to conduct this research as well as to compile usable statistical data was completed in five parts:

1. Identification of target groups for research
2. Creation of survey questions utilizing literature review
3. Publishing and disseminating of survey to target groups
4. Collection of data using survey database Qualtrics
5. Analysis of collected data

The first part of the research process involved identifying key research target groups that would help to answer my primary investigative research question. Since research was centered on retention in the Honors Program at Bryant University, target groups included honors students that were freshmen, sophomores, juniors as well as seniors completing their final capstone project. Students who had once been in the honors program and had dropped out for various reasons were also sought out to be part of research and offer some qualitative data and reasoning behind their leaving. Once these target groups were identified, it was determined that at least 100 freshmen, 75 sophomores, and 50 juniors and seniors would be the ideal numbers relative to the size of the honors program. Students who had dropped the program were included in these original numbers. The identification of these groups of students was the first stepping stone to the construction of this research project and helped to narrow the focus and direct the results towards my primary investigative research question.

The second part of this methodology included creation of survey questions utilizing my literature review. After I had conducted my literature review and focused on overarching concepts of resilience and studies that had been done on this concept, I was then able to pick and choose what dimensions of resilience I wanted to include in my study. Since the idea of multidimensional resilience centered on the idea of multiple facets or contributing factors to a students' resilience, it was important to choose the contributing factors carefully. I ultimately decided on including a student's 12-item Grit Score (See Appendix A for 12-Item Grit Test),

as derived from the study by Angela Duckworth and A.L. Quinn (2007), as well as a student's protective factors score as derived from the Resilience Questionnaire which was derived from the Adverse Childhood Experiences Test which was given in the 1990s to 17,000 participants at the Kaiser Permanente. (See Appendix B.) In addition to these two scores, the Locus of Control test (See Appendix C) which was developed by Julian B. Rotter in 1966 was included, as well as the 15-item Dispositional Hardiness Test (See Appendix D) which was created as a result of Fulbright research by Dr. Bartone in Norway in 2006. These four scores were carefully chosen to include four different dimensions that were predicted to contribute to a students' resilience.

The Grit Score looked at the link between resilience and grit as defined by Duckworth and Quinn. The idea behind this score was that grit, or what makes a student gritty or able to overcome challenges and obstacles is directly related to resilience, or what makes a student able to bounce back from these challenges or obstacles.

The second score that comprised the overall resilience score was from the Resilience Questionnaire which looked at protective factors that students may or may not have grown up with. The idea is that these protective and "promotive" factors that originated in students' families, communities, sports teams, and other involvements, would contribute to a students' academic success and overall resilience. This added the dimension of nature vs. nurture where we were trying to determine if resilience can be taught and learned, and if so, in what ways can it be learned.

The third score was the Locus of Control score which determines a students' perspective of the world around them. It decides whether the student has an internal or external locus of control. If a student has an internal locus of control, that means that they take responsibility for the failures and successes in their lives and believe that their actions have a significant impact on the way that their lives turn out. Those with an external locus of control believe that most things are going to happen regardless of what you think you can do to prevent them and that a lot of what happens is due to coincidence and luck. The difference in this perception of

the world is predicted to impact a students' overall resilience. It was believed that those with an internal locus of control would be more resilient than those with an external locus of control. This adds the dimension of perception to the resilience score to try to get a full picture of what contributes to a students' resilience.

The fourth and final score was the 15-item Dispositional Hardiness score. This score looked at the link between personality and resilience and tried to decide whether there was a correlation between students who were born with a "hardy" personality were simply more resilient because of it. This added the slight dimension of personality to the study to try to understand if students were perhaps born with the ability to be resilient.

Besides these four tests that were included in the survey, I also included some basis questions in the beginning of the survey to create some demographic data. I asked what year the participant was going to graduate, whether or not they were in the Honors Program, their age, gender, GPA, as well as asked them to check off what involvements they were involved in on campus outside of academics. In addition to this, for those who answered that they had dropped out of the Honors Program, there was a question that asked for their reason behind dropping out. I could then correlate these responses to their grit, resilience, locus of control and dispositional hardiness score to see if there was any significant relationship.

After the survey questions were chosen and the survey was compiled, the survey was disseminated to the target groups that had been identified in step 1. The most effective way to reach the number of students that I had planned to reach out to was through utilization of the campus global address book on email. They survey link was emailed to 377 honors freshmen, sophomores, juniors and seniors. It was then emailed again to 165 freshmen, and 25 seniors specifically. It was emailed to lists of students who had been reported as having originally been in the honors program when they first arrived on campus as freshmen and had since dropped out. Participants were then able to click the survey link that would take them to the survey hosted by Qualtrics. There, participants were asked to give informed consent that they understood what they were about to participate in. In order to continue with the survey,

participants had to indicate whether they understood or did not understand. If they chose that they did not understand, no more survey questions were available to be answered and the survey ended.

Due to the nature of some of the survey questions and the possible implications that could accompany these questions such as memories of childhood trauma, every question besides the demographic questions had the option to be skipped over without negative consequence affecting the participant. Unfortunately, this meant that those survey responses that were not completed in full had to be thrown out because they did not contain complete usable data.

Once participants took the survey, their responses and data were collected and sent to a database that I could access on Qualtrics. This database contained charts with percentage breakdowns of each answer that was given as well as averages, medians and minimum and maximum values for each question. From this I could pull basic information about the answers that were given for each question.

The final part of my methodology was analysis of results. Once all the basic data had been collected and documented, each participant's response needed to be reviewed in order to determine whether it was usable or not. There were many responses that were omitted from the data based on the fact that questions were skipped over and therefore full, complete data was not able to be obtained from this response. After the responses that were not usable were thrown out, I had 146 full, complete and usable responses. I then went through each individual participant's response to record all their information in order to properly find correlations. Once each participant was broken down into demographic data as well as the four scores, this data was compiled into a spreadsheet using Microsoft Excel. Information such as whether the participant was in the Honors Program or not as well as their gender, needed to be coded in order to be analyzed using SPSS. SPSS was utilized off of the Citrix server. The Microsoft Excel sheet that had all the data compiled in one place was exported to SPSS where statistical analysis was then able to take place.

DISCUSSION OF RESULTS

The results of my research on a basic level create a picture of a typical honors student at Bryant University. 168 surveys were started and 146 surveys were fully completed which yielded an 87% completion rate. Out of these completed surveys, 60% of the participants reported that they identified as female, and 40% identified as male. 77% of participants reported being in the Honors Program, and 67% of that 77% percent reported wanting to finish the program out to their senior year. 23% of participants reported dropping out of the program. Below illustrates the GPA breakdown of the participants.

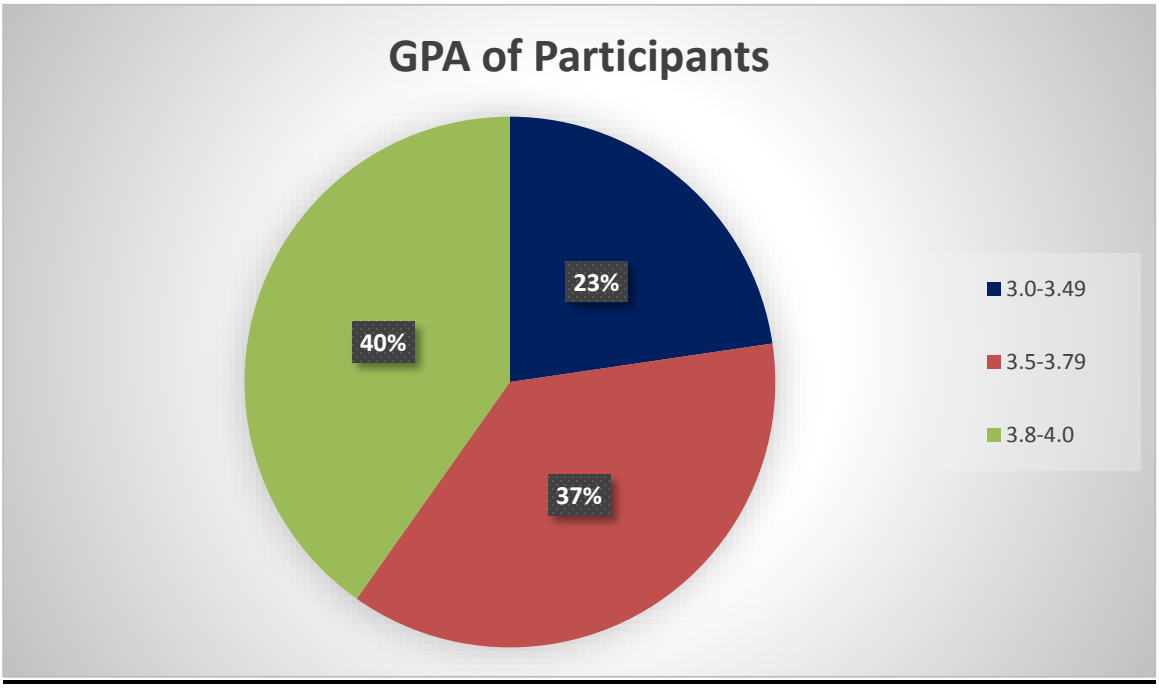


Figure 1 – GPA of Participants

The GPA breakdown of participants was pretty evenly split when it came to the participants' GPA being between 3.5 and 3.79 and 3.8 and 4.0. This was averaged out when it came to statistical analysis to 3.65 and 3.9 respectively. This was to be expected based on the target pool of participants being honors students who are expected to have higher GPAs on average.

Once demographic data was compiled, a statistical analysis was conducted using SPSS. A statistical model was derived from the data. (See Appendix E for statistical model) This statistical model was created using correlations between all variables to create a matrix of relationships between the variables. (See Appendix F for descriptive statistics on all variables) From this, we looked at Pearson correlations to decide whether the relationship between the variables was significant. A Pearson correlation was significant the closer to -1 or 1 it was. Below are the correlations that were tested to determine if the variables could predict retention in the Bryant University Honors Program or not.

Correlations

		Grit Score	Honors Code
Grit Score	Pearson Correlation	1	.066
	Sig. (2-tailed)		.432
	N	146	146
Honors Code	Pearson Correlation	.066	1
	Sig. (2-tailed)	.432	
	N	146	147

Figure 2- Correlation between Grit Score & Honors Code

Figure 2 shows the results of a T-test between Honors Code and Grit Score. The Pearson correlation here is .066 which is not high enough to be significant. That means that based on this statistical model, Grit score was not able to predict whether or not a student would stay in the Honors Program.

Correlations

		Grit Score	GPA
Grit Score	Pearson Correlation	1	.230**
	Sig. (2-tailed)		.005
	N	146	146
GPA	Pearson Correlation	.230**	1
	Sig. (2-tailed)	.005	
	N	146	147

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

Figure 3 – Correlation between Grit Score and GPA

Figure 3 shows the results of a T-test between Grit Score and GPA. The Pearson correlation here is .230 which is high enough to be significant. This means that based on this statistical model, Grit Score can predict GPA, and GPA can predict Grit Score. So, it can be concluded that the higher a student's GPA is, the grittier they are likely to be, and the higher a student's Grit Score is, the higher their GPA is likely to be. (See Appendix G for Linear Model and one-way ANOVA for this correlation)

Correlations

		Protective Factors Score	Honors Code
Protective Factors Score	Pearson Correlation	1	.021
	Sig. (2-tailed)		.798
	N	146	146
Honors Code	Pearson Correlation	.021	1
	Sig. (2-tailed)	.798	
	N	146	147

Figure 4- Correlation between Protective Factors Score and Honors Code

Figure 4 shows the results of a T-test between the Protective Factors Score which was derived from the Resilience Questionnaire, and Honors Code. Based on this statistical model, it can be concluded that based on the Pearson correlation of .021, there is no significant correlation

between these two variables. This means that a student's protective factors score cannot be usedto predict their retention in the honors program.

Correlations

		Honors Code	Locus of Control Coded
Honors Code	Pearson Correlation	1	-.012
	Sig. (2-tailed)		.888
	N	147	146
Locus of Control Coded	Pearson Correlation	-.012	1
	Sig. (2-tailed)	.888	
	N	146	146

Figure 5 – Correlation between Locus of Control Score and Honors Code

Figure 5 shows the results of a T-test between the Locus of Control Score and Honors code. With a Pearson correlation of -.012, there is no significance between these two variables based on this statistical model. This means that a student's locus of control cannot be used to determine whether or not they will stay in the program.

Correlations

		Honors Code	Dispositional Hardiness Score
Honors Code	Pearson Correlation	1	.045
	Sig. (2-tailed)		.586
	N	147	146
Dispositional Hardiness Score	Pearson Correlation	.045	1
	Sig. (2-tailed)	.586	
	N	146	146

Figure 6- Correlation between Dispositional Hardiness Score and Honors code

Figure 6 shows the results of a T-test between a student's Dispositional Hardiness Score and honors code. Based on this statistical model and the Pearson correlation of .045, there is not a significant relationship between these two variables. This means that a student's Dispositional Hardiness Score cannot be used to determine retention in the honors program.

Correlations

		Honors Code	RESILIENCE SCORE
Honors Code	Pearson Correlation	1	.043
	Sig. (2-tailed)		.604
	N	147	146
RESILIENCE SCORE	Pearson Correlation	.043	1
	Sig. (2-tailed)	.604	
	N	146	146

Figure 7 – Correlation between Resilience Score and Honors code

Figure 7 shows the results of a T-test between a student's overall Resilience Score which was the Grit score, Protective Factors score, Locus of Control score and Dispositional Hardiness scores all added together, and honors code. Unfortunately, based on this statistical model, there is not a significant correlation between Resilience score and honors code. This means that a student's resilience score cannot be used to determine whether or not a student will stay in the honors program.

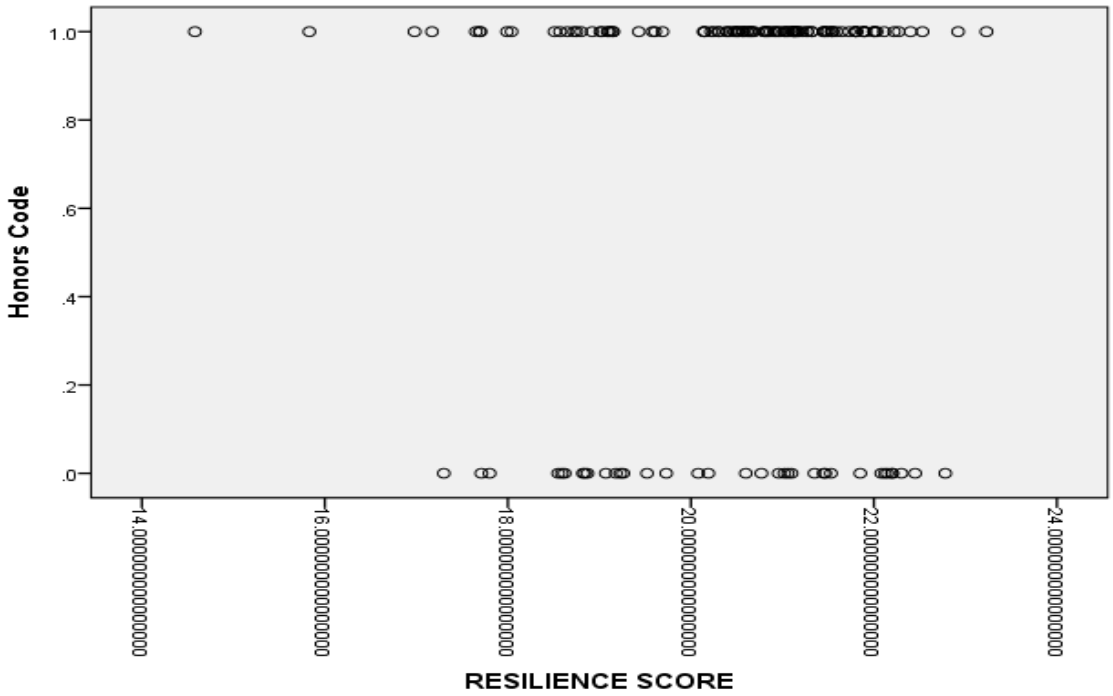


Figure 8 – Scatterplot of correlation between Honors Code and Resilience Score

Correlations

		RESILIENCE SCORE	Protective Factors Score
RESILIENCE SCORE	Pearson Correlation	1	.879**
	Sig. (2-tailed)		.000
	N	146	146
Protective Factors Score	Pearson Correlation	.879**	1
	Sig. (2-tailed)	.000	
	N	146	146

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

Figure 9 – Correlation between Resilience Score and Protective Factors Score

Figure 9 shows the results of a T-test done with Resilience score and Protective Factors score. With an almost perfect correlation of .879, we can make some assumptions of the importance of the protective factors score in calculating the resilience score. (See Appendix H for Scatterplot) Since the protective factors score is included in calculating the resilience score, it is no wonder that the two will have a relationship. However, what this tells us, is that a student's protective factors score can be used to determine their resilience score. Thus:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.819	.665		8.752	.000
	Protective Factors Score	1.067	.048	.879	22.119	.000

a. Dependent Variable: RESILIENCE SCORE

Figure 10 – Coefficient and constant to construct formula for Resilience Score

Figure 10 shows how a formula can be constructed using protective factors score to find resilience score. What this means is, if we multiply 1.067 x protective factors score and add the constant 5.819, we can get a student's resilience score. With the current statistical model, this doesn't do too much. However, if down the line, we can tweak the model to accurate represent a student's resilience, there is evidence that a student's protective factors score will play a major role in calculating that level of resilience.

Correlations

		Honors Code	GPA
Honors Code	Pearson Correlation	1	.952**
	Sig. (2-tailed)		.000
	N	147	147
GPA	Pearson Correlation	.952**	1
	Sig. (2-tailed)	.000	
	N	147	147

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

Figure 11 – Correlation between GPA and Honors code

Figure 11 shows the results of a T-test between GPA and honors code. What this tells us is that there is almost a perfect correlation based on this statistical model that says that retention in the honors program can be predicted using a student's GPA. (See Appendix I for Linear Model Summary and one-way ANOVA for this correlation) This makes sense since a student with a high GPA who is in the honors program is less likely to drop out if they are making the appropriate grades and are happy with their academic performance. Likewise, honors students are typically more academically successful than non-honors students, and therefore a student's GPA can be used to predict which students are honors students.

Correlations

		Honors Code	Involvements
Honors Code	Pearson Correlation	1	.230**
	Sig. (2-tailed)		.005
	N	147	146
Involvements	Pearson Correlation	.230**	1
	Sig. (2-tailed)	.005	
	N	146	146

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

Figure 12 – Correlation between Involvements and Honors Code

Figure 12 shows the results of a T-test between the numbers of involvements a student has on campus and honors code. (See Appendix J for Linear Model and one-way ANOVA for this correlation) What this tells us is that the number of things a student is involved in on campus

can predict whether or not that student is in the honors program. In other words, honors students are typically more involved in different things on campus outside of their academics, and the more involvements a student has, despite their demanding coursework, the more likely that student is going to be staying in the program.

Correlations

		Honors Code	Gender Coded
Honors Code	Pearson Correlation	1	.366**
	Sig. (2-tailed)		.000
	N	147	147
Gender Coded	Pearson Correlation	.366**	1
	Sig. (2-tailed)	.000	
	N	147	147

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

Figure 13 – Correlation between Honors Code and Gender

Figure 13 shows the results of a T-test between honors code and gender. (See Appendix K for the Linear Model and ANOVA for this correlation) What this result tells us is that a student's retention in the honors program can be predicted based on their gender. At Bryant University, the split between those who identify as males and those who identify as females is roughly 60% and 40% respectively. In the honors program however, the opposite is true, with significantly more females than males. Not only were males more likely to drop out than females, there were also more females who were in the program overall.

Correlations

		Gender Coded	GPA
Gender Coded	Pearson Correlation	1	.366**
	Sig. (2-tailed)		.000
	N	147	147
GPA	Pearson Correlation	.366**	1
	Sig. (2-tailed)	.000	
	N	147	147

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

Figure 14 – Correlation between Gender and GPA

Figure 14 shows the results of a T-test between gender and GPA. With the exact same Pearson correlation as in *Figure 13*, there is a link based on this statistical model between gender and retention, and in this case, gender and GPA. What this tells us is that a student's gender can help to predict their GPA. (See Appendix L for Linear Model and one-way ANOVA for this correlation.) Females were more likely to have a higher GPA than their male counterparts. In addition, the highest reported GPAs were predictability from female students. Interestingly enough, this was true for both those students that were in the honors program as well as those who had dropped.

WHAT WE'VE LEARNED

1. There is a direct correlation between an individual's grit score and their GPA or academic performance.
2. There is a weak link between a student's resilience the environment they grew up in, but this link needs to be studied further.
3. The current measures of resilience can be improved upon to get a better idea of a student's academic resilience.
4. Females are more likely to be more successful academically as well as be more resilient.
5. Students are dropping the honors program based on the fact they have to complete a long term project in order to graduate.
6. Implications of this study suggest that there are less gritty students than non-gritty students.
7. Implications of this study suggest that there are students who are high in need for achievement but not high in grit, resulting in a low retention rate.

Based on the current study, there was no real link found between resilience and academic achievement. The current measures of resilience need to be changed or adapted to better fit the population of students that the study is focusing on in order to get a stronger sense of a student's true academic resiliency. Moving forward, the measurement constructs of this study should be adjusted or changed altogether to get a different perspective on the concept of resiliency and how it is applied to honors students.

IMPLICATIONS

The implications of this research can be broken down into three categories:

1) Implications for Bryant University
2) Implications for the Future of the Honors Program
3) Implications for Honors Students

Implications of this research for Bryant University are two-fold; first of all, it gives the University an idea of what kind of students they are admitting to their University and more specifically, to the Honors Program. This research goes beyond what looks good on paper, i.e. GPA, or number of involvements on campus, and tries to get a better picture of the student on a multidimensional level. Second of all, it gives the University a stepping stone if they were to try to test the idea of resilience in students in the future.

The benefits of helping the University to understand what kinds of students are being admitted is that the University can better address the needs of these students on both an academic and vocational level and help them to better prepare to be young professionals. What this means is that while this research was not able to link resilience to retention based on the earlier stated statistical model that does not mean that it cannot be linked in the future. Also, the basic information gleaned from the demographics part of the survey can help to identify the needs of the current students in the honors program and better plan around these needs for events and services in the future. Along with this, with further research into the idea of resilience in honors students and non-honors students as well, can perhaps help to construct a curriculum around the idea of teaching students to be academically resilient in the face of scholarly challenges. This would not only help the GPAs and academic standing of the students at the University, but it would better the reputation of the University both for the Honors Program and for the University itself.

Implications of this research for the Bryant University Honors Program have the potential of offering retention solutions. It was identified in the research that the capstone is the biggest reason for students to drop out. (See Appendix M for Qualitative Word Cloud) This means that students are dropping out as soon as they need to start doing work for the year-long research project or Senior Capstone project. In May of 2015, the Honors Program will graduate 25 seniors – 19 females and 6 males. The class of 2015 in the Honors Program started at over 100 students. This means that the retention rate is less than 25%. For a program that wants to be nationally recognized, this retention rate is nowhere near where it should be. Results of the survey reported that 67% of the 77% of students who reported being in the honors program reported wanting to finish the program with completion of a capstone project in their senior year. That means that out of 146 survey participants, 110 were in the Honors Program, and out of those 110, 74 students reported staying in the program until the end. If, hypothetically, 110 was the number of students who started as freshmen in the honors program, and 74 made it to the end of their senior year and finished their project, the retention rate would be 67%, significantly higher than the actual retention rate.

So why is the actual retention rate and the retention rate as portrayed by survey participants vastly different? For the Honors Program, the key lies in encouragement of the completion of a long term goal, i.e. the capstone. The literature supports the idea that there are people who are high in need for achievement, and those who are high in grit. Those who are high in need for achievement are those easy goal-setters, high GPA students. These students are those who need that success, need that A+ and need those low-level goals accomplished in order to feel successful. They choose the easier teachers, do what needs to be done to be successful, but any project longer than a few weeks is too long-term and too difficult to complete. On the other hand, those who are high in grit, are those who like the challenge, like to set those long-term goals and don't swerve from them. Sure, there are challenges and obstacles, but the grittier the student, the harder they will work to find a creative solution or to overcome these challenges. This research helps to identify how gritty honors students really are, and what this is going to mean for capstone completion.

If we look at the descriptive statistics in Appendix F, we can look at the average grit score of the survey participants. We see the mean score was 3.59 with a standard deviation of .46. This means that the average score was calculated out to be between 3.13 and 4.05. On a scale of 1 to 5 with 5 being on the more gritty end of the spectrum.

Average Grit Score	
Honors	Dropped
3.61	3.54

Figure 16 – Average Grit Scores of Honors Students and Dropped Students

Figure 16 shows the differences in Average Grit score between Honors Students and Dropped Students. This was calculated by adding up all the Grit scores of students who dropped out of the program and dividing by 36 of them. The same was done for the 110 Honors students to get that average score. From this we can see that Honors students have a higher average Grit score than students that dropped. This tells us that those students who are less likely to finish long-term projects like the capstone are dropping out anyway, which makes sense. However, this also tells us that those students who are in the Honors Program have some degree of grit, and if that grit can be nurtured and turned into productivity and completion of the Capstone, the retention rates of the program will increase significantly.

Finally, there are implications for current Honors students. There is something to be said for taking a survey about how you approach adversity, how you perceive the world, how you grew up and your personality, if it is taken honestly. One can learn a lot about oneself, and figure out how best to proceed in order to be successful. Students who take these surveys and can understand how they perceive the world around them, or how they approach challenges, can diagnose flaws in their methods and perhaps develop into stronger, grittier, more resilient people both academically and professionally. This research can help students to see their weaknesses as well as strengths and demonstrate how these weaknesses can affect their academic performances.

LIMITATONS

As with any study, there are limitations to this study that need to be considered. First, one of the limitations with this study was sample size. The goal was to have a sample size of close to 300 if not more, which would mean getting participation from almost the entire Honors Program at Bryant University as well as at least 75 students who dropped out of the program. Unfortunately, due to the fact that the survey was based on voluntary participation, the same size only made it up to 146 usable responses, with only 32 of those being students who dropped out. Because of this small sample size, the results are limited and thus it calls into question whether or not the sample size of the survey is an accurate representation of the Honors Program at Bryant University. Moving forward, if this research was to be repeated or expanded upon, it would be beneficial to double the current sample size.

A second limitation of the study was the nature of the questions and how there was an option for participants to skip over questions. Due to the personal nature of some of these questions, participants could choose to not answer them. This caused the survey to be incomplete and the results to not be used in the study which resulted in a smaller sample size. If this research was to be repeated in the future, it would be beneficial to not give the option for participants to skip and instead if they didn't want to answer a question, they could just quit the survey. This will eliminate half-results that were received when some participants skipped some questions but answered others. This may also encourage people to answer all the questions if they cannot move forward with the survey unless the question is answered.

A third limitation of the study was the length of time for the study to be completed. The ideal study would be a longitudinal study, following participants from their freshmen to senior year. However, due to the obvious limitation of time, this study was not able to be a longitudinal study and instead was done at one point in time. If the study was able to follow freshmen up through their careers to their senior year, more data about the nature of Honors Students and their drive to finish the program could be collected on a monthly or yearly basis. This would

contribute to more complete results and stronger conclusions as well as help identify key issues in the program that are contributing to low retention rates.

And finally, the last limitation of this study was the self-report bias. All questions on the survey needed to be reported by the participant. This means that they are able to say or choose whatever answer they would like, whether or not it's true. They are not bound to tell the truth and there is often evidence of this bias especially when reporting accomplishments. Males are more often to report that they are overachieving, while females are more likely to report that they are underachieving. Because of this, the results are affected and could be significantly lower or significantly higher than they would be without the self-report bias. Moving forward, if facts such as GPA and involvements could be checked through school administration, the answers that students give could be fact-checked for reliability which would contribute to more complete results.

CONCLUSION

In conclusion, this study gives insight into the type of work ethic that honors students at Bryant University have, and the reasons behind those that are dropping out of the program. It can be concluded that while there are a lot of high achieving students academically in the program, there are not many who are willing to complete long term goals that are more difficult or challenging or have less guidelines to follow. The Senior Capstone Project is a self-driven, year-long process that requires students to be resilient in the face of challenges, have strong time-management skills and be able to see the bigger picture as well as take responsibility for their successes and failures. Students that complete this project are students who have that academic resilience, time management, and grit to go through and complete the entire process. The Bryant University Honors Program has students that are both high in grit and high in need for achievement, and it has been proven that those who are high in grit, have a strong foundation of support from their families, friends and community leaders, and have a strong academic work ethic, are those are the most successful and will graduate with honors.

Appendix A – Summary of Implications of Grit Study

Study & Investigative Research Question	**Implications**
Study 1: ***Does grit grow with age?***	It was determined that based on cultural factors in America, the next generation of individuals is less gritty than their parents. It was also determined however, that as personalities change with age, so does the level of grit, and that those who are older, tend to be grittier than younger individuals of the same circumstances.
Study 2: ***Does grit provide incremental predictive validity over and beyond the Big Five traits?***	This study found that hardiness as a personality trait is more predictive than the other Big Five traits in relation to grit. No other trait was found to be predictive of grit, while hardiness as a predictor found to be correlated to grit.
Study 3: ***Does grit predict higher GPAs?***	It was found that grit in fact does predict higher GPAs.
Study 4 & 5: ***Does grit predict retention at West Point United States Military Academy?***	Grit, combined with other predictors, was one of the main predictors of retention at West Point.
Study 6: ***Can grit predict success in avocational pursuits as well as vocational?***	Grit predicted success in the avocational pursuit of the Scripps National Spelling Bee and was able to predict who would not only advance to the finals, but how far the finalists would go.

Appendix B – 12- Item Grit Test

Please answer the following statements by choosing the answer that most applies to you

	Very Much Like Me	Mostly Like Me	Somewhat Like Me	Not Much Like Me	Not Like Me At All
I have overcome setbacks to conquer an important challenge	○	○	○	○	○
New ideas and projects sometimes distract me from previous ones	○	○	○	○	○
My interests change from year to year	○	○	○	○	○
Setbacks don't discourage me	○	○	○	○	○
I have been obsessed with an idea or project for a short time but later lost interest	○	○	○	○	○
I am a hard worker	○	○	○	○	○
I often set a goal for myself but later choose to pursue a different one	○	○	○	○	○
I have difficulty maintaining my focus on projects that take more than a few months to complete.	○	○	○	○	○
I finish whatever I begin	○	○	○	○	○
I have achieved a goal that took years of work	○	○	○	○	○
I become interested in new pursuits every few months	○	○	○	○	○
I am dilligent	○	○	○	○	○

Appendix C – Resilience Questionnaire

Please answer the following statements by choosing the answer that most applies to you. Prior to the age of 18:

	Definitely True	Probably True	Not Sure	Probably False	Definitely False
I believe my mother loved me when I was little	○	○	○	○	○
I believe my father loved me when I was little	○	○	○	○	○
When I was little, other people helped my mother and father take care of me and they seemed to love me	○	○	○	○	○
I've heard that when I was an infant, someone in my family enjoyed playing with me and I enjoyed it too	○	○	○	○	○
When I was a child, there were relatives in my family who made me feel better if I was sad or worried	○	○	○	○	○
When I was a child, neighbors or my friends' parents seemed to like me	○	○	○	○	○
When I was a child, teachers, coaches, youth leaders or ministers were there to help me	○	○	○	○	○
Someone in my family cared about how I was doing in school	○	○	○	○	○
My family, neighbors and friends talked often about making our lives better	○	○	○	○	○
We had rules in our house and were expected to follow them	○	○	○	○	○
My parents were highly involved in my school and sports/other activities	○	○	○	○	○
When I felt really sad, I could almost always find someone I trusted to talk to	○	○	○	○	○
As a youth, people noticed that I was capable and could get things done	○	○	○	○	○
I was independent and a go-getter	○	○	○	○	○
I believed life is what you make it	○	○	○	○	○

Appendix D – Locus of Control Test – Example Questions

Choose the answer that best describes how you feel

- Many of the unhappy things in people's lives are partly due to bad luck
- People's misfortunes result from the mistakes they make

Choose the answer that best describes how you feel

- One of the major reasons why we have wars is because people don't take enough interest in politics
- There will always be wars, no matter how hard people try to prevent them

Choose the answer that best describes how you feel

- In the long run, people get the respect they deserve in this world
- Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries

Choose the answer that best describes how you feel

- The idea that teachers are unfair to students is nonsense
- Most students don't realize the extent to which their grades are influenced by accidental happenings

Appendix E – 15-Item Dispositional Hardiness Test

Please indicate whether you agree, disagree, or neither agree nor disagree with each statement below

	Agree	Neither agree nor disagree	Disagree
Most of my life gets spent doing things that are meaningful	○	○	○
By working hard, you can nearly always achieve your goals	○	○	○
I don't like to make changes in my regular activities	○	○	○
I feel that my life is somewhat empty of meaning	○	○	○
Changes in routine are interesting to me	○	○	○
How things in my life go depend on my own actions	○	○	○
I really look forward to my work activities	○	○	○
I don't think there's much I can do to influence my own future	○	○	○
I enjoy the challenge when I have to do more than one thing at a time	○	○	○
Most days, life is really interesting and exciting for me	○	○	○
It bothers me when my daily routine gets interrupted	○	○	○
It is up to me to decide how the rest of my life will be	○	○	○
Life in general is boring for me	○	○	○
I like having a daily schedule that doesn't change very much	○	○	○
My choices make a real difference in how things turn out in the end	○	○	○

Appendix F – Statistical Model

Correlations

		Honors Code	Year	Gender Coded	GPA	Involvements	Grit Score	Locus of Control Coded	Protective Factors Score	Dispositional Hardiness Score
Honors Code	Pearson Correlation	1	.234**	.366**	.952**	.230**	.066	-.012	.021	.045
	Sig. (2-tailed)		.005	.000	.000	.005	.432	.888	.798	.586
	N	147	146	147	147	146	146	146	146	146
Year	Pearson Correlation	.234**	1	-.052	-.002	-.185*	-.091	-.057	-.066	.002
	Sig. (2-tailed)	.005		.534	.977	.025	.275	.495	.427	.978
	N	146	146	146	146	146	146	146	146	146
Gender Coded	Pearson Correlation	.366**	-.052	1	.366**	-.180*	-.120	-.012	-.067	.054
	Sig. (2-tailed)	.000	.534		.000	.030	.149	.882	.425	.515
	N	147	146	147	147	146	146	146	146	146
GPA	Pearson Correlation	.952**	-.002	.366**	1	.037	.230**	.030	.007	-.140
	Sig. (2-tailed)	.000	.977	.000		.659	.005	.717	.931	.093
	N	147	146	147	147	146	146	146	146	146
Involvements	Pearson Correlation	.230**	-.185*	-.180*	.037	1	.138	-.039	.085	-.003
	Sig. (2-tailed)	.005	.025	.030	.659		.096	.642	.309	.975
	N	146	146	146	146	146	146	146	146	146
Grit Score	Pearson Correlation	.066	-.091	-.120	.230**	.138	1	.028	.126	-.070
	Sig. (2-tailed)	.432	.275	.149	.005	.096		.734	.129	.403
	N	146	146	146	146	146	146	146	146	146
Locus of Control Coded	Pearson Correlation	-.012	-.057	-.012	.030	-.039	.028	1	.014	-.012
	Sig. (2-tailed)	.888	.495	.882	.717	.642	.734		.870	.884
	N	146	146	146	146	146	146	146	146	146
Protective Factors Score	Pearson Correlation	.021	-.066	-.067	.007	.085	.126	.014	1	.059
	Sig. (2-tailed)	.798	.427	.425	.931	.309	.129	.870		.480
	N	146	146	146	146	146	146	146	146	146
Dispositional Hardiness Score	Pearson Correlation	.045	.002	.054	-.140	-.003	-.070	-.012	.059	1
	Sig. (2-tailed)	.586	.978	.515	.093	.975	.403	.884	.480	
	N	146	146	146	146	146	146	146	146	146

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

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

Appendix G – Descriptive Statistics for Variables

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Honors Code	146	0	1	.5	1.627
Year	146	2014.0	2018.0	2016.541	1.3294
Gender Coded	146	0	3	.42	.538
Involvements	146	.0	8.0	2.836	1.7381
Grit Score	146	1.92	4.58	3.5900	.45962
Protective Factors Score	146	8.0	15.0	13.729	1.2202
Locus of Control Coded	146	.0	1.0	.685	.4661
Dispositional Hardiness Score	146	1.33	3.00	2.4636	.29527
RESILIENCE SCORE	146	14.5800000000 00000	23.2300000000 00000	20.4673287671 23284	1.48122004283 7889
Valid N (listwise)	146				

Appendix H – Linear Model and ANOVA for Correlation between Grit Score and GPA

Grit Score

Linear

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.230	.053	.046	.449

The independent variable is GPA.

ANOVA

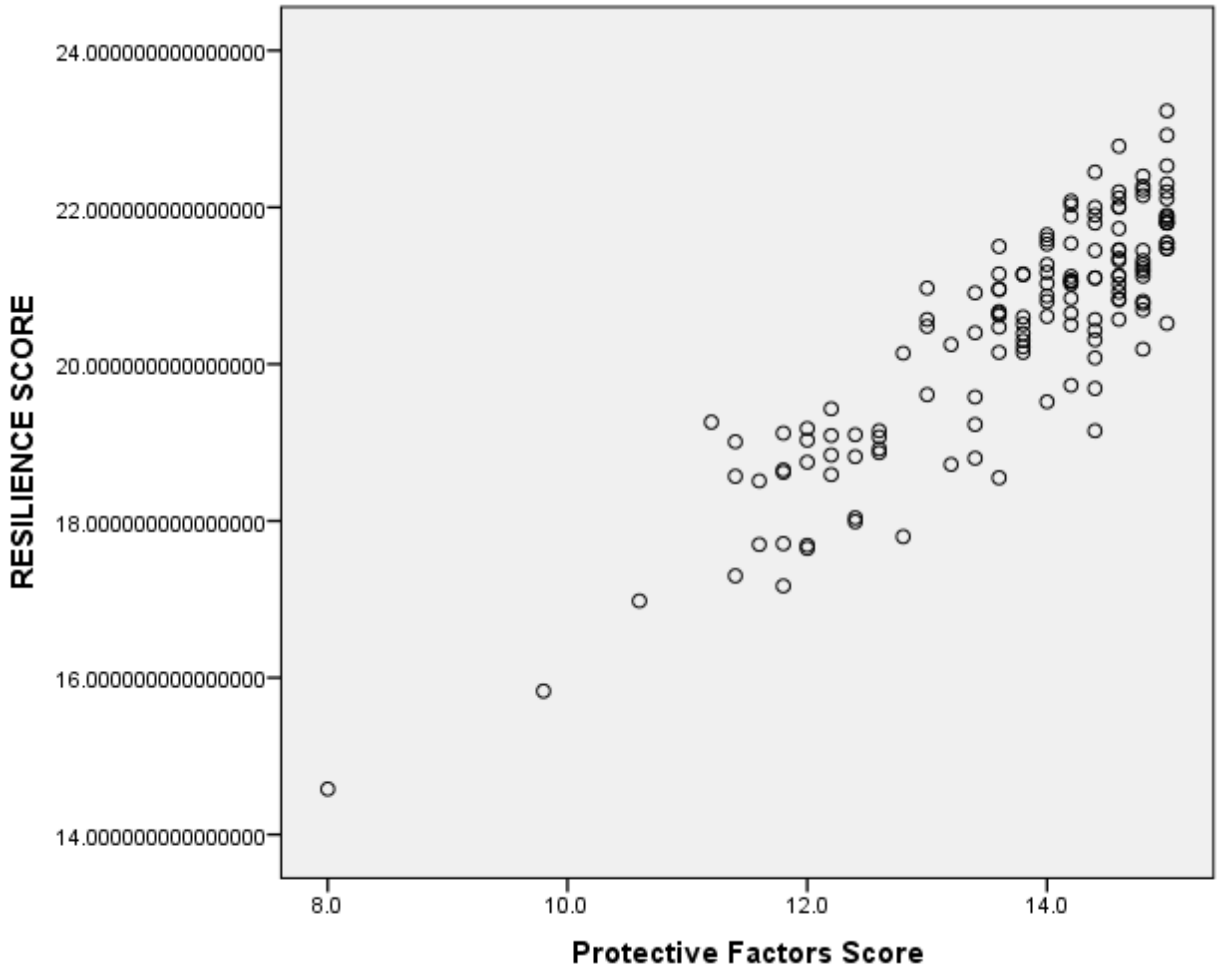
	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.618	1	1.618	8.031	.005
Residual	29.014	144	.201		
Total	30.632	145			

The independent variable is GPA.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
GPA	.363	.128	.230	2.834	.005
(Constant)	2.272	.466		4.872	.000

Appendix I – Scatterplot of correlation between Resilience Score and Protective Factors Score



Appendix J – Linear Model and ANOVA for GPA and Honors Code

Linear

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.952	.906	.906	.499

The independent variable is GPA.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	350.220	1	350.220	1405.276	.000
Residual	36.137	145	.249		
Total	386.356	146			

The independent variable is GPA.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
GPA	1.089	.029	.952	37.487	.000
(Constant)	-3.193	.116		-27.465	.000

Appendix K – Linear Model and ANOVA for Honors Code and Involvements

Linear

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.230	.053	.046	.422

The independent variable is Involvements.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.436	1	1.436	8.051	.005
Residual	25.687	144	.178		
Total	27.123	145			

The independent variable is Involvements.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Involvements	.057	.020	.230	2.837	.005
(Constant)	.591	.067		8.815	.000

Appendix L – Linear Model and ANOVA for Gender and Honors Code

Linear

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.366	.134	.128	1.519

The independent variable is Gender Coded.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	51.886	1	51.886	22.494	.000
Residual	334.470	145	2.307		
Total	386.356	146			

The independent variable is Gender Coded.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Gender Coded	1.109	.234	.366	4.743	.000
(Constant)	.415	.159		2.599	.010

Appendix M – Linear Model and ANOVA for Gender and GPA

Gender Coded

Linear

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.366	.134	.128	.502

The independent variable is GPA.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.635	1	5.635	22.358	.000
Residual	36.547	145	.252		
Total	42.183	146			

The independent variable is GPA.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
GPA	.138	.029	.366	4.728	.000
(Constant)	-.095	.117		-.811	.419

Appendix N – Qualitative Word Cloud

Appendix O – Summary of Investigative Research Questions

Investigative Research Question	Hypothesis	Conclusion
1. *Can measures of resilience predict retention in the Honor's Program at Bryant University?*	It is predicted that measures of resiliency can predict retention in the Honor's Program at Bryant University.	Measures of resilience from this study were not sufficient enough to predict retention in the Honors Program at Bryant University.
2. *Can grit score predict grade point average?*	It is predicted that there will be a positive correlation between grit score and GPA.	Grit score was able to predict GPA. Students with higher GPAs also reported having higher Grit Scores and vice versa.
3. *Can grit score predict retention?*	It is predicted that grit score can predict retention in the Honors Program.	Grit Score was able to predict retention to a slight degree. Students who had higher grit scores were more likely to stay in the Honors Program.
4. *Can locus of control predict retention?*	It is predicted that locus of control can predict retention in the Honors Program.	Locus of control, either internal or external, was not a strong predictor of retention in the Honors Program.
5. *Can the resilience questionnaire that measures family and community support predict retention?*	It is predicted that there will be a connection between the resilience questionnaire and retention in the Honors Program.	There was a weak link between the resilience questionnaire scores and resilience. It is concluded that while this study does not fully explore this connection, there is a connection between academic resiliency and support that students have from their family, friends and community.
6. *Can hardy personality predict retention?*	It is predicted that a hardy personality will have a positive impact on retention.	Hardy personality measures from this study were not strong enough to predict retention in the Honors Program.
7. *Can a combination of grit score, measure of locus of control, measure of family and community support and measure of hardiness predict retention?*	It is predicted that a combination of all the test scores can help to predict retention.	The combination of all the measurements used to measure different dimensions of resiliency was not an accurate predictor of retention in the Honors Program.

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