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THESIS

**EVALUATING THE EFFECT OF THE COVID-19
PANDEMIC ON THE RESILIENCE OF MALE AND
FEMALE MIDSHIPMEN AT THE UNITED
STATES NAVAL ACADEMY**

by

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June 2023

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RESILIENCE OF MALE AND FEMALE MIDSHIPMEN AT THE UNITED
STATES NAVAL ACADEMY**

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ABSTRACT

In June 2020, the Centers for Disease Control reported a 31% increase in anxiety and depression among adults in the United States due to a worldwide pandemic, the Coronavirus Disease (COVID-19). For a few years, protocols to mitigate virus spread existed in the United States and were strictly enforced among members of the armed forces. This pandemic raised the question of how this unfamiliar situation affected a military member's ability to recover from an adverse situation. This paper analyzes the resilience of Midshipmen at the United States Naval Academy (USNA) over a four-month period during the height of COVID-19 restrictions. The research utilizes pre-collected survey data that tested Midshipman resilience in June and September 2020, utilizing Smith et al.'s 2008 Brief Resilience Scale (BRS). Literature indicates varying gender resilience responses to adverse stimuli; therefore, BRS scores were separated into male and female categories and further into graduating cohorts: the Classes of 2021–2023. The results indicate a statistically significant decrease in overall resilience score for all surveyed females and the Class of 2022 female cohort when stratified by graduating class. Similarly, we observe a statistically significant decrease in resilience when examining all male students and within the three separate graduating male cohorts. Through our findings, this study attempts to bring awareness to gender-specific responses to adversity.

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TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	BACKGROUND	1
B.	PURPOSE	2
C.	EXPECTED BENEFITS	2
D.	SCOPE AND RESEARCH OBJECTIVE	3
E.	ORGANIZATION OF STUDY	3
II.	BACKGROUND AND LITERATURE REVIEW	5
A.	INTRODUCTION.....	5
B.	DEFINING RESILIENCE.....	5
1.	Static Process	5
2.	Dynamic Process	6
3.	Aligning Definitions	7
4.	Culminating Definition of Resilience	9
C.	GENDER AND RESILIENCE	10
1.	Gender Differences in Resilience in the Face of Broad Adversities	10
2.	Gender Brain Structural Differences.....	10
3.	Gender Response to Social and Interpersonal Relations	11
D.	RESILIENCE AND COVID-19	11
1.	Resilience Response as it Relates to COVID-19 and Gender.....	12
E.	HYPOTHESIS.....	13
III.	DESCRIPTION OF DATA AND RESEARCH METHODOLOGY.....	15
A.	INTRODUCTION.....	15
B.	RESEARCH APPROACH.....	15
C.	DESCRIPTION OF DATA.....	16
D.	METHODOLOGY	18
IV.	RESULTS	21
A.	INTRODUCTION.....	21
B.	ANALYSIS	23
1.	ALL FEMALES	23
2.	CLASS OF 2021 FEMALES.....	24
3.	CLASS OF 2022 FEMALES.....	25

4.	CLASS OF 2023 FEMALES.....	27
5.	ALL MALES	28
6.	CLASS OF 2021 MALES.....	29
7.	CLASS OF 2022 MALES.....	31
8.	CLASS OF 2023 MALES.....	32
C.	DISCUSSION	33
1.	SOCIAL ISOLATION AND RESILIENCE	33
2.	GENDER COPING STRATEGIES AND RESILIENCE.....	35
3.	GENDER INTEROCEPTION AND RESILIENCE	36
V.	SUMMARY, LIMITATIONS, AND RECOMMENDATIONS	39
A.	SUMMARY OF RESEARCH FINDINGS.....	39
B.	LIMITATIONS	40
C.	RECOMMENDATIONS FOR FURTHER RESEARCH	41
	LIST OF REFERENCES.....	43
	INITIAL DISTRIBUTION LIST	49

LIST OF FIGURES

Figure 1.	The Brief Resilience Scale. Adapted from Smith (2008).	18
Figure 2.	Distribution of the Six Items that Contribute to the Female June Survey Final Resilience Measure.....	21
Figure 3.	Distribution of the Six Items that Contribute to the Male June Survey Final Resilience Measure.....	22
Figure 4.	Distribution of the Six Items that Contribute to the Female September survey Final Resilience Measure.	22
Figure 5.	Distribution of the Six Items that Contribute to the Male September Survey Final Resilience Measure.....	23
Figure 6.	Percentage of All Female Resilience Scores or June and September Surveys.....	24
Figure 7.	Percentage of Class of 2021 Female Resilience Scores for June and September Surveys.....	25
Figure 8.	Percentage of Class of 2022 Female Resilience Scores for June and September Surveys.....	26
Figure 9.	Percentage of Class of 2023 Female Resilience Scores for June and September Surveys.....	28
Figure 10.	Percentage of All Male Resilience Scores or June and September Surveys.....	29
Figure 11.	Percentage of Class of 2021 Male Resilience Scores for June and September Surveys.....	30
Figure 12.	Percentage of Class of 2022 Male Resilience Scores for June and September Surveys.....	32
Figure 13.	Percentage of Class of 2023 Male Resilience Scores for June and September Surveys.....	33

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LIST OF TABLES

Table 1.	Quantity of Gender Respondents for June and September 2020 Surveys.....	17
Table 2.	Welch’s <i>t</i> -test Results Comparing All Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.....	24
Table 3.	Welch’s <i>t</i> -test Results Comparing the Class of 2021 Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.	25
Table 4.	Welch’s <i>t</i> -test Results Comparing the Class of 2022 Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.	26
Table 5.	Welch’s <i>t</i> -test Results Comparing the Class of 2023 Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.	27
Table 6.	Welch’s <i>t</i> -test Results Comparing All Male Resilience Scores in the September 2020 Survey to the June 2020 Survey.	29
Table 7.	Welch’s <i>t</i> -test Results Comparing the Class of 2021 Male Resilience Scores in the September 2020 Survey to the June 2020 Survey.....	30
Table 8.	Welch’s <i>t</i> -test Results Comparing the Class of 2022 Male Resilience Score in the September 2020 Survey to the June 2020 Survey.	31
Table 9.	Welch’s <i>t</i> -test Results Comparing the Class of 2023 Male Resilience Score in the September 2020 Survey to the June 2020 Survey.	33

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LIST OF ACRONYMS AND ABBREVIATIONS

BRS	Brief Resiliency Scale
CDC	Center for Disease Control and Prevention
COVID-19	Coronavirus Disease
DOD	Department of Defense
DON	Department of the Navy
HPA	Hypothalamic Pituitary Adrenal
MDC	Midshipmen Development Center
USNA	United States Naval Academy

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I. INTRODUCTION

A. BACKGROUND

In March 2020, a worldwide health pandemic erupted that would affect every single person's way of life, daily routines, health, and mental well-being. The novel Coronavirus Disease, also known as COVID-19, was a traumatic life-altering event that will have lasting effects for many generations. The pandemic caused the United States and the world to close businesses and schools, isolate them in their homes, and challenge the interpersonal and community interactions necessary for mankind (Singh & Singh, 2020). The absence of social interactions leads to stressful states of loneliness, anxiety, depression, mental disorders, health hazards, and many other issues that impact the life of the individual and the collective society (Singh & Singh, 2020). COVID-19 created such an inability to interact socially that many people started experiencing mental health issues. Most notably, however, the pandemic environment affected young adults attending university's daily school and social lives. Social events, events with friends, learning, and traveling are all things that college students may look forward to when they go to school. When the familiar college experience transformed, it took a toll on the mental well-being of many students nationwide. Many studies began to measure the effects COVID-19 had on undergraduate students' mental health and resilience. The pandemic had a distinct impact on collegiate students and their mental health (Center for Collegiate Mental Health, 2021). College students had considerable mental health concerns that impacted their overall health and academic performance (Lederer et al., 2021). In 2020, as a result of the pandemic, students faced an increase in housing and food insecurity, financial hardships, a lack of social connectedness and sense of belonging, uncertainty about the future, and access issues that impeded their academic performance and well-being (Lederer et al., 2021); therefore further increasing concern for resilience changes in college students and ultimately their performance in a future workforce.

Specifically, regarding Midshipmen at USNA during the height of the pandemic, this study strives to identify if resilience has been affected by the COVID-19 pandemic and the contributing factors that may help the military determine a path toward training,

developing, and retaining this demographic within their ranks. USNA was unique in that it was one of few universities to continue with in-person classes in the Fall of 2020 (Millar et al., 2021). As a result, from June to September 2020, the Midshipmen at USNA faced uncertainty, isolation, social deprivation, and fluctuating rules and regulations regarding COVID-19 procedures. These impacts could potentially have long-term effects on these future military leaders graduating from USNA. Students who attend a military academy are often described as resilient and tough individuals; however, the pandemic's effects should still be considered.

B. PURPOSE

This research project aims to understand the effect of COVID-19 on the Midshipmen classes of 2021, 2022, and 2023 from June and September 2020. This paper's research begins with a literature review to define resilience due to the myriad of definitions proposed in past studies. Next, the paper reviews the studied effects of COVID-19 on resilience separately by sex. Then, data collected from the Midshipmen Development Center (MDC) through a resilience survey is analyzed to assess how resilience has changed for the Midshipmen between June and September 2020. Finally, the results are discussed to provide insights into the potential effects that caused the Midshipmen to change resilience during the height of the adverse COVID-19 environment.

C. EXPECTED BENEFITS

The results of this study will emphasize the impact this novel experience had on their newly Commissioned Officers who were personally affected by the pandemic. Additionally, it will potentially elicit a response by top-ranking leaders of USNA, the Navy, and the Marine Corps, to shift towards a military that effectively educates and builds a warfighter's resilience and overall mental health in order to facilitate the growth of a more developed service member who will continue to promote the core values of each service successfully.

D. SCOPE AND RESEARCH OBJECTIVE

Our thesis will include two components: (1) A thorough literature review focused on defining resilience and understanding what effects COVID-19 had on resilience by gender, and (2) An analysis and explanation of the results of two resilience surveys that were given to Midshipmen at USNA in June and September 2020.

Our primary research question is to address the following:

- What effects did COVID-19 have on the resilience of male and female Midshipmen at USNA?

Our secondary question includes the following:

- Which graduation classes were most affected by COVID-19?

E. ORGANIZATION OF STUDY

Following this brief introduction section, this thesis is divided into four chapters. Chapter II covers the background and literature review of defining resilience, comparing resilience as it relates to sex and resilience as it relates to COVID-19 and males and females. When defining resilience, multiple definitions and interpretations were assessed to assist with creating a culminating definition of resilience that will be used as the basis of this study going forward. Additionally, this chapter reviews literature that will allow us to understand the differences in resilience between males and females and how COVID-19 affected the resilience of males and females. This information will allow us to apply the findings to the survey data results to understand better how the pandemic affected the Brigade of Midshipmen. Chapter III will describe the pre-collected data and the research methodology used to calculate, consolidate, and analyze the data of both the June and September 2020 surveys. Chapter IV will analyze the data, discuss the results, and compare our findings to the hypothesis in Chapter II. Lastly, Chapter V will include the summary, conclusion, and future recommendations. The recommendations will suggest additional research and recommendations for USNA and other military leaders.

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II. BACKGROUND AND LITERATURE REVIEW

A. INTRODUCTION

USNA is a unique university where all students are co-located in a dormitory for four years. COVID-19 presented several issues, especially as the requirement of social distancing, isolation, and frequent policy updates altered the culture for two years. As a military academy, USNA strives to develop military students with high resilience and the capability to overcome adversity. The challenges presented by COVID-19 potentially changed the resilient capabilities of a generation of future Naval and Marine Corps Officers; therefore, this study seeks to understand the effects and provide a way forward for leaders at USNA and the military.

B. DEFINING RESILIENCE

Resilience has been studied and defined through various mechanisms, ultimately leading to many definitions that can define results differently (Sisto et al., 2019). As technology develops and more studies surface, the definition of resilience continues to transition toward a dynamic process that constantly updates. With the varying interpretations, research was influenced by these definitions of the term, altering the outcome of studies.

1. Static Process

In pioneering studies, resilience was a static theory highlighting the development of personality traits affected by purely biological considerations. These studies aimed to assess childhood traumas and their effect on maturing personalities (Bonanno, 2004; Herman et al., 2011; Klohnen, 1996). Furthermore, research focused on brain development occurring within a child experiencing unhealthy childhood diversities (Bonanno, 2004; Cicchetti, 2010; Herman et al., 2011; Klohnen, 1996) indicating that “harsh early environments can affect developing brain structure, function, and neurobiological systems,” which can “exacerbate or reduce vulnerability to future psychopathology” (Herman et al., 2011, p. 260). Contrariwise, in an article studying disadvantaged orphaned

children, oxytocin levels were discovered to be significantly suppressed compared to those in healthy family conditions. This finding resulted in a lack of suppression within the hypothalamic-pituitary-adrenal (HPA) axis, which “directly or indirectly influences emotionality and social behaviors” (Carter, 2005, p. 18247), and insufficient regulation of the autonomic nervous system for fight-or-flight responses. Static assumptions of brain maturation related to resilient behavior point to positive and negative results, suggesting there may be more to acquiring resilience than evolution and childhood development. Nevertheless, the pioneering studies regarding brain analytics were underdeveloped at the time of these studies, indicating that the initial examinations of brain functions were not well understood and would require further research as technology develops (Cicchetti, 2010).

Other statically defined research indicated that the impact of traumatic experiences “may be mediated by factors such as body chemistry and personality traits, which may predispose an individual to greater resilience or greater vulnerability to life stresses” (Miller, 1988, Abstract section) or that resilience develops as “a personality trait operating after a short-lived trauma” (Herman et al., 2011, p. 259). The last quote refers to two other studies by Bonanno (2004) and Klohn (1996) suggesting that a child who experiences adverse life events, such as “traumatic events, natural disasters, violence, war, and physical illness” (Herman et al., 2011, p. 259), would develop the traits to overcome adversity. The researcher suggests that beyond childhood development, experiencing shorter adverse situations augments resilient tendencies towards future unfavorable situations. Furthermore, Herman et al. (2011) finalize by suggesting that avoiding “strong, frequent, or prolonged” (p. 263) exposure to stressful life events will more likely allow a child or adult to acquire resilience. Altogether, prolonged exposure to adverse conditions may indicate a reduced ability to acquire resilience in children and adults.

2. Dynamic Process

A turning point for research occurred when Werner and Smith (1992) studied 698 candidates from birth to 32 years old in Hawaii, basing resilient subjects on their evolutionary traits and not on their external conditions. This study changed the trajectory

of resilience studies as Sisto et al. (2019) summarized Werner and Smith's revolutionary definition of "the consolidation of the subject's skills in adverse situations" (p. 2). Studies began to emerge resembling a "dynamic process" (p. 12), which Sisto et al. (2019) define as "the interactions of a constellation of variables that allow the reduction of the impact with the risk conditions and thus effectively dealing with the adverse condition" (p. 13). Factors beyond brain functioning and personality traits emerged, indicating that resilience can also be learned and developed as a skill (Herman et al., 2011). Furthermore, more definitions of resilience appeared, delving into how subjects mentally return to their initial baseline or a new baseline incorporating formed skills that could thwart future adversities (Sisto et al., 2019, p. 22).

3. Aligning Definitions

Despite the shifted trajectories, wide varieties of resiliency dynamics took form, altering the studies' analytics. Researcher Sisto et al. (2019) accrued an extensive dictionary of researchers, outlining the similarities and differences to create one "transversal definition" (p. 1) to align future research. The construct took form into five macro-concepts that summarized the extensive research: "1) ability to recover, 2) type of functioning that characterizes the individual, 3) capacity to bounce back, 4) dynamic process evolving over time, and 5) positive adaptation to life conditions" (Sisto et al., 2019, pp. 4–5).

a. The Ability to Recover

The ability to recover emanates from statically and dynamically defined research regarding "personal characteristics, family, and social resources" (Sisto et al., 2019, p. 5) and a subject's ability to express self-awareness to view the eminent adaptation. Multiple definitions focus on this ability to see through to the end of an adverse situation. "The capacity to sustain well-being and recover" (Okvat & Zautra, 2011, p. 376; Zautra, 2008) indicates a continuous reaction that holds consistent with a subject's baseline, whereas "the ability to recover...through a dynamic process of adaptation" (Caldeira & Timmins, 2016, p. 194) suggests that recovery involves personal modification rather than permanence. With conflicting definitions regarding recovery, Sisto et al. (2019) suggest the summarized

definition of “the tendency of the individual to maintain their own internal balance” (p. 11), suggesting that each person will execute the path to recovery based on the skills within them through evolutionary considerations, childhood maturation, and personal development through all phases of prior life experiences.

b. Type of Functioning That Characterizes the Individual

The characteristics required to function stem from static research regarding each individual’s functioning, using their “personal characteristics to face difficult conditions” to adapt (Sisto et al., 2019, p. 6). Many definitions range the characteristics from which an individual will function to affect resilience: “genetic, epigenetic, developmental, psychosocial, and neurochemical factors” (Wu et al., 2013, Abstract section), “psychological and physical functioning” (Bonanno, 2004, p. 20), and “a set of traits reflecting general resourcefulness and sturdiness of character” (Luthar et al., 2000, p. 546). Each researcher defined their surveyed subject through a myriad of constructs, from genetic to developmental, illustrating that functioning stems from both internal and external factors: “a complex phenomenon,” which Sisto et al. (2019) summarize as “the personal qualities identified as protective factors despite stressful or traumatic events” (p. 12). Future studies must consider all decision variables and continue to narrow the research to determine the most statistically significant contributors.

c. Capacity to Bounce Back

The studies focused on the “bounce back” (Sisto et al., 2019, p. 8) definition indicate various stages to overcome the adverse situation. Silverman et al. (2017) express that bounce back occurs “when faced with challenges” (Abstract section), indicating a simultaneous alignment to normal conditions when undergoing adverse events. Netuveli et al. (2008) describe resilience as “preserving the same level of the outcome or rebounding back to that level after an initial shock” (Abstract section), broadening the range of time that an individual can be considered highly resilient. The amount of time a person must bounce back creates significant disparities between high and low resilience. Sisto et al. (2019) express “bounce back” (p. 8) regarding the response after an adverse event occurs,

opening up the potential for those who undergo adversity to be still considered highly resilient once they have met their baseline following the event.

d. Dynamic Process Evolving Over Time

The dynamic process involves how the individual interacts with the situation. This roots itself again in both static and dynamic definitions, suggesting that biological factors, experience with prior stressors, and adaptation occur within resilient individuals (Sisto et al., 2019). This dynamic aspect aligns best with the definition promoted by Caldeira & Timmins (2016), stating that resilience is “the ability to recover from perceived adverse or changing situations, through a dynamic process of adaptation, influenced by personal characteristics, family, and social resources, and manifested by positive coping, control, and integration” (p. 194). The dynamics of resilience in many studies also suggest a mindset that allows change to occur within the individual, allowing for growth to aid future circumstances that require resilience to overcome.

e. Positive Adaptation to Life Condition

The last construct that many definitions share goes beyond the willingness to change but includes the ability to adapt and foster a growth mindset. Some definitions include “how one learned to grow stronger from the experience” (Thomas & Asselin, 2018, p. 231), the ability to “thrive” (Vaishnavi et al., 2007, p. 293), and “positive adjustment” (Dias et al., 2015, p. 14). Sisto et al. (2019) promote the definitions of positive change, suggesting that to be resilient, one must recover in a positive state, whether at your initial baseline or beyond in growth.

4. Culminating Definition of Resilience

Referencing the extensive literature review by Sisto et al. (2019), our study aligns with their final definition:

Resilience is the ability to adapt positively to life conditions. It is a dynamic process evolving over time that implies a type of adaptive functioning that specifically allows us to face difficulties by recovering an initial balance or bouncing back as an opportunity for growth. (p. 14)

C. GENDER AND RESILIENCE

1. Gender Differences in Resilience in the Face of Broad Adversities

Whether a disaster occurs at the hands of a disgruntled individual or through nature's havoc, individual resilience has consistently been a studied factor. Mental health issues have arisen through these extreme life events, such as mass shootings that plagued the United States prior to the onset of the pandemic. Lowe and Galea (2017) conducted literature research on 49 peer-reviewed articles following 15 mass shootings in the United States. Their research indicated that survivors and family members experienced increased fears and a lower sense of security following the incidents. Individuals with pre-incident psychological symptoms, emotional regulation difficulties, and females were among those found to be at higher risk of post-incident symptoms. Furthermore, females have consistently scored and labeled as a strong predictor for higher chances of Post-Traumatic Stress Disorder, increased fears, and decreased levels of behavioral and emotional well-being (Lowe & Galea, 2017).

Public health emergencies, such as the avian flu, have historically occurred throughout the world's history, with no indication that they will stop occurring as the world continues to evolve (Institute of Medicine, 1988). When studying the effects of resilience, Smith et al. (2009) discovered that the "female sex predicted worse emotional responses" (p. 371) coupled with lower resilience in response to the avian flu outbreak in the mid-20th century. In addition, the male sex was placed on the spectrum of a more positive emotional and resilient response, further confirming that with the onset of COVID-19, females will experience more significant degradations to their resiliency levels (Smith et al., 2009).

2. Gender Brain Structural Differences

Females have structurally different cortical and subcortical brain volumes than males (Longarzo et al., 2021). These structural differences create stronger interoception in females than in males. Interoception is "the ability to perceive inner body sensations" (Longarzo et al., 2021, Abstract section). Interoception differences affect one's sense of self. Evidence suggests that females are more attentive to their bodily functions and sensations (Longarzo et al., 2021). This heightened ability to perceive one's inner body

signals a stronger sense of self. In Longarzo et al. (2021) study, MRIs were conducted with the Self-Awareness Questionnaire for interoceptive sensibility. The findings strongly connected the parietal and temporal brain areas with interoceptive measures. It was concluded that females have a higher level of reflective self-consciousness due to differences in brain structure than that of males.

3. Gender Response to Social and Interpersonal Relations

Singh & Singh (2020) suggest that “man is a social animal and social relations and interactions are necessary to his existence” (p. 168). Social and interpersonal support are integral aspects of developing strong internal resilience. Individuals need a social support network that can provide tools to cope with traumatic events or emotional distress (Sippel et al., 2015). Social support is defined by Cohen (2004) as “a social network’s provision of psychological and material resources intended to benefit an individual’s capacity to cope with stress” (p. 676). Without a family, group, community, or organization to provide resources and support, the capacity for an individual to overcome adversity is severely challenged. Research suggests that, with the proper support systems in place, individuals possess the capability to overcome adversity (Sippel et al., 2015).

Females need personal connections and outlets to cope with adversity and emotions, whereas males are known to be more independent and capable of overcoming obstacles are their own (Rosenfield & Mouzon, 2013). Social connectedness is a considerable factor for an individual’s resilience. According to a study conducted by Weitzel et al. (2022) utilizing the ENRICH Social Support Inventory, social support and social networks were directly related to higher resilience. Weitzel et al. (2022) also suggested that these results prove the importance of interpersonal relationships and social support. Social and interpersonal relationships are essential in the development of resilience and an individual’s ability to overcome adversities such as COVID-19.

D. RESILIENCE AND COVID-19

Given that resilience is a measure of an individual’s ability to cope and bounce back from the negative effects of stressors and that the COVID-19 pandemic created numerous stressors, resilience was a clear indicator of students’ mental well-being during this time of

adversity. The national and mostly worldwide lockdown precautions were one of the main contributors to the increase in stressors (Czeisler et al., 2020). In addition, individual isolation creates a lack of mental health resources (Horton, 2021). The COVID-19 pandemic lockdown also created a loss of social connectedness among college students, which was found to have a direct correlation with students' depression and anxiety (Watts et al., 2022). Watts et al.'s study measured resilience among collegiate students and the impacts resilience had on the students' worries and mental health. It was found that those with better resilience scores were less worried and more mentally stable, and those with worse resilience scores were more heavily impacted by COVID-19 stressors indicating higher levels of depression and anxiety.

1. Resilience Response as it Relates to COVID-19 and Gender

Recent studies have culminated since an awareness of mental health issues has arisen due to the COVID-19 pandemic and the isolating environment it created across the globe. In June 2020, the Center for Disease Control (CDC) reported a 31% increase in anxiety and depression among adults in the United States (Czeisler et al., 2020, Table 1). Through this web-based survey, the CDC stratified results by various demographics – including gender – reporting males to have a slightly greater inclination towards suicidal thoughts than females. Furthermore, males ranked slightly higher than females in the categories of depression, substance abuse, and stress-related disorders, whereas females scored higher in the anxiety category (Czeisler et al., 2020, Table 1). Contrary to the CDC's survey of approximately 6,000 respondents, other studies have highlighted the significant effect COVID-19 has had on females in locations that closely mirror the USNA environment and age. Based on the cognitive ability to evaluate oneself more adequately, female responses are assumed to hold more credibility than males due to the "stronger predisposition toward interoceptive sensations" (Longarzo et al., 2021, Abstract section) found in female brain anatomy. The increased ability to sense and more accurately assess one's inner dissonance and conflict can be applied to the CDC's information from the male population by negating the validity of a self-evaluated questionnaire. We defer to other studies focusing on sex and COVID-19 due to the elevated results towards females regarding the negative effect of COVID-19 (Connor et al., 2020; Peyer et al., 2022).

A study by Ehmke et al. (2022) focused on college-aged individuals at a U.S. Agricultural University and the effects of the diminished availability of resilience resources on these students. COVID-19 restricted, or even fully paused, access to personal and environmental resiliency resources. Some examples of affected personal resources were “less future orientation or graduate school aspirations, food and housing insecurity, and personal health risks” (Abstract section), while environmental resources included “lower quality online learning experiences, isolation, family health risk, and discrimination experiences” (Abstract section). Again, females were more likely than males to be affected by the reduced availability of resources. This is consistent with the previous literature indicating that females are at a higher risk for degraded resilience in the face of adversity and traumatic events, such as COVID-19.

E. HYPOTHESIS

The Novel Coronavirus added stressors and changes to daily life, such as isolation, online education, and increased health concerns. Based on research and analysis, we hypothesize that during the height of COVID-19, we expect to see a statistically significant change in resilience scores for both male and female Midshipmen between June 2020 and September 2020 scores. Furthermore, based on the literature, we expect male Midshipmen to increase their average resilience scores and female Midshipmen to decrease their average resilience scores.

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III. DESCRIPTION OF DATA AND RESEARCH METHODOLOGY

A. INTRODUCTION

This section describes the type of data utilized and the methodology for the data collection and the statistical analysis. This research aims to determine the effect of the COVID-19 environment on Midshipmen at USNA, specifically on resilience. Additionally, this study splits Midshipmen into a female and male category and determines the change over time. If resilience is positively or negatively affected, it may be possible to correlate the COVID-19 environment during that period at USNA. Furthermore, since COVID-19 was a worldwide pandemic with similar national and international responses, the effect could relate to incoming persons for the next several graduating classes that experienced the pandemic and are closer in age to the studied Midshipmen. A desired outcome for this study is to provide high-level unit leadership at USNA an understanding that males and females may or may not have been affected differently and potentially alter training agendas should the results indicate a negative correlation.

B. RESEARCH APPROACH

First, a literature review identified the resilience definition that will apply throughout the study. Next, other literature was reviewed to indicate the common trends among sex and resilience, then the effects that COVID-19 has had on resilience among males and females in a wide array of subjects. These studies shaped our hypothesis and applied it to the subsequent data analysis. This study uses pre-collected data administered in 2020 by the Midshipman Development Center (MDC)—an on-base counseling and therapy service to Midshipmen (United States Naval Academy, 2023)—via two resilience surveys separated by four months. First, the data was split into two genders self-identified by the Midshipmen. Next, the genders were tested altogether and then separately as classes over time. Finally, a Welch's *t*-test assuming unequal variances was administered among each group, comparing the resilience change over the time frame (Welch, 1947).

C. DESCRIPTION OF DATA

Data was obtained in two surveys separated by four months immediately following the outbreak of the COVID-19 pandemic. The surveys were administered by the MDC and collected by the Office of Institutional Research, and the raw data was returned to the MDC. Surveys were emailed to the Brigade, consisting of approximately 3,581 Midshipmen in June 2020 and 4,543 Midshipmen in September 2020 (DATAUSA, 2020; United States Naval Academy, 2020c; USNA Admissions, 2020). Each survey was voluntary and anonymous, with additional demographic questions such as gender, Class year, and ethnicity. With both surveys, responses were removed from the final data that comprised members who did not report their gender or answer all questions on the BRS.

The first survey was administered between June 12 and June 22, 2020, and consisted of 750 valid responses, representing a 20.94% response rate of the 3,581 eligible Midshipmen. During the survey administration period, the Class of 2020 graduated, displaying a lower-than-usual total of eligible members of the Brigade. Of those total valid responses, 295 were reported as female and 455 as male, representing an 8.24% and 12.71% response rate, respectively.

The second survey was administered between September 14 and September 18, 2020, with 393 total valid responses, representing an 8.65% response rate of the 4,543 eligible Midshipmen. Within the September survey, valid respondents consisted of Midshipmen who completed at least one pre-pandemic Plebe Summer Indoctrination and one pre-pandemic academic semester; therefore, the Class of 2024 responses were omitted. Of those total valid responses, 173 were reported as female and 220 as male, representing a 3.81% and 4.84% response rate, respectively.

The summary of studied survey respondents can be viewed in Table 1, which is split into sex and further separated by class year.

Table 1. Quantity of Gender Respondents for June and September 2020 Surveys.

Females			Males		
Category	Quantity	% of Brigade*	Category	Quantity	% of Brigade*
Total identifying as Female**	468	5.76%	Total identifying as Male**	675	8.31%
Total Females – JUNE Survey	295***	8.24%	Total Males – JUNE Survey	455	12.71%
Class of 2021 Females – JUNE Survey	95	2.65%	Class of 2021 Males – JUNE Survey	161	4.50%
Class of 2022 Females- JUNE Survey	107	2.99%	Class of 2022 Males- JUNE Survey	135	3.77%
Class of 2023 Females – JUNE Survey	92	2.57%	Class of 2023 Males – JUNE Survey	159	4.44%
Total Females - SEPT Survey	173	3.81%	Total Males - SEPT Survey	220***	4.84%
Class of 2021 Females – SEPT Survey	75	1.65%	Class of 2021 Males – SEPT Survey	79	1.74%
Class of 2022 Females – SEPT Survey	55	1.21%	Class of 2022 Males – SEPT Survey	90	1.98%
Class of 2023 Females – SEPT Survey	43	0.95%	Class of 2023 Males – SEPT Survey	50	1.10%
<u>Notes:</u> * Brigade Total for JUNE 2020 survey: 3581 (DATAUSA, 2020; United States Naval Academy, 2020c). Brigade Total for SEPT 2020 Survey: 4543 (USNA Admissions, 2020). ** Includes both June and September Surveys that were determined testable. *** One female and one male did not report the class year. Therefore, respondents were added to the total and removed from individual class year statistics.					

D. METHODOLOGY

The pre-collected data was administered via the BRS. Created and validated by Smith et al. (2008), the BRS's purpose is to assess "the ability to bounce back or recover from stress" (Smith et al., 2008, p. 194). The BRS comprises six items, shown in Figure 1, that alternate between negatively and positively worded statements (Smith et al., 2008). The surveyed persons respond via a 5-point Likert Scale (Likert, 1932), determining whether they "1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree" (Smith et al., 2008, p. 195). The summation of the individual score is divided by the number of items (six total) to receive a score (Measure Wellbeing, n.d.). The final score determines the level of perceived resilience, with 1 indicating low resilience to 5 indicating high resilience. Ultimately, a score is generalized to either low (1.00-2.99), normal (3.00-4.30), or high (4.31-5.00) resilience based on the final score (Measure Wellbeing, n.d.).

Respond to each statement below by circling <u>one</u> answer per row.		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BRS 1	I tend to bounce back quickly after hard times.	1	2	3	4	5
BRS 2	I have a hard time making it through stressful events.	5	4	3	2	1
BRS 3	It does not take me long to recover from a stressful event.	1	2	3	4	5
BRS 4	It is hard for me to snap back when something bad happens.	5	4	3	2	1
BRS 5	I usually come through difficult times with little trouble.	1	2	3	4	5
BRS 6	I tend to take a long time to get over setbacks in my life.	5	4	3	2	1

Figure 1. The Brief Resilience Scale. Adapted from Smith (2008).

The MDC chose the BRS due to its wide use in the military to study the resilience of servicemembers (Allan, 2021; Cabrera et al., 2022; Elliott et al., 2019). The BRS has

been tested for validity through various studies, with results indicating validity and reliability (Allan, 2021; Cabrera et al., 2022; Windle et al., 2011; Smith et al., 2008).

In addition to the BRS, the Midshipmen were asked various demographic questions, including graduation class year and gender. The response to gender included a male, female, or blank response. Due to the survey categorizing gender as either male or female, this study parallels the assertion that gender is self-identifying as male or female. Additionally, a blank response to gender was ultimately omitted.

Due to the independent sample sizes over time, the data is evaluated utilizing Welch's *t*-test assuming unequal variances (Welch, 1947). June and September surveys were evaluated using a two-tailed Welch's *t*-test with a 5% significance level analyzing the changing population means between the two time periods. A total of eight groups were analyzed: All Females, All Males, Class of 2021 Females, Class of 2021 Males, Class of 2022 Females, Class of 2022 Males, Class of 2023 Females, and Class of 2023 Males.

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IV. RESULTS

A. INTRODUCTION

This chapter aims to determine if male and female Midshipmen experienced a change in resilience. Within each category, statistical analysis is applied to individual class cohorts between Classes of 2021, 2022, and 2023, separated by gender. With an alpha value of 5%, statistical significance could indicate that COVID-19 influenced resilience for male and female Midshipmen. Midshipmen who took the BRS answered six items in addition to demographic questions to identify their gender and graduation year. Items 1, 3, and 5 are positively worded items, whereas items 2, 4, and 6 are negatively-worded items. Responses to items 2, 4, and 6 are reverse-coded to account for the type of resilience appropriately demonstrated. The distribution of item responses by all female and male participants in June and September are shown in Figures 1–4.

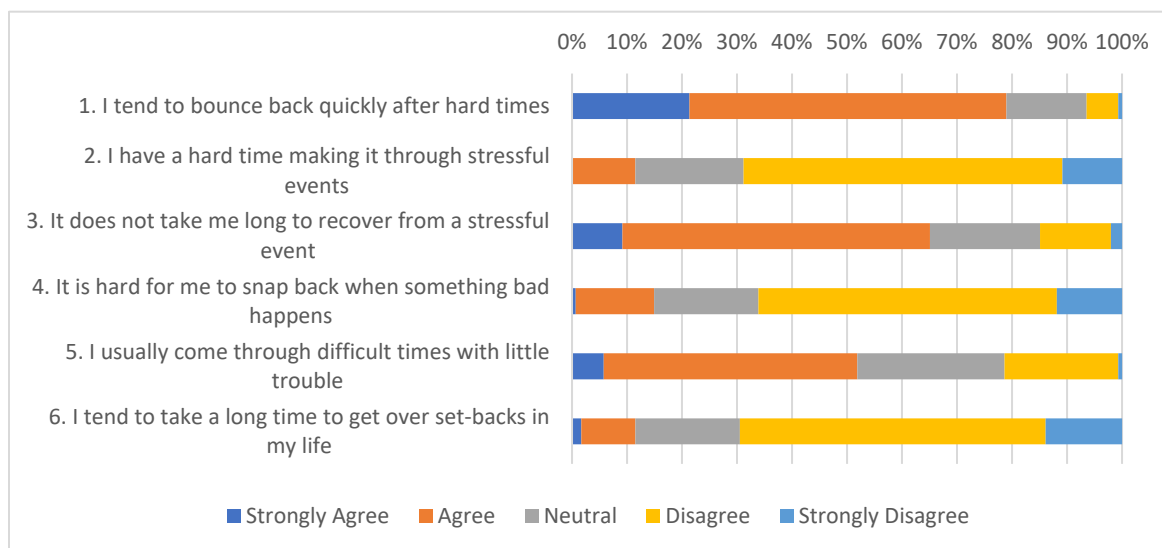


Figure 2. Distribution of the Six Items that Contribute to the Female June Survey Final Resilience Measure.

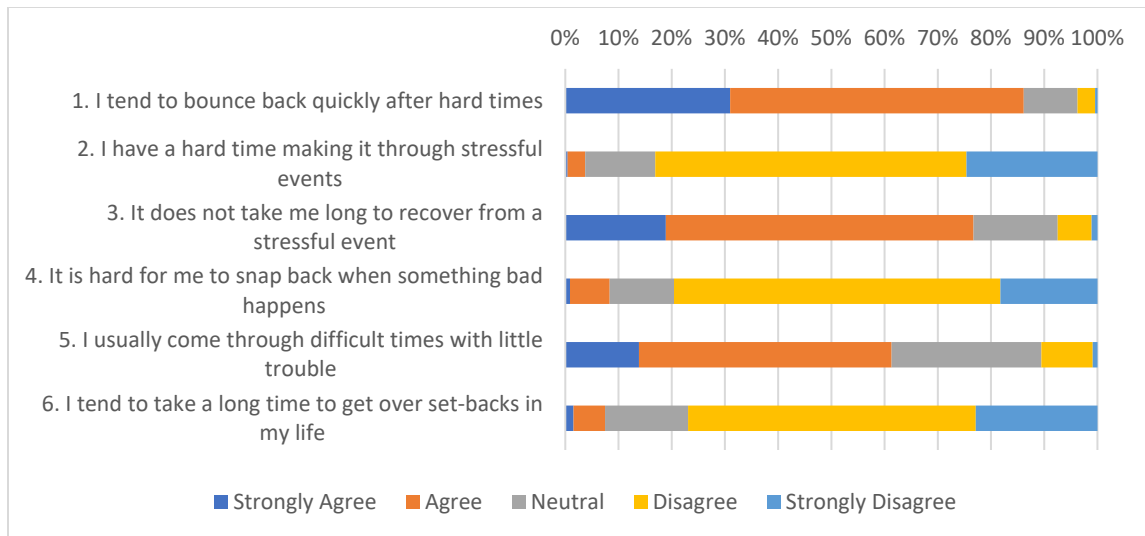


Figure 3. Distribution of the Six Items that Contribute to the Male June Survey Final Resilience Measure.

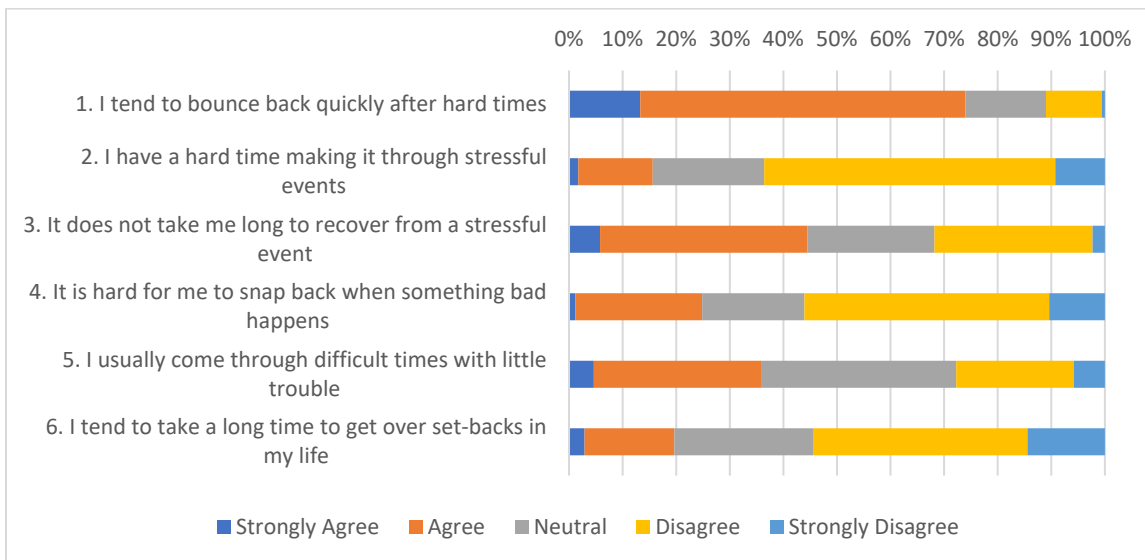


Figure 4. Distribution of the Six Items that Contribute to the Female September survey Final Resilience Measure.

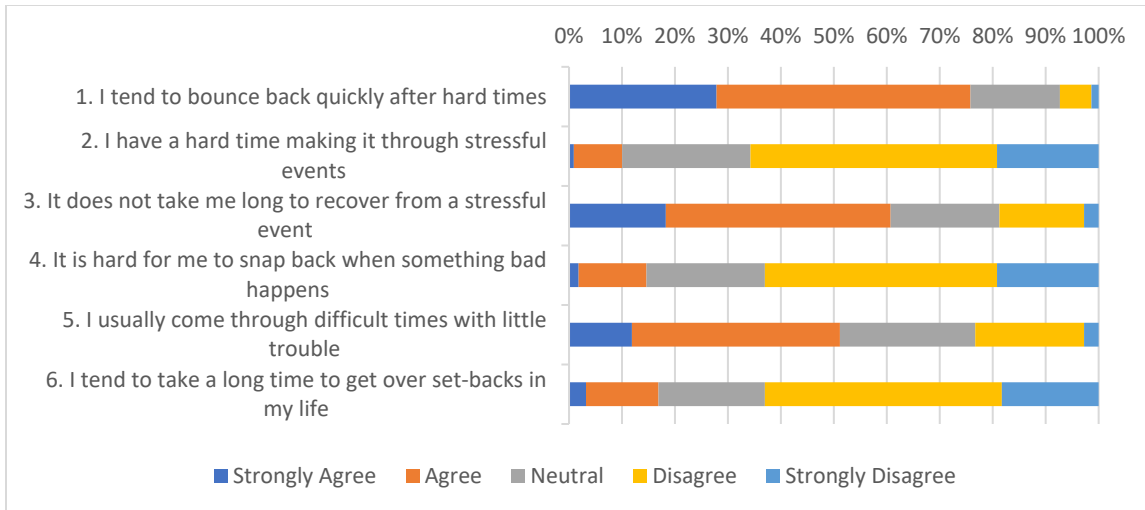


Figure 5. Distribution of the Six Items that Contribute to the Male September Survey Final Resilience Measure.

B. ANALYSIS

1. ALL FEMALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of all females between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 2 reveals that there was a statistically significant decrease ($t(327) = 3.62, p = 0.00034, CI: -1.967 \text{ to } 1.967$) in scores for all June 2020 female respondents ($M = 3.64, SD = 0.65$) and all September 2020 female respondents ($M = 3.40, SD = 0.73$). Figure 5 shows a significant negative resilience shift from June to September, illustrating a higher percentage of September resilience scores in the normal (3.00 – 4.30) and low (1.00 – 2.99) ranges than June’s scores (Measure Wellbeing, n.d.). These findings suggest that, as a whole, all surveyed females’ resilience were negatively affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 2. Welch's *t*-test Results Comparing All Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.

<u>All Females</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	295	3.64	0.65	3.618	1.967	327	0.00034	Reject Ho
Sept 2020	173	3.40	0.73	Note: 95% Confidence Interval				

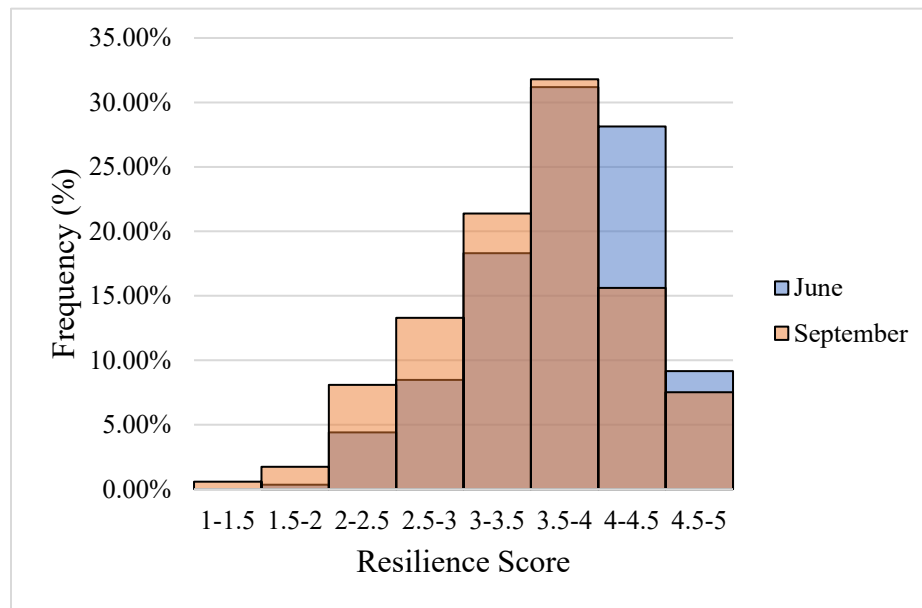


Figure 6. Percentage of All Female Resilience Scores or June and September Surveys.

2. CLASS OF 2021 FEMALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of the Class of 2021 females between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 3 and Figure 6 reveal that there were no statistically significant differences ($t(149) = 1.71, p = 0.089, CI: -1.98 \text{ to } 1.98$) in scores for June 2020 female respondents in the Class of 2021 females ($M = 3.64, SD = 0.62$) and September 2020 female respondents in the Class of 2021 females ($M = 3.46, SD = 0.71$). These findings suggest

that the Class of 2021 females were not significantly affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 3. Welch's *t*-test Results Comparing the Class of 2021 Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.

<u>2021 Females</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	95	3.64	0.62	1.709	1.976	149	0.089	Fail to Reject Ho
Sept 2020	75	3.46	0.71	Note: 95% Confidence Interval				

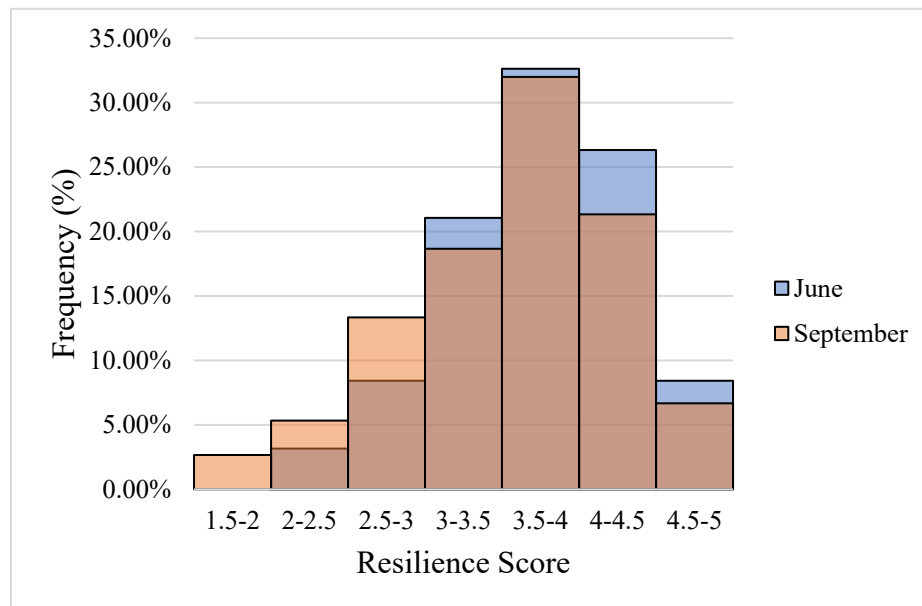


Figure 7. Percentage of Class of 2021 Female Resilience Scores for June and September Surveys.

3. CLASS OF 2022 FEMALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of the Class of 2022 females between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 4 reveals that there was a statistically significant decrease (*t*

(107) = 3.05, $p = 0.0029$, CI : -1.98 to 1.98) in scores for June 2020 female respondents in the Class of 2022 ($M = 3.60$, $SD = 0.70$) and September 2020 female respondents in the Class of 2022 ($M = 3.24$, $SD = 0.71$). Figure 7 shows a significant negative resilience shift from June to September, illustrating a higher percentage of September resilience scores in the normal (3.00 – 4.30) and low (1.00 – 2.99) ranges than June’s scores and significantly fewer distributions of high scores (4.31 – 5.00) (Measure Wellbeing, n.d.). These findings suggest that the Class of 2022 females were negatively affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 4. Welch’s t -test Results Comparing the Class of 2022 Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.

<u>2022 Females</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	107	3.60	0.70	3.050	1.982	107	0.0029	Reject Ho
Sept 2020	55	3.24	0.71	Note: 95% Confidence Interval				

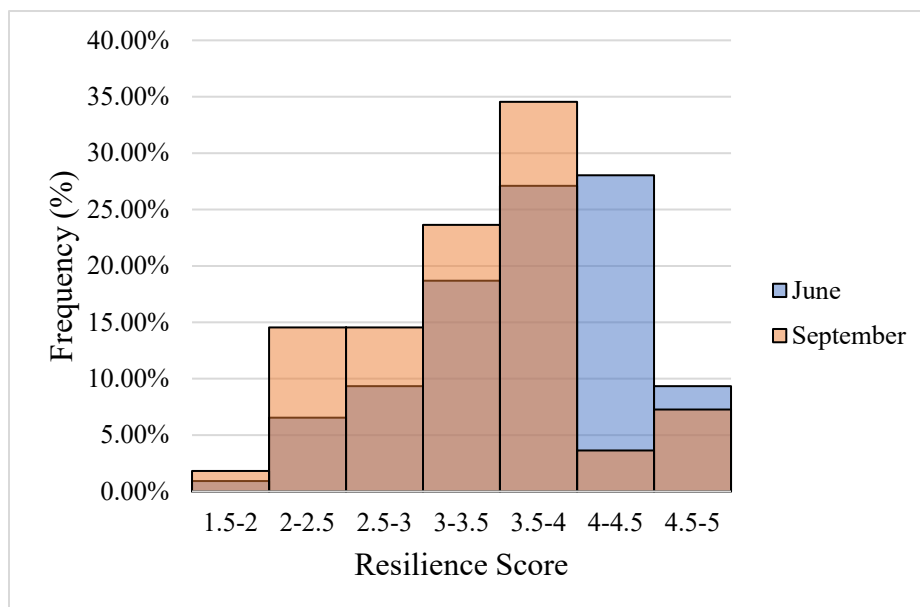


Figure 8. Percentage of Class of 2022 Female Resilience Scores for June and September Surveys.

4. CLASS OF 2023 FEMALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of the Class of 2023 females between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 5 and Figure 8 reveal that there were no statistically significant differences ($t(68) = 1.44$, $p = 0.155$, $CI: -2.00$ to 2.00) in scores for June 2020 female respondents in the Class of 2023 ($M = 3.71$, $SD = 0.61$) and September 2020 female respondents in the Class of 2023 ($M = 3.52$, $SD = 0.77$). These findings suggest that the Class of 2023 females were not significantly affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 5. Welch's *t*-test Results Comparing the Class of 2023 Female Resilience Scores in the September 2020 Survey to the June 2020 Survey.

<u>2023 Females</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	92	3.71	0.61	1.440	1.995	68	0.155	Fail to Reject Ho
Sept 2020	43	3.52	0.77	Note: 95% Confidence Interval				

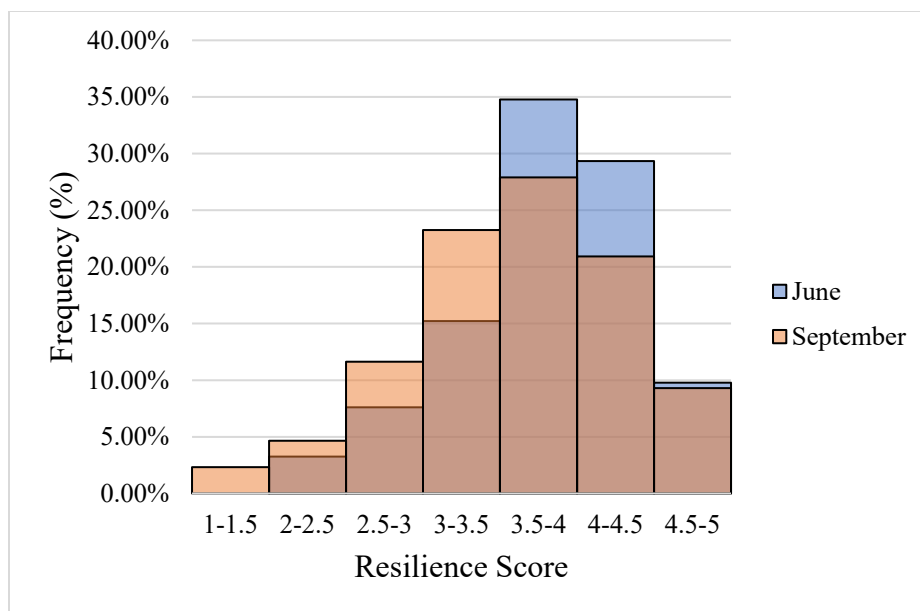


Figure 9. Percentage of Class of 2023 Female Resilience Scores for June and September Surveys.

5. ALL MALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of all surveyed males between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 6 reveals that there was a statistically significant decrease ($t(361) = 4.62, p = 0.0000055, CI: -1.97 \text{ to } 1.97$) in scores for all June 2020 male respondents ($M = 3.91, SD = 0.60$) and all September 2020 male respondents ($M = 3.65, SD = 0.74$). Figure 9 shows a significant negative resilience shift from June to September, illustrating a higher percentage of September resilience scores in the normal (3.00 – 4.30) and low (1.00 – 2.99) ranges than June’s scores and significantly lower distribution in the high scores (4.31 – 5.00) (Measure Wellbeing, n.d.). These findings suggest that, as a whole, all surveyed males’ resilience were negatively affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 6. Welch's *t*-test Results Comparing All Male Resilience Scores in the September 2020 Survey to the June 2020 Survey.

<u>All Males</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	455	3.91	0.60	4.615	1.967	361	0.0000055	Reject Ho
Sept 2020	220	3.65	0.74	Note: 95% Confidence Interval				

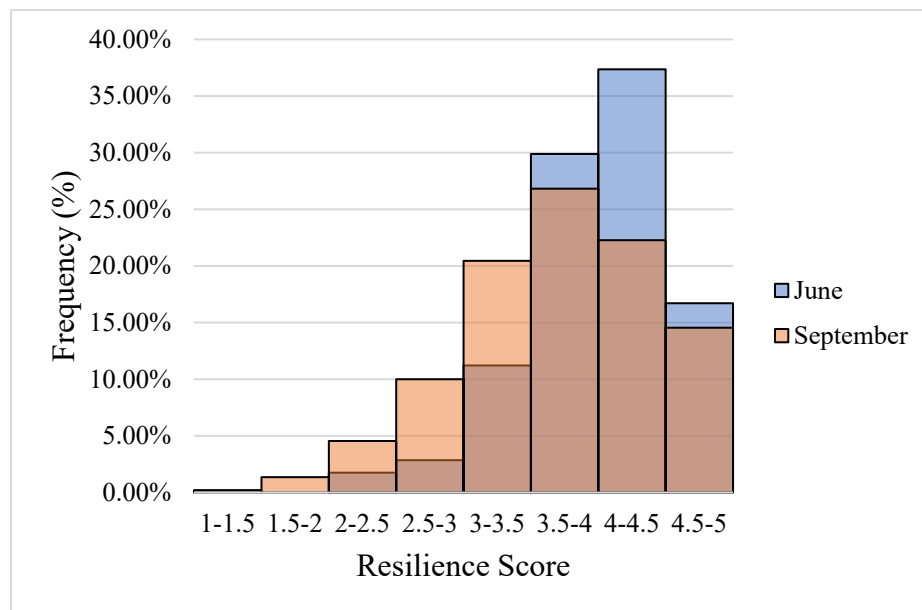


Figure 10. Percentage of All Male Resilience Scores or June and September Surveys.

6. CLASS OF 2021 MALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of the Class of 2021 males between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 7 reveals that there was a statistically significant decrease ($t(130) = 2.35, p = 0.020, CI: -1.98 \text{ to } 1.98$) in scores for June 2020 male respondents in the Class of 2021 ($M = 3.93, SD = 0.58$) and September 2020 male respondents in the Class of 2021

($M = 3.71$, $SD = 0.71$). Figure 10 shows a significant negative resilience shift from June to September, illustrating a higher percentage of September resilience scores in the low (1.00 – 2.99) ranges than June’s and significantly fewer high scores (4.31 – 5.00). These findings suggest that the Class of 2021 males were negatively affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 7. Welch’s t -test Results Comparing the Class of 2021 Male Resilience Scores in the September 2020 Survey to the June 2020 Survey.

<u>2021 Males</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	161	3.93	0.58	2.346	1.978	130	0.020	Reject Ho
Sept 2020	79	3.71	0.71	Note: 95% Confidence Interval				

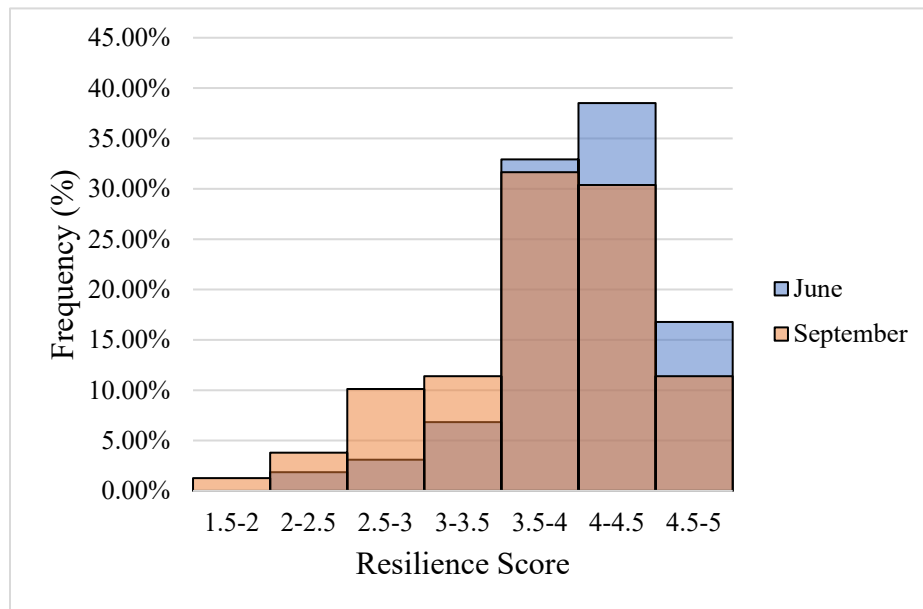


Figure 11. Percentage of Class of 2021 Male Resilience Scores for June and September Surveys.

7. CLASS OF 2022 MALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of the Class of 2022 males between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 8 reveals that there was a statistically significant decrease ($t(147) = 2.99, p = 0.0033, CI: -1.98 \text{ to } 1.98$) in scores for June 2020 male respondents in the Class of 2022 ($M = 3.89, SD = 0.58$) and September 2020 male respondents in the Class of 2022 ($M = 3.60, SD = 0.82$). Figure 11 shows a significant negative resilience shift from June to September, illustrating a higher percentage of September resilience scores in the low (1.00 – 2.99) ranges than June’s scores and a significantly lower distribution in the normal (3.00 – 4.30) and high scores (4.31 – 5.00). These findings suggest that the Class of 2022 males were negatively affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 8. Welch’s *t*-test Results Comparing the Class of 2022 Male Resilience Score in the September 2020 Survey to the June 2020 Survey.

<u>2022 Males</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	135	3.89	0.58	2.987	1.976	147	0.0033	Reject Ho
Sept 2020	90	3.60	0.82	Note: 95% Confidence Interval				

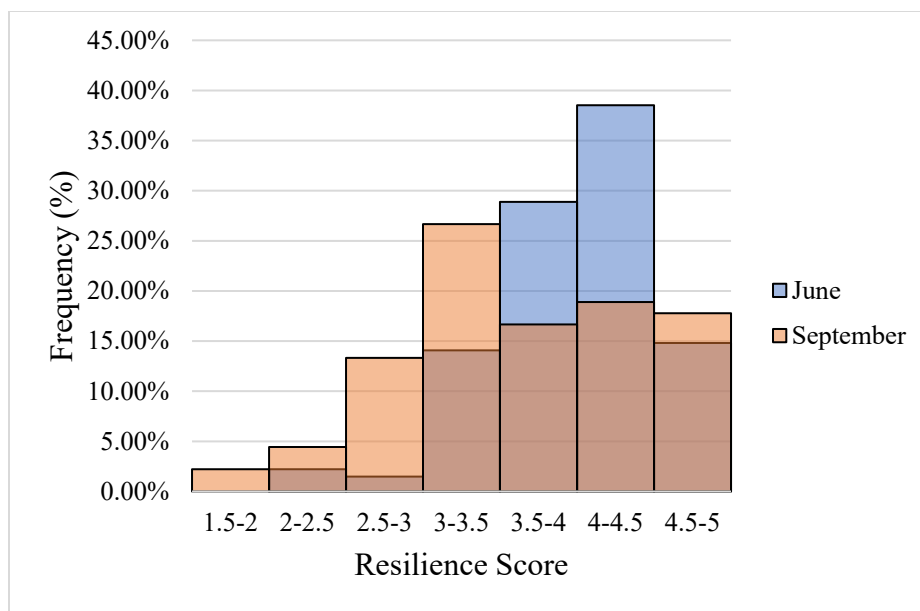


Figure 12. Percentage of Class of 2022 Male Resilience Scores for June and September Surveys.

8. CLASS OF 2023 MALES

An independent sample two-tailed *t*-test was conducted to compare the resilience scores of the Class of 2023 males between June 2020 and September 2020 respondents. It was hypothesized that resilience scores would change in September 2020 compared to the June 2020 survey. Table 9 reveals that there was a statistically significant decrease ($t(83) = 2.45, p = 0.016, CI: -1.99 \text{ to } 1.99$) in scores for June 2020 male respondents in the Class of 2023 ($M = 3.91, SD = 0.64$) and September 2020 male respondents in the Class of 2023 ($M = 3.66, SD = 0.64$). Figure 12 shows a significant negative resilience shift from June to September, illustrating a higher percentage of September resilience scores in the normal (3.00 – 4.30) ranges than June’s scores and a significantly lower distribution in the high scores (4.31 – 5.00). These findings suggest that the Class of 2023 males were negatively affected by the COVID-19 pandemic between June 2020 and September 2020.

Table 9. Welch's *t*-test Results Comparing the Class of 2023 Male Resilience Score in the September 2020 Survey to the June 2020 Survey.

<u>2023 Males</u>	<u>n</u>	<u>Mean</u>	<u>SD</u>	<u>t-cal</u>	<u>t-crit</u>	<u>df</u>	<u>p</u>	<u>Decision</u>
June 2020	159	3.91	0.64	2.451	1.989	83	0.016	Reject Ho
Sept 2020	50	3.66	0.64	Note: 95% Confidence Interval				

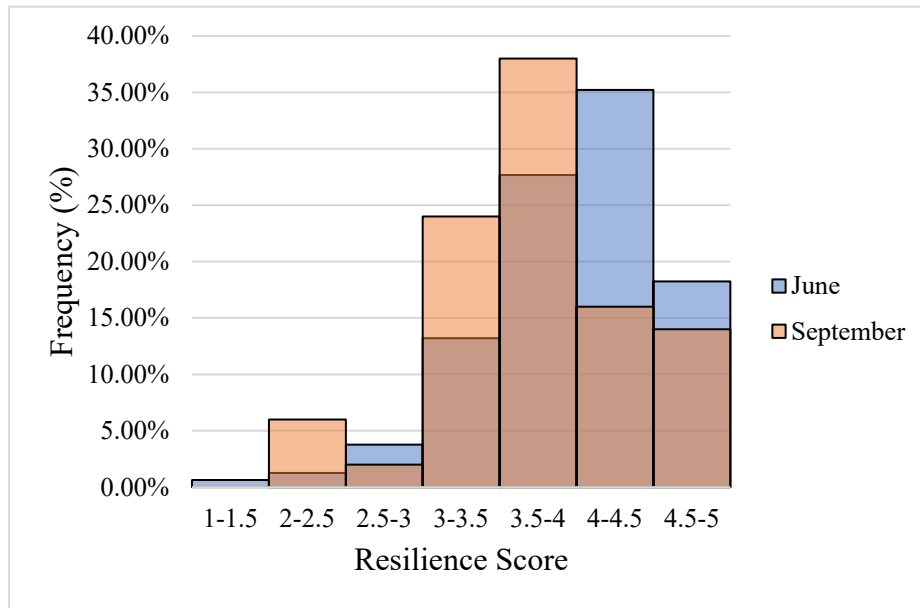


Figure 13. Percentage of Class of 2023 Male Resilience Scores for June and September Surveys.

C. DISCUSSION

1. SOCIAL ISOLATION AND RESILIENCE

After the CDC declared COVID-19 a pandemic on March 12, 2023, presidential and military responses immediately followed, implementing travel bans, medical protocols, and teleworking recommendations (Center for Disease Control and Prevention [CDC], 2020, CDC, 2023; Department of the Navy [DON], 2020; Esper, 2020). USNA followed guidance from the CDC, the Department of Defense (DOD), and the DON, implementing social distancing procedures which inevitably resulted in vast social isolation for the Midshipmen (United States Naval Academy, 2020a). Steptoe et al. (2013)

define social isolation as “an objective and quantifiable reflection of reduced social network size and paucity of social contact.” Following the mandatory social distancing protocols, the Midshipmen were mainly isolated except for exposure to symptom-free roommates and interactions via an online academic environment (CDC, 2020; CDC, 2023; DON, 2020; Esper, 2020; USNA, 2020a).

The Class of 2021 and 2022 were among the first to return to the Brigade, which commenced in mid-July, removing them from the social support of close families and friends (United States Naval Academy, 2020b). Females tend to “seek social support” (Rosenfield & Mouzon, 2013, p. 284) while in stressful conditions, which suggests that the all-female group and especially the Class of 2022 female’s decreased resilience could be due to the prolonged isolation periods experienced while both in the 14-day Restriction-in-Movement periods and their room during shelter-in-place protocols. The inability to develop and maintain social relationships may have caused the statistically significant decrease in resilience since females often “involve themselves in social relationships,” attempting to utilize relationships to express themselves and cope with stressors (Rosenfield & Mouzon, 2013, p. 284).

Throughout their lifetime, females are significantly less socially isolated than males, suggesting that social distancing protocols significantly affect their ability to recover from adversity during isolation (Umberson et al., 2022). The Class of 2021 females did not experience a significant change, which may emanate from the new leadership positions acquired during the senior year (United States Naval Academy, n.d.). The new authorities grant the seniors power to “make daily decisions affecting the morale and performance of other midshipmen” (USNA, n.d., Leadership Responsibility section). With the unpredictable nature of the pandemic, the sense of empowerment experienced by the males and females in the Class of 2021 may positively affect resilience as the seniors aided leadership in developing effective COVID-19 protocols (Bole, 2020; van den Berg et al., 2022). Specifically, the male Class of 2021 had a smaller statistically significant decrease than the other classes, suggesting that although their resilience decreased, imparting impactful changes lessened the impact of the pandemic environment. In addition, the new roles suggest that the Class of 2021 female’s adverse effects caused by social isolation are

offset by the positive effects of empowerment created by new leadership opportunities (van den Berg et al., 2022). The Class of 2023 females also did not experience a significant change in resilience which could be attributed to the prolonged periods in a socially connected environment at home domiciles (USNA, 2020b). Females experience reduced stress when exposed to the social support of family and friends; therefore, the external environment at USNA has minimal effects on their mental well-being (Rosenfield & Mouzon, 2013, p. 285).

Compared to females, the literature indicates that males require fewer social interactions than females and are more socially isolated throughout their lifetime (Umberson et al., 2022). For the Class of 2023 males, residing at home with family and friends during the summer months appears not to have as significant an impact as it had on the females. In general, males have a higher tendency to “hide their problems” and are “less likely to vent” (Rosenfield & Mouzon, 2013, p. 285), suggesting that for all groups of males, the period of social isolation and distancing in any environment had a more significant adverse effect on males. This is potentially due to their inability to enact efficient coping mechanisms as the social isolation period continued to extend longevity.

2. GENDER COPING STRATEGIES AND RESILIENCE

Females tend to assess stressful situations as more severe than males, creating a higher chance of experiencing more adverse situations (Rosenfield & Mouzon, 2013, p. 284). In addition, females often internalize problems and deflect the issue onto themselves, increasing the chances for depression and anxiety. Both depression and anxiety are inversely correlated with resilience, indicating that increased internalization increases mental health issues and thus decreases resilience (Chandra et al., 2010; Diaz-Martinez et al., 2021; Wu et al., 2023). Internalizing and heightened stress responses require a significant demand for coping strategies (Rosenfield & Mouzon, 2013, p. 284). Coping strategies for females often involve expressive behaviors, utilizing social contacts to overcome adverse situations by trying to “change the way they think about the situation” (Rosenfield & Mouzon, 2013, pp. 283–284). The lack of social interactions with other

Midshipmen while on base suggests that females experienced reduced coping opportunities, thus negatively affecting resilience.

On the other hand, males tend to remain stoic, deflect stressful situations, and externalize situations by turning to physically responsive coping strategies (Rosenfield & Mouzon, 2013, pp. 283–284). Some externalizing behaviors include substance abuse, physical fitness, and antisocial behaviors, which act as coping mechanisms for stress-inducing situations (Peyer et al., 2022; Rosenfield & Mouzon, 2013, p. 278). For both males and females, physical activities involving vigorous exercise are inversely related to perceived stress levels (Peyer et al., 2022). The males’ tendency to externalize their stress responses suggests that physical activities are a more common coping response for male Midshipmen than female Midshipmen. During COVID-19, the Midshipmen were authorized to conduct physical fitness, but strict regulations required physical distancing, location restrictions, and time intervals for workout periods (USNA, 2020a; USNA, 2021). The heightened restrictions on a pivotal male coping mechanism could potentially have caused the decrease across all male Midshipmen resilience measurements due to both the Naval Academy and the nation enacting social distancing protocols and recommendations (Centers for Disease Control and Prevention, 2022; Peyer et al., 2022; Rosenfield & Mouzon, 2013).

3. GENDER INTEROCEPTION AND RESILIENCE

The BRS evaluates resilience through the respondent’s assessment of self, which can directly attribute to each sex’s ability to evaluate and interpret their mental state accurately. Longarzo et al. (2021) define interoception as the “capability in perceiving inner body signals” (Abstract section). Studies indicate that males and females display distinct interoceptive capabilities due to the difference in brain areas (Longarzo et al., 2021). These assessment capabilities may suggest the types of responses between male and female Midshipmen on the BRS. Many parts of the brain interact and provide interoceptive functions, such as self-processing, self-identity, emotional awareness, somatosensory functioning, and elaborative capabilities (Longarzo et al., 2021). Longarzo et al. (2021) find that females hold an advantage over males regarding interoceptive functioning,

indicating that they “exhibit higher attention to internal states and somatic complaints” (Introduction section). These findings positively correlate with our findings, indicating that all females and the Class of 2022 females’ resilience decrease may be due to an acute awareness of bodily functions, coupled with the other factors mentioned above, such as social isolation at the Naval Academy and lack of empowerment experienced by the Class of 2023 and the Class of 2021, respectively.

In another study, Peyer et al. (2022) discuss that “females may be more sensitive to adverse events and thus more willing to report” (Discussion section). Along with the ability to self-evaluate and cope more efficiently in a pandemic environment than males, females may over-report their internal assessments, contributing to decreased resilience in the two groups.

In contrast, males express “carelessness...in paying attention toward proper bodily signals” (Longarzo et al., 2021, Discussion section). Every group measurement of males at the Naval Academy experienced decreased resilience potentially through their inability to assess their internal signals properly. This lack of self-awareness could thwart a male’s ability to process and cope with the stressful environment posed by the Naval Academy and even in a safe home environment.

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V. SUMMARY, LIMITATIONS, AND RECOMMENDATIONS

A. SUMMARY OF RESEARCH FINDINGS

This research was conducted utilizing a comparative and analytical approach. First, a detailed and extensive review of supporting literature was conducted to define resilience and identify factors that could cause a change in resilience. The literature assisted in developing the hypothesis that events such as COVID-19 would change the resilience of all Midshipmen at USNA. Second, data received from two surveys that were administered in June and September 2020 by the MDC were separated into two genders, then by class year and gender. Each survey was a self-assessment of resilience via the BRS. Finally, the data was analyzed utilizing Welch's *t*-test to determine whether there was a statistically significant change in resilience during the COVID-19 environment.

The results of this research both proved and disproved the hypotheses. All females at USNA who participated in the survey showed a statistically significant change in resilience when analyzed altogether. However, when the females were separated into three classes, only one class showed statistically significant resilience change in the negative direction because of the pandemic environment. Nevertheless, all female classes showed averages trending in a negative direction. The all-female group and the Class of 2022 females proved the hypothesis, whereas the Class of 2021 females and Class of 2023 females rejected the hypothesis.

Overall, all males who participated in the survey showed statistically significant changes in resilience. When separated into the three classes, all three showed statistically significant changes in a negative direction, suggesting that the COVID-19 environment at USNA negatively affected male resilience. The results of all groups of surveyed male Midshipmen proved our hypothesis; however, the results showed contrary to our second hypothesis that all groups of surveyed males would increase resilience. All groups of males experienced statistically significant changes through a decrease in average resilience scores.

These results draw particular interest such that all males and only some females experienced a statistically significant change in resilience during the height of COVID-19 protocols at USNA. The results lead to additional questions, such as, “What happened in the summer of 2020 to the males of all classes and the females of the Class of 2022?” and “Were there other factors, other than COVID-19, related to the decrease in resilience?”

A third question to ask following the results: “How do the Midshipmen at USNA compare to subjects in other studies?” The creator of the BRS, Smith et al., conducted two studies utilizing the BRS in 2008 and 2013 to assess the overall resistance scores of healthy and unhealthy males and females. The results of the mixed population in 2008 and 2013 were 3.67 and 3.70, respectively (Smith et al., 2008; Smith et al., 2013, p. 177). Comparatively, the average BRS score for the surveyed Midshipmen at USNA was 3.65 across both genders and surveys. Compared to Smith et al.’s surveys, the Midshipmen at USNA have a slightly lower resilience score than the mixed population but still fall within the normal resilience score (Smith et al., 2013).

B. LIMITATIONS

This research project has potential limitations due to the sample size, time, and the nature in which the surveys were administered. It should also be acknowledged that our study is not generalizable to any institution outside of the United States Naval Academy.

Both surveys had a low response rate relative to the Brigade size, with approximately 20.94% and 8.65% participation in the June and September surveys, respectively. In addition, the survey was voluntary for Midshipmen. The willingness of the respondents to take the voluntary survey suggests that the sample could potentially not represent the Brigade. Coupled with the relatively low response rate, this study could not capture a large enough sample size to prove sufficiently that those who are willing to take voluntary mental health surveys represent those who are not. Limitations could also be present due to how close in time the surveys were administered to the Brigade. With a four-month separation period, the Midshipmen continued to experience COVID-19 protocols during both surveys. The ability to return to a normal baseline could potentially not have presented itself yet as they were still navigating the strict pandemic environment.

C. RECOMMENDATIONS FOR FURTHER RESEARCH

(1) First Recommendation

The analysis of the survey data did not include the results of depression and anxiety that the MDC also measured. Both surveys not only measured resilience but also measured anxiety and depression among the same group of Midshipmen. Analyzing the depression and anxiety results could help support the findings of the females in the Class of 2022 and aid the explanation of their singular graduation class decrease in resilience. In addition, further studies with these risk factors could potentially gain insight into the female Classes of 2021, and 2023 decreased average resilience during the four-month period. Further research on the anxiety and depression results could also help us understand if the other groups' results were consistent with the results. Ultimately continued research into how depression and anxiety relate to resilience can assist with creating coping mechanisms to combat risk factors and build stronger resilience.

(2) Second Recommendation

Conduct a survey and additional analysis on the amount of physical fitness Midshipmen at USNA executed during the COVID-19 lockdown. This information could provide additional insight into the variances in resilience levels among the different classes. Studies suggest that physical activities are directly related to psychological stress and resilience (Ligeza et al., 2022). Specifically, males use physical activities to relieve stress and express emotions (Peyer et al., 2022; Rosenfield & Mouzon, 2013). During isolation, USNA allowed Midshipmen to engage in limited physical activities, which is a potential explanation for all groups of males' decrease in resilience during the height of the pandemic regulatory period.

(3) Third Recommendation

The separation period between both surveys was only four months. In order to evaluate the long-term effects of the pandemic environment at USNA, a third survey could be administered to the Classes of 2021, 2022, and 2023 in the Fleet. BRS surveys could be implemented in annual health evaluation checks, such as annual Physical Health

Assessments or service-specific physicals. Ultimately, if the effects prolonged into their careers as Navy and Marine Corps Officers, elevated responses for resilience-building protocols may need to be implemented to create the most resilient military warfighter.

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