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AN INQUIRY INTO THE RESILIENCE OF U.S. NAVY RECRUITS

December 2015

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AN INQUIRY INTO THE RESILIENCE OF U.S. NAVY RECRUITS

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ABSTRACT

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LIST OF ACRONYMS AND ABBREVIATIONS

CFI	Comparative Fit Index
CNO	Chief of Naval Operations
DC	Division Cohesion
DRS	Division Resilience
ER	Ego Resilience
IDND	Identification with Navy Division
IDNN	Identification with the Navy
IDNR	Identification with Navy Recruit Division Commander
IDNS	Identification as a Navy Sailor
LEAD	Leadership
LGO	Learning Goal Orientation
OJ	Organizational Justice
PERS	Personality
PF	Positive Framing
PGO	Performance Goal Orientation
PS	Psychological Safety
RDC	Recruit Division Commander
RMSEA	Root Mean Square Error of Approximation
RS	Resilience, Specifically Individual Resilience
RTC	Recruit Training Command
SWB	Subjective Well-Being
WDQ	Work Design Questionnaire

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I. INTRODUCTION

The U.S. Navy's basic training is a psychologically and physically intense eight-week program designed to transform civilians into Sailors. At Recruit Training Command (RTC), Navy recruits undergo many stressful events during their integration into the military. In order to investigate how resilience plays a role in recruits' ability to complete the arduous training, as well as prepare them for their first sea-duty assignment, this study was conducted on 299 U.S. Navy recruits throughout their basic training. This study surveyed the recruits at four time intervals to get a baseline assessment as well as observe any significant changes that may have occurred throughout their time at basic training. More specifically, this study looked at individual resilience, organizational resilience, and the attributes we feel contribute to resilience with the goal of gaining a better understanding of resilience in U.S. Navy recruits.

The three tenets of the Chief of Naval Operations' Sailing Directions are warfighting first, operator forward, and be ready. According to the Navy's Task Force Resilient report, "building resilience is essential to producing a force that is always ready to operate forward and execute its warfighting mission" (Carter, 2013). A common assessment identified is that incoming recruits at Recruit Training Command (RTC) lack resilience to face demanding requirements of basic training and apprenticeship training. A lack of resilience is especially important to the U.S. Navy because of the basic-training completion rate and follow-on problems with newly reported Sailors' ability to handle adversity once they arrive in the fleet.

The purpose of this project is to develop a better understanding of resilience in new recruits as they go through Recruit Training Command (RTC). We are seeking to examine all factors that contribute to higher or lower levels of resiliency. Our results may provide insight for recommendations to increase resilience capacity, and could be used during accession training to help recruits overcome the many difficult situations they encounter while in the Navy.

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II. LITERATURE REVIEW

A. OVERVIEW

A review of existing literature provides the foundation for gaining a better understanding of resilience and provides the framework in which it is defined. Resilience literature provides multiple definitions and characteristics of resilience. The definitions and characteristics vary somewhat when analyzing resilience from the organizational or individual perspective. Additionally, there is debate among scholars whether resilience is a personality trait or a skill that can be learned (Masten & Reed, 2002). A common theme across resilience literature, despite disagreement over the minutiae, is that resilience is seen as the ability to bounce back or recover from adversity (Gittel, Cameron, Lim, & Rivas, 2006; Zolli & Healy, 2012; McGarry, Walklate, & Mythen, 2015).

This review will focus on resilience as a capacity that can be learned. We focus on both individual and organizational resilience, and related factors that may help explain resilience. These factors include, but are not limited to, self-efficacy, newcomer identification, learning/competence, psychological safety, social support, cohesion, leadership, and organizational justice.

1. Definition of Resilience

Although academic research and resilience literature do not present a unified definition of resilience, there are, nevertheless, several reoccurring themes and characteristics. Powley (2012) examines resilience in the following manner. Resilience in individuals refers to

> (a) the maintenance of positive adjustment under challenging conditions (Masten, Cutuli, Herbers, & Reed, 2009; Sutcliffe & Vogus, 2003), (b) the ability to bounce back (Gittel, Cameron, Lim, & Rivas, 2006; Zolli & Healy, 2012), and (c) how individuals overcome trials and learn from adversity (Janoff-Bulman, 1985, 1992; Tugade & Federickson, 2004) (as cited by Powley, 2012). Resilience serves as repair function, providing steadiness and stability in times of crisis and trauma (Maitlis, 2012; Westphal & Bonanno, 2007).

Previous research suggests that resilience supports one's ability to positively adjust in adverse conditions (Luthar, Cicchetti, & Becker, 2000; Sutcliffe & Vogus, 2003). Resilience is also viewed not only as the capacity to bounce back from adversity, but the ability to withstand setbacks (Wildavsky, 1991). Through learning, inspiration, and efficacy, resilience can progress over time into an "adaptive capacity" (Sutcliffe & Vogus, 2003; Wildavsky, 1991). This view of growth and learning through adversity emphasizes the view of resilience as a process where adaptability incrementally improves (Greve & Staudinger, 2006; Leipold & Greve, 2009; Sutcliffe & Christianson, 2012). In this perspective, resilience can be accumulated and kept until needed, as it were, then used in times of crisis or adversity (Powley, 2009; Sutcliffe & Christianson, 2012).

We see resilience as a state-like capacity that may be developed and accrued over time through training and experiences. Resilience is also multi-level and not person-specific, in the sense that not only individuals, but also groups and teams, departments, and organizations may manifest resilience capacity (Sutcliffe & Vogus, 2003). To assess resilience implies detection of positive and adaptive behaviors that enable individuals, groups, and organizations to learn, adapt, recover, and grow from challenges (Coutu, 2002).

2. Individual Resilience

Individual resilience is a "dynamic process wherein individuals display positive adaptation despite experiences of significant adversity or trauma" (Luthar & Cicchetti, 2000, p. 858). Although Luthar & Cicchhetti's definition of individual resilience refers to a process, earlier academic research focused on analyzing resilience as a trait. For example, approximately 50 years ago a study by Norman Garmezy looked at the reasons why kids of schizophrenic parents "did not suffer psychological illness as result of growing up with them" (Coutu, 2002, p. 47). The results of the study suggested that resilience contributed more to mental health than formerly believed (Coutu, 2002). Further studies of resilience have developed an agreement in the field that it is important to distinguish between resilience as a personality trait and as a process (Masten, 1994). Such distinction is critical to avoid the perception that some individuals possess what it

takes to overcome adversity while others do not. Research suggests that individual resilience can be learned and developed by an average individual (Rutter, 2008). Increasing individual resilience is critical to our research since, "people with high resilience are able to utilize their coping skills and social resources to recover from challenges" (Yu et al., 2015).

Scholars provide other definitions of individual resilience, that when combined offer a more comprehensive understanding. For example, one definition of individual resilience is "the maintenance of positive adjustment under challenging conditions" (Sutcliffe & Vogus, 2003). Essentially, to establish resilience requires both a decision that the individual is "doing OK' or "better than OK" relative to the expectations for behavior, and also a judgment that they faced a perceived threat to a positive outcome (Masten & Reed, 2002, p. 75). Another definition of individual resilience is an ability to bounce back from unfavorable circumstances (Gittel, Cameron, Lim, & Rivas, 2006; Zolli & Healy, 2012). Sutcliffe & Vogus (2003) use a materials science metaphor to describe a strong material being able to absorb strain and still maintain its shape. Similarly, Wildavsky sees resilience as a "capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back" (Wildavsky, 1991, p. 77). The third definition of individual resilience refers to "how individuals overcome trials and learn from adversity (Janoff-Bulman, 1985, 1992; Tugade & Federickson, 2004)" (as cited by Powley, 2012). For example, Doe (1994) refers to individuals seeing "change as an opportunity to grow, learn, and achieve new results rather than as a threat to themselves or the environment" (Doe, 1994, p. 23).

The predominant argument that arises from the vast research of individual resilience is that it is made up of two main beliefs. First belief is that resilience is generally more prevalent when individuals have sufficient access to resources (i.e., material capital, human, social, and emotional) so they are able to develop competence (Sutcliffe & Vogus, 2003). Second belief is that resilience is more prevalent when a person's motivational system is activated, since completion of successful accomplishments reinforces self-efficacy, which in turn motivates future actions (Sutcliffe & Vogus, 2003, p. 97; Masten & Reed, 2002). These two fundamental beliefs

are the foundation to preventing or reducing risks and stressors (Masten & Coatsworth, 1995; Masten & Reed, 2002) and ultimately promoting resilience (Sutcliffe & Vogus, 2003, p. 102).

3. Individual Resilience and Self-Efficacy

A fundamental belief is that self-efficacy is a key component of individual resilience and therefore merits inclusion when defining individual resilience. By definition, perceived self-efficacy signifies "a positive sense of personal competence that seems to be a pervasive phenomenon accounting for motivation and accomplishments in human beings" (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002).

The construct of perceived self-efficacy is prevalent in psychological research (Scholz, 2002). Results suggest strong self-efficacy positively contributes to improved health and greater success (Schwarzer, 1992; Bandura, 1977). Previous research also demonstrates that self-efficacy controls individual coping mechanisms to include how much willpower will be expended in adverse conditions (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002).

Perceived self-efficacy is a belief that one possesses the ability to successfully accomplish a desired action. Essentially the individual is influencing their control over the environment. A strong sense of self-efficacy is positive affirmation of one's ability to overcome obstacles despite challenging conditions (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002).

Self-efficacy affects an individual's cognitive process, behavior, and actions (Bandura, 1977). Individuals with little self-efficacy tend to have a negative assessment of their ability to achieve success and can suffer from low self-esteem (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002). Conversely, individuals with higher self-efficacy tend to have a positive assessment of their ability to achieve success and are less likely to suffer from depression (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002).

Research suggests that self-efficacy levels can increase or inhibit motivation (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002). People with high self-efficacy will

generally attempt more difficult tasks (Bandura, 1977). High self-efficacy individuals also strive for greater accomplishments and expend more energy to achieve their goals (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002). In terms of envisioning success, an individual's action is first, imagined in their mind with the expected outcome influenced by their level of self-efficacy (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002). Lastly, an individual with high self-efficacy will recover more quickly from setbacks while still maintaining their commitment to goals (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002).

4. Organizational Resilience

Organizational resilience is defined as "the maintenance of positive adjustment in the face of adversity" (Sutcliffe & Vogus, 2003). Organizational resilience is also considered the organization's ability to "emerge from periods of adversity strengthened and more resourceful" (Sutcliffe & Vogus, 2003). Lastly, organizational resilience goes beyond the adaptive capacity to "bounce back" and includes the ability to "withstand setbacks" (Wildavsky, 1991).

Similar to individual resilience, through learning, creativeness, and efficacy, organizational resilience can develop over time into an "adaptive capacity" (Sutcliffe & Vogus, 2003; Wildavsky, 1991). An organization's growth and learning through adversity helps develop itself whereby adaptability incrementally improves (Greve & Staudinger, 2006; Leipold & Greve, 2009). Therefore, resilience can be accumulated and stored, then used in times of crisis or adversity (Sutcliffe & Christianson, 2012; Powley, 2009).

An organization's positive adaptation in the midst adversity entails tradeoffs between growth and competence (Sutcliffe & Vogus, 2003, p. 108). Additionally, as Sutcliffe and Vogus (2003) point out

> organizational resilience is anchored in organizational processes aimed at enhancing an organization's overall competence and growth (especially the ability to learn and to learn from mistakes), and restoring efficacy through enhancing the ability to quickly process feedback and flexibly rearrange or transfer knowledge and resources to deal with situations as they arise. (p. 15)

These organizational processes are illustrated in Meyer's (1982) study of how a hospital adapted to an unexpected doctors' strike by being able to absorb the disruption and restore order (Meyer, 1982, p. 520). It discovered that the hospital's "attempts to restore efficacy through strategic reorientations as well as promote competency through broad skills within the organization were positively associated with resiliency" (Sutcliffe & Vogus, 2003, p. 104).

Resilience is observed in organizations that face a crisis and are able to respond by implementing better processes to help them deal with the difficult circumstances (Mallak, 1998). Analyzing how organizations positively adapt under these adverse conditions and emerge more resourceful is key to understanding organizational resilience (Vogus & Sutcliffe, 2007).

B. MEASURABLE CONSTRUCTS AND ATTRIBUTES OF RESILIENCE

Beyond the definition of resilience, including both individual and organizational, resilience it is essential to explore the constructs, which we believe likely influence resilience of individuals and organizational units. We examine several constructs based on conversations and broader discussions with our advisors and the research team analyzing resilience at RTC. In particular, we review literature on leadership, newcomer identification, and cohesion. These constructs formed the basis of assessments to measure resilience as well as the attributes that contribute to resilience.

1. Leadership

While a leader, in the most basic sense, is simply one who leads or guides a group in the completion of a common task, the leader's role has substantial impact on the group members and the organization as a whole. For newcomers especially, the leader serves a formative and facilitative function in establishing one's relational identification (part of the process of self-definition upon joining an organization) that is moderated by the leader's prototypicality (Sluss et al., 2012). This relational identification generalizes to organizational identification (Sluss & Ashford, 2007) thus a leader who establishes a positive relational identification for the newcomer simultaneously can create positive organizational identification. This view is particularly valuable to organizations as "a

person who identifies with the group sees himself or herself as psychologically intertwined with the fate of the group, and experiences the successes and failures of the group as personal successes and failures" (Shamir, Zakay, Brainin & Popper, 2000, p. 613).

The supervisor is key in establishing the sense of self in the workplace and careful reading of employees, especially newcomers, to determine moods and opinions can be used to establish commonalities and a positive environment that affects attitudes to the organization (Sluss et al., 2012). The leader-member relationship is central in the successful socialization process, mediates newcomer adjustment and occupational identification, and has a direct relationship to job satisfaction (Sluss & Thompson, 2012). The supervisor-worker relationship and subsequent relational identification increase the sense of connection and belonging, positive attitude, and cooperation within the group (Sluss et al., 2012). This sense of belonging can make a person see the organization as part of their self. For example, one could say, "I work for the Navy," but one who organizationally identifies might say, "I am a Sailor."

Beyond prototypicality, there are numerous tools leaders have to create, such as social identification and group mindset. Leaders can emphasize collective identity, emphasize shared values of group members, engage in inclusive behaviors including showing support, and use symbolic or cultural artifacts to foster a distinct group identity with varying success depending on the target audience (Shamir et al., 2000). Shamir et al.'s study (2000) found the social identification strongly correlates to group discipline, potency, and forms the basis of collectivist work where group members will participate in activities they would not normally be interested in for the sake of the group, even without incentives.

A carefully selected leader can be more than simply a director. An organization that selects a prototypical leader can influence newcomers' perception of the organization, sway organizational identification, facilitate the socialization process, create a positive environment that enables learning behavior, and create group identity. In turn, these attributes contribute to resilience of individuals and organizations as shown.

2. Newcomer Identification

Newcomer identification is how new members integrate into a group, come to understand their prospective roles in the group (role clarity), establish relations in the group (socialization and social capital), and understand the organizational structure (Ellis, et al., 2015; Sluss & Thompson, 2012; Edmondson, 1999). This process comes with its own unique stressors, which can be mediated by resources from both the individual and the organization. The successful integration of newcomers can be substantially impacted by how well organizations implement policies and environments that encourage positive self-identification in the group (Ellis et al., 2015). The immediate supervisors and leaders are critically important in the social acceptance into a group and adopting shared group values (Shamir, Zakay, Brainin, & Popper, 2000).

Previously, relational identity and relational identification were largely used interchangeably, but Sluss and Ashford (2007) offer a refined definition of relational identification and relational identity, which is useful in clarifying how newcomers establish their own identities in organizations. Relation identity refers to how well one understands their role in relation to their supervisors and coworkers. Relational identification refers to how much a person incorporates their organizational role into their personal identity or self-image.

Socialization literature uses Berger and Calabrese's (1975) uncertainty reduction theory as a vehicle to define role by reducing uncertainty in tasks, roles, and social relations for newcomers (Ellis et al., 2015). In the role identity sphere, this reducing of role ambiguity leads to role clarity in an organization resulting in less stress and increased productivity (Frone, Russel, & Cooper, 1995). Organizations with institutionalized socialization programs are more successful (Ellis et al., 2015) and those that carefully select immediate supervisors are even more successful given the integral role of guiding newcomers as they establish their relational identity in groups (Sluss & Thompson, 2012).

Ashford and Mael (1989) (as cited by Sluss, Ployhart, Cobb, & Ashford, 2012) state that newcomers seek to define themselves as they adjust to their new organization.

This role clarity can in turn support self-identity (Frone et al., 1995). In this period, the influence of a prototypical leader (one who promotes or embodies core organizational values) is a key moderator of newcomer's role identification with the organization (Sluss et al., 2012, p. 949). When coupled with an effective socialization program that establishes role identity, an effective prototypical leader can inspire newcomers to internalize shared group values and integrate one's organizational role into that member's definition of self.

Role clarity, integration into and support from the group, and effective mentoring by prototypical leaders are all crucial to newcomer identification. They also have been shown to reduce stress, promote overall health, self-efficacy, workplace productivity, and identification with the organization with a feeling of "insider status" (Ellis et al., 2015). These, in turn, contribute to an individual's resilience and that person can thus contribute to the organization's resilience (Sutcliffe & Vogus, 2003).

3. Cohesion

Cohesion can be described as "social and motivational forces that exist between group members" (Beal, Cohen, Burke, & McLendon, 2003). Additionally, cohesion can be considered the propensity for a group to work in unison in support of an objective or to fulfill the needs of its members (Beal et al., 2003). Researchers have also focused on the relationship between cohesion and productivity. Theory and intuition believe that cohesion builds a bond within a group and through this stronger bond, it improves the group's productivity (Beal et al., 2003). The belief is that, stronger cohesion is a motivating factor for group members to perform well and to achieve their goals (Cartwright, 1968; Davis, 1969).

Previous research has also investigated group cohesion through individual observations in order to understand the relationship cohesion has on individual performance. A study by Gully, Devine, and Whitney (1995), addressed this approach and discovered the relationship "between cohesion and performance were stronger when both constructs were measured at the group level" (Gully, Devine, & Whitney, 1995).

The data from this study analyzes the connection of cohesion and performance in an effort to gain a better understanding of their relationship.

Research of other dynamics existing in groups that may provide insight to what leads to better performance has suggested the relationship of goal acceptance and cohesion. For example, Locke and Latham (1990) shows that goal acceptance positively contributes to group performance and that managers have influence over goal acceptance (Locke & Latham, 1990). Later research by Gully et al. (1995) suggested that "when groups are highly cohesive and their goals are congruent with that of the organization, their performance should be high, whereas when groups are highly cohesive, but their goals are not congruent with the organization, their performance should be low" (Gully, Devine, & Whitney, 1995). Research by Greene (1989) also illustrates that cohesion and productivity are moderated by goal acceptance (Green, 1989). Greene's data generally supported the hypothesis that groups who accepted an organization's goals were more productive than those who did not (Greene, 1989). Specifically, his research of a paper-machine company showed that cohesion and productivity are positively correlated (Green, 1989). Green's data showed that groups within the company who did not accept the goals of the organization had lower cohesion and productivity (Green, 1989). Greene's study provides some evidence that leadership can positively influence goal acceptance and ultimately improve cohesion and productivity of groups (Greene, 1989).

Greene's study is important in that it suggests management techniques for improving group performance can be moderated through goal acceptance and cohesion (Greene, 1989). In situations where goal acceptance of a group is high but cohesion is low, it would require techniques by managers to improve cohesion. Some management techniques suggest this can be accomplished by focusing on the importance of the group, reducing differences, being supportive, facilitating interaction, and rewarding a team mentality. If the group has both low cohesion and low goal acceptance, managers need to employ techniques that promote goal acceptance as well as do the things that improve cohesion. Some techniques for promoting goal acceptance as mentioned by Locke and Latham (1990), is to reframe goals to better appeal to the group (Locke & Latham, 1990). Additionally, managers may need to adjust goals if they are too easy or difficult to attain.

Lastly, include a process that provides feedback so the group members are aware of their progress towards achieving objectives (Locke & Latham, 1990). A very challenging situation is where cohesion is high but goal acceptance is low. A possible explanation is that the group members do not trust the organization's leadership. Under this situation, managers must put forth maximum effort to stimulate goal acceptance or reduce cohesion (Podsakoff, MacKenzie, & Ahearne, 1997). Reducing cohesion seems counterintuitive to enhance group performance; however, data from Podsakoff et al. (1997) study shows that when goal acceptance is low, cohesion and productivity are negative (Podsakoff et al., 1997).

The study of cohesion goes beyond just looking at its relationship with performance. In some instances, cohesion can provide enhancements to quality of life in the work place environment for its employees. For example, Seashore's study (1954) of industrial organizations discovered that members in highly cohesive groups exhibited less anxiety such as nervousness, pressure, and frequent worry of work-related matters than members low cohesive groups (Seashore, 1954). Additionally, group cohesiveness is positively related to interaction within a group, which could be perceived as beneficial in terms of communication and the ability to work talk through differences or disagreements when they arise.

C. HYPOTHESIS

The aim of this study is to develop a better understanding of resilience in new recruits through exanimating some of the key factors that contribute to higher and lower levels of resilience. Based on our review of existing academic literature as well as including our own experience in the U.S. Navy and U.S. Marine Corps basic training we expect the survey data to illustrate the following:

1. Resilience Trend Analysis

This study expects to see an increase in individual and division resilience over time throughout the recruit's basic training phase. Both authors experienced an increase in resilience as they progressed through basic training. Some of the factors they felt as though contributed to increased resilience include self-efficacy, leadership, newcomer

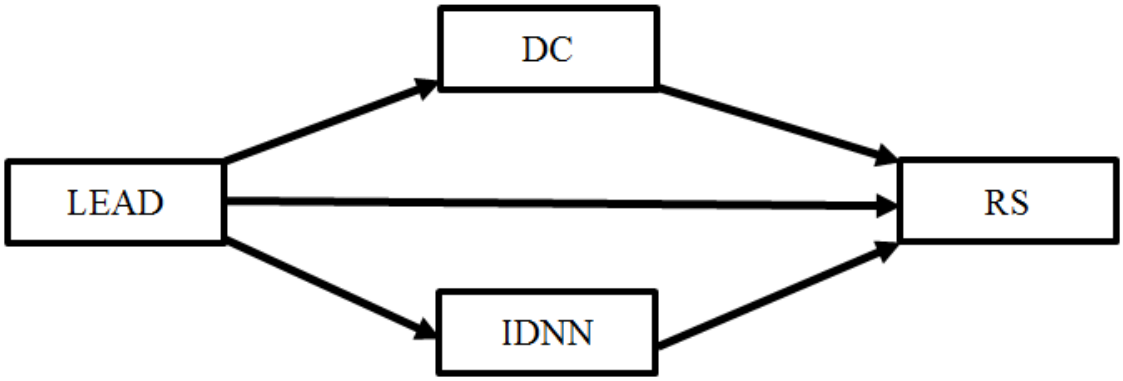
identification, and cohesion. Additionally, a study in the Journal of Health Psychology of Chinese Army recruits also showed some degree of positive personal growth changes as a result of their basic training (Yu et al., 2015). Specifically, their data showed "Chinese Army recruits suffered fewer mental health problems" such as anxiety and depression "since they had a higher level of resilience after basic training" (Yu et al., 2015).

2. Hypothesized Path Models for Individual and Divisional Resilience

Based on existing literature, we hypothesize that leadership has a direct, positive effect on individual resilience and indirect effects moderated by division cohesion and individual identification with the Navy. The relationship between leadership and both cohesion and identification with an organization was previously mentioned, but the effects of group cohesion on individual resilience are less certain. Group cohesion can create learning environments providing social support that foster feelings of psychological safety and self-efficacy in members, which we posit will positively relate to individual resilience. Likewise leadership can help establish role clarity in groups, prototypical leadership enhances self-identification with the group ("I am a Navy Sailor"), which have been shown to promote overall health, self-efficacy, and a feeling of "insider status" (Ellis et al., 2015), which fosters an environment that should conducive to growth in individual resilience. Based on this literature, we hypothesize the following, as seen in Figure 1:

1. Leadership has a direct, positive effect on individual resilience.
2. Leadership has a positive effect on division cohesion.
3. Leadership has a positive effect on individual identification with the Navy.
4. Division cohesion moderates the effect of leadership on individual resilience.
5. Individual identification with the Navy moderates the effect of leadership on individual resilience.

Figure 1. Hypothesized Pathways to Individual Resilience



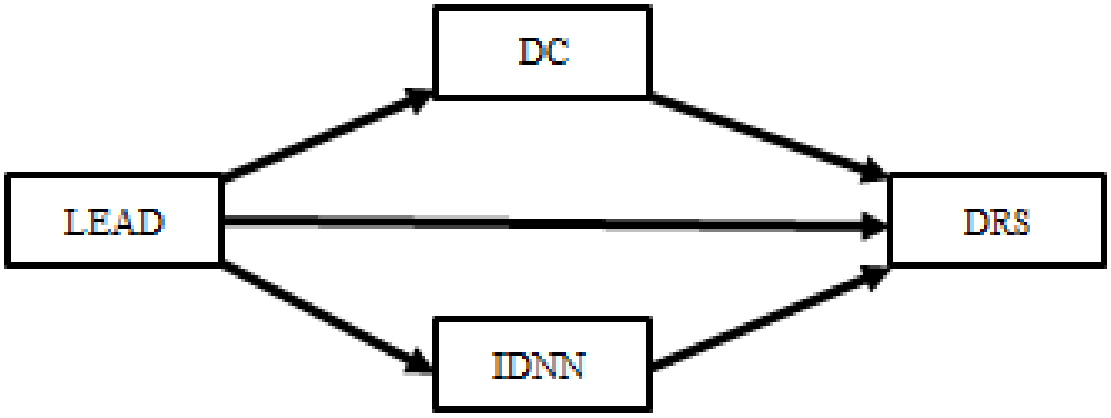
Likewise, we hypothesize that leadership has a significant, positive impact on divisional resilience directly and indirectly when moderated by division cohesion and individual identification with the Navy (see Figure 1). Frone et al. (1995) and Sluss et al. (2012) have shown that leadership affects organizational resilience by reducing role uncertainty in individuals and creating learning environments. Additionally, Greene's (1989) research corresponds with recruit training methods in that leadership can use created adversity as an opportunity to teach other how to overcome this adversity thus increasing organizational resilience. Shamir et al. (2000), Sluss et al. (2012) have shown leaders, especially prototypical leaders, positively impact both group cohesion as well as how individual, especially newcomers, self-identify with the organization. Cohesive groups are known to be more productive, provide climates of psychological safety, and better able to work through disagreements and differences, all of which are factors contributing to group resilience. Finally, Sutcliffe and Vogus (2003) found self-identification with the group, incorporating common goals and motivations could contribute to group resilience. Leveraging off this existing literature, we propose the following hypotheses, as seen in Figure 2:

6. Leadership has a direct, positive effect on division resilience.

7. Division cohesion moderates the effect of leadership on division resilience.

8. Individual identification with the Navy moderates the effect of leadership on division resilience.

Figure 2. Hypothesized Pathways to Division Resilience

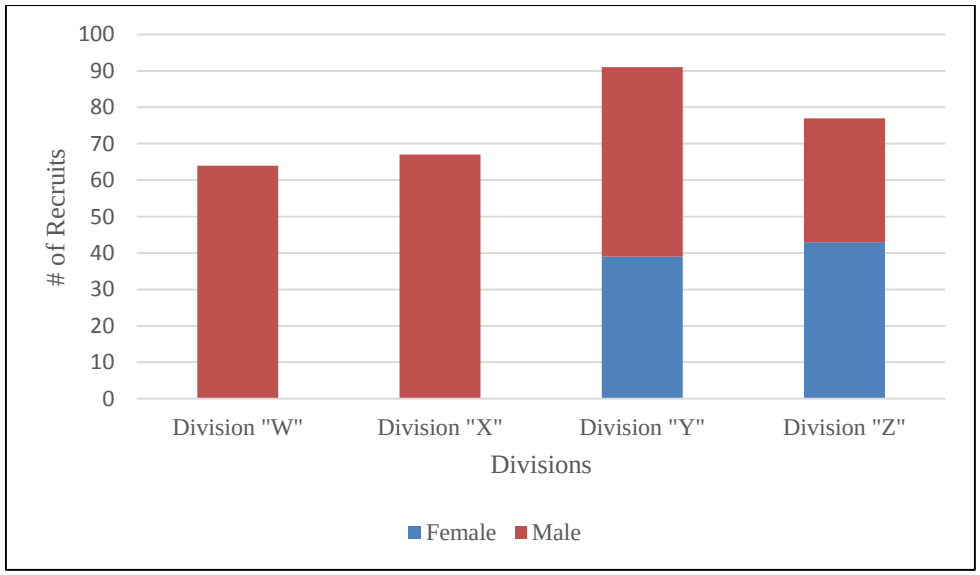


III. METHODOLOGY

A. PARTICIPANTS

A sample of 299 Navy recruits at Naval Recruit Training (RTC) command, participated in a series of surveys throughout their eight weeks of basic training. The 299 recruits were distributed into four divisions consisting of 82 females and 217 males. Divisions "W" and "X" were all-male divisions consisting of 64 and 67 males respectively. Divisions "Y" and "Z" were integrated with both male and female recruits. Integrated division "Y" consisted of 91 Sailors with a distribution of 39 females and 52 males. Integrated division "Z" consisted of 77 Sailors with a distribution of 43 females and 34 males.

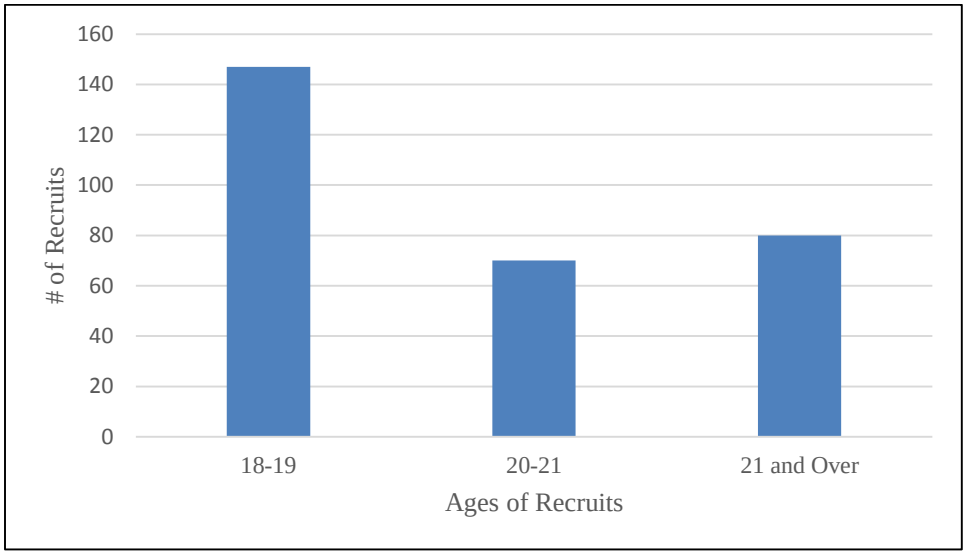
Figure 3. Divisional Gender Make Up



The following is the recruit age distribution of the 299 recruits:

- 147 recruits were from the ages of 18 to 19 years old
- 70 recruits were from the ages of 20 to 21 years old
- 80 recruits older than the age of 21

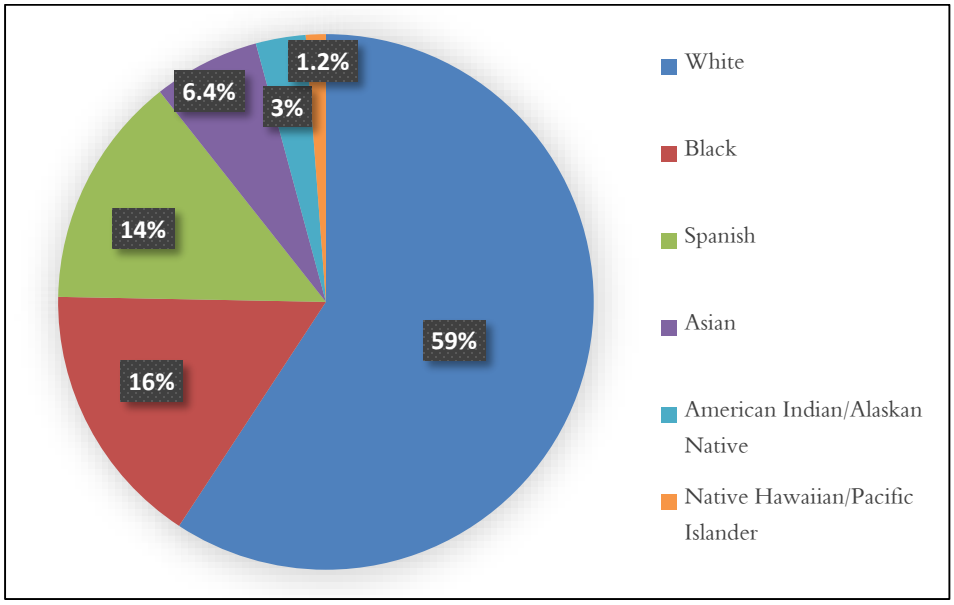
Figure 4. Age Distribution of Recruits



The following is the ethnicity distribution of the 299 recruits:

- 1.2 %: Native Hawaiian or other Pacific Islander (e.g. Samoan, Guamanian, or Chamorro)
- 3 %: American Indian or Alaskan Native
- 6.4 %: Asian (i.e. Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese)
- 14 %: Spanish/Hispanic/Latino
- 16 %: Black or African American
- 59 %: White

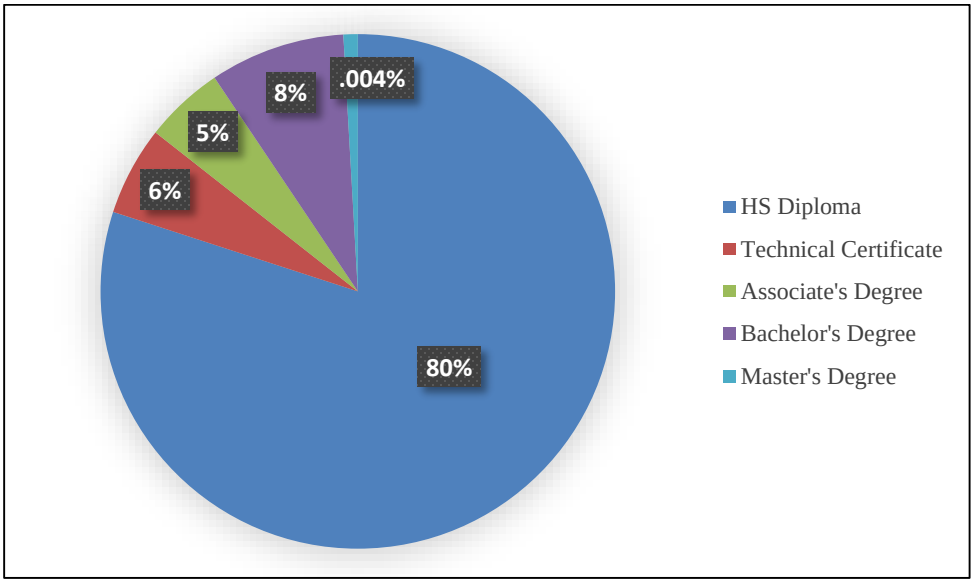
Figure 5. Ethnicity Distribution of Recruits



The following is the education distribution of the 299 recruits:

- 80 %: High School Diploma or the equivalent (for example: GED)
- 5.5 %: Technical School certificate or Degree
- 5 %: Associate's Degree
- 8.5 %: Bachelor's Degree
- 0.004 %: Master's Degree

Figure 6. Education Distribution of Recruits



For the population, approximately 39,000 recruits graduate basic training annually. Volunteers were randomly selected by the Commanding Officer, of Naval Service Training Command (NSTC). The Naval Postgraduate School Institutional Review Board (IRB) of the Human Research Protection Office approved the research to include the surveys used in the research.

B. PROCEDURES

For this study, we traveled to Great Lakes, Illinois, to administer surveys at the Navy's Recruit Training Command (RTC). During our data collection we administered surveys at four different intervals throughout training. First surveys and interviews were conducted a couple weeks into training as a baseline assessment. The following two surveys were conducted before stressful events (e.g., physical fitness assessment, battle stations, etc.) as well as after the stressful events. The last set of surveys and interviews were conducted near the end of the eight-week training.

Prior to taking the surveys, each recruit provided informed consent to participate and was assured confidentiality and anonymity. Our study wanted to ensure there was no perception that the recruit's answers and feedback could be used as reprisal against them by their Recruit Division Commander (RDC) or others in their chain of command.

Participants were informed that the survey was voluntary and they could withdraw at any time. Additionally, since as naval officers our presence could cause undue pressure to participate, we wore civilian attire so as not to limit any potential for bias in the recruits' responses. The surveys were administered in a training classroom where two divisions completed at a time. The self-reported questionnaires were paper-based and recruits were given approximately 45 minutes to complete. Recruits filled out questionnaires together and returned to researchers after completing them.

C. MEASURES

The surveys administered included numerous subject areas in attempt to identify and measure factors associated with resilience. Furthermore, the surveys were designed to measure resilience at the individual recruit level as well as at the division level. In addition to measuring resilience, the surveys also include demographic data (e.g., age, race, gender, etc.) as well as experience data (e.g., educational level, family military history, and prior NROTC experience).

1. Resilience.

We utilized the Connor-Davidson Resilience Scale (CD-RISC) (Connor and Davidson, 2003) comprises 10-items, with higher scores reflecting higher resilience. Questions were rated on a 4-point scale where "0" is not true at all and "4" is true all the time. Sample questions include: 1) I am able to adapt to change, 2) I believe that coping with stress can strengthen me, 3) I tend to bounce back after illness or hardship, and 3) I think of myself as a strong person.

2. Leadership.

We used Shamir, Zakay, Brainin, & Popper's (2000) research to measure leadership. Questions were rated on a 7-point scale ranging from never to always. A sample of the questions included: Tell us how frequently your Recruit Division Commander do the following: a) Emphasizes the strengths of the division, b) uses slogans and nicknames that are special to our division, and c) Often refers to the history

of the Navy, d) Talks to us as people not just as recruits, and e) Shows sensitivity to recruits needs and feelings.

3. Identification.

We used the Army Research Institute study by Sluss, Ployhart, Cobb, & Ashford (2012) and Frone, Russell, & Cooper (1995) and tailored the questions to measure identification at the Navy-level, Sailor-level, divisional-level, and Recruit Division Commander-level. Questions were rated on a scale from strongly disagree to strongly agree. Sample questions included: 1) When I talk about the Navy, I usually say we rather than they, 2) When someone praises the Navy it feels like a personal compliment, 3) The most important things that happen to me involve becoming a Navy Sailor, 4) To me becoming a Navy Sailor is a very large part of who I am, 5) My division's successes are my successes.

4. Cohesion.

We used research from Podsakoff, MacKenzie, & Ahearne (1997) to develop questions that measured cohesion. Sample questions included: 1) Our division is well coordinated, 2) Our division members provide assistance to each other, 3) Our division is unified in its task focus, 3) Our division members get along well with each other, and 4) Our division members support each other.

D. STATISTICAL METHODS

This project used quantitative analysis techniques to surface factors relevant to increasing resiliency in new Navy recruits. The survey results were collected, input into spreadsheets, and verified for accuracy. Any information that could identify individual service members was removed from the data to protect privacy and ensure anonymity.

All statistical analysis was performed using the "R" statistics program. The Pearson correlation was used to determine the relationship between constructs at each time point. ANOVA was used to determine if the constructs (RS, IDNN, and DRS) were statistically different in each of the four time points. The p-value was used to determine if the difference between each time point was significantly different from Time Point One

(T1). If the p-value was less than 0.05 then the difference was considered to be statistically significant.

The three path models were used for the first three time points to measure the hypothesized relationship between a set of variables. Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) were used to determine the fits of the path models. If the CFI was greater than 0.95, then the fit for model is ideal, and if the RMSEA is less than 0.1, then the fit of the model is accurate. Determining if the relationship between variables within the path models also relied on p-values. A p-value less than 0.05 was also used to determine if the relationship was significant.

Regression was also used to determine if one variable could predict another variable. Once again, in order to determine if the relationship between these variables was statistically significant, a p-value of less than 0.05 indicated significance.

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IV. RESULTS AND FINDINGS

A. CORRELATION

The surveys used the Connor-Davidson Resilience Scale (CD-RISC) to measure various constructs relating to recruits' resilience to compute the relationships between those constructs. The correlation matrices for time point one through time point four are included in Tables 1, 2, 3, and 4 respectively.

Table 1. Time Point 1 Correlation of Resilience

	RS	PF	IDNN	IDNS	IDND	IDNR	OJ	SWB	LGO	PGO	ER	PS	LEAD	DRS	DC
RS	1														
PF	0.57	1													
IDNN	0.38	0.42	1												
IDNS	0.21	0.37	0.55	1											
IDND	0.33	0.38	0.47	0.41	1										
IDNR	0.2	0.32	0.29	0.34	0.24	1									
OJ	0.34	0.31	0.27	0.31	0.33	0.3	1								
SWB	0.29	0.41	0.35	0.33	0.36	0.29	0.38	1							
LGO	0.51	0.58	0.31	0.22	0.34	0.3	0.42	0.41	1						
PGO	0.12	0.07	0.19	0.15	0.02	0.04	0.23	0.08	0.12	1					
ER	0.54	0.55	0.37	0.25	0.32	0.25	0.39	0.38	0.56	0.25	1				
PS	0.17	0.16	0.12	0.07	0.22	0.3	0.4	0.15	0.18	0.07	0.18	1			
LEAD	0.23	0.27	0.22	0.21	0.22	0.26	0.48	0.21	0.34	0.2	0.27	0.3	1		
DRS	0.3	0.33	0.27	0.22	0.34	0.34	0.64	0.27	0.37	0.14	0.33	0.63	0.56	1	
DC	0.18	0.17	0.2	0.15	0.33	0.29	0.49	0.22	0.25	0.17	0.27	0.72	0.39	0.8	1

Table 2. Time Point 2 Correlation of Resilience

	RS	**PF**	**IDNN**	**IDNR**	**OJ**	**PS**	**LEAD**	**DRS**	**DC**
RS	1								
PF	0.66	1							
IDNN	0.37	0.43	1						
IDNR	0.19	0.21	0.35	1					
OJ	0.37	0.35	0.47	0.44	1				
PS	0.27	0.17	0.4	0.29	0.43	1			
LEAD	0.24	0.25	0.35	0.32	0.57	0.34	1		
DRS	0.38	0.36	0.5	0.44	0.66	0.61	0.66	1	
DC	0.29	0.26	0.48	0.35	0.61	0.75	0.49	0.8	1

Table 3. Time Point 3 Correlation of Resilience

RS	1								
PF	0.67	1							
IDNN	0.37	0.49	1						
IDNR	0.18	0.23	0.26	1					
OJ	0.32	0.35	0.37	0.44	1				
PS	0.27	0.27	0.4	0.35	0.52	1			
LEAD	0.29	0.29	0.34	0.45	0.67	0.34	1		
DRS	0.34	0.37	0.45	0.42	0.74	0.64	0.66	1	
DC	0.27	0.32	0.44	0.36	0.68	0.79	0.48	0.84	1
	RS	PF	IDNN	IDNR	OJ	PS	LEAD	DRS	DC

Table 4. Time Point 4 Correlation of Resilience

RS	1				
IDNN	0.36	1			
IDNS	0.34	0.69	1		
SWB	0.35	0.47	0.43	1	
DRS	0.36	0.58	0.46	0.28	1
	RS	**IDNN**	**IDNS**	**SWB**	**DRS**

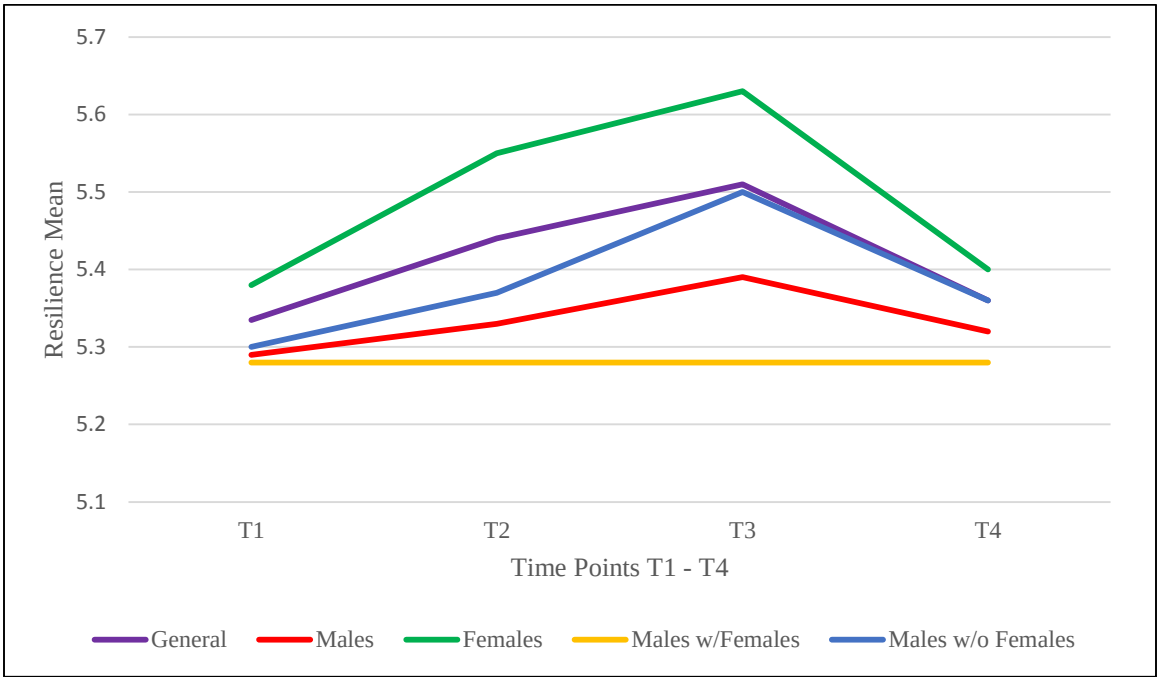
B. RESILIENCE TRENDS

Resilience was measured at time points one through four and we conducted trend analysis to understand resilience over time. Individual resilience and divisional resilience were measured separately and further divided into sub-groups to explore any possible differences. The sub-groups included analyzing all males and females separately across all four divisions. The other sub-groups analyzed males in all-male divisions as well as males in integrated divisions. Lastly, the recruits were grouped into three age groups: 18–19, 20–21, and 21 & over.

1. Individual Resilience

Figure 7 documents individual resilience trends over time points one through four.

Figure 7. Individual Resilience Trends



a. General

Time point 3 is statistically larger than time point 1; however, time point 2 and 4 are not statistically larger than time point 1. The general theme increases from time point 1 to time point 3 and then drops by a small portion by time point 4. The average resilience is 5.34 at time point 1 and increases by 0.11 at time point 2; and increases by 0.18 at time point 3; and only increases by 0.03 overall at time point 4.

b. All Males

Time point 3 is statistically larger than time point 1; however, time points 2 and 4 are not statistically larger than time point 1. The general theme increases from time point 1 to time point 3 and then drops by a small portion. The average resilience is 5.29 at time point 1 and increases by 0.04 at time point 2; and increases by 0.10 at time point 3; and only increases by 0.03 overall at time point 4.

c. All Females

Time point 3 is statistically larger than time point 1; however, time points 2 and 4 are not statistically larger than time point 1. The general theme increases from time point 1 to time point 3, then drops by a small portion by time point 4. The average resilience is 5.38 at time point 1 and increases by 0.17 at time point 2; and increases by 0.25 at time point 3; and only increases by 0.02 overall at time point 4.

d. Males with Females

No time points are statistically larger than time point 1. The general theme is that differences are close to zero for all time points. Thus, the resilience does not seem to change.

e. Males without Females

Time points 3 is statistically larger than time point 1; however, time point 2 and 4 are not. The general theme increases from time point 1 to time point 3 and then drops by a small portion by time point 4. The average division resilience is 5.30 at time point 1 and increases by 0.07 time point 2; and increases by 0.20 at time point 3; and only increases by 0.06 overall at time point 4.

f. Ages 18–19

Time point 3 is statistically larger than time point 1; however, time points 2 and 4 are not statistically larger than time point 1. The average resilience is 5.44 at time point 1 and decreases by 0.01 at time point 2; and increases by 0.19 at time point 3; and only increases by 0.01 overall at time point 4.

g. Ages 20–21

Time point 3 is statistically larger than time point 1, however time points 2 and 4 are not statistically larger than time point 1. The general theme increases from time point 1 to time point 3 and then drops by a small portion by time point 4. The average resilience is 5.23 at time point 1 and increases by 0.13 at time point 2; and increases by 0.30 at time point 3; and only increases by 0.1 overall at time point 4.

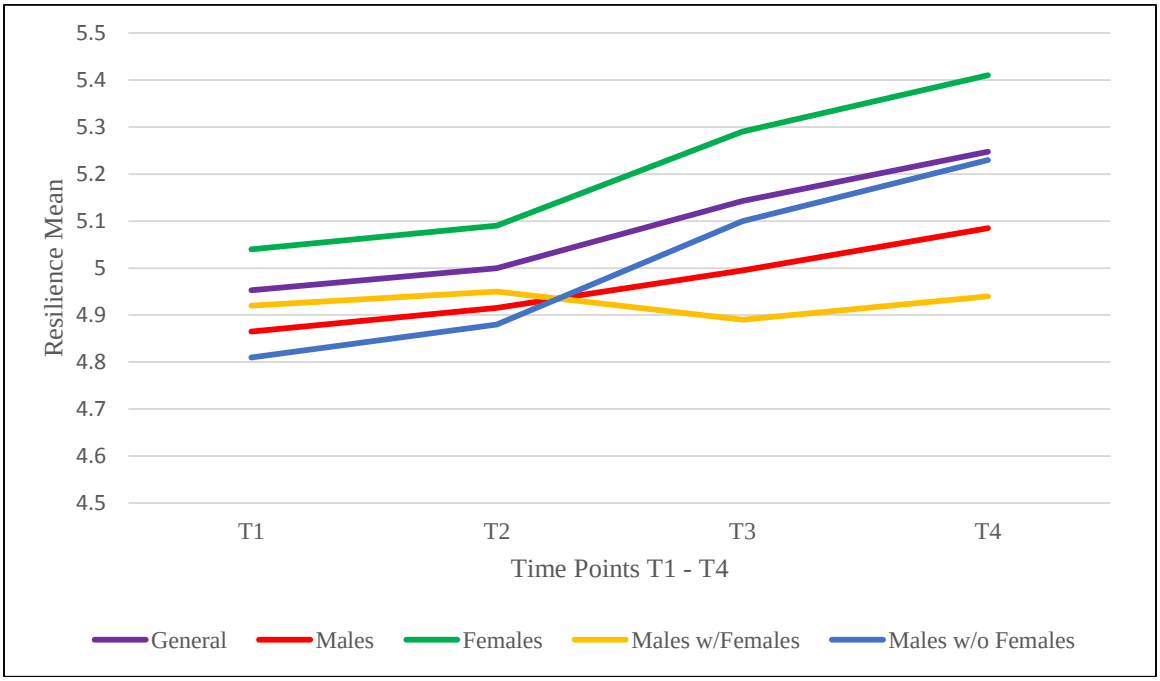
h. Ages >21

Time points 2 and 3 are statistically larger than time point 1; however, time point 3 is not statistically larger than time point 1. The general theme increases from time point 1 to time point 3 and then drops by a small portion by time point 4. The average resilience is 5.28 at time point 1 and increases by 0.22 at time point 2; and increases by 0.26 at time point 3; and only increases by 0.16 overall at time point 4.

2. Divisional Resilience

Figure 8 documents divisional resilience trends over time points one through four.

Figure 8. Divisional Resilience Trends



a. General

Time points 3 and 4 are statistically larger than time point 1; however, time point 2 is not. The general theme increases from time point 1 to time point 4. The average division resilience is 4.95 at time point 1; and increases by 0.05 time point 2; and increases by 0.19 at time point 3; and increases by 0.30 at time point 4.

b. All Males

Time points 3 and 4 are statistically larger than time point 1; however, time point 2 is not. The general theme increases from time point 1 to time point 4. The average division resilience is 4.86 at time point 1; and increases by 0.05 time point 2; and increases by 0.14 at time point 3; and increases by 0.23 at time point 4.

c. All Females

Time points 4 are statistically larger than time point 1; however, time point 2 and 3 not. The general theme increases from time point 1 to time point 4. The average division resilience is 5.04 at time point 1; and increases by 0.05 time point 2; and increases by 0.25 at time point 3; and increases by 0.37 at time point 4.

d. Males with Females

No time points are statistically larger than time point 1; however, the general theme increases from time point 1 to time point 4 except from time point 2 to time point 3. The average division resilience is 4.92 at time point 1 and increases by 0.03 time point 2, and decreases by 0.03 at time point 3 and increases by 0.02 at time point 4.

e. Males without Females

Time points 4 are statistically larger than time point 1; however, time point 2 and 3 not. The general theme increases from time point 1 to time point 4. The average division resilience is 4.81 at time point 1; and increases by 0.07 time point 2; and increases by 0.29 at time point 3; and increases by 0.42 at time point 4.

f. Ages 18–19

Time points 3 and 4 are statistically larger than time point 1; however, time point 2 is not. The general theme increases from time point 1 to time point 4. The average division resilience is 4.94 at time point 1; and increases by 0.07 time point 2; and increases by 0.30 at time point 3; and increases by 0.39 at time point 4.

g. Ages 20–21

No time points are statistically larger than time point 1; however, the general theme does not increase from time point 1 to time point 4. The average division resilience is 4.99 at time point 1 and decreases by 0.008 time point 2, and increases by 0.14 at time point 3 and increases by 0.05 at time point 4. This trend can be caused by sample size.

h. Ages >21

Time points 4 are statistically larger than time point 1; however, time point 2 and 3 not. The general theme increases from time point 1 to time point 4. The average division resilience is 4.99 at time point 1; and increases by 0.09 time point 2; and increases by 0.12 at time point 3; and increases by 0.36 at time point 4.

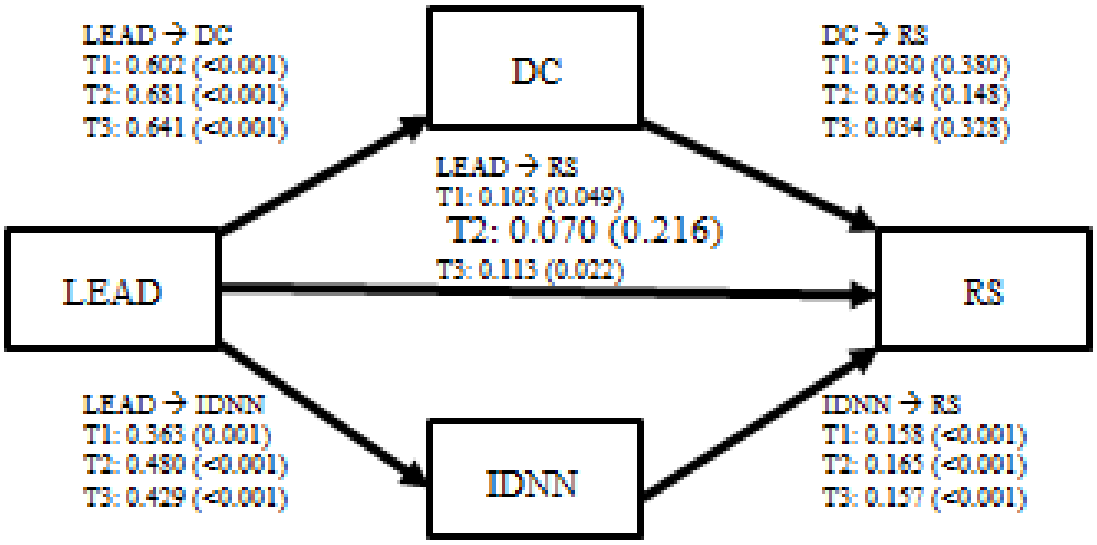
C. PATH MODEL

The results support hypothesis 1 in the individual resilience path model. Leadership (LEAD) was shown to affect division cohesion (COH) at time points 1, 2, and 3 (T1, T2, and T3). The results do not support hypothesis 2 as division cohesion's effect on individual resilience (RS) was not statistically significant at any time point. Therefore, the path model showing a positive leadership effect on individual resilience via division cohesion is not significant. Hypothesis 3 partially supports the second path as leadership was shown to affect individual resilience at T1 and T3, though not statistically significant at T2. Hypothesis 4 is supported as leadership was shown to affect individual identification with the Navy (IDNN) at all three times. Hypothesis 5 is supported as IDNN was shown to affect individual resilience at all times. Hypothesis 4 and 5 support the path from leadership to individual identification to individual resilience as the strongest path in the individual resilience path model. This implies that leadership's effect on individual resilience is both direct and indirect by way of individual identification with the Navy.

In the individual resilience path model, at T1, the root mean square error of approximation (RMSEA) was 0.11, and the comparative fit index (CFI) was 0.966. At T2

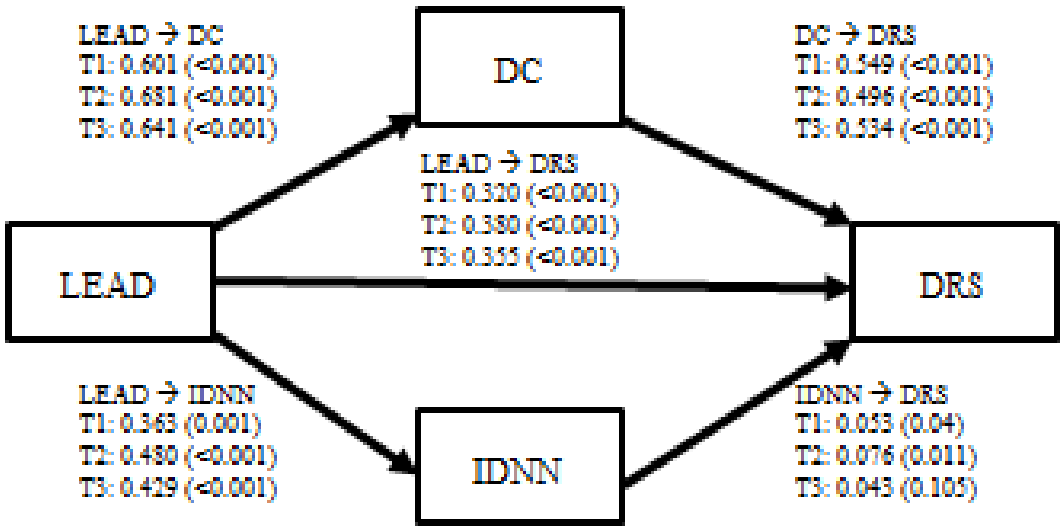
the CFI dropped to 0.728, and the RMSEA increased to 0.383. All T3 the CFI was 0.70, and the RMSEA was 0.381. CFI and RMSEA are only good for T1.

Figure 9. Hypothesized Pathways to Individual Resilience



The results of the path model for leadership to division resilience are promising. Hypothesis 1 where leadership was shown to affect division cohesion at T1, T2, and T3 remains valid. Hypothesis 6 is supported as division cohesion was shown to affect division resilience at all time points. This supports the leadership to division cohesion to division resilience path. Hypothesis 7 is supported and the second path in this model as leadership was shown to affect division resilience directly at T1, T2, and T3. Hypothesis 3 where leadership was shown to affect individual IDNN remains valid. Hypothesis 8 is partially supported as individual identification with the Navy was shown to affect division resilience in T1 and T2, but not in T3. This means the leadership to IDNN to division resilience path is partially supported.

Figure 10. Hypothesized Pathways to Division Resilience



For the leadership-to-division resilience path model, each time point between leadership and division cohesion and each time point between leadership and individual identification with the Navy is statistically significant. However, leadership's relationship between division resilience is the same at each time point directly and indirectly. In other words, if individual identification with the Navy and division cohesion were not in the model, leadership will still be able to cause division resilience. The fit, using CFI, is generally decent for all time points (0.991, 0.915, 0.919), but this is not the case for RMSEA where only T1 (0.117) has a good RMSEA value.

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V. INTERPRETATIONS

A. CORRELATION

Since there are no official published standards for the magnitude of correlation coefficient to be categorized as strong, moderate or weak, it is important to establish our measurement guidelines. Additionally, the topic of study is also relevant in the interpretation of coefficients. Since resilience and its constructs are more difficult to measure than easily quantifiable items (e.g., items that can be counted) it is reasonable to expect correlation coefficient thresholds to be lower. Prevalent expectation in human studies is that rarely will correlations exceed 0.6. Accordingly, the following thresholds are provided for this analysis:

$0.00 < |r| < 0.29$ weak correlation

$0.30 < |r| < 0.40$ moderate correlation

$|r| > 0.40$ strong correlation

The correlation matrix revealed many interesting relationships. For individual resilience, the strongest correlations were with positive framing, ego resilience, and a learning goal orientation. The moderate correlations for individual resilience were identification with the Navy, identification with the division, organizational justice, subjective well-being, and division resilience. Leadership began as a weak correlation but increased over time.

Relationships with division resilience show stronger correlations in the matrix. The strongest correlations for division resilience were division cohesion, leadership, psychological safety, and organizational justice. Moderate relationships were psychological safety, identification, learning goal orientation, individual resilience, and ego resilience.

The correlation matrix confirms many relationships established in existing literature. Positive framing, ego resilience, and learning goal orientation are the most strongly correlated with individual resilience and present excellent opportunities for

further studies and possible interventions, but are more innate traits. Leadership, on the other hand, is an external factor with strong to moderate correlations impacting both individual and division resilience that is easily implemented by an organization. Over three time periods, leadership exhibited a positive and generally increasing correlation with division cohesion, identification, division resilience, individual resilience, organizational justice and psychological safety. Based on these relationships and the Recruit Training Command's ability to control the quality of leadership placed over new recruits, leadership is an excellent target of opportunity. We feel the leadership factor is the most easily administered. It minimizes disruption to existing processes, and has the most abundant resources available.

B. RESILIENCE TRENDS

Our hypothesis that resilience would increase over time during a recruit's time at basic training was demonstrated in all sub-groups with one exception. Recruits and divisions experienced a net gain from time one to time four in division resilience and in individual resilience except for males in integrated divisions. Despite an overall increase in resilience, one interesting result with respect to individual resilience is the decline after time point three. There are no overt details or data to explain the slight decline; however, time point three coincides with two of the largest exit milestones that must be accomplished in order to graduate. The final physical fitness assessment and a 24-hour simulated casualty scenario called "Battle Stations," which are two demanding events that could possibly explain the slight decline from time point three to time point four. Another possible explanation is that after going through the final milestones to graduate basic training, recruits now realize they will soon be headed to the fleet so there is a decrease in self-efficacy and ultimately their individual resilience. However, the slight decline in individual resilience after time point three did not occur in the divisional resilience results, which showed an increase at each time point.

A notable trend for female recruits was that they were assessed with the highest individual resilience at time one and continuing through time three. Perhaps a higher resilience in females is attributed to a more select group of females that would be willing

to join the military compared to men; however, the surveys did not capture this information and would need to be explored further to find a more definitive explanation. Although females had the highest individual resilience throughout time points one through three they also experienced the biggest decline at time point four compared to all other sub-groups. Again, there is no explanation for this result, but perhaps previous explanations in regards to the physical fitness assessment, Battle Stations, or integration with the fleet could possibly impact them more than their male counterparts. This is another area that needs to be investigated further to find the reason for declining individual resilience near the end of basic training. The decline after time point three did not occur in divisional resilience and females had the highest resilience of all sub-groups from time one through time four. The evidence suggests despite a recruit's decline in individual resilience their divisional resilience is able to help them overcome the difficult challenges they encounter.

The analysis of age groups revealed that recruits 18–19 years old had the highest individual resilience initially and at time four. Perhaps the youngest recruits have not experienced some of the difficult challenges in the civilian work force compared to their peers and therefor have a higher self-efficacy to make it through basic training. Divisional resilience showed the opposite results whereby recruits 21 years old and above demonstrated a higher divisional resilience throughout time points one and four. A possible explanation is that despite previous challenges they now feel as though the divisional make up will help them positively adapt under adverse conditions and emerge more resourceful than if they did it on their own.

C. PATH MODELS

The individual resilience path model's strongest path was leadership's positive effect on individual resilience through a sailor's individual identification with the Navy. Leadership was shown to strongly affect individual identification, which we would expect to see based on the literature review, especially given prototypical leaders' ability to engender organizational identity into newcomers. That result may be unsurprising given the efforts the Navy expends in finding prototypical leaders, but is still worth

mentioning. The correlation matrix supports it as well as the correlation between leadership and identification with the Navy increased over time. Finishing the path, identification with the Navy was shown to affect individual resilience. This is also in line with literature review, where we saw that individuals who incorporate their group identity into their personal self-image are more resilient because they are more prone to fight to preserve and protect their self-image and are thus more resilient. In short, a recruit who sees himself as a U.S. Sailor will fight harder to remain a Sailor and preserve that adopted self-identity. The direct path between leadership and individual resilience is less supported as one time period was statistically insignificant and the two other periods were small, if still positive and statistically significant. The leadership to individual resilience via division cohesion path was unsupported, as division cohesion was not shown to have any effect on individual resilience.

The division resilience path model's strongest path was leadership's positive effect on division resilience through division cohesion. Leadership was shown to strongly affect division cohesion, which is also in line with literature showing leadership's dramatic influence on group dynamics. This is also typical given how groups like Navy recruits bond together in difficult situations with shared hardships. The correlation matrix supports it as the correlation between leadership and division cohesion increased over time. The second part of the first path is also valid as division cohesion strongly affected division resilience. It is also strongly supported by the literature and correlation matrices showing that a group that is more cohesive is also more resilient. The direct path between leadership and division resilience is also supported and the relationship increases over time both in the path model and correlation matrices. The leadership to division resilience via individual identification with the Navy path is partially supported. Leadership's effect on individual identification is remains strong, but the individual identification's effect on division cohesion was small and only statistically significant at two time points.

VI. DISCUSSION

Our study of U.S. Navy recruits suggests that their resilience likely increases over time through basic training. These results support previous research, such as that of Chinese Army recruits, where they found recruits had a higher level of resilience after basic training (Yu, et al., 2015). The practical implications show that methods utilized in basic training likely increase resilience and also demonstrate the possibility of increasing resilience capacity through external factors. An important take away is that this suggests resilience is similar to a skill that be learned and is not entirely a personality trait. Furthermore, the external factors and constructs that appear to contribute to resilience can be applied in a way that increases a recruit's resilience. Based on the resilience trends in Recruit Training Command, we believe that leadership is a notable contributing casual factor to increasing resilience.

The constructs mostly highly related to resilience that surfaced from our study were ego-resilience, learning goal orientation, and positive framing. We initially believed that ego-resilience, learning goal orientation, and positive framing were mainly innate traits. How much they explain resilience as a personality trait is important in determining how many external factors can influence the remaining capacity versus how much is innate in the individual. However, because the correlations of ego-resilience, learning goal orientation, and positive framing to resilience are so high they merit further study. Additionally, we observed that positive framing increased over time. If that increase can be duplicated, it could suggest that it is not entirely an innate trait, but one that can be influenced by external factors.

The surveys revealed many strong correlations between resilience and other factors, and leadership was not the strongest, nonetheless, we chose to focus on leadership as the single factor that could be most readily influenced by the Recruit Training Command with the least disruption to established processes. The strongest correlations with leadership were division resilience, organizational justice, division cohesion, and identification with the Navy. More importantly, leadership's positive correlation with those factors increases consistently over times one, two, and three. The

practical applicability of prototypical leadership on increasing divisional and individual resilience is useful, but the extent of its influence is not thoroughly understood and merits further research.

Leadership's influence may have an even greater effect on resilience through its relationships with other factors. Our research only focused leadership's influence on division cohesion, self-identification, and resilience. How much leadership contributes to organizational justice, which later contributes to highly correlated factors such as division resilience, psychological safety, learning goal orientation, cohesion, and resilience among others, is not the focus of this study. Likewise, leadership has a strong influence on self-identification and self-identification, and is strongly correlated to psychological safety and positive framing while it is moderately correlated with individual resilience. The existing literature has shown, and our path models support, that leadership can create an environment where the factors that contribute to resilience can flourish.

Our study did produce some unanswered questions. The data showed a trend of increasing resilience as a whole and for all sub-groups with the exception of male recruits in integrated divisions. There is no apparent explanation for the question, "why do male recruits in integrated divisions have lower resilience?" It would be interesting to measure resilience and its constructs at the U.S. Marine Corps, U.S. Army, and U.S. Air Force basic training commands to investigate if their recruits showed similar results. Conversely, we wanted to know the reasons for female recruits showing a higher level of resilience than their male counterparts. Do female U.S. Navy recruits actually have higher resilience than males or do they self-report having higher resilience? Lastly, we could not explain why there was a slight decline in resilience after time point three. We thought the decline might be attributed to final exit milestones such as "Battle Stations" and their final physical fitness assessment; however, surveys did not reveal any explanations.

After this study, we wished to examine whether self-reported resilience was an indicator of performance and the metric available for this study was the recruits' actual performance during their physical fitness assessments (PFAs). Based on this we decided to test resilience against initial and final PFA scores to see if there was any improvement.

We used logistic regression to model the relationship between PFA scores and self-reported resilience. We anticipated that higher self-reported resilience would predict a passing score or better in the final PFA. Surprisingly, the results showed that self-reported resilience does not predict performance.

Based on this study's results we recommend several methods for increasing resilience in U.S. Navy recruits. We recommend implementing interventions focused on leadership, cohesion, and positive framing. Leadership resources that can foster division cohesion as well as increase identification with the U.S. Navy are readily available and can provide a significant impact on division resilience. An intervention focused exclusively on building division cohesion, such as focused discussion groups, can be easily implemented and could also significantly increase division resilience. Lastly, although we believe the positive framing construct to mainly be an innate trait, it has the highest correlation with individual resilience and increased over time so it may provide opportunities to influence a recruit's resilience.

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VII. CONCLUSION

The aim of this study was to examine resilience in U.S. Navy recruits undergoing basic training to determine factors that contribute to high and low levels of resilience. A correlation of resilience constructs provided initial insight to hypothesize how these relationships can contribute to increased resiliency. Our resilience trend analysis also provided indications that resilience can be learned or accumulated as a capacity to deal with adverse situations. This study's results support previous research that resilience is not entirely a personality trait. Lastly, our results provided important insights on how resilience constructs such as leadership, cohesion, and self-identification, can significantly influence resilience through direct and moderating relationships.

The practical implications of this study suggest that the Recruit Training Command may realize increases in recruit resilience by continuing their focus on quality leadership as well as including interventions or other activities designed to increase cohesion and positive framing. We believe interventions focused on leadership, cohesion, and positive framing offer promising benefits to help recruits complete basic training. Additionally, after basic training, Sailors will face considerably more challenges, such as deployments, arduous duty, and inherently dangerous operations, and their ability to be resilient in the face of stress could be greatly enhanced if resilience enhancing behaviors can be incorporated in training. Recruit Training Command is in a unique position to foster these abilities in recruits. These abilities could follow Sailors throughout their careers thus influencing not only the countless others that they will interact with, and potentially lead, on a daily basis, but also contribute to the overall resilience of the Navy as an organization.

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