Character Strengths in the Army: Development and Initial Validation of the Army-Based Character Scale

31 Dec 2017

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Character Strengths in the Army: Development and Initial Validation of the Army-Based Character Scale

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UNCLASSIFIED

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
1. AGENCY USE ONLY ***(Leave blank)***	**2. REPORT DATE** 31 Dec 2017	**3. REPORT TYPE AND DATES COVERED** Internal Technical Report	
4. TITLE AND SUBTITLE Character Strengths in the Army: Development and Initial Validation of the Army-Based Character Scale		**5. FUNDING NUMBERS** HHSN316201200036W_HHSP233201400190W	
6. AUTHOR(S) Loryana L. Vie, Marisa Nihill, Raghav Ramachandran, Jacob Hawkins			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Research Facilitation Laboratory Monterey, CA		**8. PERFORMING ORGANIZATION REPORT NUMBER**	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) Center for the Army Profession and Ethic Bldg 621 Wilson Road, Rm 118, West Point, NY 10996		**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number: ARDEC IRB # 17-006___.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release;distribution is unlimited.		**12b. DISTRIBUTION CODE** A	
13. ABSTRACT (maximum 200 words) This project examined character strengths within the Army context. Leveraging existing data from the Global Assessment Tool (GAT), we culled items reflecting the Army's Values and the DoD's Ethical Values. In Study 1, we developed a 19-item Army-Based Character (ABC) scale assessing five facets: Benevolence, Positivity, Endurance, Work Engagement and Camaraderie. In Study 2, we examined growth trajectories in demographic subsamples by service component and Army tenure (new or established Soldier). We found evidence of growth in nearly every group and identified demographic characteristics that predict character change. In Study 3, ABC predicted odds of completing an initial service contract, of renewing one's contract, and the nature of one's service (evidence of predictive validity). The ABC outperformed the Abbreviated Character Strengths Test, a 24-item character measure administered on the GAT. The abbreviated nature of the ABC scale provides novel opportunities to assess character more frequently, in a wider variety of contexts, and in relation to additional outcomes while minimizing survey fatigue.			
14. SUBJECT TERMS Character, Army Values, DoD Ethical Values, Global Assessment Tool, Measurement, Longitudinal Data Analysis, Attrition			**15. NUMBER OF PAGES** 104
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	**18. SECURITY CLASSIFICATION OF THIS PAGE** UNCLASSIFIED	**19. SECURITY CLASSIFICATION OF ABSTRACT** UNCLASSIFIED	**20. LIMITATION OF ABSTRACT** UU

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LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation (Acronym)	Definition
δ	Standardized uniqueness
α	Cronbach's alpha
A	Honorable discharge
AAG	Army Analytics Group
ABC	Army-Based Character Scale
ACST	Abbreviated Character Strengths Test
ADRP	Army Doctrine Reference Publications
AFQT	Armed Forces Qualification Test
ALDS	Army Leader Development Strategy
AR	Army Regulation
ARDEC	Army Armament Research, Development & Engineering Center
ASQ	Attributional Style Questionnaire
AUC	Area under the ROC curve statistic
β	Parameter slope coefficient
B	Discharge of under general honorable conditions
BNV	Benevolence
C1	Component Invariance Test, Model 1
C2	Component Invariance Test, Model 2
C3	Component Invariance Test, Model 3
CAM	Camaraderie
CAPE	Center for the Army Profession and Ethic
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CH	Character subscale
CI	Confidence Interval

Abbreviation (Acronym)	Definition
CM	Comparison Model
CP	Coping subscale
CT	Catastrophic Thinking subscale
Δ	Change
$\Delta S\chi^2$	Scaled chi-square difference test
d	Cohen's d effect size
D	Bad conduct discharge
df	Degrees of freedom
DoD	Department of Defense
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities
DP	Depression subscale
DUSA	Office of the Deputy Under-Secretary of the Army
E	Under other than honorable conditions
EFA	Exploratory Factor Analysis
END	Endurance
ENG	Engagement subscale
ESEM	Exploratory Structural Equation Modeling
F	Dishonorable discharge
FND	Resignation due to miscellaneous/general reasons
FY	Fiscal Year
GAT	Global Assessment Tool
G1	Gender Invariance Test, Model 1
G2	Gender Invariance Test, Model 2
G3	Gender Invariance Test, Model 3
KGM	Accept Commission or warrant in the Army

Abbreviation (Acronym)	Definition
λ	Standardized factor loading
LDRSHP	Loyalty, Duty, Respect, Selfless Service, Honor, Integrity, Personal Courage
LN	Loneliness subscale
M	Mean
MEPCOM	Military Entrance Processing Command
ML	Maximum Likelihood
MLR	Maximum Likelihood estimator with Robust standard errors
MOS	Military Occupational Specialty
N	Sample size
NA	Negative affect subscale
ω	Omega consistency
ORG	Organizational Trust subscale
p	Probability value
PA	Positive Affect subscale
PANAS-X	Positive and Negative Affect Scale - Expanded Form
PDE	Person-Event Data Environment
PHQ-9	Patient Health Questionnaire
POS	Positivity
PTSD	Posttraumatic Stress Disorder
r̂	Correlation between two latent factors
R1	Rank Invariance Test, Model 1
R2	Rank Invariance Test, Model 2
R3	Rank Invariance Test, Model 3
RET	Retirement due to Disability
RMSEA	Root Mean Square Error of Approximation
ROC	Receiver Operating Characteristics

Abbreviation (Acronym)	Definition
SD	Standard Deviation
SPIR	Spiritual Fitness subscale
SRMR	Standardized Root Mean Square residual
TAPAS	Tailored Adaptive Personality Assessment System
TLI	Tucker-Lewis Fit Index
UCLA	University of California Los Angeles
VD	Voluntary Discharge from Active Duty
VIA-IS	Values in Action Inventory of Strengths
VR	Voluntary Release from Active Duty
WKENG	Work Engagement
χ^2	Chi-square
Y	Uncharacterized discharge
z	z statistic
Z	Unknown discharge
ZZZ	Unknown separation code

Executive Summary

The Research Facilitation Laboratory (RFL) proposed the study “Influence of Character Strengths on U.S. Army Soldier Readiness and Performance Outcomes” to develop a character scale that would comport with Army doctrine (i.e., the Army’s Values and the DoD’s Ethical Values) and could predict important Army outcomes. The Army defines character as “an individual’s moral and ethical qualities” (U.S. Army, 2012a), “who a person is, what a person believes, how a person acts” (U.S. Army, 2012b), “one’s ‘true nature including identity, sense of purpose, values, virtues, morals, and conscience’” (U.S. Department of the Army, 2017) and “an Army professional’s dedication and adherence to the Army Ethic, including Army Values, as consistently and faithfully demonstrated in decisions and actions” (U.S. Department of the Army, 2017). This research was sponsored by the Army Study Program Management Office (ASPMO), Headquarters Department of the Army (HQDA), Deputy Chief of Staff (DCS), G-8. The Center for the Army Profession and Ethic (CAPE), U.S. Army Training and Doctrine Command (TRADOC) was the principal stakeholder for this study.

The research team merged Global Assessment Tool (GAT) data with Soldier career and demographic data to assess responses across a variety of demographic groups, over time, and in relation to Army attrition outcomes. The researchers examined data representing U.S. Army Active Duty, Reserve, and National Guard Soldiers who served from 2009 – 2014. The team focused on three research objectives:

1. Develop a character measure rooted in Army doctrine that is psychometrically sound and consistent across various demographic subgroups.
2. Assess changes in the character measure across time in various demographic subgroups.
3. Assess how well the character measure predicts important Army attrition-related outcomes.

Significant Findings

- We developed and provided initial validation for a 19-item Army-Based Character (ABC) scale that comports with Army doctrine.
- Over a four year period, we observed character growth across nearly every service component and Army tenure (new or established Soldier) subgroup.
- ABC predicted odds of completing an initial service contract, of renewing one's contract, and the nature of one's service, better than an existing character measure.

Immediate Impact

This research provides the Army with a character measure (the ABC scale) that aligns with Army doctrine. The ABC scale provides novel opportunities to assess and follow the character development of new and prospective Soldiers at key milestones (e.g., Military Entrance Processing Station, basic training, Army character development programs) and to examine character in relation to additional important Army outcomes and cost-drivers.

The ABC scale will enable Army leaders to assess Soldiers' character between yearly assessments and make informed decisions regarding the need for Soldier character-building programs. Identifying group differences in character growth can help the Army more efficiently tailor and target future character building efforts to those who may benefit the most.

Future Research

More research is needed to examine how the ABC relates to other Army measures and outcomes. Fortunately, these data exist and are available for conducting this research. The ensuing findings will equip the Army to better understand in what contexts the ABC

will prove most useful. While we made significant advances in measuring Army character, we recommend future research do the following:

- Refine the ABC to more fully capture Army Values and DoD Ethical Values.
- Compare the ABC's predictive utility to that of other existing Army measures.
- Expand consideration to other important Army milestones and outcomes.
- Examine the extent to which the ABC can capture character change among new and prospective Soldiers (e.g., MEPS, basic training), as well as before and after Army character development programs.

In sum, our work sets the foundation for an Army-Based Character measure that could inform Army leaders of Soldiers' Army character at initial accession and throughout their career, predict important outcomes, and provide critical information to character building programs designed to develop honorable Army leaders.

Introduction

Character has a driving influence on many aspects of one's life. Character influences the decisions that a person makes, their behavior, and their reputation. Not surprisingly, understanding character has received considerable attention from psychologists, philosophers, and the general public alike. Studying character, with its heavy moral overtones, can be complex. Although many have argued for the importance of character, a widely accepted definition of character has proved elusive. Broadly speaking, character can be thought of as, "those impenetrable and habitual qualities within individuals, and applicable to organizations that both constrain and lead them to desire and pursue personal and societal good" (Wright & Lauer, 2013, p. 27). In addition to being the morally superior choice, researchers have also argued that behaviors that engender high character can also help companies achieve greater products and profits (Peterson & Park, 2006). This project examines character within a branch (Army) of the largest employer in the world, the U.S. Department of Defense (DoD). Although character impacts human behavior broadly, the magnitude of consequences and impact that even a single Soldier can potentially have on our nation's security is of utmost importance; understanding, measuring and fostering character in U.S. Army (hereafter, "Army") Soldiers is an imperative need.

We begin our discussion with an overview of previous work on character strengths, specifically the Values in Action Inventory of Strengths (VIA-IS), in order to provide context of character research in general. We then discuss how character may vary across cultures, and address the military culture in particular, to explain why character should be considered specifically within an Army context. Then we provide an overview of important Army initiatives and considerations of ethics, values, and morality, describe Army efforts to assess character, and address why the current work is needed.

Values in Action Inventory of Strengths

Peterson and Seligman (2004) investigated the universal qualities that drive people to want to do the right thing. As part of their endeavor, they outlined six character virtues, which they defined as, “the core characteristics valued by moral philosophers and religious thinkers: wisdom, courage, humanity, justice, temperance, and transcendence” (p. 13). In addition, they identified 24 character strengths, which can be thought of as, “the psychological ingredients—processes or mechanisms—that define the virtues” (p.13). These character virtues and strengths are as follows: creativity, curiosity, judgment, love-of-learning, perspective, bravery, honesty, perseverance, zest, kindness, love, social intelligence, fairness, leadership, teamwork, forgiveness, humility, prudence, self-regulation, appreciation of beauty, gratitude, hope, humor, and spirituality. Based on this classification system, Peterson and Seligman (2004) developed the Values in Action Inventory of Strengths (VIA-IS), which includes 10 items assessing each of the 24 character strengths, for a total of 240 items. Since its inception, the VIA-IS has been translated into numerous languages (e.g., Littman-Ovadia & Lavy, 2012; Ruch et al., 2010) and compared across over 75 countries (e.g., McGrath, 2015; Park, Peterson & Seligman, 2006).

Culture and Gender

To provide an understanding of the ubiquity of these qualities, as well as where and how these qualities tend to converge and diverge, it is important to consider cultural and gender trends surrounding character strengths. For example, Shimai, Otake, Park, Peterson, and Seligman (2006) found that both American and Japanese participants who completed the VIA-IS reported greater love, humor, and kindness strengths and reported lesser levels of prudence, self-regulation, and modesty strengths. In addition, male participants were more likely to report strengths of bravery and creativity, while females were more likely to report love and kindness, for both American and Japanese participants (Shimai et al., 2006). Additionally, participants from both countries

demonstrated associations between character strengths (zest, hope, curiosity, and gratitude) and happiness. Cultural influences can also extend beyond national culture into subcultures within a single nationality, such as civilian and military culture.

Character Strengths in the Military

Limited research has examined which character strengths are most important in military populations. A study of the Norwegian Military Academy, for example, asked an expert group to rate the most important character strengths for military officers (Boe, Bang, and Nilsen, 2015b). The experts identified the following nine character strengths as being most important: leadership, integrity, persistence, bravery, citizenship, open-mindedness, social intelligence, self-regulation, and creativity. In the same study, a group of military employees selected the same nine character strengths, along with three additional strengths: fairness, love of learning, and perspective. In another study, 25 experienced military officers (primarily from the Norwegian Army) were asked to rate the importance of each of the 24 VIA-IS character strengths for military leaders (Boe, Bang, and Nilsen, 2015a). These military leaders identified the same top 12 character strengths as Boe et al. (2015b). Additionally, a study of 95 male applicants to the Australian Army Special Forces found that applicants endorsed four strengths greater than would be expected by chance: integrity (45%), team worker (41%), persistence (36%), and love of learning (25%; Gayton & Keyhoe, 2015). Consistently, these studies identify strengths that highlight the importance of integrity, a strong work ethic, a creative and intelligent orientation, and an ability to work well with others.

Matthews, Eid, Kelly, Bailey and Peterson (2006) compared character strengths across three groups: West Point cadets, Norwegian Naval Academy cadets, and U.S. civilians ages 18-21. They found that the absolute scores of the West Point cadets were higher than those of the other two groups. Additionally, a rank order comparison revealed the two military samples were more similar to one another than to the U.S.

civilian sample. Finally, the most evident character strengths among the military samples were honesty, hope, bravery, industry and teamwork.

Army Character

As clearly indicated above, an understanding of a person's character, along with the ability to measure, predict, and mold it, has significant implications for a person's actions. Beyond the confines of a laboratory or academic setting, variations in people's character can have real-world consequences. There are valuable benefits associated with being able to identify individuals with a strong character, place them in important and influential positions, and work to continually develop people's character, particularly those who have the ability to impact the lives of others. The Army is one such organization that has a vested interest in identifying and fostering character in its workforce. When placing Soldiers in positions in which they must make decisions with dramatic repercussions, such as considerable financial consequences and life and death decisions, equipping Soldiers with a guiding set of agreed upon values and ethics provides some reassurance that Soldiers fighting our nation's wars will do so in a character-driven manner.

As a testament to the emphasis that the Army places on instilling character in its Soldiers, the Army not only conducts ethical screening of those who wish to enter the military but also has funded a wide range of ethical initiatives, interventions and trainings. A Soldier's character has implications for the ability to ethically conduct war and ensure that missions are conducted strategically, with minimal errors and loss of life. Character is not only a fundamental underpinning of Army leadership (e.g., ALDS, 2013; Michelson, 2013), it is also critical for the lowest ranking Soldier executing commanders' orders and utilizing their own judgment. In fact, entire organizations have been established to study and promote the Army Profession and Ethic. The Center for Army Profession and Ethic (CAPE) is one such organization. Established in May 2008, CAPE's mission has evolved to include: "assess[ment], study, and refine[ment of] the

Profession of Arms, the Army Ethic and culture; increase Army members understanding and internalization of what it means for the Army to be a Profession and to be a Professional; accelerate professional and character development in individuals, units, and Army culture through training, education, and leader development; and lead Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF) initiatives to reinforce the Army Profession, Army Ethic, and culture."

Although researchers and academics have defined and explored character in civilian populations, the Army also has a wide range of working definitions for character. In a recent white paper, CAPE (U.S. Department of the Army, 2017) defined character intrinsically as "one's 'true nature including identity, sense of purpose, values, virtues, morals, and conscience'" (p. 2) but also operationally as "an Army professional's dedication and adherence to the Army Ethic, including Army Values, as consistently and faithfully demonstrated in decisions and actions." The first definition is in keeping with the manner in which academics and philosophers have defined character, as discussed above. The second definition reflects the unique light in which character must be considered within the Army context. Given the constraints of conducting warfare, character must be considered within an operational context.

More broadly, the Army has defined character as "an individual's moral and ethical qualities" (U.S. Army, 2012a), and "who a person is, what a person believes, how a person acts" (U.S. Army, 2012b), and has identified four elements of character: (1) Army Values, (2) Empathy, (3) Warrior Ethos & Service Ethos, and (4) Discipline. Alternatively, the Center for the Army Profession and Ethic (U.S. Department of the Army, 2016b) recently defined character as "our true nature, including identity, sense of purpose, values, virtues, morals, and conscience. Character, in an operational sense, is revealed in our dedication and adherence to the Army Ethic, including Army Values, as consistently and faithfully demonstrated in our decisions and actions" (p. 1). CAPE is one of the authoritative sources of Army ethical development. In a recent review, CAPE

identified numerous Army and DoD publications that emphasize the importance of character and identify trust as a foundational element of character.

Despite the variety of working definitions for character in the Army, there remains no single standard definition of character, and more importantly, no consistent, standardized method of measuring character. Indeed, the Army Capabilities Need Analysis noted that the ability to identify character and measure character development efforts was a specific capabilities gap (U.S. Department of the Army, 2016b). Measuring character within a military context has unique ramifications compared to a civilian population. Civilians do not regularly shoulder the responsibility of national security or life and death decisions; character, especially the lack of character, has much greater implications for personal and societal outcomes in the military domain, relative to the typical civilian domain. The distinction between military and civilian populations, therefore, warrants consideration of a military-specific character measure.

Despite the plethora of ways in which character has been defined in the Army, two initiatives have been particularly dominant and pervasive in driving the ethical conversation in the Army community. These two initiatives are the **Army Values** and the **DoD Ethical Values.** Combined, they convey the priorities the Army places on ethical and moral behavior that, when internalized, reflect a Soldier's character.

Army Values. The Army has identified seven core values: Loyalty, Duty, Respect, Selfless Service, Honor, and Personal Courage (Table 1). Combined and read in order, they form the acronym LDRSHP, which reflects the Army's view that these values represent the foundation for creating a leader with a strong moral compass. The Army Values are touted throughout a Soldier's military career, starting as early as basic training. "By taking an oath to serve the nation and the institution, one agrees to live and act by a new set of values—Army Values" (ADRP 6-22).

Table 1. Defining Army Values

Loyalty	Bear true faith and allegiance to the U.S. Constitution, the Army, your unit and other Soldiers. Bearing true faith and allegiance is a matter of believing in and devoting yourself to something or someone. A loyal Soldier is one who supports the leadership and stands up for fellow Soldiers. By wearing the uniform of the U.S. Army you are expressing your loyalty. And by doing your share, you show your loyalty to your unit.
Duty	Fulfill your obligations. Doing your duty means more than carrying out your assigned tasks. Duty means being able to accomplish tasks as part of a team. The work of the U.S. Army is a complex combination of missions, tasks and responsibilities — all in constant motion. Our work entails building one assignment onto another. You fulfill your obligations as a part of your unit every time you resist the temptation to take "shortcuts" that might undermine the integrity of the final product.
Respect	Treat people as they should be treated. In the Soldier's Code, we pledge to "treat others with dignity and respect while expecting others to do the same." Respect is what allows us to appreciate the best in other people. Respect is trusting that all people have done their jobs and fulfilled their duty. And self-respect is a vital ingredient with the Army value of respect, which results from knowing you have put forth your best effort. The Army is one team and each of us has something to contribute.
Selfless Service	Put the welfare of the nation, the Army and your subordinates before your own. Selfless service is larger than just one person. In serving your country, you are doing your duty loyally without thought of recognition or gain. The basic building block of selfless service is the commitment of each team member to go a little further, endure a little longer, and look a little closer to see how he or she can add to the effort.
Honor	Live up to Army values. The nation's highest military award is The Medal of Honor. This award goes to Soldiers who make honor a matter of daily living — Soldiers who develop the habit of being honorable, and solidify that habit with every value choice they make. Honor is a matter of carrying out, acting, and living the values of respect, duty, loyalty, selfless service, integrity and personal courage in everything you do.
Integrity	Do what's right, legally and morally. Integrity is a quality you develop by adhering to moral principles. It requires that you do and say nothing that deceives others. As your integrity grows, so does the trust others place in you. The more choices you make based on integrity, the more this highly prized value will affect your relationships with family and friends, and, finally, the fundamental acceptance of yourself.
Personal Courage	Face fear, danger or adversity (physical or moral). Personal courage has long been associated with our Army. With physical courage, it is a matter of enduring physical duress and at times risking personal safety. Facing moral fear or adversity may be a long, slow process of continuing forward on the right path, especially if taking those actions is not popular with others. You can build your personal courage by daily standing up for and acting upon the things that you know are honorable

Department of Defense (DoD) Ethical Values. The Joint Ethics Regulation (DoD 5500.7R, U. S. Department of Defense, 1993) stipulates the joint DoD ethics (ethical values; Table 2). This regulation serves as the singular source for standards of ethical conduct across the Department of Defense. The regulation outlines expectations for ethical behavior for DoD employees, including military service members, civilian employees and contractors. Although not as widely touted, these ethics have been officially codified into DoD regulations and serve to guide not only Soldier behavior, but also behavior across the sister services, as well as the civilian and contractor personnel that support service members.

Table 2. DoD Ethical Values

Honesty	Being truthful, straightforward and candid are aspects of honesty. (1) Truthfulness is required. Deceptions are easily uncovered and usually are. Lies erode credibility and undermine public confidence. Untruths told for seemingly altruistic reasons (to prevent hurt feelings, to promote good will, etc.) are nonetheless resented by the recipients. (2) Straightforwardness adds frankness to truthfulness and is usually necessary to promote public confidence and to ensure effective, efficient conduct of Federal Government operations. Truths that are presented in such a way as to lead recipients to confusion, misinterpretation or inaccurate conclusions are not productive. Such indirect deceptions can promote ill-will and erode openness, especially when there is an expectation of frankness. (3) Candor is the forthright offering of unrequested information. It is necessary in accordance with the gravity of the situation and the nature of the relationships. Candor is required when a reasonable person would feel betrayed if the information were withheld. In some circumstances, silence is dishonest, yet in other circumstances, disclosing information would be wrong and perhaps unlawful.
Integrity	Being faithful to one's convictions is part of integrity. Following principles, acting with honor, maintaining independent judgment and performing duties with impartiality help to maintain integrity and avoid conflicts of interest and hypocrisy.
Loyalty	There are many synonyms for loyalty: fidelity, faithfulness, allegiance, devotion and fealty. Loyalty is the bond that holds the nation and the Federal Government together and the balm against dissension and conflict. It is not blind obedience or unquestioning acceptance of the status quo. Loyalty requires careful balancing among various interests, values and institutions in the interest of harmony and cohesion.

	Table 2. DoD Ethical Values
Accountability	DoD employees are required to accept responsibility for their decisions and the resulting consequences. This includes avoiding even the appearance of impropriety because appearances affect public confidence. Accountability promotes careful, well thought-out decision-making and limits thoughtless action.
Fairness	Open-mindedness and impartiality are important aspects of fairness. DoD employees must be committed to justice in the performance of their official duties. Decisions must not be arbitrary, capricious or biased. Individuals must be treated equally and with tolerance.
Caring	Compassion is an essential element of good government. Courtesy and kindness, both to those we serve and to those we work with, help to ensure that individuals are not treated solely as a means to an end. Caring for others is the counterbalance against the temptation to pursue the mission at any cost.
Respect	To treat people with dignity, to honor privacy and to allow self-determination are critical in a government of diverse people. Lack of respect leads to a breakdown of loyalty and honesty within a government and brings chaos to the international community.
Promise Keeping	No government can function for long if its commitments are not kept. DoD employees are obligated to keep their promises in order to promote trust and cooperation. Because of the importance of promise keeping, it is critical that DoD employees only make commitments that are within their authority.
Responsible Citizenship	It is the civic duty of every citizen, and especially DoD employees, to exercise discretion. Public servants are expected to engage personal judgment in the performance of official duties within the limits of their authority so that the will of the people is respected in accordance with democratic principles. Justice must be pursued and injustice must be challenged through accepted means.
Pursuit of Excellence	In public service, competence is only the starting point. DoD employees are expected to set an example of superior diligence and commitment. They are expected to be all they can be and to strive beyond mediocrity.

Taken together, the Army Values and the DoD Ethical Values embody the character strengths of the greatest importance to the Army.

Global Assessment Tool

Despite the importance of the Army Values and the DoD Ethical Values, current measures of character already in use in the Army are not tailored to these constructs. In 2009, the Army launched the Comprehensive Soldier Fitness program, a preventive

program designed to enhance Soldier psychological strengths, rather than wait to intervene after a problem has manifested (see American Psychologist, Volume 66, Number 1, January 2011 for a special issue dedicated to this program). As part of this program, the Army needed a way to measure psychological strengths, in order to identify in which areas a Soldier may benefit from training. The Army tasked leading experts to develop such a psychological strengths measure that the Army could administer to Soldiers annually. This inventory, named the Global Assessment Tool (GAT), originally included 105 items spanning 16 scales (i.e., GAT 1.0; Peterson, Park, and Castro, 2011). One of the scales was designed to assess character and was an abbreviated version of the VIA-IS (Peterson & Seligman, 2004). This abbreviated version contains one item assessing each character strength, rather than the original 10 items per strength. Despite the drastic reduction in the inventory length, the Abbreviated Character Strengths Test (ACST) still comprised nearly one quarter of the items on the GAT. The amount of space dedicated to measuring character on the GAT further reflects the importance of character in the Army. In addition to assessing character strengths, the GAT also assesses a number of other key constructs, such as adaptability and work engagement. Although the current GAT (referred to as GAT 2.0) contains 170-items, the additional items assess physical health and lifestyle, not psychological strengths or character, and were not deemed relevant to the present study.

Initial validation of the ACST relying on Exploratory Structural Equation Modeling (ESEM) yielded four character factors, rather than the hypothesized six character virtues (Vie, Scheier, Lester, & Seligman, 2016). Other studies examining the factor structure of character based on the 24-item ACST (e.g., Vanhove, Harms, & DeSimone, 2016) as well as the full 240 item VIA-IS (e.g., McGrath, 2014; Shryack, Steger, Krueger, & Kallie, 2010) have also yielded inconsistent factor structures.

Overview of the Current Studies

We conducted a series of studies in order to develop and validate a measure of character strengths that is consistent with Army doctrine:

Study 1: Measuring character in the Army

Both the Army and the research community have operationally defined character and emphasized its importance. Unlike the research community, however, the Army has yet to develop a character measure that aligns with its values and ethics. For this reason, in Study 1, we investigated the extent to which items on the annually required GAT align with the Army's values and ethics. This approach has several benefits. First, secondary data analysis is more time- and cost-effective than collecting new data. Second, because the GAT is currently in its 9th year, there are opportunities to examine changes in growth (Study 2) and associations between character and key outcomes (Study 3), both of which would not be possible if administering a new scale. Third, because all Soldiers complete the GAT annually, we were able to examine character in far more Soldiers than we could in a pilot study for a new instrument. Because a subset of the VIA-IS character strengths (e.g., creativity, curiosity, humor, social intelligence, and zest) are thought lack the moral dimension required to be considered key components of character (Wright & Lauer, 2013; Wright, Quick, Hannah & Hargrove, 2017), we inspected the relevance of each character strength to the Army's values and ethics. Additionally, because the GAT was developed to assess constructs important to the Army, we expanded our search beyond the ACST to the full GAT, so we could include additional items relevant to the Army's values and ethics. The objective of Study 1 was to identify the GAT items that assess Army values and ethics, and examine the psychometric properties of those items.

Study 2: Do Soldiers grow in character?

After constructing a psychometrically sound measure of Army-specific character (the Army-Based Character Scale; ABC Scale), we then investigated whether Soldier's character scores change over time. The Army expends considerable effort and resources attempting to cultivate an environment of character and ethics for Soldiers to internalize. As such, repeated GAT responses should ideally capture measureable differences in character over time. Study 1 examined character at a single time point (FY 2010). In Study 2, we examined GAT responses over multiple years to investigate the extent to which Soldiers' character changes over time. Additionally, it is quite possible that particular demographic characteristics (e.g., being male or female) or military characteristics (e.g., time in service) are associated with naturalistic changes in character. Such information could help the Army tailor and target character training to relevant demographic and military subgroups to maximize the efficacy of Army character building programs.

Study 3: Can character predict attrition or service outcomes?

After establishing the ABC scale's invariance within time (Study 1) and changes across time (Study 2), and demonstrating evidence of adequate convergent and discriminant validity (Study 1), we next investigated the scale's predictive validity in relation to important Army outcomes. Specifically, we examined attrition from the Army (departing from the Army while under contract) and separation from the Army broadly (i.e., departing before or after completing one's service). We hypothesized that greater character at baseline would be associated with a reduced likelihood of attriting from the Army. We examined the extent to which the ABC scale predicts four key aspects of attrition: 1) whether a Soldier fulfills his or her initial contract; 2) whether a Soldier remains in the Army after his or her initial contract; 3) whether a Soldier's separation from the Army is voluntary or involuntary; and 4) the character of service designated upon a Soldier's separation from the Army (e.g., honorable discharge). Additionally,

because we seek an optimal measure of character that predicts outcomes important to the Army, we compared the predictive validity of the newly derived ABC scale with the predictive validity of the original GAT character scale (i.e., the ACST). Because of a combination of data constraints and differences in service agreements and requirements between components, we limited Study 3 to Active Duty Soldiers. Additionally, because we were interested in retention of new Soldiers, we limited our scope to first-term Soldiers.

All three studies were reviewed and approved by the Army Armament Research, Development and Engineering Center (ARDEC) Institutional Review Board. We employed secondary data analysis using Department of Defense and Army data housed within the Person-event Data Environment (PDE), a virtual enclave that serves as a secure repository and data analysis platform (Vie, Griffith, Scheier, Lester, Seligman, 2013; Vie et al., 2015).

Study 1 Methodology

Study Design

We used a cross-sectional study design, which included the latest GAT for each Army Soldier who took the GAT during Fiscal Year 2010 (Oct 2009-Sep 2010), the first full Fiscal Year the GAT was administered. Each Soldier in the study was also required to have a record with demographic characteristics in the Master Personnel file (Active Duty, Reserve, or National Guard).

Sample

We examined 445,132 Active Duty, Reserve, and National Guard Army Soldiers who completed a GAT during FY 2010, indicated their GAT responses could be used for research purposes, and had a Master Personnel file record. The distribution of months during which the GAT was taken for the entire sample is shown in Figure 1.

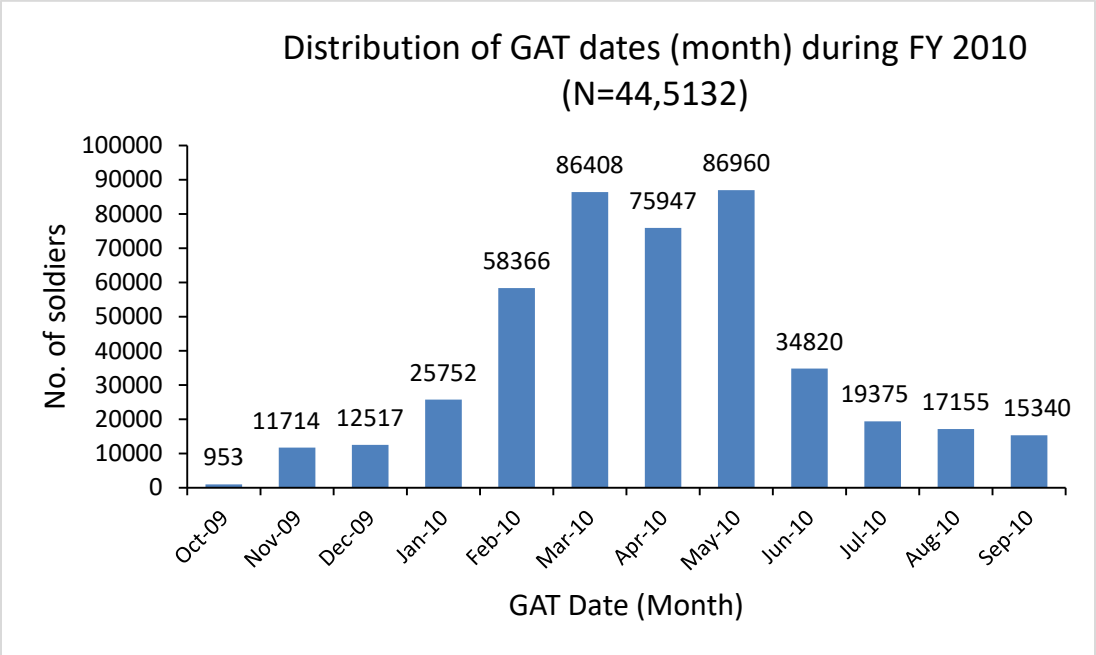

Figure 1. Distribution of GAT Completion Dates (in Months)

We performed a factor analysis of the GAT items related to character in two separate random samples of N=18,000 Soldiers, drawn from the initial pool of 445,132 Soldiers, without replacement. We also drew a random stratified sample (N=18,000) without replacement to test measurement invariance of our factor structure across gender (male or female), rank (enlisted or officer), and component (Active Duty, Reserve, and National Guard). The stratified sample consisted of an equal number of Soldiers in each group based on gender, rank, and component. We needed a sufficiently large random sample to ensure adequate representation across each of the 12 different groups based on gender, rank, and component (2 x 2 x 3 possible value sets). The smallest sample size across these groups in the initial pool of Soldiers corresponded to female National Guard officers (N=1,848), and preliminary power analyses indicated that a size of N=1,500 was sufficient for each group. For this reason, we examined random sample sizes of N=1,500*12=18,000.

Measures

We examined the full GAT 1.0 inventory, less five items from the Friendship scale, which were measured on a different response scale (dichotomous rather than ordered categorical Likert format). GAT 1.0 is comprised of 16 scales: adaptability, bad coping, good coping, catastrophizing, character, depressive symptoms, positive affect, negative affect, optimism, family satisfaction, family support, engagement, friendship, organizational trust, loneliness, and meaning.

We obtained basic demographic information (gender, rank, and component) for the measurement invariance analyses largely from the Army's Master Personnel files. However, if gender, rank, or component was not available in the Master Personnel file within three months of a Soldier's GAT, this information was pulled from the GAT.

Analysis

As part of an initial qualitative analysis, a team of 4 coders, working separately, evaluated the extent to which each GAT item (presented in a randomized order) aligned with each Army value or ethic. Once the mapping was complete, we compiled the ratings from each coder into a spreadsheet and the research team discussed discrepancies until a consensus could be reached. In instances in which a consensus could not be reached, items were retained and examined analytically.

Basic descriptive sample statistics and random sampling (including stratification) were performed in R 3.3.2. ESEM of the GAT items pertaining to character was implemented in MPlus 7.11 (Muthen & Muthen, 1998-2012). Unlike confirmatory factor analysis (CFA), ESEM does not constrain cross-factor loadings to zero (Morin & Maïano, 2011), and since many of our items are moderately related with each other, this approach is preferable to CFA. The ESEM models were estimated using an oblique geomin rotation with ε=0.5, according to the guidelines provided by Marsh and colleagues (2009, 2010). We used the Maximum Likelihood estimator with Robust standard errors (MLR) to obtain accurate standard errors of estimates for non-normal

ordered categorical GAT data (Hoyle, 2012; Morin & Maïano, 2011). For analyses involving the composite scores of items on different scales, we used the Maximum Likelihood (ML) estimator.

We tested the factor structure of the character items in two random samples of 18,000 Soldiers in order to confirm replicability of the factor structure in different samples. We then tested measurement invariance across three demographic subgroups: gender (male vs. female), rank (officer vs. enlisted), and component (Active Duty vs. National Guard vs. Reserve) in a third random sample of 18,000 Soldiers stratified by each of the 12 combinations of demographic subgroups, with 1,500 Soldiers in each group.

Model fit was evaluated using several goodness-of-fit criteria, including the Comparative Fit Index (CFI; Bentler, 1990) and Tucker-Lewis Fit Index (TLI; Tucker & Lewis, 1973), which are based on the likelihood function and account for sample size and model parsimony. We also used the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) and its 90% Confidence Intervals, as well as the Standardized Root Mean square Residual (SRMR; Jöreskog & Sörbom, 1986). The chi-square test of model fit was reported but not used to evaluate model fit because of its sensitivity to sample size and minor deviations from multivariate normality (Marsh, Balla, & McDonald, 1988).

Measurement invariance tests involved parameter-nested models in which the more restrictive model with additional equality constraints was evaluated against the less restrictive model without the specified constraints. We tested three different types of model invariance from least to most restrictive: *configural* (the factor structure is the same across groups), *metric* (configural invariance with factor loadings equivalent across groups), and *scalar* (metric invariance with observed variable intercepts equivalent across groups). We used a MLR scaling correction to calculate chi-square (χ^2) difference tests between each model and the progressively more restrictive model (Satorra & Bentler, 2010). A nonsignificant scaled chi-square difference test ($p > .05$)

lends support for the more restrictive model, indicating stricter measurement invariance across groups.

Given our large sample sizes, nonsignificant scaled chi-square difference tests are very difficult to obtain even for relatively small changes in χ^2. Consequently, following recommendations by Marsh and colleagues (2010), we also assessed the magnitude of change in CFI using the recommended 0.01 benchmark (Chen, 2007; Cheung & Rensvold, 2002). Given concerns regarding the large number of parameters estimated in ESEM (Marsh et al., 2009, 2010), we also examined changes in fit indices that correct for parsimony, namely TLI and RMSEA. Finally, we tested convergent validity (factors that should theoretically be related to each other are actually related to each other in the sample) and discriminant validity (factors that are theoretically different from each other are unrelated to each other in the sample) of the character factors by calculating correlations among them in one of the non-stratified random samples of 18,000 Soldiers.

Study 1 Results

Sample Characteristics

The majority of the Soldiers in the two non-stratified random samples (N=18,000 each) were male (83%) and enlisted (84 to 85%). Also, just under half of the Soldiers were Active Duty (48%), 29 to 30% were Reserve, and the remaining 22 to 23% were National Guard. Almost exactly half of the Soldiers were married (50 to 51%), while just 23% of the samples had a college education (Associate's degree or higher). The racial and ethnic composition of the samples was as follows: 74% non-Hispanic White, 19 to 20% African-American, 3% Asian, 3% Hispanic, and 1% Other. The average length of time between the GAT assessments and personnel records was 2 ± 29 days. On average, Soldiers in our samples were in the military for 9.2 ± 8.6 years.

In the stratified random sample (N=18,000), the stratification resulted in 50% males, 50% enlisted, and 33.3% in each component (Active Duty, Reserve, and

National Guard). Similar to the non-stratified random samples, 52% were married but unlike those samples, 52% had a college education (Associate's degree or higher). The racial and ethnic composition of the stratified random sample was fairly similar to the other random samples: 72% non-Hispanic White, 21% African-American, 3% Asian, 3% Hispanic, and 1% Other. For the stratified random sample, the average length of time between the GAT assessments and personnel records was 1 ± 38 days and the average length of time in the military was 11.5 ± 9.2 years, which was higher than the military tenure in the other random samples.

Identifying GAT Items Assessing Army Character

The qualitative analysis identified 29 GAT items that align with the Army's seven Values and ten DoD Ethics (Table 3). Notably, only 12 of the 24 character strengths adapted from the VIA-IS were retained at this stage. Additionally, by expanding our scope beyond the abbreviated VIA-IS to the entire GAT scale, we were able to identify an additional 17 GAT items that pertain to the Army's Values and DoD's Ethics. Items were adapted from the Attributional Styles Questionnaire (ASQ, Peterson et al., 1982), VIA-IS (Peterson & Seligman, 2004), PHQ-9 (e.g., Kroenke, Spitzer, & Williams, 2001; Spitzer, Kroenke, & Williams, 1999), an engagement scale (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997), the Brief version of the COPE scale (Carver, 1997; Carver, Scheier, & Weintraub, 1989), the UCLA Loneliness Scale (Russell, Peplau, & Ferguson, 1978), the organizational trust literature (e.g., Mayer, Davis, & Schoorman, 1995; Sweeney, Thompson, & Blanton, 2009), the Positive and Negative Affect Scale (PANAS-X; Watson, Clark & Tellegen, 1988), and the Purpose in Life scale (e.g., Crumbaugh, 1968).

Character: Factor Validity

We first applied Exploratory Factor Analysis (EFA) to the initial white list of 29 character items, testing models with 1-8 factors on the first random sample of Soldiers (N=18,000). The EFA yielded five meaningful factors with good model fit. Next, we

examined the 5 factors using ESEM and identified a set of suboptimal items. Through an iterative process, we excluded items with primary loadings below 0.3 (CP1, ORG1, ORG2, SPIR1 and SPIR2) or secondary loadings greater than 0.3 (CH5, CH7, CH8, DP1, and NA2; Costello & Osborne, 2005; Tabachnick & Fidell, 2007). This iterative approach yielded a final 5-factor ESEM model comprised of 19 GAT items (see Table 3). Table 4 shows the 5 factor ESEM model clearly fit the data better than models with a smaller number of factors (CFI=.981, TLI=.962, RMSEA=.035 (90% CI: [.034,.037]), SRMR=.011).

Table 3. Whitelist of 29 Character Items from the GAT

GAT Scale	GAT Item
Catastrophizing	I have no control over the things that happen to me. CT1*[a] When I fail at something, I give up all hope. CT2*[a] I respond to stress by making things worse than they are. CT3*[a] *Current; 5-point scale (Not like me at all; Very much like me); Source: ASQ*
Character	How often have you shown/used critical thinking, open-mindedness, or good judgment? CH1* How often have you shown/used perspective or wisdom? CH2* How often have you shown bravery or courage? CH3* How often have you shown persistence? CH4* How often have you shown honesty? CH5 How often have you shown love or closeness with others (friends, family members)? CH6* How often have you shown kindness or generosity to others? CH7 How often have you shown/used teamwork? CH8 How often have you shown/used fairness? CH9* How often have you shown forgiveness or mercy? CH10* How often have you shown modesty or humility? CH11* How often have you shown gratitude and thankfulness? CH12* *Past four weeks; 11-point scale (Never; Always); Source: ACST*
Depression	How often do you feel bad about yourself, or that you are a failure, or have let yourself or your family down? DP1[a] *Past four weeks 5-point scale (Not at all; Every day) ;Source: PHQ-9*
Engagement	My work is one of the most important things in my life. ENG1* I am committed to my job. ENG2* How I do in my job influences how I feel. ENG3* *Current; 5-point scale (Not like me at all; Very much like me); Source: Engagement*
Good Coping	When something stresses me out, I try to solve the problem. CP1 *Current; 5-point scale (Not like me at all; Very much like me); Source: Brief COPE*
Loneliness	How often do you feel close to people? LN1* *Current; 5-point scale (Never; Most of the time) Source: UCLA Loneliness Scale*
Organizational Trust	I trust my fellow Soldiers in my unit to look out for my welfare and safety. ORG1 My immediate supervisor has much knowledge about the work that needs to be done. ORG2 *Current; 5-point scale (Strongly disagree; Strongly Agree); Source: Organizational Literature*
Negative Affect	How often do you feel ashamed? NA1*[a] How often do you feel hostile? NA2[a] *Past four weeks; 5-point scale (Never; Most of the time);Source: PANAS-X*
Positive Affect	How often do you feel love? PA1* *Past four weeks; 5-point scale (Never; Most of the time);Source: PANAS-X*
Spiritual Fitness	I am a person of dignity and worth. SPIR1 I believe that in some way my life is closely connected to all humanity and all the world. SPIR2* The job I am doing in the military has enduring meaning. SPIR3* *Current; 5-point scale (Not like me at all; Very much like me);Source: Purpose in Life*

*Indicates item was included in the final model. [a] Indicates reverse scored item.

Table 4. Exploratory Structural Equation Model Fit Statistics: Character

Model	χ^2 (df)	CFI	TLI	RMSEA	90% CI	SRMR	CM	$\Delta S\chi^2$ (Δdf)	ΔCFI	ΔTLI	ΔRMSEA
1-factor	31786.46 (152)	.688	.649	.108	.107-.109	.090	-	-	-	-	-
2-factor	21365.81 (134)	.791	.733	.094	.093-.095	.068	1F	9535.92 (18)	.103	.084	-.014
3-factor	11442.61 (117)	.888	.837	.073	.072-.074	.040	2F	10174.63 (17)	.097	.104	-.021
4-factor	6937.95 (101)	.933	.886	.061	.060-.063	.029	3F	2994.32 (16)	.045	.049	-.012
5-factor	2032.10 (86)	.981	.962	.035	.034-.037	.011	4F	11487.22 (15)	.048	.076	-.026

Note. Computed from our first random sample of N=18,000. χ^2 = chi square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval of the RMSEA; SRMR = standardized root mean square error of approximation; CM = comparison model; $\Delta S\chi^2$ = scaled chi-square difference test; Δ = change. All $p < .001$

We identified the following five factors: Positivity (reverse-coded, e.g. ashamed, perceiving things worse than they are), Endurance (e.g. critical thinking, wisdom, courage), Benevolence (e.g. mercy, humility, gratitude), Work Engagement (e.g. commitment to current job, job has enduring meaning), and Camaraderie (e.g. love or closeness with others, feel close to people). Table 5 contains the standardized ESEM parameter estimates (factor loadings and uniquenesses, i.e., residual variances).

Table 5. Character: Standardized ESEM Factor Loadings and Uniquenesses

Item	POS (λ)	END (λ)	BNV (λ)	WKENG (λ)	CAM (λ)	δ
CT1	**.423**	.024	-.029	.034	.047	.799
CT2	**.794**	.028	.012	.027	.037	.326
CT3	**.788**	.018	.052	.018	.033	.331
CH1	.098	**.665**	.102	.064	.117	.320
CH2	.055	**.739**	.120	.046	.070	.253
CH3	.017	**.583**	.161	.042	.081	.465
CH4	.067	**.618**	.134	.087	.100	.378
CH6	.007	.180	.159	-.032	**.612**	.396
CH9	.106	.262	**.522**	.098	.061	.385
CH10	.009	.004	**.734**	.028	.124	.356
CH11	.016	.097	**.692**	.032	.021	.413
CH12	.074	.182	**.491**	.061	.240	.390
ENG1	-.010	.024	.020	**.768**	.021	.388
ENG2	.111	.058	.053	**.731**	.050	.346
ENG3	-.020	.027	.014	**.622**	.008	.602
LN1	.101	-.008	.017	.103	**.602**	.540
NA1	**.353**	.064	-.048	.021	.189	.785
PA1	.047	-.024	.020	.030	**.683**	.500
SPIR3	.074	.045	.103	**.452**	.225	.590

Note. Bold entries = primary loadings. Computed from our first random sample of N= 18,000. λ = standardized factor loading; δ = standardized uniqueness; POS= Positivity; END = Endurance; BNV = benevolence; WKENG = Work Engagement; CAM = Camaraderie; CT = catastrophic thinking (reverse-coded); CH = character, ENG = work engagement; LN = loneliness (reverse-coded); NA = negative affect (reverse-coded); PA= positive affect; SPIR = spiritual fitness

The primary loadings across the 5 factors were substantial (*M*=.62, *SD*=.13), while the cross-loadings were generally very small (*M*=.06, *SD*=.06). Two of the factors, Endurance and Benevolence, contained items from a single GAT scale, while the remaining factors (Positivity, Work Engagement, and Camaraderie) contained items from multiple scales. In addition to the Catastrophic Thinking items, the Positivity factor contained one reverse-coded Negative Affect item ("How often do you feel ashamed?"). In addition to the Work Engagement items, the Work Engagement factor contained one Spiritual Fitness item ("The job that I am doing in the military has enduring meaning."). The Camaraderie factor contained items related to love and closeness to family and friends from three different GAT scales: ACST (Character), Positive Affect, and Loneliness.

There were also only four items with a primary loading <.5, which indicates mediocre fit of those items on their respective factors. All estimates of relative consistency using both Omega and Cronbach's alpha (Zinbarg, Revelle, Yovel, & Li, 2005) were relatively high (above .7) for each of the five factors (Positivity: ω=.74, α=0.70 (4 items); Endurance: ω=.88, α=.87 (4 items); Benevolence: ω=.85, α=.85 (4 items); Work Engagement: ω=.79, α=.78 (4 items); Camaraderie: ω=.75, α=.74 (3 items)).

Higher-Order Factor Structure

We also tested the suitability of a higher order character factor structure using composite scores obtained from the 5-factor primary model. A one-factor higher order model fit the data adequately (CFI=.964, TLI=.928, RMSEA=.102 (90% CI: [.097, .108]), SRMR=.032). All standardized loadings for this model were higher than .4 (Positivity: λ =.43, Endurance: λ=.81, Benevolence: λ=.82, Work Engagement: λ=.51, Camaraderie: λ=.65). The loadings on this higher-order character factor were pretty high overall (*M*=.64, *SD*=.18).

Replication Analyses

We replicated both the final 5-factor model and the higher order model in a second random sample of Soldiers (N=18,000). Both the primary (CFI=.980, TLI=.961, RMSEA= .036 (90% CI: [.035, .037]), SRMR=.012) and higher order model (CFI=.968, TLI=.935, RMSEA= .098 (90% CI: [.093, .104]), SRMR=.031) fit just as well in the separate replication sample. The pattern of factor loadings was also consistent between the two samples (average absolute difference in primary factor loadings =.010, average absolute difference in higher order factor loadings =.008).

Tests of Measurement Invariance across Demographic Subgroups

Table 6 shows the fit indices from the configural, metric, and scalar tests of measurement invariance across the three demographic subgroups. As depicted, the ESEM character factor structures fit well across gender, rank, and component subgroups. Given even trivial deviations in parameter estimates may produce a significant nested χ^2 test with large sample sizes (Marsh et al.,1988), we primarily considered model fit indices that are less influenced by sample size (CFI, TLI, RMSEA, and SRMR). For instance, in all of the subgroup comparisons, the decrement in CFI did not reach the level required to signal rejection of the null hypothesis (i.e., signaled equivalent between-group measurement parameters; Cheung & Rensvold, 2002). Additionally, constraining factor loadings to equality resulted in an improvement in the TLI for all subgroups. Constraining the item intercepts to equality, however, produced a trivial decrease in the TLI. The RMSEA shrunk following imposition of the factor loading constraints, suggesting improved model fit. The RMSEA either remained unchanged or increased a trivial amount (.001) when item intercepts were constrained to equality. These observations reinforce equivalence of the character factor structure and its parameters across the different demographic subgroups.

Table 6. Exploratory Structural Equation Model Fit Statistics: Invariance Tests

Model Description	χ^2 (df)	CFI	TLI	RMSEA	90% CI	SRMR	CM	$\Delta S\chi^2$ (Δdf)	ΔCFI	ΔTLI	ΔRMSEA
Gender											
G1: Configural Invariance	1989.24 (172)	.982	.964	.034	.033-.036	.012	-	-	-	-	-
G2: λ Invariant	2151.29 (242)	.981	.973	.030	.028-.031	.018	G1	170.95 (70)	-.001	.009	-.004
G3: τ Invariant	2444.80 (256)	.978	.971	.031	.030-.032	.021	G2	386.63 (14)	-.003	-.002	.001
Rank											
R1: Configural Invariance	2040.40 (172)	.982	.963	.035	.033-.036	.012	-	-	-	-	-
R2: λ Invariant	2346.44 (242)	.979	.971	.031	.030-.032	.020	R1	328.80 (70)	-.003	.008	-.004
R3: τ Invariant	3335.35 (256)	.970	.959	.037	.035-.038	.026	R2	1378.77 (14)	-.009	-.012	.001
Component											
C1: Configural Invariance	2083.03 (172)	.982	.964	.034	.033-.036	.012					
C2: λ Invariant	2357.63 (242)	.980	.975	.029	.028-.030	.018	C1	300.04 (140)	-.002	.011	-.005
C3: τ Invariant	2521.34 (256)	.979	.975	.029	.028-.030	.020	C2	162.86 (28)	-.001	.000	.000

Note. Computed from our stratified random sample of N=18,000. χ^2 = chi square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval of the RMSEA; SRMR = standardized root mean square error of approximation; CM = comparison model; $\Delta S\chi^2$ = scaled chi-square difference test; Δ = change; λ = factor loading; τ = intercept. All $p < .001$

The average absolute differences in factor loadings among each of the different demographic subgroups were quite small: Gender (male vs female): ∆λ=.017, Rank (enlisted vs officer): ∆λ=.025, and Component (Active Duty, Reserve, and National Guard): ∆λ=.021. Since component had three categories, we calculated the average absolute difference in factor loadings between each pair of component categories and then calculated the average of the three pairwise differences. Practically speaking, these differences are negligible and reinforce the plausibility of the null model specifying equivalent factors structures across gender, rank, and component subgroups.

Convergent and Discriminant Validity

We next examined the correlations among the five GAT character factors. The findings in Table 7 reinforce divergence for most of the underlying scales (average correlation (r̄) =.26, *SD*=.08). This average correlation excluded the correlation between the Endurance and Benevolence factors, which were formed using items from the same GAT ACST Character scale (r̄ =.51). These results suggest that factors formed from different GAT scales do indeed measure different facets of character (i.e., discriminant validity), while factors formed from the same GAT scale are more related (i.e., convergent validity). The 19 retained items were coded such that higher values represent greater character, and the positive factor correlations were in the expected direction.

Table 7. Correlations among Character Factors: Convergent and Discriminant Validity

Factor	END	BNV	WKENG	CAM
POS	.232	.161	.177	.297
END		**.507**	.227	.349
BNV			.221	.389
WKENG				.249

Note. Computed from our first random sample of N= 18,000; all correlations are statistically significant (*p* <.001); correlations >.40 are bolded; POS = Positivity; END = Endurance; BNV = Benevolence; WKENG= Work Engagement; CAM= Camaraderie

Study 1 Summary

Study 1 aimed to develop and test the psychometric properties of an Army-specific measure of character. To do so, we identified items from the Global Assessment Tool that were possibly related to the Army's Values and the DoD's Professional Ethics. A team of 4 researchers performed an iterative qualitative coding process and identified 29, related to the Army's Values and the DoD's Professional Ethics, that were then included in initial exploratory analyses. We conducted Exploratory Structural Equation Modeling with a random sample of 18,000 Soldiers who completed the GAT in 2010. The results of the ESEM provided support for a 19-item, five factor model of character, consisting of Positivity, Endurance, Benevolence, Work Engagement, and Camaraderie, with minimal item cross-loadings across factors. We also found support for a one factor, higher order model. We then replicated both the five factor model and the higher order one factor model in a second random sample of 18,000 Soldiers. In a third random sample (stratified by rank, gender, and component), we demonstrated that the five-factor structure was consistent across rank, gender and component. Finally, we demonstrated sufficient convergent and discriminant validity amongst the five factors.

Taken together, the findings from Study 1 identify 19 items, culled from existing items on the GAT and rooted in the Army Values and the DoD Professional Ethics, which together form a psychometrically sound, Army-specific measure of character, which we call the Army-Based Character (ABC) scale. The scale's psychometric properties are consistent across multiple samples and across multiple demographic groups. These findings provide initial evidence that the scale may have utility and may measure something meaningful in Army Soldiers.

Study 2: Character Growth

Although positive changes, such as appreciation of life and feelings of new possibilities, following stressful or traumatic experiences have been heavily studied (e.g., Tedeschi & Calhoun, 2004), less is known about how character strengths change after traumatic experiences, or over time more broadly. Traumatic experiences may, for example, lead to meaning-making and coping, which may also enhance character (Park & Ai, 2006). A study of character strengths before and after the September 11th terrorist attacks found that some aspects of character (gratitude, hope, kindness, leadership, love, spirituality, and teamwork) were at higher levels two months after the attack, compared to before the attacks, and these character strengths continued to show slight elevations even 10 months after the attack (Peterson & Seligman, 2003). Experiencing a greater number of traumatic events (e.g., life-threatening events, sexual assaults, and physical assaults) has been linked to reporting greater character strengths (Peterson, Park, Pole, D'Andrea, & Seligman, 2008). Other work comparing character strengths among groups who completed the assessment either before or after a mass-shooting yielded mixed findings (Schueller, Jayawickreme, Blackie, Forgeard, & Roepke, 2015). The current understanding of how character strengths change over time, and particularly how different types of individuals may be differentially affected by major events, remains unclear, and further research is needed to understand these complex processes.

Peterson, Park, and Seligman (2006) have also studied character changes in other settings, as well. They suggest that the process of recovering from a physical illness has the potential to foster growth in character. In a retrospective web-based study of approximately 2,000 adults, individuals who reported a history of physical illness reported significantly greater character strengths, compared to those who did not report a history of physical illness (Peterson et al., 2006). These associations, although

statistically significant, were modest, and should be interpreted with caution given the retrospective nature of the study.

Based on the limited evidence suggesting character can grow in some circumstances, Study 2 examined whether character grows in the context of the Army. Because of the emphasis placed on Army Values and DoD Ethical Values, we hypothesized that Soldiers may grow in character over time as they spend greater time in the Army community (Hypothesis 1). We also hypothesized that immersion into Army culture and Army life may yield greater character growth among Soldiers who were newer to the Army (i.e., joined within the past year), relative to Soldiers who had been in the Army for over a year (Hypothesis 2). We used the ABC scale developed in Study 1 to test these hypotheses.

Study 2 Methodology: Character over Time

Study Design

We used a longitudinal study design, which included four GAT assessments for each Army Soldier, beginning with the earliest GAT completed in FY 2010 and including subsequent assessments through FY 2014. Although the GAT is an annual requirement, there is variation in the timing of the GAT completion. We included GAT assessments that were completed 9-15 months apart to ensure reasonably uniform spacing between the time points. For inclusion in this study, we also required Soldiers to have a record in the Master Personnel file (Active Duty, Reserve, or National Guard), the source for demographic information in this study.

Sample

We examined 48,786 Active Duty, Reserve, and National Guard Army Soldiers who took four GAT assessments spaced roughly a year apart (9-15 months) from October 2009 to January 2014, indicated their GAT responses could be used for research purposes, and who had a record in the Army Master Personnel file.

Measures

Table 8 presents an overview of the ABC scale developed in Study 1. The items derived from the GAT ACST character scale were on an 11-point scale ranging from 0 to 5 in increments of 0.5, whereas the remaining GAT items were on 5-point scales ranging from 1 to 5. The ABC scale reflects these original response scales. The corresponding latent construct for each item is also included in Table 8.

Table 8. Army-Based Character Scale Items and Latent Constructs

Character Factor	Character Item
Positivity	"I have no control over the things that happen to me."– CT1 [a] "When I fail at something, I give up all hope."– CT2 [a] "I respond to stress by making things worse than they are." – CT3 [a] "How often do you feel ashamed?"– NA1 [a]
Endurance	"How often have you shown/used critical thinking, open-mindedness, or good judgement?" – CH1 "How often have you shown/used perspective or wisdom?" – CH2 "How often have you shown bravery or courage?" – CH3 "How often have you shown persistence?" – CH4
Camaraderie	"How often have you shown love or closeness with others (friends, family members)?" – CH6 "How often do you feel close to people?" -– LN1 "How often do you feel love?" – PA1
Benevolence	"How often have you shown/used fairness?" – CH9 "How often have you shown forgiveness or mercy?" – CH10 "How often have you shown modesty or humility?" – CH11 "How often have you shown gratitude and thankfulness?" – CH12
Work Engagement	"My work is one of the most important things in my life." – ENG1 "I am committed to my job." – ENG2 "How I do in my job influences how I feel." – ENG3 "The job I am doing in the military has enduring meaning." – SPIR3

[a] Indicates a reverse scored item.

We obtained basic demographic information (gender, marital status, education, rank, race/ethnicity, Combat Arms Military Occupational Specialty (MOS), and component) from the Active Duty Military Personnel and Reserve Components

Common Personnel Data System Master files. We included baseline Master Personnel records for each Soldier within 3 months of their baseline GAT. We examined gender (male vs female), marital status (married vs not married), education (high school degree or less vs greater than high school degree), rank (enlisted vs officer), race/ethnicity (White vs other), and Combat Arms MOS (Combat Arms vs other) as binary variables, and we examined component as a three-category nominal variable (Active Duty, National Guard, and Reserve). The Combat Arms MOS classification was based, in part, on the groupings used in previous research (e.g., Gubata, Piccirillo, Packnett, & Cowan, 2013; Kessler et al., 2015). We accounted for Combat Arms MOS because prior research has found that psychological strengths (Love, 2011) and attrition rates of new recruits (Cunha, Arkes, Lester & Shen, 2015) differ for Soldiers in Combat Arms occupations, compared to other occupations. To ensure we were using the most reliable demographic data for each Soldier, we culled gender, rank, and component information from the GAT when an Army Master Personnel record was not available within 3 months of a Soldier's baseline GAT.

We were interested in whether character growth trajectories differ between new Army Soldiers (defined as Soldiers who had been in the Army a year or less at baseline) and established Army Soldiers (defined as those who had been in the Army over a year at baseline), with the expectation that new Soldiers had not yet acclimated to Army culture and should therefore have more opportunity and room for character growth than established Soldiers, who had spent more time in the Army. We calculated time in service by taking the difference between the Uniformed Services Initial Entry Date (taken from the Active Duty and Reserve Component Master Personnel files) and the date each Soldier completed his or her baseline GAT. Because we also hypothesized character growth may differ among Army components as a result of the different degree of daily immersion in Army culture, we included Army tenure (new vs established) and component as grouping variables in all analyses.

Analysis

Basic sample descriptive statistics were obtained in R 3.3.2. We used MPlus 7.11 to model separate linear growth models for each of the five latent character constructs identified in Study 1 (Muthén & Muthén, 1998-2012). The linear growth models were run across six different groups by component (Active Duty, Reserve, National Guard) and Army tenure (new and established). We also tested models of quadratic growth for each of the five latent character constructs across the six groups (by component and Army tenure) mentioned above, to check for non-linear growth in character over time.

We used the Maximum Likelihood estimator with Robust standard errors (MLR) to obtain accurate standard errors of estimates for non-normal ordered categorical data (i.e. the GAT items; Hoyle, 2012; Morin & Maïano, 2011) as well as for non-normally distributed composite scores of items on different factors. We followed the standard guidelines for accurate latent variable growth curve modeling (Duncan & Duncan, 2009; Curran, Obeidat, & Losardo, 2010).

Model fit was evaluated using several goodness-of-fit criteria, including the CFI (Bentler, 1990) and TLI (Tucker & Lewis, 1973), which are based on the likelihood function and account for sample size and model parsimony. We also used the RMSEA (Steiger, 1990) and its 90% Confidence Intervals, as well as the SRMR (Jöreskog & Sörbom, 1986). The chi-square test of model fit was performed but not used to evaluate model fit because of its sensitivity to sample size and minor deviations from multivariate normality (Marsh et al., 1988).

We estimated growth models for each character construct across six different groups (Army tenure [new/established] x component [Active Duty, Reserve, and National Guard]). We then compared the means and variances of the linear change in each character construct both within Army tenure (e.g., new Active Duty Soldiers vs. new National Guard Soldiers) and within component (e.g., new Active Duty Soldiers vs. established Active Duty Soldiers), for a total of 9 comparisons.

We also examined the extent to which demographic characteristics (i.e., gender, marital status, rank, education, race/ethnicity, and Combat Arms MOS) predict change in character in each of the above six groups. For this final analysis, we examined averages of the items corresponding to each character construct. For the Camaraderie factor, we rescaled the Positive Affect and Loneliness items from a 1 - 5 scale to a 0 - 5 scale (using the formula: [5/4]*[item score-1]) to ensure that these items were on the same scale as the ACST item assessing love and closeness to family. The remaining construct scores were calculated as simple averages (all items were measured on the same scale).

Study 2 Results

Sample Characteristics

The majority of the Soldiers in the sample (N=48,786) were male (83.3%) and enlisted (82.8%). Also, 59.8% of Soldiers were Active Duty, 15.6% were Reserve and the remaining 24.6% were National Guard. In the study sample, 58.8% of the Soldiers were married, while just 35.0% had a college education (Associate's degree or higher). White Soldiers comprised 67.6% of the sample. On average, demographic characteristics were assessed within 42.7 to 46.3 days of each GAT assessment (SD: 24.7-29.1 days). We identified 4,836 new Soldiers in our sample, compared to 43,932 established Soldiers (i.e. Soldiers who joined the Army more than a year before their Time 1 GAT).[1] On average, new Soldiers had been in the military for 0.57 ± 0.26 years, whereas established Soldiers had been in the Army 11.25 ± 7.94 years. Soldiers missing an Army start date were excluded from analyses that grouped Soldiers by Army tenure (i.e., new or established Soldier).

[1] Total sample (N=48,768, 18 missing military tenure): 10.19 +/- 8.19 years

Change in Character Over Time

We plotted average scores for the five character constructs (Endurance, Benevolence, Camaraderie, Work Engagement, and Positivity) across all four time points and all six groups to examine group-level changes in character (see Figures 2-6).

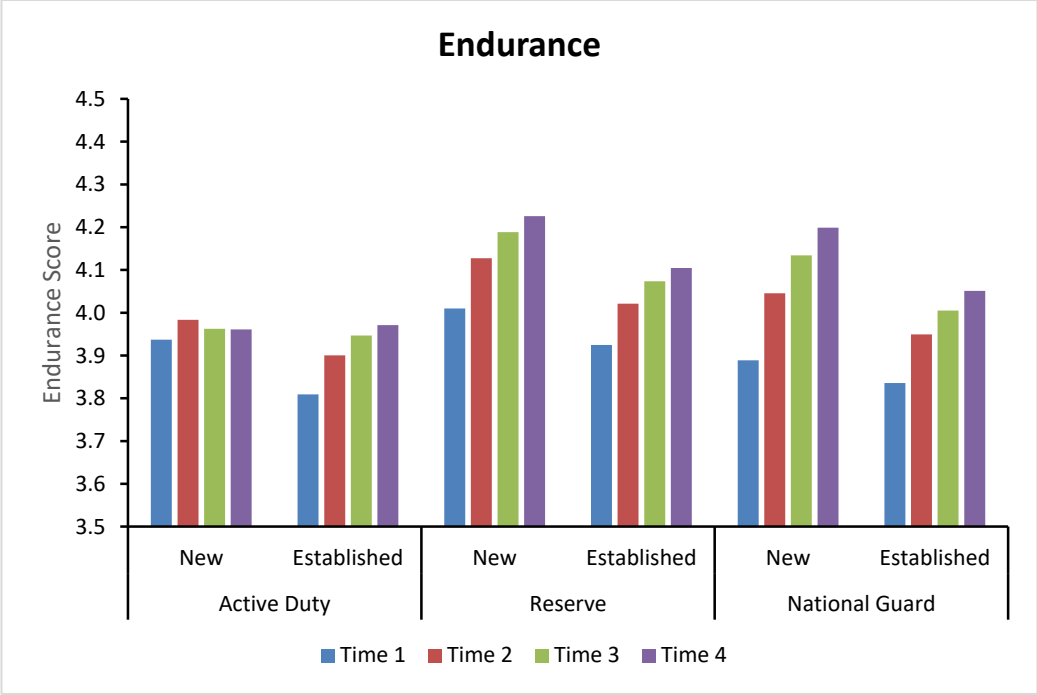

Figure 2. Endurance across Four Years, by Component and Army Tenure

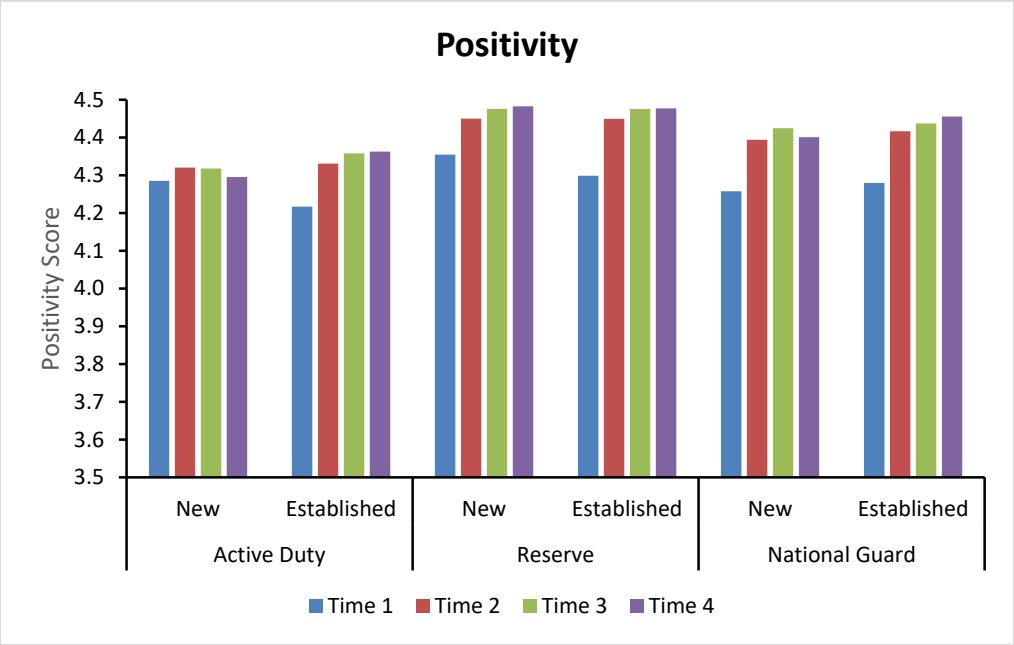

Figure 3. Positivity across Four Years, by Component and Army Tenure

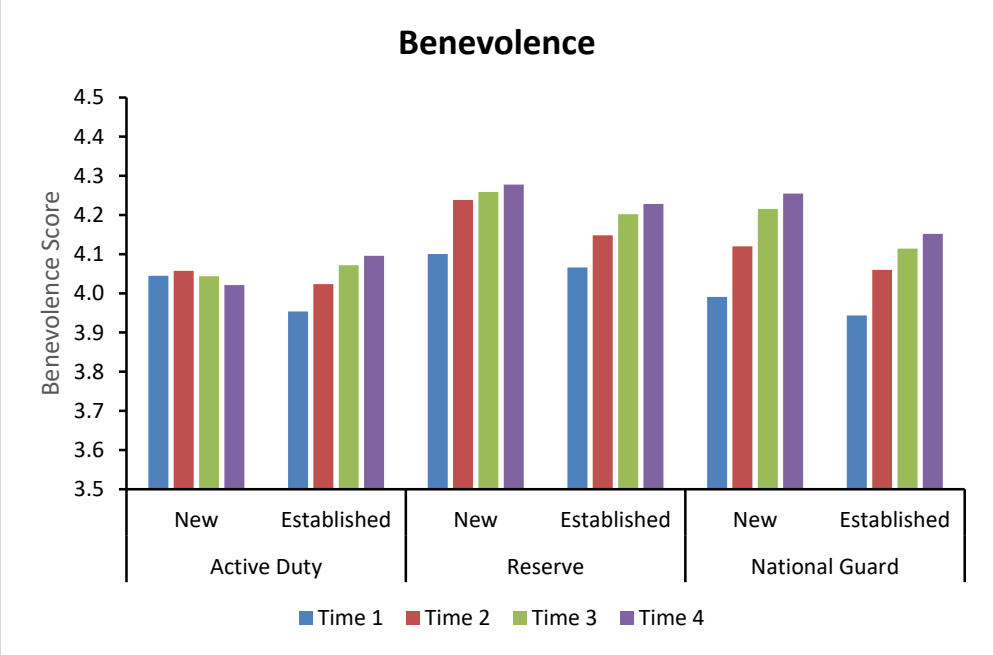

Figure 4. Benevolence across Four Years, by Component and Army Tenure

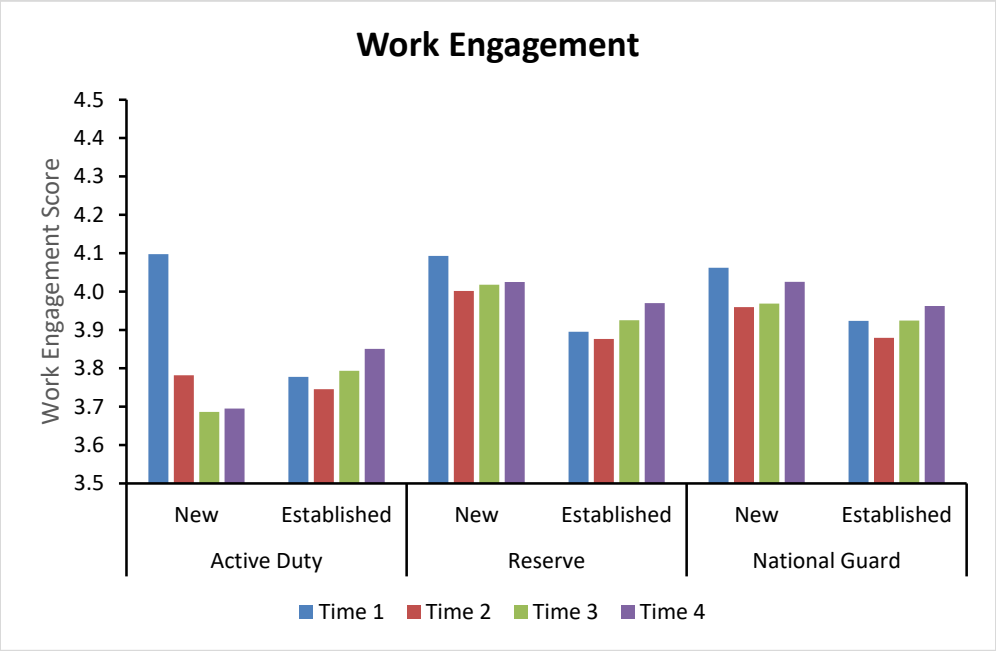

Figure 5. Work Engagement across Four Years, by Component and Army Tenure

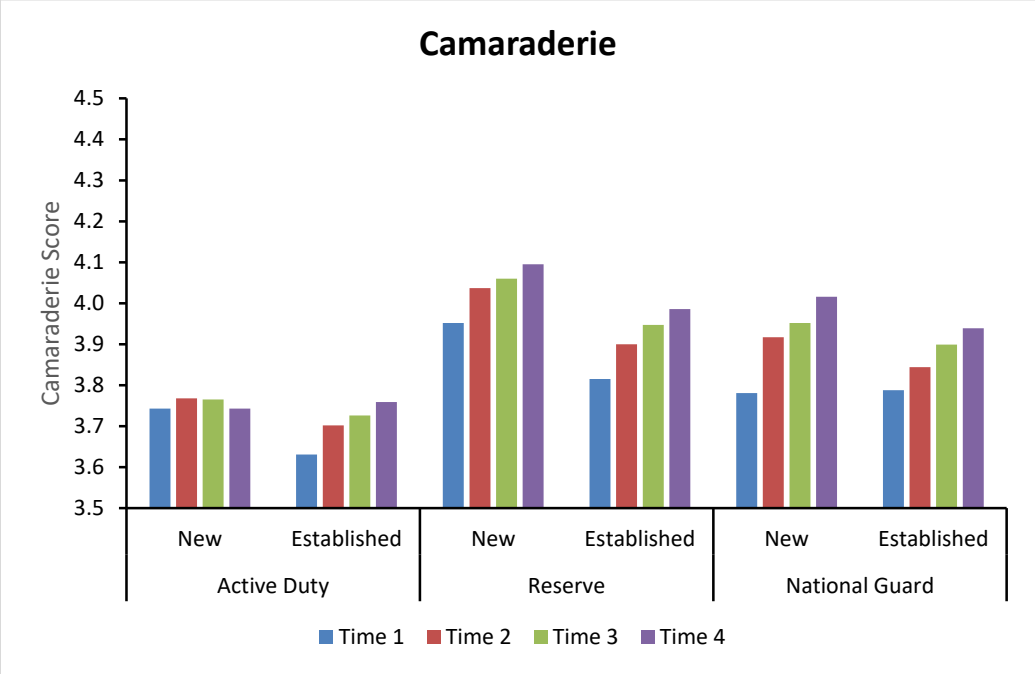

Figure 6. Camaraderie across Four Years, by Component and Army Tenure

We observed modest growth in Endurance, Benevolence, Camaraderie, and Positivity (about 0.1-0.3 on a 5-point scale) across new Reserve and National Guard Soldiers and all established Soldiers. These five groups also exhibited slight decreases in Work Engagement between Time 1 and Time 2, followed by a steady increase in Work Engagement between Time 2 and Time 4. In contrast, Endurance, Benevolence, Camaraderie, and Positivity remained fairly stable in new Active Duty Soldiers across the study window, and Work Engagement decreased substantially from Time 1 to Time 2 (by about 0.3 point), decreased again from Time 2 to Time 3 (by about 0.1 point), and then plateaued. Across the five character constructs, the new Soldier groups on average reported greater character at Time 1 (0.2 point higher), compared to the established Soldier groups.

After observing group-level changes in character construct means over time, we tested linear growth models based on the composite scores, and separately, the latent representations. The fit statistics associated with these models are presented in Table 9.

Table 9. Growth Model Fit Statistics: Examining Character over Time

Factor	χ^2 (df)	CFI	TLI	RMSEA	90% CI	SRMR
Composite Scores						
Endurance	214.03 (30)	.992	.991	.027	.024-.031	.014
Benevolence	216.22 (30)	.992	.990	.028	.024-.031	.020
Camaraderie	224.99 (30)	.996	.995	.028	.025-.032	.016
Work Engagement	740.10 (30)	.981	.977	.054	.051-.057	.049
Positivity	673.12 (30)	.966	.959	.051	.048-.055	.020
Latent Variables						
Endurance	9256.45 (612)	.974	.969	.042	.041-.042	.025
Benevolence	7386.45 (612)	.972	.967	.037	.036-.038	.033
Camaraderie	2076.87 (302)	.990	.987	.027	.026-.028	.021
Work Engagement	6646.65 (612)	.975	.971	.035	.034-.036	.047
Positivity	4183.37 (612)	.980	.976	.027	.026-.028	.042

Note. N=48,768. χ^2 = chi square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; 90% CI = 90% confidence interval of the RMSEA.

The fit statistics for all models were very good, and in general, the models based on composite scores fit slightly better than the models based on latent variables. The CFI and TLI values (>.95) and the RMSEA values (<.06) meet the cutoffs recommended by Hu and Bentler (1999). The models examining growth in Camaraderie fit marginally better than the models examining the other constructs.

We compared the means and variances of the latent linear slopes for growth in each character construct (modeled as a latent variable) across the 6 component x tenure status groups. We first ran an unconstrained model for each character construct; the fit statistics for these models are shown under the Latent Variables section in Table 9. We then ran the 9 group comparisons described in the Data Analysis section for each of the five character constructs, resulting in 10 models for each character construct. All 10 models for each character factor had very similar fit indices (i.e., CFI, TLI, RMSEA, and SRMR differed by 0.005 or less across models), suggesting that there were no important differences in the nature of character growth among component and Army tenure groups.

Table 10 shows the means and variances of the unstandardized linear slopes (units are 1 year) for growth models corresponding to each latent character construct (Endurance, Benevolence, Camaraderie, Work Engagement, Positivity) across the six different groups by component and Army tenure.

Table 10. Linear Growth Slopes over Time: Character

Factor	New Soldiers (N=4,836)					
	Active Duty		National Guard		Reserve	
Linear slopes	Mean	Variance	Mean	Variance	Mean	Variance
Endurance	0.083 ***	0.043	0.108 ***	0.045	0.092 ***	0.041
Benevolence	0.078 ***	0.046	0.109 ***	0.052	0.087 ***	0.032
Camaraderie	0.077 ***	0.078	0.093 ***	0.098	0.104 ***	0.086
Work Engagement	0.040 ***	0.098	0.026 ***	0.084	0.049 ***	0.086
Positivity	0.092 ***	0.042	0.106 ***	0.039	0.103 ***	0.021
	Established Soldiers (N=43,932)					
	Active Duty		National Guard		Reserve	
Linear slopes	Mean	Variance	Mean	Variance	Mean	Variance
Endurance	0.012	0.060	0.164 ***	0.050	0.115 ***	0.041
Benevolence	-0.020 *	0.078	0.145 ***	0.032	0.084 ***	0.043
Camaraderie	-0.027 *	0.111	0.102 ***	0.121	0.065 ***	0.070
Work Engagement	-0.295 ***	0.179	-0.018	0.142	-0.038 *	0.106
Positivity	-0.006	0.060	0.092 ***	0.051	0.076 ***	0.065

* p<.05, ** p<.01, *** p<.001.

As can be seen in Table 10, character change was fairly modest (many slopes < 0.1), particularly for Active Duty personnel, relative to Reserve and National Guardsmen, for both new and established Soldiers. For new Soldiers, the average slopes for the Endurance, Benevolence, and Positivity factors for National Guardsmen and the Camaraderie and Positivity factors for Reservists were above 0.1 per year. For established National Guardsmen, the average slopes for the Endurance, Benevolence, and Camaraderie factors were above 0.1 per year, while for established Reservists, the Endurance factor slope was above 0.1 per year. We observed negative average slopes among established Active Duty Soldiers for Benevolence and Camaraderie, and we observed negative average slopes among established Soldiers in all three components for Work Engagement, indicating decline over time for these character factors. The average Work Engagement slope for new Active Duty Soldiers was the largest in

magnitude (-0.295 per year). This finding is consistent with the group-level change patterns we observed in Figure 6.

Finally, we tested for quadratic growth in Positivity, Endurance, Camaraderie, Benevolence, and Work Engagement over time and found that the quadratic slopes were much smaller than the linear slopes for each factor. Moreover, the group-level change patterns in the average character construct scores displayed in Figures 2 through 6 do not provide overwhelming evidence for quadratic growth in character over time. As a result, we focused only on linear growth for this study.

Table 11 shows the effects of various demographic characteristics on growth in each character construct (modeled as composite scores) across components for new Soldiers with sufficient demographic data (N = 4,003).

Table 11. Associations between Demographic Characteristics and Character Change Over Time in New Soldiers, by Component (N = 4,003)

	Active Duty					
	Rank	Male	Marital Status	High School or less	White (Race)	Combat Arms
Endurance	0.034	**0.042****	0.008	-0.008	0.025	0.001
Benevolence	0.016	**0.042****	0.008	-0.015	**0.026***	0.001
Camaraderie	0.005	**0.053****	**-0.043****	-0.027	0.027	**-0.033***
Work Engagement	0.084	**0.050*****	**0.034****	-0.014	**-0.037****	-0.004
Positivity	-0.026	**0.024***	0.005	-0.021	0.010	**-0.025***
	National Guard					
	Rank	Male	Marital status	High School or less	White (race)	Combat Arms
Endurance	-0.002	**-0.228****	0.015	0.090	0.047	-0.005
Benevolence	0.020	-0.133	0.005	-0.027	0.075	<0.001
Camaraderie	0.087	-0.099	-0.084	0.049	0.030	-0.026
Work Engagement	0.051	**-0.160***	-0.046	-0.023	**0.113***	0.103
Positivity	0.227	0.025	-0.084	-0.017	0.101	-0.064
	Reserve					
	Rank	Male	Marital Status	High School or less	White (race)	Combat Arms
Endurance	0.033	0.007	**-0.050***	0.021	0.015	0.025
Benevolence	-0.076	0.036	-0.015	-0.003	0.007	0.007
Camaraderie	-0.047	0.032	0.023	0.040	0.023	**0.063***
Work Engagement	0.068	0.034	-0.046	0.001	0.022	0.001
Positivity	-0.007	-0.001	0.023	0.014	0.004	0.012

Note: This table contains the unstandardized coefficients associated with demographic characteristics regressed on the linear growth slopes for each character construct composite. All statistically significant associations (p<.05) are bolded.
* p<.05, ** p<.01, *** p<.001.

Among new Active Duty Soldiers, being male was associated with greater character growth over time across all five character constructs, whereas being in Combat Arms was associated with decreases in Camaraderie and Positivity over time. Additionally, being male was associated with decreases in Endurance and Work Engagement over time in the National Guard, and Combat Arms predicted an increase

in Camaraderie in the Reserve group. Being married in the Reserve was associated with a decrease in Endurance. Rank and education (high school or less) did not significantly predict changes in character in new Soldiers in any component.

Table 12 presents the associations between the demographic characteristics examined and growth in each character construct (composite scores) across components for the 42,396 (out of 43,932) established Soldiers with complete demographic data.

Table 12. Associations between Demographic Characteristics and Character Change Over Time in Established Soldiers, by Component (N=42,396)

	Active Duty					
	Rank	Male	Marital Status	High School or less	White (race)	Combat Arms
Endurance	**0.045*** **	**0.036*** **	-0.001	0.006	**0.014*** **	**0.045*** **
Benevolence	**0.024*** **	**0.023*** **	-0.005	0.003	**0.015*** **	**0.024*** **
Camaraderie	**0.030*** **	**0.034*** **	**-0.032*** **	0.002	0.003	**0.030*** **
Work Engagement	<0.001	**0.021*** **	**0.010***	-0.002	-0.007	<0.001
Positivity	**0.014***	**0.012***	-0.002	0.006	0.006	**0.014***
	National Guard					
	Rank	Male	Marital Status	High School or less	White (race)	Combat Arms
Endurance	-0.016	0.002	<0.001	**-0.027*** **	<0.001	-0.016
Benevolence	-0.014	**0.021***	-0.006	**-0.019***	0.009	-0.014
Camaraderie	-0.001	0.016	-0.015	**-0.018***	0.004	-0.001
Work Engagement	-0.006	0.004	-0.004	-0.003	0.015	-0.006
Positivity	-0.002	-0.014	-0.003	-0.008	0.013	-0.002
	Reserve					
	Rank	Male	Marital Status	High School or less	White (race)	Combat Arms
Endurance	0.006	0.011	**-0.012***	0.006	**0.026*** **	0.006
Benevolence	0.006	**0.018****	**-0.013***	0.003	**0.025*** **	0.006
Camaraderie	-0.007	**0.034*** **	**-0.026*** **	-0.011	**0.020****	-0.007
Work Engagement	0.004	0.012	**-0.021*** **	-0.003	0.006	0.004
Positivity	0.007	-0.004	-0.008	0.007	0.006	0.007

Note: This table contains the unstandardized coefficients associated with demographic characteristics regressed on the linear growth slopes for each character construct composite. All statistically significant associations (p<.05) are bolded.
* p<.05, ** p<.01, *** p<.001.

The pattern of associations between demographic characteristics and growth in character differed between new Soldiers (Table 11) and established Soldiers (Table 12). Whereas rank, gender (male), race/ethnicity (White), and Combat Arms predicted an increase in growth for many of the character factors in the established Active Duty Soldier group, only gender predicted an increase in growth in any of the character factors in the National Guard, and only gender and race/ethnicity predicted growth in any character factors in the Reserve group. Among established Active Duty Soldiers, being married predicted decreases in Camaraderie, whereas among established Reserve Soldiers, being married was associated with decreases in Camaraderie, Endurance, Benevolence and Work Engagement. Having a high school degree or less (compared to more than a high school degree) was associated with decreases in Endurance, Benevolence, and Camaraderie among established National Guard Soldiers.

The model fit statistics for the models with demographic effects (Table 13) were comparable (even slightly better) to those presented in Table 9 for the character construct composite scores. This indicates that adding demographic characteristics as predictors of character growth in each of the 6 component x tenure status groups did not worsen model fit.

Table 13. Growth Model Fit Statistics, Adjusting for Demographic Characteristics

Model	χ^2 (df)	CFI	TLI	RMSEA	90% CI	SRMR
Endurance	318.81 (102)	.995	.990	.017	.015 - .019	.007
Benevolence	331.92 (102)	.994	.990	.017	.015 - .019	.009
Camaraderie	321.16 (102)	.997	.994	.017	.015 - .019	.007
Work Engagement	875.69 (102)	.985	.974	.031	.029 - .033	.023
Positivity	959.89 (102)	.974	.954	.033	.031 - .035	.011

Study 2 Summary

After developing a psychometrically sound measure of character in the Army (Study 1), we next used the ABC scale to investigate whether Army Soldiers change in character over time. We examined changes in construct means over time, and we tested linear growth models using MPlus software. We examined Soldiers with four equally-spaced measures of character (9-15 months apart). We hypothesized that Soldiers would grow in character, and this growth would be most evident among Soldiers who had most recently been immersed in Army culture (i.e., joined the Army in the past year).

Across all three components, we found evidence of growth in character, which supports our first hypothesis. However, this growth was fairly small over a four year period from 2009 to 2013 (0.1-0.3 point on a 5-point scale), except for Work Engagement, which moderately declined (~0.4 point) from 2009 to 2013. We did not find significant differences in character growth between new and established Soldiers within each component (Hypothesis 2). New Soldiers did, however, report greater character, on average, relative to established Soldiers. One unexpected finding was that character, for the most part, remained fairly stable among new Active Duty Soldiers. The only exception to this finding was for Work Engagement, which decreased among new Active Duty Soldiers and then plateaued.

We found some evidence that demographic characteristics predict growth in character. Among new Soldiers, for example, being male was associated with greater growth within Active Duty Soldiers, decreases in Endurance and Work Engagement in the National Guard, and gender was unrelated to character growth in new Reserve Soldiers. Among established Active Duty Soldiers, being male, officer, White, and Combat Arms were each associated with greater character growth. In contrast, among established Reserve Soldiers, being male was associated with greater growth in Benevolence and Camaraderie, while being White was associated with growth in Benevolence, Camaraderie, and Endurance. Finally, among established National

Guardsmen, having a high school degree or less (compared to more than a high school degree) was associated with decreases in Endurance, Benevolence, and Camaraderie. Further, being married was associated with decreases in four of the five character constructs for established Reserve Soldiers (all but Positivity).

In sum, we found evidence of character change across all three components and evidence of linkages to demographic characteristics. However, beyond individual differences in character change, it is important that character strengths (as assessed on the ABC) also predict objective behavioral Army outcomes. We tested this question in Study 3.

Study 3 Character Outcomes

Extensive research has examined outcomes, correlates, and predictors of character strengths over the past 20 years. In this section, we review research pertaining to behavioral outcomes such as well-being, performance, stress, and coping. Although this research primarily pertains to the civilian sector, it provides valuable insight into how character strengths may function within the military.

Character and Behavioral Outcomes

Beyond simply assessing character, along with longitudinal and group differences in character, it is important to consider implications of character on real world behaviors and outcomes. Other work has demonstrated that character is linked to health and well-being. For example, in a study examining the relationship between cardiovascular recovery from social stress (i.e. public speaking and problem solving) and character strengths, Li, Duan, and Guo (2017) reported that participants with high character strengths recovered more quickly physiologically (i.e., heart rate, blood pressure). This effect was found even if participants demonstrated similar cardiovascular levels of arousal. These authors propose that character strengths may assist in defending against certain psychological and physiological stress factors,

something that could be highly valuable for Service Members. Additionally, Peterson and colleagues (2006) looked closely at the relationship between character strengths and recovery from both physical and mental illness. They found that adults who experienced and recovered from a physical illness reported greater appreciation of beauty, bravery, curiosity, fairness, forgiveness, gratitude, humor, kindness, love of learning, and spiritualty, whereas those who had fully recovered from a psychological disorder reported greater appreciation of beauty, creativity, curiosity, gratitude, and love of learning (Peterson et al., 2006). Moreover, adults who reported greater bravery, kindness, and humor maintained a higher life satisfaction after a physical illness, while those who reported greater appreciation of beauty and love of learning maintained a higher life satisfaction after suffering a psychological disorder (Peterson et al., 2006). These authors suggest that recovery from a disorder or disease may actually bolster certain character strengths. Other work with veterans has found that character strengths are negatively associated with social anxiety (Kashdan, Julian, Merrit, & Uswatte, 2006). Additionally, all 24 VIA-IS character strengths have also been linked to greater life satisfaction amongst college students (Lounsbury, Fisher, Levy, & Welsh, 2009).

Beyond health and wellbeing, other work has examined how character is linked to work performance and coping, outcomes that are extremely critical in the Army. Character strengths have been linked to job performance by both self-report and supervisory rating (Harzer & Ruch, 2014). Within the work environment, Gander, Proyer, Ruch, and Wyss (2012) found that the character strengths of zest, persistence, hope, and curiosity were vital in work satisfaction and one's work engagement. Additionally, a study examining the Australian Army Special Forces found that Service Members who reported being high in the character strength of teamwork were significantly more likely to make it through the Special Forces training, with a success rate of 37.5%, compared to 14.3% (Gayton & Kehoe, 2015). Wisdom, as measured by the VIA-IS, has been negatively linked to stress and positively related to creative task performance amongst working adults (Avey, Luthans, Hannah, Sweetman, and

Peterson, 2012). Harzer and Ruch (2015) also determined that intellectual, emotional, and interpersonal strengths, measured by the VIA-IS, helped to buffer stress in the workplace and were significantly related to one's ability to cope with high levels of stress. Interpersonal character strengths were particularly important for coping with stress amongst nurses, likely because of the higher levels of communication and interaction required in this profession (Harzer & Ruch, 2015). In addition, sixteen VIA-IS character strengths have been linked to greater academic performance amongst college students (Lounsbury et al., 2009).

Attrition

Attrition from any organization is an expected part of managing a workforce, civilian or military. However, attrition in a military context reduces force readiness, especially if attrition is greater than expected or if high performing soldiers attrite at higher rates. When trained Soldiers leave the force, they take with them institutional knowledge and skills, and their separation may leave a critical vacancy if unplanned. This can have a significant impact on the Army's ability to effectively and efficiently fight the nation's wars. Cunha and colleagues (2015) examined associations between a variety of strengths assessed on the GAT and Army attrition. This study examined the 24-character items (ACST) as a single score, and modeled it along with the 15 other GAT scales (with and without relevant demographic covariates). Because the authors did not have contract length data, they defined attrition as leaving the Army within the first 36 months for any reason other than education. Character, modeled as the bottom 5% vs. top 95%, was not significantly associated with attrition in this study. It remains to be seen, however, whether we would observe different associations with Army attrition if character strengths were measured and modeled differently.

Study 3 Methodology

Study Design

We examined the first GAT for each Active Duty Army Soldier who took the GAT during FY 2010-2013 (Oct 2009-Sep 2013) and joined the Army a year or less before their first GAT (i.e., new Soldiers). We tracked attrition from the Army from FY 2010 through Jun 30, 2017. We limited our sample to Active Duty Soldiers, because we could only obtain accurate contract information for Active Duty Soldiers. Each Soldier in the study was also required to have basic demographic information and a valid contract term provided by the Military Entrance Processing Command (MEPCOM).

Sample

We had a total sample size of 26,204 Active Duty Soldiers who took their first GAT assessment during the period from FY 2010-2013 within a year of joining the Army, indicated their GAT responses could be used for research purposes, and had basic demographic information and a valid contract term data. Character was assessed before the Soldier's potential separation from the Army (i.e. outcome).

Measures

Table 14 presents the 19 ABC items identified in Study 1. Nine items were measured on an 11-point scale ranging from 0 to 5 (in 0.5-unit increments), while the remaining 10 items were assessed on 5-point scales ranging from 1 to 5 (in 1-unit increments). The corresponding construct (factor) for each item is also included in Table 14. In addition to examining the ABC scale as a predictor of Army attrition, we also felt it was important to test whether the ABC scale could predict Army attrition as well as or better than the ACST scale (Peterson & Seligman, 2004). Table 15 shows the 24 GAT items from the ACST that were derived from the VIA-IS.

Table 14. List of 19 Character Items from the GAT and their Latent Constructs (Army-Based Character, ABC, Scale)

Character Factor	Character Item
Positivity	"I have no control over the things that happen to me."– CT1[a] "When I fail at something, I give up all hope."– CT2 [a] "I respond to stress by making things worse than they are." – CT3 [a] "How often do you feel ashamed?"– NA1 [a]
Endurance	"How often have you shown/used critical thinking, open-mindedness, or good judgement?" – CH1 "How often have you shown/used perspective or wisdom?" – CH2 "How often have you shown bravery or courage?" – CH3 "How often have you shown persistence?" – CH4
Camaraderie	"How often have you shown love or closeness with others (friends, family members)?" – CH6 "How often do you feel close to people?" – LN1 "How often do you feel love?" – PA1
Benevolence	"How often have you shown/used fairness?" – CH9 "How often have you shown forgiveness or mercy?" – CH10 "How often have you shown modesty or humility?" – CH11 "How often have you shown gratitude and thankfulness?" – CH12
Work Engagement	"My work is one of the most important things in my life." – ENG1 "I am committed to my job." – ENG2 "How I do in my job influences how I feel." – ENG3 "The job I am doing in the military has enduring meaning." – SPIR3

a Reverse-coded items, i.e. 1 is the worst, 5 is the best

Table 15. List of 24 GAT Items Derived from the ACST Scale

Character Factor	Character Item
Wisdom / Knowledge	"How often have you shown creativity-coming up with new ideas?"
	"How often have you shown curiosity or interest?"
	"How often have you shown/used critical thinking, open-mindedness, or good judgement?"
	"How often have you shown a love of learning?"
	"How often have you shown/used perspective or wisdom?"
Courage	"How often have you shown bravery or courage?"
	"How often have you shown persistence?"
	"How often have you shown honesty?"
	"How often have you shown zest or enthusiasm?"
Humanity	"How often have you shown love or closeness with others (friends, family members)?"
	"How often have you shown kindness or generosity to others?"
	"How often have you shown social skills or social awareness or street smarts?"
Justice	"How often have you shown/used fairness?"
	"How often have you shown teamwork?"
	"How often have you shown leadership?"
Temperance	"How often have you shown forgiveness or mercy?"
	"How often have you shown modesty or humility?"
	"How often have you shown prudence or caution?"
	"How often have you shown self-control?"
Transcendence	"How often have you shown appreciation of beauty and excellence?"
	"How often have you shown gratitude and thankfulness?"
	"How often have you shown hope or optimism?"
	"How often have you shown/used playfulness or humor?"
	"How often have you used spirituality?"

In order to understand the impact of ABC on attrition, controlling for demographic and other risk factors, we created averages for each ABC factor: Positivity, Endurance, Camaraderie, Benevolence, and Work Engagement (ABC-5). We also compared the performance of two broader measures of character in the context of our attrition-based outcomes, an average of all 19 items from our ABC measure (ABC-1) and an average of all 24 items derived from the ACST (ACST-1).

Our attrition-based outcomes were obtained from a variety of data sources and covered two different aspects of attrition: contract term and type of discharge. For the first aspect of attrition, the length of the contract term (in months) and accession date for each Soldier were pulled from the Military Entrance Processing Command (MEPCOM): Regular Army Analyst file. The end of Army service date was first determined from the MEPCOM: Regular Army Analyst and if missing, it was obtained from the Active Duty Military Personnel Transaction file (Army). We calculated Army service duration as the number of months between the accession date and the Army service end date.

Our first outcome of interest, satisfy contract, had a value of 1 (Yes) if the Soldier's Army service duration was greater than the length of the contract term or no more than three months less than the term length and 0 (No) otherwise. Our next outcome, renew contract, had a value of 1 (Yes) if the Soldier's Army service duration was more than six months greater than their contract length, evidence that the Soldier most likely re-upped his or her contract and 0 (No) otherwise. This outcome was only analyzed for the N=18,653 Soldiers who satisfied their initial contract according to the definition above (i.e. "satisfy contract" equal to 1 (Yes)), in order to distinguish Soldiers who merely satisfied the requirements of their contract from those who committed to additional Army service above and beyond the terms in their contract. The Army service duration thresholds of three months less than term length and six months greater than term length were based on Army Regulation AR 601-280 (p. 21).

For the second aspect of attrition, namely type of discharge, we garnered additional information about Army attrition from the Active Duty Military Personnel Transaction file (Army). The data that we used included a designator for the character of service (various categories from honorable to dishonorable discharge), Army separation codes (reasons for separation), and Army separation group codes (types of separation, e.g., involuntary discharge, voluntary discharge). These variables were used to create two more outcomes, namely character of service and voluntary separation, for a total of

four outcomes: satisfy contract, renew contract, voluntary separation and character of service.

The voluntary separation variable was created from the Army separation group codes and had a value of 1 (Yes) if the separation group code was “Voluntary Release from Active Duty” (VR) or “Voluntary Discharge” (VD) or “Retirement” (RET). It was also 1 (Yes) if the separation code was “surviving family member-sole survivorship” (FCQ). All other separation and separation group codes were classified as involuntary separation (i.e. voluntary separation value of 0 (No)). A total of 53 Soldiers who had the following separation codes, which do not clearly represent either voluntary or involuntary separations, were excluded from the analyses: “resignation due to miscellaneous/general reasons” (FND; N=40), “accept commission or warrant in the Army” (KGM; N=5), and “unknown” (ZZZ; N=8). The categorization of separation codes into voluntary and involuntary separations was cross-checked with Army Regulation AR 635-5-1. The voluntary separation outcome was only analyzed for N=10,770 (10,823 - 53) Soldiers in our sample who had a voluntary or involuntary separation from the Army before the end of our study (June 30, 2017).

The character of service outcome was an unordered categorical variable with 4 different categories coded to loosely reflect an A to F grading scale: Honorable [‘A’], Under honorable conditions (general) [‘B’], Other (Bad conduct [‘D’], Under other than honorable conditions [‘E’] or Dishonorable [‘F’]) and Uncharacterized [‘Y’]. The ‘D’, ‘E’ and ‘F’ character of service codes were combined into one category to ensure that this category represented an adequate number of Soldiers since the ‘D’, ‘E’, and ‘F’ codes were very rare. Fourteen of the 10,823 Soldiers who separated from the Army with non-missing separation codes had a character of service code of Unknown (’Z’). The character of service outcome was analyzed for N=10,809 (10,823 - 14) Soldiers with a valid non-missing character of service code.

We obtained basic demographic information (age, gender, marital status, education, rank, race/ethnicity, Combat Arms Military Occupational Specialty (MOS))

and the Armed Forces Qualification Test (AFQT) percentile score from the Active Duty Military Personnel Master file. The demographic and military characteristics used to predict attrition were very similar to those used in another study to predict Army attrition from psychological health (Cunha et al., 2015). The Master Personnel records at each time point for each Soldier were chosen so that they were within 3 months of each of the GAT assessments, if possible. Age was treated as a continuous variable and was calculated in years as the difference between the Master Personnel snapshot date and birth date. Gender (male vs female), marital status (married vs not married), education (High School or less vs greater than High School degree), rank (enlisted vs officer), race/ethnicity (White vs other), and Combat Arms MOS (Combat Arms vs other) were all formulated as binary variables. The AFQT percentile score was treated as a continuous variable ranging from the 10^{th} to the 99^{th} percentile.

Gender and rank were also available in the GAT and if one or more of those variables was missing from the Master Personnel or if the closest Master Personnel record was more than a quarter (3 months) before or after the GAT, the variable was taken from the GAT. This ensured that we were using the most reliable demographic data for each Soldier since the Master Personnel data for our study was captured every quarter.

Analysis

Basic descriptive sample statistics were obtained in R 3.3.2. We analyzed three attrition-related binary outcomes (satisfy contract, renew contract, and voluntary separation) and one unordered categorical (i.e. nominal) service outcome (character of service) with three different character measures (ABC-5, ABC-1, or ACST-1), resulting in a total of 9 logistic regression and 3 multinomial regression models, also implemented in R 3.3.2. The three multinomial models had character of service, an unordered categorical variable, as the outcome. In addition to the character measures, we also included the demographic variables (age, gender, marital status, rank, education,

race/ethnicity, and Combat Arms MOS) and the AFQT percentile scores as covariates for each of the outcome models. We implemented our logistic and multinomial regression models in accordance with the theory and proper implementation and evaluation of these models (Hilbe, 2011).

We evaluated the fit of the logistic regression models using Area under the Receiver Operating Characteristics (ROC) curve, which we calculated using the pROC package in R (Robin et al., 2011). We also generated confidence intervals for the Area under the ROC curve (AUC) statistic (Ruscio & Mullen, 2012). For greater interpretability, we converted the AUC statistics to Cohen's *d* effect size estimates (Ruscio, 2008), which can indicate small (> .2), medium (> .5), or large (> .8) effect sizes (Cohen, 1988).

We examined the effects of our covariates and each individual character factor of the ABC-5 measure on each outcome, to identify the factors in our measure that have the biggest impact on Army attrition. We then compared the predictive power of the ABC-1 and the ACST-1 to predict each outcome, by examining the absolute value of the z statistic (estimate of coefficient / standard error) associated with each measure. The absolute values of the z statistic represent the relative importance for the ABC-1 and ACST-1 measures, which helps us determine if our ABC measure has a larger or smaller effect than the ACST-1 in predicting Army attrition.

For all analyses, we used averages of the items corresponding to each character factor (scale scores) instead of the corresponding latent variables, since the factor structure of the ABC character measure had already been established in Study 1. While calculating the ABC-1, the scale scores of all GAT items not from the Character scale (i.e. not labeled CH1-4, CH6, or CH9-12) were rescaled from a 1 to 5 scale to a 0 to 5 scale using the following formula: (5/4)*(item score-1). This was done to ensure that the ABC-1 and the ACST-1 were on the same scale.

For the ABC-5, the scale score for the Camaraderie factor was calculated by first rescaling the Positive Affect and Loneliness items from a 1 to 5 scale to a 0 to 5 scale

by the following formula: (5/4)*(item score-1). This was done to ensure that the Positive Affect and Loneliness items for this factor were on the same scale as the Character item assessing love and closeness to family (11-point scale ranging from 0 to 5). The scale scores for the other four factors were calculated as the averages of their corresponding items since all of the items corresponding to each of those factors were measured on the same scale.

Study 3 Results

Sample Characteristics

The majority of the Soldiers in the initial sample (N=26,204) were male (83.9%), enlisted (99.3%), and White (75.9%). Only 22.5% of the Soldiers were married, while 83.6% had no more than a high school education, and 49.1% had a Combat Arms occupation. The GAT assessments were completed 14.77 ± 30.42 days before Soldiers' personnel records. These Soldiers were very young with an average age of 22.69 ± 4.39 years and had an average AFQT percentile score of 62.30 ± 19.79. The average ABC-1 and ACST-1 character measure values (0 to 5 scale) for this sample were 3.88 ± 0.61 and 3.95 ± 0.66, respectively. For the ABC-5, the average values (0 to 5 scale) for the Endurance, Camaraderie, and Benevolence factors were 3.89 ± 0.78, 3.65 ± 1.01, and 3.98 ± 0.77 respectively. The average values (1 to 5 scale) for the Work Engagement and Positivity factors were 4.05 ± 0.76 and 4.23 ± 0.68 respectively. In our sample, 18,653 Soldiers (71.18%) satisfied their contract term length. On average, these Soldiers were in the Army for 53.52 ± 27.73 months.

Of the Soldiers who met their initial contract (N=18,647), 11,383 (61.0%) renewed or re-upped their contract. Of the Soldiers who separated from the Army and had a separation code (N=10,823), 53 separated for unknown reasons, leaving 10,770 Soldiers. Table 16 provides the frequency for each separation and character of service outcome. See Table 17 for the descriptive statistics for the samples examined for each outcome (satisfied initial contract, had voluntary/involuntary separations from the Army, and had a valid character of service code).

Table 16. Soldier Separation and Character of Service

Separation	N	%
Unknown Reason	48	
Voluntary Separation	8,019	74.4
Involuntary Separation	2,756	25.6
Character of Service Code		
Missing	14	
Honorable	6,661	61.3
General honorable conditions	3,000	27.8
Less than favorable (*Bad conduct*, *Other than honorable conditions* or *Dishonorable)*	391	3.6
Uncharacterized	757	7.02

Table 17. Descriptive Statistics of Soldier Sub-Samples

Variable	Satisfied contract (N=18,647)	Involuntary/ Voluntary Army separation (N=10,770)	Valid character of service (N=10,809)
	Mean ± SD	Mean ± SD	
Character measures			
ABC-1 (0-5)	3.91 ± 0.60	3.84 ± 0.64	3.84 ± 0.64
VIA-1 (0-5)	3.97 ± 0.65	3.92 ± 0.68	3.92 ± 0.68
ABC-5: Endurance (0-5)	3.92 ± 0.76	3.85 ± 0.81	3.85 ± 0.81
Camaraderie (0-5)	3.67 ± 1.00	3.63 ± 1.03	3.63 ± 1.03
Work Engagement (1-5)	4.08 ± 0.74	4.00 ± 0.81	4.00 ± 0.81
Positivity (1-5)	4.25 ± 0.66	4.18 ± 0.71	4.18 ± 0.71
Benevolence (0-5)	4.00 ± 0.76	3.94 ± 0.79	3.94 ± 0.79
Continuous predictors and timing measures			
Age (years)	22.81 ± 4.45	22.39 ± 4.38	22.41 ± 4.41
AFQT percentile (10^{th} to 99^{th})	61.82 ± 19.78	59.92 ± 18.84	59.95 ± 18.86
Timing of GAT before personnel record (days)	14.23 ± 30.63	14.35 ± 30.20	14.37 ± 30.43
Military tenure (months)	65.33 ± 22.43	36.69 ± 21.41	36.66 ± 21.40
Binary predictors			
	N (%)	N (%)	N (%)
Gender (Male)	16067 (86.2%)	8536 (79.3%)	8560 (79.2%)
Rank (Enlisted)	18646 (100.0 %)	10714 (99.5%)	10717 (99.1%)
Marital Status (Married)	4377 (23.5%)	2372 (22.0%)	2383 (22.0%)
College Education (High School diploma or less)	15744 (84.5%)	9414 (87.5%)	9417 (87.2%)
Race-ethnicity (White)	14053 (75.4%)	8129 (75.5%)	8164 (75.6%)
Combat Arms MOS	9271 (50.0%)	5061 (47.4%)	5066 (47.3%)

Impact of Character on Enlistment Contract Period

We analyzed the effects of our five-factor character measure, ABC-5, controlling for demographics and the AFQT score, on the binary outcome of satisfying the contract term (N=26,204) using logistic regression. Table 18 shows the results of this model, namely the coefficient (β), odds ratio, standard error, and z statistic (β / standard error) for each predictor variable. We also included the number of missing observations (i.e., the number of Soldiers excluded from the analysis due to missing values on one or more predictors).

Table 18. Logistic Regression Model for Satisfy Contract Outcome (N=26,204; 573 missing observations)

Variable	β	Odds Ratio	Standard Error	z
Intercept	-1.369 ***	0.254	0.159	-8.60
Endurance	0.039	1.040	0.025	1.57
Camaraderie	0.014	1.014	0.016	0.85
Work Engagement	**0.071 *** **	**1.074**	0.021	3.37
Positivity	**0.158 *** **	**1.171**	0.022	7.08
Benevolence	0.023	1.024	0.025	0.95
Age	**0.033 *** **	**1.034**	0.004	7.93
Gender (Male)	**0.575 *** **	**1.778**	0.038	15.23
Marital Status (Married)	**0.080 ***	**1.083**	0.039	2.07
Education (High School diploma or less)	0.039	1.040	0.045	0.87
Race-ethnicity (White)	**-0.100 ****	**0.905**	0.035	-2.85
Combat Arms MOS	0.056	1.058	0.030	1.89
AFQT percentile	**-0.002 ****	**0.998**	0.001	-2.91

* p<.05; ** p<.01; *** p<.001. Significant predictor effects (p<.05) are in **bold.**

For the model represented in Table 18 (outcome: satisfy contract), we observed an AUC = 0.587; 95% CI: [0.579, 0.595], which corresponds to a Cohen's *d*= 0.311, signifying a small to medium effect size (0.2 to 0.5). From the table above, we can see that the Work Engagement and Positivity measures of character from the ABC-5 scale were positively associated with satisfying the contract term. Being older, male, and

married also increased the likelihood of satisfying the contract term, while being White and having a higher AFQT percentile score were negatively associated with satisfying the contract. The percentage increase in the odds of satisfying the contract for a higher predictor value can be determined from the odds ratio. For example, the odds ratio for Work Engagement was 1.074, which indicates that every one unit increase in Work Engagement was associated with a 7.4% greater odds of a Soldier satisfying his or her contract. The odds ratio for Positivity (1.170) indicates that a one unit increase on the Positivity scale was associated with a 17% greater odds of a Soldier satisfying his or her contract. Similarly, the odds ratio for marital status (binary) was 1.084, indicating married Soldiers had an 8.4% greater odds of satisfying their contracts, compared to unmarried Soldiers.

Table 19 shows the effects of the same predictors on the outcome of renewing or re-upping the contract, in a sample of Soldiers who satisfied their initial contract (N=18,653).

Table 19. Logistic Regression Model for Renew Contract Outcome (N=18,653; 126 missing observations)

Variable	β	Odds Ratio	Standard Error	z
Intercept	-0.519 **	0.595	0.177	-2.91
Endurance	0.030	1.030	0.028	1.09
Camaraderie	**0.046 ***	**1.047**	0.018	2.55
Work Engagement	**0.152 *****	**1.164**	0.024	6.33
Positivity	0.049	1.050	0.025	1.90
Benevolence	**-0.063 ***	**0.939**	0.028	-2.29
Age	0.003	1.003	0.004	0.72
Gender (Male)	**-0.110 ***	**0.896**	0.048	-2.31
Marital Status (Married)	**0.488 *****	**1.629**	0.042	11.55
Education (High School diploma or less)	**0.137 ****	**1.147**	0.048	2.83
Race-ethnicity (White)	**-0.318 *****	**0.728**	0.039	-8.22
Combat Arms MOS	**-0.595 *****	**0.551**	0.032	18.37
AFQT percentile	**0.007 *****	**1.007**	0.001	8.87

* p<.05; ** p<.01; *** p<.001. Significant predictor effects (p<.05) are in **bold.**

For the model predicting contract renewal (Table 19), we observed an AUC=0.627; 95% CI: [0.619, 0.635], which relates to a Cohen's *d*=0.457, which corresponds approximately to a medium effect size (0.5). Table 19 illustrates that every one unit increase in Camaraderie was associated with a 4.7% greater odds of renewing one's contract. A one unit increase in Work Engagement was associated with a 16.4% greater odds of renewing one's contract, whereas a one unit increase in Benevolence was associated with a 6.1% decreased odds of renewing the Army contract among Soldiers who satisfied their initial contract. Being married, having no more than a high school education, or obtaining a higher AFQT percentile score were each associated with a greater odds of contract renewal, whereas being White, male, or having a Combat Arms MOS were each associated with a lower odds of contract renewal.

Impact of Character on Nature of Army Separation

After examining the effects of our ABC-5 measure on Army service contract completion, we explored the extent to which ABC predicts other aspects of Army attrition, such as the type of separation from the Army. Table 20 shows the effects of the ABC-5 character measure and demographic characteristics on whether or not a voluntary separation occurred, for all Soldiers with a specified separation (N=10,823).

Table 20. Logistic Regression Model for Voluntary Separation Outcome (N=10,770; 281 missing observations)

Variable	β	Odds Ratio	Standard Error	z
Intercept	-3.362 ***	0.035	0.247	-13.61
Endurance	**0.115 ** **	**1.121**	0.041	2.82
Camaraderie	0.045	1.046	0.027	1.64
Work Engagement	-0.026	0.975	0.034	-0.75
Positivity	**0.090 ***	**1.094**	0.037	2.39
Benevolence	0.008	1.008	0.041	0.21
Age	**0.064 *** **	**1.067**	0.006	10.92
Gender (Male)	**-0.692 *** **	**0.501**	0.057	-12.17
Marital Status (Married)	**0.230 *** **	**1.259**	0.058	3.95
Education (High School diploma or less)	**-0.192 ** **	**0.825**	0.073	-2.62
Race-ethnicity (White)	**0.241 *** **	**1.272**	0.058	4.17
Combat Arms MOS	**0.141 ** **	**1.152**	0.049	2.87
AFQT percentile	**0.005 *** **	**1.005**	0.001	3.88

* p<.05; ** p<.01; *** p<.001. Significant predictor effects (p<.05) are in **bold.**

Table 20 presents the model examining voluntary separation from the Army. We observed an AUC=0.648; 95% CI: [0.636, 0.660], which corresponds to a Cohen's *d*=0.538, signifying a medium effect size (> 0.5). From Table 20, we can see that every one unit increase in Endurance was associated with a 12.1% greater odds of voluntarily, rather than involuntarily, separating from the Army. Similarly, every one unit increase in Positivity was associated with a 9.4% greater odds of voluntarily separating from the Army, rather than involuntarily separating from the Army. Soldiers who were older, married, White, held a Combat Arms MOS, or earned a higher AFQT percentile score were each more likely to have a voluntary separation. In contrast, males and those with no more than a high school education had lower odds of voluntarily separating, signifying an increased odds of an involuntary separation.

Tables 21-23 show the results of the multinomial logistic regression of the ABC-5 character measure predicting character of service, adjusting for demographic characteristics. Each table presents model results for a character of service outcome

(under general honorable conditions, other/less than favorable conditions or uncharacterized), relative to the reference group (honorable discharge).

Table 21. Multinomial Regression Model for the Character of Service Outcome with Honorable ('A') as the Reference Group (N=10,809; 320 missing observations)
Outcome: Under General Honorable Conditions ('B')

Variable	β	Odds Ratio	Standard Error	z
Intercept	1.037 ***	2.821	0.282	3.68
Endurance	0.036	1.037	0.040	0.89
Camaraderie	0.005	1.005	0.027	0.20
Work Engagement	0.058	1.060	0.034	1.70
Positivity	**0.084 ***	**1.088**	0.037	2.28
Benevolence	**-0.126 ****	**0.882**	0.039	-3.19
Age	**-0.104 *****	**0.901**	0.008	-12.71
Gender (Male)	**1.165 *****	**3.206**	0.072	16.22
Marital Status (Married)	**-0.290 *****	**0.748**	0.067	-4.36
Education (High School diploma or less)	**0.300 ****	**1.350**	0.094	3.18
Race-ethnicity (White)	**-0.490 *****	**0.613**	0.056	-8.76
Combat Arms MOS	0.084	1.088	0.049	1.72
AFQT percentile	**-0.011 *****	**0.989**	0.001	-8.22

* p<.05; ** p<.01; *** p<.001. Significant predictor effects (p<.05) are in **bold.**

Table 22. Outcome: Other Conditions (Less than Honorable; 'D', 'E', or 'F')

Variable	β	Odds Ratio	Standard Error	z
Intercept	-1.401 *	0.246	0.627	-2.24
Endurance	0.169	1.184	0.092	1.84
Camaraderie	-0.051	0.950	0.060	-0.86
Work Engagement	0.009	1.009	0.076	0.12
Positivity	-0.107	0.899	0.079	-1.35
Benevolence	-0.085	0.919	0.089	-0.95
Age	**-0.068 *** **	**0.934**	0.017	-3.89
Gender (Male)	**1.495 *** **	**4.459**	0.198	7.56
Marital Status (Married)	-0.181	0.834	0.149	-1.21
Education (High School diploma or less)	0.102	1.107	0.202	0.51
Race-ethnicity (White)	**-0.399 ** **	**0.671**	0.125	-3.19
Combat Arms MOS	-0.126	0.882	0.111	-1.14
AFQT percentile	**-0.010 *** **	**0.990**	0.003	-3.31

* p<.05; ** p<.01; *** p<.001. Significant predictor effects (p<.05) are in **bold.**

Table 23. Outcome: Uncharacterized ('Y')

Variable	β	Odds Ratio	Standard Error	z
Intercept	**2.364 *** **	10.633	0.437	5.42
Endurance	**-0.144 * **	0.866	0.064	-2.25
Camaraderie	0.037	1.038	0.045	0.82
Work Engagement	**-0.171 ** **	0.843	0.054	-3.15
Positivity	**-0.317 *** **	0.728	0.055	-5.75
Benevolence	0.008	1.008	0.065	0.12
Age	**-0.061 *** **	0.941	0.013	-4.64
Gender (Male)	**-0.320 *** **	0.726	0.092	-3.49
Marital Status (Married)	**-0.422 *** **	0.656	0.117	-3.61
Education (High School diploma or less)	-0.085	0.919	0.142	-0.60
Race-ethnicity (White)	-0.028	0.972	0.098	-0.28
Combat Arms MOS	-0.008	0.992	0.086	-0.10
AFQT percentile	**-0.008 *** **	0.992	0.002	-3.41

* p<.05; ** p<.01; *** p<.001. Significant predictor effects (p<.05) are in **bold.**

Predicting Soldiers' character of service yielded the following fit statistics, AUC [95% CI]: 'A' or honorable (reference), AUC=0.669 [0.659, 0.679], Cohen's *d*=0.618; 'B'

or under general honorable conditions, AUC=0.684 [0.673, 0.695], and Cohen's *d*=0.677; 'D/E/F' or other/less than honorable, AUC=0.625 [0.598, 0.652], and Cohen's *d*=0.450; and 'Y' or uncharacterized, AUC=0.650 [0.629, 0.671], and Cohen's *d*=0.544. Based on the previously outlined guidelines for interpreting Cohen's *d* values, the effects can be characterized as medium to large (0.5 to 0.8), with the exception of the other/less than honorable outcome, for which the effect was just below the 0.5 cutoff for medium effect sizes. Every one unit increase in Positivity was associated with an 8.8% greater odds of receiving a discharge under general honorable conditions, relative to the most favorable outcome, honorable discharge (Table 21). In contrast, every one unit increase in Benevolence was associated with an 11.8% decreased odds of discharge under general honorable conditions, as compared to the most favorable outcome, honorable discharge. Being male and having no more than a high school education increased the likelihood of an "under general honorable conditions" discharge, while being older, White, married or having a higher AFQT percentile scores were related to lower odds of having an "under general honorable conditions" discharge, relative to an honorable discharge.

From Table 22, none of the five ABC-5 character measures had significant effects on predicting other/less than honorable discharges, relative to an honorable discharge. Being male increased the odds of less than honorable discharges, but Soldiers who were older, White or who had higher AFQT scores had a lower odds of having a less than honorable discharge, relative to an honorable discharge.

Finally from Table 23, we see that the effects of our predictors on uncharacterized discharges are vastly different from those in the other two discharges, justifying the need to treat these discharges as a separate category. Every one unit increase in Endurance was associated with a 13.4% decreased odds of receiving an uncharacterized discharge (character of service code equal to 'Y'), relative to an honorable discharge. Similarly, every one unit increase in Work Engagement was associated with a 15.7% decreased odds of receiving an uncharacterized discharge

(relative to an honorable discharge), and every one unit increase in Positivity was associated with a 27.2% decreased odds of receiving an uncharacterized discharge, relative to an honorable discharge. Soldiers who were older, male, married or who had a higher AFQT percentile score all had a lower odds of having an uncharacterized discharge, relative to an honorable discharge.

Comparison between ABC and ACST Character Measures on Attrition Outcomes

In order to determine if our character measure, ABC, performed better than the existing ACST measure in predicting Army attrition, we ran the models above with the ABC-5 measure replaced by the average of all 19 ABC items (ABC-1). We ran the same models again with the ACST-1 character measure (average of all 24 items on the ACST scale), instead of the ABC-1, as a predictor of Army attrition. Table 24 shows the comparisons of z statistics for the ABC-1 and ACST-1 predictor variables across each of our outcome models.

Table 24. Comparison of z Statistics of ABC-1 and ACST-1 Measures (Variable Importance) across Models with Different Outcomes

Outcome	ABC-1 (|z|)	ACST-1(|z|)
Satisfy contract	11.02	8.74
Renew contract	7.40	4.71
Voluntary separation	5.55	5.27
Character of Service (Ref: Honorable)		
Under general honorable conditions	4.25	4.83
Less than honorable conditions	0.47	0.48
Uncharacterized	8.57	6.57

A visual inspection of Table 24 reveals the ABC-1 measure better predicted (operationalized as greater variable importance [i.e., larger z statistic]) whether Soldiers satisfied their contract, renewed their contract, and even whether they made it through basic training (i.e., uncharacterized discharge), relative to the ACST-1 measure.

Predictions for the remaining outcomes (voluntary separation, discharge under general honorable conditions and other, less than honorable discharge) were fairly comparable.

Study 3 Summary

After investigating character growth over time across different demographic subgroups, we analyzed the extent to which Army character (measured in new Soldiers, within a year of enlistment) predicted Army attrition. Data on contract terms was available for Active Duty Soldiers who were processed through MEPCOM stations. We examined GAT assessments completed between FY 2010 and FY 2013. We looked at four Army attrition outcomes: satisfying a contract term, renewing or re-upping the contract, voluntary separation from the Army, and character of service (the classification of a Soldier's service rendered upon discharge [e.g. honorable, dishonorable, uncharacterized]).

A one unit increase in Work Engagement and, separately, Positivity was associated with a 7.4% and 17.1% greater odds of satisfying the contract term, respectively. Soldiers who had greater odds of satisfying their service contracts tended to be older, male, or married Soldiers, while White Soldiers and those with higher AFQT scores had a lower odds of doing so. Among Soldiers who satisfied their initial contract, a one unit increase in Camaraderie and, separately, Work Engagement was associated with a 4.7% and 16.4% greater odds of contract renewal, whereas a one unit increase in Benevolence was associated with a 6.1% decreased odds of contract renewal. Married Soldiers, Soldiers with no more than a high school education and Soldiers with higher AFQT scores had a greater odds of renewing their contract, while White or male Soldiers or those with a Combat Arms occupation had a lower odds of renewing their contract.

Among Soldiers who separated from the Army, we also examined whether the separation was voluntary and what character of service was designated at discharge. Every one unit increase in Endurance was associated with a 12.1% greater odds of

voluntarily, rather than involuntarily, separating from the Army, while every one unit increase in Positivity was associated with a 9.4% greater odds of voluntarily separating from the Army, rather than involuntarily separating from the Army. Being older, married, White, possessing a Combat Arms MOS, or having a higher AFQT score was associated with greater odds of separating voluntarily. Male Soldiers and Soldiers with no more than a high school education had lower odds of having a voluntary separation. Every one unit increase in Positivity was associated with an 8.8% greater odds of receiving a discharge under general honorable conditions (relative to honorable conditions), whereas every one unit increase in Benevolence was associated with an 11.8% decreased odds of discharge under general honorable conditions rather than honorable conditions. Every one unit increase in Endurance was associated with a 13.4% decreased odds of receiving an uncharacterized discharge, relative to an honorable discharge. Similarly, every one unit increase in Work Engagement and, separately Positivity, was associated with a 15.7% and a 27.2% decreased odds of receiving an uncharacterized discharge relative to an honorable discharge, respectively. Being male or having no more than a high school education was associated with lower odds of having a discharge under general honorable conditions, compared to an honorable discharge. Being male was also associated with increased odds of having a less than honorable discharge, versus an honorable discharge. Soldiers who were older, White, married or who had a higher AFQT had a lower odds of having a discharge under general honorable conditions, relative to an honorable discharge. Older, White or higher AFQT Soldiers also had a lower odds of having a less than favorable discharge, while older, male, married, or higher AFQT Soldiers had a lower odds of having an uncharacterized discharge.

Finally, we investigated whether an aggregate measure of items on the ABC scale performed better than the established ACST scale in predicting Army attrition outcomes. Our aggregate ABC measure had a larger effect (better) than the ACST scale on predicting odds of satisfying a service contract, renewing a service contract,

and receiving an uncharacterized discharge. Performance predicting the remaining outcomes was similar for both the ABC measure and ACST scale.

Discussion

Review of Findings

Study 1 Summary

There are a variety of ways to assess character, including the VIA-IS and the abbreviated VIA-IS (i.e., the ACST, which is included in the GAT). In Study 1, we sought to develop a scale that assesses Army-based character and leverages data the Army routinely collects. As such, we developed and tested the psychometric properties of an Army-specific character measure. Our team identified 29 GAT items that seemed to reflect the Army's Values and the DoD's Professional Ethics. Exploratory Structural Equation Modeling in a random sample of 18,000 Soldiers established support for a 19-item, five factor model of character (Positivity, Endurance, Benevolence, Work Engagement, and Camaraderie), which we replicated in a second random sample of 18,000 Soldiers. This demonstrated that the factor structure observed in the first sample is consistent across groups of people, and is not specific to the first sample we modeled. We also found evidence that a one factor, higher order model fit well across both samples of Soldiers. We then replicated the findings in a third stratified random sample, demonstrated invariance across gender, rank, and component subgroups, and also demonstrated convergent and discriminant validity through the factor correlations.

The findings from Study 1 offer an exciting opportunity to leverage routinely collected data to better understand Soldiers' Army-specific character. Whereas the GAT is an annual requirement, something like the ABC could be administered between GAT assessments to maintain a pulse on how a Soldier is doing between yearly assessments, such as after certain milestone events (e.g., after basic training, completion of military educational courses, when transitioning to a new unit, or after deployment). The ABC may also complement other assessment initiatives during

accessions to provide increased understanding and predictive validity of a new recruit's likelihood of completing his or her first term of enlistment. Because the ABC consists of only 19 items (rather than more than 100 items), there would be fewer concerns about survey fatigue. The ABC scale offers the utility of being able to examine individual character facets (e.g., Camaraderie) or overall character. The decision to only include items from the GAT could be considered a limitation; a scale with novel items could more directly and fully capture Army Values and DoD Ethical Values. However, we intentionally leveraged items that are completed annually because it is substantially more cost-effective. Furthermore, over 8 years of data already exist, which makes it possible to study changes over time and longitudinal associations with key outcomes (both of which we did in this study).

Our analyses in Study 1, were, however, limited to a single moment in time. Because of the Army's efforts to foster character in Soldiers, we hypothesized that character grows over time. Independent of the Army's efforts to instill character in its forces, character may also change as a result of Soldiers' experiences while serving -- experiences such as combat and leadership roles. In Study 2, we investigated whether Soldiers grow in character and if so, whether character growth differs across component, tenure status, or key demographic characteristics.

Study 2 Summary

In Study 2, using linear growth models to model responses to four GAT assessments (from 2010-2013), we found evidence of character change over time. Comparing new Soldiers to more established Soldiers, we expected that Soldiers who were newly serving in the Army might exhibit different patterns of character growth than Soldiers who had been in the Army for a longer period of time; new Soldiers had been exposed to a new culture with new emphases on character and values, and therefore might be more likely to exhibit change. In contrast, more established Soldiers had likely already largely responded to the Army culture and exhibited most of the character change that the Army culture might prompt. Indeed, we found that individuals new to the

Army showed slightly greater character (as measured by the ABC scale) during the first four iterations of their GAT assessment than Soldiers who were not new to the Army. Given we observed growth in character in new Reserve and National Guard Soldiers, it is unclear why we did not observe character growth in new Active Duty Soldiers.

The stable character we observed among new Active Duty Soldiers, compared to the character growth observed among new Reserve or National Guard Soldiers, could stem from a number of potential differences: 1) different relationships with Army leadership (leaders may be tougher on Active Duty Soldiers), 2) different work environments (Reserve and National Guard Soldiers may feel a greater sense of accomplishment and prestige wearing their uniforms around civilians, compared to Active Duty Soldiers who are typically stationed on an installation and surrounded by other Soldiers), 3) different home environments (new Active Duty Soldiers are often displaced and may feel disconnected from family and friends), and 4) maturity differences (new Active Duty Soldiers tend to be younger than new Reserve or National Guard Soldiers). This unexpected finding warrants further attention. It is, however, notable that we were able to observe growth in character in established Soldiers (across all three components). This suggests Soldiers continue to develop in character even after they acclimate to Army culture.

However, we did find that character growth patterns were related to some demographic characteristics, such as gender: new Active Duty male Soldiers showed general character increases, while new National Guard male Soldiers showed decreases in Endurance and Work Engagement. Established Active Duty male Soldiers also showed greater character growth in general, and established male Reserve Soldiers showed growth in Benevolence and Camaraderie. Being a married Reservist was associated with decreases in character for established Reserve Soldiers (with the exception of Positivity). Although it may seem unexpected that established Reserve and National Guard Soldiers show character growth, this may reflect the more delayed and drawn out exposure that Reserve and National Guard Soldiers have to Army culture.

These Soldiers only experience the Army on average 38 days a year, compared to the Active Duty Soldier's possibly daily exposure to the Army culture. If there is a certain amount of change that happens in proportion to exposure, it would take longer for Reservists and National Guard members to reach the same level of exposure as Active Duty Soldiers, and thus they may take longer to demonstrate the same character change.

In general, we observed modest character growth across most component and Army tenure groups. We suspect even greater growth would be observed if Soldiers were assessed before and after a targeted character enhancing training. Future research could investigate which of the Army's character enhancing initiatives are most effective in promoting growth among character strengths.

Study 3 Summary

Study 3 found that the ABC scale predicted outcomes of particular interest to the Army. ABC scores were related to likelihood of completing one's initial service contract with the Army, likelihood of renewing one's service contract, voluntarily vs involuntarily separating from the Army, and type of service discharge (e.g., honorable, dishonorable). Some elements of our ABC character measure (i.e., Work Engagement and Positivity) were associated with greater odds of completing one's initial service contract with the Army. Of those Soldiers who completed their initial service contract, we found that higher Camaraderie and Work Engagement (but lower Benevolence) predicted greater odds of signing a subsequent Army contract.

In addition to service contracts (legal commitments to the Army), we also investigated the nature of a Soldier's departure from the Army: voluntary versus involuntary separation and the type of discharge. We found that Soldiers with higher Endurance and Positivity scores were more likely to voluntarily separate from the Army (rather than involuntarily separate). We also found that Soldiers with lower Benevolence or higher Positivity scores were more likely to have a discharge of under general honorable conditions (compared to an honorable discharge); Soldiers with lower

Endurance, Work Engagement, or Positivity scores were more likely to have an uncharacterized discharge rather than an honorable discharge. Older, male, married, or Soldiers with higher AFQT scores were less likely to have an uncharacterized discharge. Although “Uncharacterized” discharge as a description for an Army discharge sounds vague, this categorization reflects a very unique set of circumstances particularly interesting for the current effort. Specifically, “uncharacterized discharge” means that Soldiers were discharged from the Army before completing their initial entry training, with less than 180 days in the Army (Army Regulation 635-200, Department of the Army, 2016a). In other words, these Soldiers not only did not complete their initial service contract, but they also did not come close to doing so but rather separated from the Army incredibly quickly. The “uncharacterized” discharge indicates there was too little active service to classify the discharge as honorable or dishonorable. In other words, our ABC measure predicted not only service contract completion and renewal, along with honorable and dishonorable discharge, but also a hybrid of the two: likelihood of failing to complete initial entry training (i.e., basic training).

Finally, we investigated how our measure compared to the ACST character scale in predicting attrition outcomes. Relative to the ACST, the ABC measure better predicted odds of satisfying a service contract, renewing a service contract, and receiving an uncharacterized discharge. The differences between the ABC and the ACST in predicting voluntary separation, discharges under general honorable conditions, and discharges under less than honorable conditions, on the other hand, were fairly small. Although the ACST is derived from a well-established scale, our scale’s ability to better predict Army-specific outcomes should not be terribly surprising. Our scale was developed specifically to map onto Army Values and DoD Ethical Values. In general, the more specific one’s measurement is, the better it will predict related outcomes (Ajzen & Fishbein, 1977).

Limitations

Our development of the ABC measure and our subsequent examination of its related growth trajectories and relationship to Army attrition outcomes is a strong initial step in the creation and validation of an Army-based character measure. However, the current effort does have some limitations. For example, our initial development of the scale was based on assessments completed during the first full year of the GAT: FY 2010. Focusing on FY 2010 ensured sufficient time for follow-up (4 years) so that we could examine character change (Study 2) and the impact of character on subsequent Army attrition, which required following first-term soldiers to the end of their contract (Study 3). Soldiers who had recently entered the Army in 2010, and even more so now as the conflicts in the Middle East have dragged on for over 16 years, may enter the Army without an expectation of peace or quick resolution to war. Comparatively, established Soldiers in 2010 may have entered the Army prior to the September 11th terrorist attacks and without an initial expectation of combat deployments. Individuals who enter the Army with different expectations for combat may differ substantially in their character strengths and how they respond to the Army's focus on values and ethics.

An additional limitation of our work on attrition outcomes is that nearly all of our Study 3 sample consisted of enlisted Soldiers (99.3%). We only had access to contract length data for Soldiers who entered the Army through MEPCOM processing stations. Given very few officers are processed through these stations, this resulted in a disproportionately low number of officers in the Study 3 analyses. As such, the results we describe for attrition outcomes may not extend fully to officers. Although a small number of officers are represented in Study 3, there may be something systematically different about officers who enter the Army through recruiting offices rather than through other means. Likewise, the ABC scale predicts odds of receiving an uncharacterized discharge from the Army. In our sample, this code was not utilized for any officers'

separation from the Army. As such, our finding regarding the relationship between ABC scores and uncharacterized discharge is only applicable to enlisted Soldiers.

Implications and Recommendations

Based on the current findings, we have four recommendations.

1) ***Compare the ABC's predictive utility to that of other existing Army measures.*** Beyond the current comparison between the ABC and the ACST, future work should examine the predictive utility of the ABC relative to other existing Army measures. Because the data that feed into the ABC are already routinely collected by the Army, comparing the performance of the ABC with other measure that are routinely collected by the Army can be done in a manner that is both cost-effective and time-effective for the Army. For example, while the Army already utilizes personality measures to predict likelihood of success in the Army (e.g., the Tailored Adaptive Personality Assessment System, TAPAS; e.g., Nye et al., 2012), the ABC scale could potentially provide additional information and predictive value for understanding the likelihood of a Soldier completing his or her initial service contract, along with the quality of service that he or she will give the Army.
2) ***Expand consideration to other important Army outcomes.*** Additional work should also investigate the extent to which the ABC is linked to other Army specific outcomes (e.g., performance evaluation outcomes, promotion timing, awards and disciplinary actions). Additionally, character strengths have been linked to resilience (such as emotional, interpersonal, intellectual, and restraint factors; Martinez-Marti & Ruch, 2017), and, resilience may even mediate the association between character and key Army outcomes (i.e., character predicts resilience and resilience predicts the outcome).
3) ***Examine the extent to which the ABC can capture more nuanced character change.*** Assessing character more frequently (e.g., two times per year instead of one) could help the Army maintain a pulse on Soldiers'

character. In addition, deployment and combat experiences may alter the pattern of character strengths for initial deployments and subsequent deployments, and also for Soldiers who are nearing the end of their Army career. Other core formative experiences in the Army may likewise have an impact on Soldiers as they progress through their career and transition back to civilian life. For example, if Soldiers exhibit reduced Camaraderie as they separate from the Army, the Army could enhance the social support resources they offer to help transitioning Soldiers acclimate to civilian life. Additionally, Soldiers who transition from enlisted service to a warrant officer or a commissioned officer position may undergo character changes as they take on new responsibilities and expectations. The Army could benefit from knowing the extent to which such changes result in character challenges or growth and providing additional guidance to these Soldiers. In addition, assessing character strengths before and after targeted character training may shed light on the extent to which existing character, values, and ethics initiatives boost Soldiers' character; initiatives that fail to demonstrate an impact could be revised to improve their capabilities.

4) ***Refine the ABC scale to more fully capture Army Values and DoD Ethical Values.*** Although we were able to build a psychometrically sound instrument with evidence of predictive validity by leveraging existing Army data, it remains unknown how much more precisely we could measure Army character or predict key outcomes if we refined the scale to align even more closely with Army Values and DoD Ethical Values.

Conclusion

The newly developed ABC scale holds promise for better understanding five key constructs of Army character: Benevolence, Positivity, Endurance, Work Engagement and Camaraderie. Although the measure requires additional scientific validation and is

not ready for operational implementation, the results are very promising. For example, the ABC scale demonstrated invariance across demographic subgroups (gender, rank, and component). We observed modest character growth across four annual assessments in nearly every component and Army tenure (the only exception was new Active Duty Soldiers, whose character remained fairly stable), and we identified demographic and service predictors of character growth. The ABC scale predicted key Army attrition and service outcomes (evidence of the scale's predictive validity), and a follow up analysis revealed the ABC scale outperformed the existing ACST character scale when predicting a number of critical Army outcomes. The abbreviated nature of the ABC scale (19 items) relative to many longer inventories (over 100 items) makes it possible to assess character more frequently and in a wider variety of contexts while minimizing survey fatigue. Moving forward, we recommend additional research to complete the validation of this measure and posture the measure for Army-wide implementation in a variety of settings, particularly during major milestones and at transition points throughout a Soldier's career. These data exist and are available for conducting this research. Assessing character and its development is a worthwhile endeavor for the Army as it sets the conditions for developing Army leaders who will serve honorably under all conditions. This study has taken an important step toward developing a brief character measure that is consistent with Army doctrine and holds promise that upon further validation, can be implemented Army wide.

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