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Supporting the well-being of student veterans and service members: Contextual factors and self-determination

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**Supporting the well-being of student veterans and service members:
Contextual factors and self-determination**

by

Matthew T. Seipel

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Psychology (Counseling Psychology)

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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University

Ames, Iowa

2019

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ABSTRACT

The present study investigated the well-being of student veterans and service members (SVSMs), a rapidly-growing subpopulation of college students in the U.S. with unique needs and lived experiences, through the lens of Self-Determination Theory (SDT). SDT posits that contextual factors relate to well-being via perceived satisfaction of three basic psychological needs (i.e., competence, autonomy, and relatedness) and the facilitation of intrinsic motivation. A path model tested these SDT-stipulated relations in a sample of 182 SVSMs from the three Regent universities in Iowa, incorporating four SVSM-specific contextual factors (i.e., Office of veterans and military services (OVMS) support, veteran-friendly campus perception, veteran identity centrality, and positive regard for veteran identity). The model yielded a good fit; however, not all of the hypothesized relations were significant. Veteran-friendly campus perception and positive regard for veteran identity emerged as robust direct predictors of psychological need satisfaction and indirect predictors of well-being (i.e., globally and specific to the academic domain). OVMS support had a significant relationship only with perceived relatedness, and veteran identity centrality did not have significant direct or indirect relations with any of the psychological needs or well-being. Perceived competence was a robust mediator of multiple relations between contextual factors and well-being, and perceived relatedness also mediated some of the relations between contextual factors and well-being. The predictive utility of volitional autonomy and academic intrinsic motivation was not supported in the present study. Conclusions, implications, and future directions for research are discussed.

CHAPTER 1. INTRODUCTION

It is well-documented that there has been a massive influx of U.S. military veterans and active military personnel entering U.S. institutions of higher education in the past decade, at least partially attributable to the passage of the Post-9/11 GI Bill, one of the most generous educational benefits for veterans in U.S. history (e.g., Sander, 2012). In fact, more than 1 million veterans, military personnel, and their beneficiaries have used the Post-9/11 GI Bill since it was passed in 2008 (Cate, 2014). As this unique subpopulation continues to grow, it is imperative that institutions of higher education identify and implement supports for their well-being not only for moral reasons (e.g., serving those who have served us) but also to nurture the unique contributions these students make to the intellectual vitality of the academy (e.g., McGrevey & Kehrer, 2009).

Student Veteran and Service Member Well-Being

Deci and Ryan (2008) described well-being as a state of being fully functioning that goes beyond the absence of negative affect or pathology and is more inclusive than happiness, which is often conceptualized as the presence of positive affect or hedonic pleasure. Life satisfaction has widely been conceptualized and used as a key index of well-being (e.g., Diener, 1984), and others (e.g., Ryff, 1989) have emphasized that well-being is related to feelings of satisfaction and mastery in relevant developmental domains (e.g., forming peer relationships for children and adolescents). In this vein, the present study examined life satisfaction as an index of global well-being and academic satisfaction as an index of academic well-being (a central developmental domain for college students) for student veterans and service members (SVSMs). In an effort to support the well-being of SVSMs, colleges and universities have added a range of targeted services, one of the more prominent being offices of veterans and military services (OVMSs).

Office of Veterans and Military Services Support

The ways in which OVMSs support student veterans and service members vary by institution, but all share a common core: “At the most basic level, OVMSs provide central contact points for student veterans and service members who are enrolled or are seeking to enroll, and OVMS staff work to ensure that individuals have access to the services and resources needed for their success” (Abel, Bright, & Cooper, 2013, p. 168). Many OVMSs offer additional services, including tutoring, career development assistance, social programming, and dedicated space for studying and socializing (e.g., Evans, Pellegrino, & Hoggan, 2015). Put simply, OVMSs exist to support the well-being of SVSMs.

A small body of anecdotal evidence suggests that OVMSs are effective in supporting the well-being of SVSMs, but quantitative research guided by psychological theory has been noticeably absent (Borsari et al., 2017). Thus, it is unclear to what extent these services are *actually* supporting SVSMs; in some cases we know which services are available to SVSMs and the rates at which they are being utilized, but the literature has not examined whether they are *perceived* as supportive by SVSMs nor related directly or indirectly to SVSM well-being. Further, in cases where OVMSs are associated with SVSM well-being, the mechanisms (i.e., psychological factors) by which they are supportive are currently unknown. The present study addressed these gaps by modeling the relations between OVMS support, other aspects of the SVSM context, and SVSM well-being using self-determination theory (SDT). Figure 1 portrays the hypothesized model.

Self-Determination Theory

SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) is a meta-theoretical approach to human motivation and personality. It explains how people actualize their tendency for growth, function optimally, and attain well-being through intrinsically-motivated action.

Intrinsic Motivation

Ryan and Deci (2000) described intrinsic motivation as “the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn” (p. 70), and it can alternatively be described as engaging in an activity (e.g., college education) *for its own sake*. Intrinsic motivation is contrasted with extrinsic motivation, which involves engaging in a behavior for any of a number of reasons other than its inherently satisfactory nature (e.g., compliance with authority, avoiding anxiety or guilt, obtaining prestige or wealth), and amotivation, which is the absence of intention to act (Ryan & Deci). Academic intrinsic motivation has been positively associated with both global well-being (e.g., Burton, Lydon, D'alessandro, & Koestner, 2006) and academic well-being (e.g., Taylor et al., 2014) in college students. Furthermore, academic intrinsic motivation has been found to mediate relations between psychological need satisfaction and well-being across several domains, including education (Milyavskaya & Koestner, 2011).

Psychological Needs

SDT asserts that intrinsic motivation and well-being are facilitated by the satisfaction of three basic psychological needs (Ryan & Deci, 2000): perceived competence (a sense of self-efficacy or mastery), volitional autonomy (making one's own work/life choices), and perceived relatedness (mutual caring, concern, and connection with others). Evidence for the predictive utility of each need is briefly considered in turn, and it is particularly noteworthy that recent

international research suggests that satisfaction of the psychological needs has similar outcomes across diverse cultures, supporting SDT's claim of their universality (Chen et al., 2015; Church et al., 2013).

Perceived competence. Perceived competence has been positively associated with academic intrinsic motivation in college student samples (e.g., Black & Deci, 2000). It has also demonstrated positive relations with indicators of both global well-being (e.g., Coffman & Gilligan, 2002) and academic well-being (e.g., León & Núñez, 2013) in college students.

Volitional autonomy. Volitional autonomy has been positively associated with academic intrinsic motivation in college student samples (e.g., Ciani, Sheldon, Hilpert, & Easter, 2011). It has also been associated with global well-being (e.g., Merino & Privado, 2014) and academic well-being (Paradnikė & Bandzevičienė, 2015) in college students.

Perceived relatedness. Perceived relatedness has been positively associated with academic intrinsic motivation in college student samples (e.g., Zook & Herman, 2011). It has also demonstrated positive relations with indicators of both global well-being (e.g., Elliott & Doane, 2015) and academic well-being (e.g., Fleming, Oertle, Plotner, & Hakun, 2017) in college students.

Contextual Factors

A subtheory of SDT, Cognitive Evaluation Theory (Deci & Ryan, 1985), specifies that in many cases psychological need satisfaction fully mediates relations between contextual factors (e.g., personal identities, environmental supports) and intrinsic motivation, and that intrinsic motivation in turn partially mediates relations between need satisfaction and well-being. Two other SDT subtheories, Basic Psychological Needs Theory (Ryan & Deci, 2002) and Relationships Motivation Theory (Deci & Ryan, 2014), describe how need satisfaction also fully

mediates relations between contextual factors and well-being. Taken together, these subtheories suggest that certain contextual factors may impact one's sense of well-being indirectly through psychological need satisfaction and the facilitation of intrinsic motivation.

Empirical evidence supports these mediation relations in college samples and, to a lesser extent, in military samples. However, the empirical literature thus far has been inconclusive as to which indirect effects are fully versus partially mediated. Satisfaction of the psychological needs has been found to mediate relations between contextual factors and academic intrinsic motivation (full mediation: Zook & Herman, 2011), global well-being (full mediation: e.g., Schiffrin et al., 2014; partial mediation: e.g., Reed, Duncan, Lucier-Greer, Fixelle, & Ferraro, 2016), and academic well-being (full mediation: Byars-Winston, Estrada, Howard, Davis, & Zalapa, 2010; partial mediation: Ratelle, Larose, Guay, & Senécal, 2005) in college students. In a Dutch military sample, Delahaij, Theunissen, & Six (2014) found that perceived competence fully mediated relations between training instructor support and intent to quit (an index of domain-specific well-being). The present study provided a novel examination of the relations between contextual factors and SVSM well-being. Support received from OVMSs is a relevant contextual factor for SVSMs, as is the perception of a "veteran-friendly" campus climate.

Veteran-Friendly Campus Perception

The notion of creating a campus climate that is friendly and welcoming to SVSMs has become increasingly popular in the past decade, with the influx of SVSMs pursuing higher education since the passage of the Post-9/11 GI Bill (Heineman, 2016). The concept of establishing veteran-friendly campuses was especially encouraged by President Obama's (2012) executive order that institutions of higher education matriculating SVSMs abide by "principles of excellence." The Departments of Veterans Affairs and Education built upon this executive order

and provided eight specific recommendations for institutions of higher education to support SVSMs:

1. Create a culture of trust and connectedness across the campus community to promote well-being and success for veterans.
2. Ensure consistent and sustained support from campus leadership.
3. Implement an early alert system to ensure all veterans receive academic, career, and financial advice before challenges become overwhelming.
4. Coordinate and centralize campus efforts for all veterans, together with the creation of a designated space (even if the space is limited in size).
5. Collaborate with local communities and organizations, including government agencies, to align and coordinate various services for veterans.
6. Utilize a uniform set of data tools to collect and track information on veterans, including demographics, retention and degree completion.
7. Provide comprehensive professional development for faculty and staff on issues and challenges unique to veterans.
8. Develop systems that ensure sustainability of effective practices for veterans (U.S. Department of Education, 2013).

OVMSs, in conjunction with other campus support services, intend to fulfill many of these mandates (Abel, Bright, & Cooper, 2013).

Despite the widespread belief that a veteran-friendly campus is imperative for SVSM well-being, its actual impact has received minimal empirical validation and remains an area for which scholars have expressed need for sound investigation (e.g., Rumann & Hamrick, 2010). A single qualitative study was located that sampled SVSMs in West Virginia who attended college

before and after the passage of state legislation mandating veteran-friendly campuses. Positive experiences on campus was a more common theme among SVSMs attending college after the passage of the legislation than it was among SVSMs who attended the same institutions prior to the legislation, with a sense of relatedness on campus appearing more frequently in responses given after the legislation (Adkins, 2015).

The linkage between campus climate and well-being has received more validation in the general college student population (e.g., Byrd & McKinney, 2012; Edman & Brazil, 2009; Thompson, Orr, Thompson, & Grover, 2007), as well as for specific subpopulations, including sexual minority students (e.g., Woodford, Kulick, & Atteberry, 2015), students with disabilities (e.g., Ramsdell, 2015), and racial/ethnic minority students (e.g., Gloria & Ho, 2003; Brown, Morning, & Watkins, 2005). Overall, the extant literature suggests that perceived campus climate has significant implications for college student well-being and that psychological need satisfaction is a potential mediator of this relationship that warrants further investigation.

In addition to providing a unique examination of campus climate for SVSMs in relation to other contextual factors, psychological need satisfaction, academic intrinsic motivation, and well-being, the present study was also the first to systematically operationalize the extent to which SVSMs *perceive* their campus as being veteran-friendly. Existing measures have typically taken the form of checklists for institutions to verify they are providing mandated/recommended services (e.g., Environmental Evaluation for Veterans Index; Griffin & Gilbert, 2012), or single-item measures that query global perception of veteran friendliness without identifying any actual contributing factors. The approach taken in the present study (i.e., measuring SVSMs' perception of veteran friendliness across multiple dimensions) was consistent with the emphasis of SDT on

the person's subjective experience of their environment. I now introduce a final component of the veteran student context: veteran identity.

Veteran Identity

All SVSMs have unique experiences of their military service, and these experiences intersect with other lived experiences and identities to establish a sense of veteran identity. Harada and colleagues (2002, p. 1118) are credited with offering the first cogent definition of veteran identity in the peer-reviewed literature: "veterans' self-concept that derives from his or her military experience within a sociohistorical context." Thus, while there are undoubtedly some basic similarities among SVSMs (e.g., experience working within hierarchical organizations oriented toward national defense and public service), significant heterogeneity exists among the experiences and identities of SVSMs (Vaccaro, 2015).

Di Leone, Wang, Kressin, and Vogt (2016) conceptualized veteran identity as having two dimensions: centrality and positive regard. Centrality refers to how salient a person's veteran status is to their self-concept, whereas positive regard refers to the affective valence a person holds toward their veteran status. In line with other identity scholars (e.g., Ashmore, Deaux, & McLaughlin-Volpe, 2004), Di Leone and colleagues found that veteran identity centrality and positive regard were related but distinct constructs in their veteran sample, correlating significantly at $r = .49$. That is, greater veteran identity centrality was *typically* associated with higher positive regard for veteran identity, but their relation was not perfect. This is bolstered by previous findings that negative experiences associated with a salient identity may lead to decreased (or negative) regard for that identity (e.g., Rüsç et al., 2009).

Veteran identity has previously demonstrated significant relations with veterans' usage of veteran-specific services. Di Leone and colleagues (2016) found higher veteran identity

centrality and positive regard to be associated with female veterans' usage of Veterans Health Administration (VHA) services such that both facets were significantly related to sense of entitlement to use VHA services and perceived fit with the VHA setting. Further, logistic regression results in Di Leone et al. suggested that participants with higher veteran identity centrality were more likely to have used VHA medical and mental health services in the past six months; however, positive regard for veteran identity was not significantly associated with past usage of VHA services. Harada and colleagues (2002) also found that veterans with greater veteran identity salience and more positive perceptions of their military experience (analogous to positive regard for veteran identity) expressed greater preference for using VHA services over non-VHA providers. Additionally, participants who belonged to a veterans' organization (e.g., Veterans of Foreign Wars) were also more likely to prefer VHA services.

Veteran identity has not been examined in relation to other constructs that were included in the present study, although centrality of and positive regard toward other identities (e.g., racial, ethnic, sexual) have been found to significantly relate to several of the aforementioned constructs. Of note, in college student samples they were significantly related to perceived competence (Kim & Omizo, 2005), perceived relatedness (e.g., Dueñas & Gloria, 2017), and global well-being (e.g., Griffin, Chavous, Cogburn, Branch, & Sellers, 2012). Taken together, these preliminary findings suggested that veteran identity centrality and positive regard for veteran identity would increase the predictive utility of the present model of SVSM well-being.

Hypotheses

The overarching hypothesis for this study was that the path model depicted in Figure 1 would yield a good fit. This model allowed the three psychological needs to relate directly to the well-being variables, as well as indirectly via academic intrinsic motivation. It was also predicted

that the hypothesized model would yield a better fit than the alternative path model depicted in Figure 2. This alternative model only allowed the three psychological needs to relate indirectly to the well-being variables via academic intrinsic motivation. It was otherwise identical to the hypothesized model, making it a nested model.

The following were the specific hypothesized relations, as outlined in Table 1:

Hypothesis 1. OVMS support, veteran-friendly campus perception, veteran identity centrality, and positive regard for veteran identity would display significant, positive, direct relations with all three psychological needs.

Hypothesis 2. All three psychological needs would display significant, positive, direct relations with academic intrinsic motivation, academic well-being, and global well-being.

Hypothesis 3. All three psychological needs would fully mediate relations between all four contextual factors and academic intrinsic motivation, and fully mediate relations between all four contextual factors and both indices of well-being.

Hypothesis 4. Academic intrinsic motivation would display significant, positive, direct relations with academic well-being and global well-being.

Hypothesis 5. Academic intrinsic motivation would partially mediate relations between the three psychological needs and both indices of well-being.

CHAPTER 2. LITERATURE REVIEW

This chapter will review the extant literature supporting the hypothesized model and its specific relationships that were introduced in Chapter 1 and are displayed in Figure 1. First, I will introduce the construct of well-being and discuss different ways that it has been operationalized and measured. Second, I will introduce contextual factors that are relevant to the student veteran and service member (SVSM) college experience and provide evidence for their relation to well-being. Third, I will introduce self-determination theory as a conceptual framework for the present investigation and provide evidence for how its core constructs both directly relate to well-being as well as mediate relations between contextual factors and well-being. The chapter will conclude with a summary that emphasizes the gaps in the extant literature that the present study sought to fill.

All literature searches were conducted using the PsycINFO and ERIC online databases, inclusive of all publication dates. Significance of bivariate relations was determined at the level of $p < .05$, unless a study justified a more stringent threshold (e.g., Bonferroni correction). Goodness-of-fit for path and structural equation models was assessed using the guidelines of Hu and Bentler (1999): comparative fit index (CFI) of .95 or greater, a root-mean-square error of approximation (RMSEA) or .06 or less, and a standardized root-mean-square residual (SRMR) of .08 or less; I have reported all available relevant fit statistics.

Well-Being

In the 21st century, there has been a noteworthy effort within the field of psychology to examine positive aspects of human functioning, as opposed to a sole focus on pathology. Seligman (1998) is often credited with coining the term *positive psychology* and catalyzing this paradigm shift, but the seeds of his work can be traced to Maslow's (1943) promulgation of all

people's capacity for *self-actualization* and Rogers' (1951) client-centered model of clinical psychology that posited an inherent human tendency toward growth.

Central to contemporary positive psychology is the examination and promotion of well-being. In a landmark article on the topic, Deci and Ryan (2008) described well-being as a state of being fully functioning that goes beyond the absence of negative affect or pathology and is more inclusive than *happiness*. Happiness, they asserted, is more closely associated with *hedonia* (i.e., maximizing positive affect and pleasure), whereas well-being is aligned with *eudaimonia* (i.e., having meaning and purpose in life).

Well-being is typically operationalized as a multidimensional construct with several indicators. In a recent review of over 1,000 peer-reviewed articles that contained the key words "well-being indicators," Lijadi (2018) identified ten common indicators of well-being: life satisfaction, health, education, financial, social, community, time use, governance, environment, and religion. Further, they emphasized that indicators vary in salience depending on cultural and developmental considerations. The present study utilized a broad/global indicator (life satisfaction), as well as a relevant domain-specific indicator (education) in its examination of SVSM well-being. Before considering these indicators in greater detail, the need to examine well-being specific to the SVSM population is justified.

SVSM Well-Being

Since the proliferation of divisions of student affairs, supporting the well-being of students has been codified as an ethical mandate for all institutions of higher education (e.g., Madiba, 2014), and this is particularly true with respect to underrepresented student populations. SVSMs represent a rapidly growing minority population of college students.

It is well-documented that there has been a massive influx of U.S. military veterans and active military personnel entering U.S. institutions of higher education in the past decade, at least partially attributable to the passage of the Post-9/11 GI Bill, one of the most generous educational benefits for veterans in U.S. history (e.g., Sander, 2012). In fact, more than 1 million veterans, military personnel, and their beneficiaries have used the Post-9/11 GI Bill since it was passed in 2008 (Cate, 2014). Colleges and universities not only have the same *prima facie* duty to support SVSMs as they do to support all other student populations, they arguably have additional obligation to return services to those that have made significant sacrifices for the safety and well-being of the nation. Further, supporting the well-being of SVSMs is also in the best interests of colleges and universities because it nurtures the unique contributions that these students make to the intellectual vitality of the academy (e.g., Francis & Kraus, 2012). The present study examined their global and academic well-being.

Global Well-Being

Global well-being refers to a subjective, integrative assessment of positive functioning in general in a person's life (Diener, 1984). Life satisfaction has widely been used as a proxy for global well-being in psychological and educational research (e.g., Oishi, Diener, Choi, Kim-Prieto, & Choi, 2007; Sheu, Liu, & Li, 2017; Thøgersen-Ntoumani, Fox, & Ntoumanis, 2005), most commonly measured using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS has demonstrated good psychometric properties in recent college student samples (e.g., Garriott, Hudyma, Keene, & Santiago, 2015; Lent et al., 2005; Niemiec, Ryan, & Deci, 2009) and recent military/veteran samples (e.g., Hammer, Wan, Brockwood, Mohr, & Carlson, 2017; Proyer, Annen, Eggimann, Schneider, & Ruch, 2012; Seligowski et al., 2012; Skomorovsky & Sodom, 2011; Tsai, Harpaz-Rotem, Pietrzak, &

Southwick, 2012). The SWLS was used to operationalize global well-being in the present study and is described in detail in the following chapter.

Academic Well-Being

Academic well-being refers to positive functioning across facets of the student learning experience (e.g., subjective progress toward learning goals, positive affect in relation to schoolwork, perceived difficulty processing learning material; Nguyen & Deci, 2016). Academic satisfaction has been used as a proxy for academic well-being in recent psychological and educational research (e.g., Lent et al., 2005; Pedersen, 2017; Sheu et al., 2017), with the Academic Satisfaction Scale (ASS; Lent et al.) being a measure that has demonstrated good psychometric properties in recent college student samples (e.g., Garriott et al., 2015; Lent et al.). The ASS was used to operationalize academic well-being in the present study and is described in detail in the following chapter.

Summary

With the growing influence of positive psychology, significant recent attention has been given to the investigation of well-being. SVSMs represent a growing subpopulation of college students whose well-being the academy has an ethical mandate and vested interest in supporting. This study examined their well-being globally and specific to the academic domain. The next section introduces contextual factors that were hypothesized to relate to SVSM well-being.

Contextual Factors

In order for colleges and universities to best understand and support SVSM well-being, a keen understanding of the *context* in which well-being occurs is critical, as that represents an important area where student affairs professionals can intervene. Contextual factors relevant to the SVSM college experience include aspects of the campus environment, as well as social

identities that students possess. The present study focused on support received from Offices of Veterans and Military Services (OVMSs), perception of campus veteran friendliness, and veteran identity as key contextual factors that were hypothesized to predict SVSM well-being.

OVMS Support

A key way by which colleges and universities have attempted to support the well-being of SVSMs is through the establishment of OVMSs. The ways in which OVMSs provide support vary by institution, but all share a common core: “At the most basic level, OVMSs provide central contact points for student veterans and service members who are enrolled or are seeking to enroll, and OVMS staff work to ensure that individuals have access to the services and resources needed for their success” (Abel, Bright, & Cooper, 2013, p. 168). Many OVMSs offer additional services, including tutoring, career development assistance, social programming, and dedicated space for studying and socializing (e.g., Evans, Pellegrino, & Hoggan, 2015).

In some respects, OVMSs can be viewed as a contemporary extension of the campus culture center (CC) movement. The first CCs in the U.S. were established by African American students (“Black Culture Centers”) in the 1960s and 1970s to provide a welcoming space where African American students could congregate, receive support, and advocate for their well-being at predominantly white institutions (PWIs; Patton, 2010). CCs, also sometimes referred to as *resource centers*, have since been established around the country for other minority student populations including Latinas/os, Asian Americans, American Indians, LGBTQ students, and students with disabilities (Fine, 2012; Patton). The literature on relations between OVMS support and SVSM well-being is reviewed in turn, and it is supplemented by literature relating support from other CCs to well-being in other student populations.

OVMS support and SVSM well-being. Three articles were located that examined the relation between OVMS support (or close analogues) and SVSM well-being, all of them qualitative or anecdotal and all of them in the context of community colleges. Ahern, Foster, and Head (2015) reported SVSM enrollment and graduation rates increased dramatically in the five years after their institution established an OVMS. Similarly, SVSM graduation rates increased by 10 percent and dropout rates decreased by 55 percent in the two years after another institution established their OVMS (American Association of Community Colleges, 2013). Zinger and Cohen (2010) interviewed ten community college student veterans of the wars in Iraq and Afghanistan, and their participants largely reported that support from their structured Veteran Club (their closest analogue to an OVMS) was helpful, with one participant specifically reporting that it was supportive of their emotional well-being.

In sum, initial evidence suggests that OVMSs may be effective in supporting the well-being of SVSMs, but quantitative research guided by psychological theory remains a hole that scholars and student affairs professionals have repeatedly noted (e.g., Borsari et al., 2017; Kirchner, 2015). Thus, it is presently unclear to what extent these services are *actually* supporting SVSMs; in some cases we know which services are available to SVSMs and the rates at which they are being utilized, but the literature has not examined whether they are *perceived* as supportive by SVSMs nor statistically related to SVSM well-being. The present study addressed these gaps and extended this literature to include SVSMs at four-year universities.

Other culture centers and college student well-being. Three qualitative studies were located that suggest CCs for other student populations are supportive of their well-being. Jones, Castellanos, & Cole (2002) conducted focus groups with 35 students from several racial/ethnic minority groups at a PWI, and several students suggested their CC was supportive of their social

and emotional well-being, as well as student retention. Turner (1994) interviewed 17 students from several racial/ethnic minority groups at a PWI, and multiple students associated their CC usage with both emotional and academic well-being. Patton (2006) interviewed 11 African American students at a PWI, and multiple participants described their Black CC as helping them adjust to the campus and college life, buffering against stress and the adverse effects of racism on campus, and validating their racial identity. In sum, this area of the literature is plagued by similar shortcomings to the OVMS literature, but it does lend additional support for the notion that population-specific culture/resource centers are positively associated with college student well-being. Another contextual factor ostensibly associated with SVSM well-being is campus veteran friendliness.

Veteran-Friendly Campus Perception

The notion of creating a campus climate that is friendly and welcoming to SVSMs has become increasingly popular in the past decade, with the influx of SVSMs pursuing higher education since the passage of the Post-9/11 GI Bill (Heineman, 2016). The concept of establishing veteran-friendly campuses was especially encouraged by President Obama's (2012) executive order that institutions of higher education matriculating SVSMs abide by "principles of excellence." The Departments of Veterans Affairs and Education built upon this executive order and provided eight specific recommendations for institutions of higher education to support SVSMs, placing explicit emphasis on their well-being:

1. Create a culture of trust and connectedness across the campus community to promote well-being and success for veterans.
2. Ensure consistent and sustained support from campus leadership.

3. Implement an early alert system to ensure all veterans receive academic, career, and financial advice before challenges become overwhelming.
4. Coordinate and centralize campus efforts for all veterans, together with the creation of a designated space (even if the space is limited in size).
5. Collaborate with local communities and organizations, including government agencies, to align and coordinate various services for veterans.
6. Utilize a uniform set of data tools to collect and track information on veterans, including demographics, retention and degree completion.
7. Provide comprehensive professional development for faculty and staff on issues and challenges unique to veterans.
8. Develop systems that ensure sustainability of effective practices for veterans (U.S. Department of Education, 2013).

Existing measures of campus veteran friendliness have typically taken the form of checklists for institutions to verify they are providing mandated/recommended services (e.g., Environmental Evaluation for Veterans Index; Griffin & Gilbert, 2012), or single-item measures that query global perception of veteran friendliness without identifying any actual contributing factors. The present study examined the extent to which SVSMs *perceived* their campus as being veteran-friendly across multiple dimensions, which helped clarify the felt impact of their institutions' efforts and represents a novel contribution to the literature.

Veteran-friendly campus perception and well-being. Despite the widespread belief that a veteran-friendly campus is imperative for SVSM well-being, their relation has received minimal empirical validation and remains an area for which scholars have expressed need for sound investigation (e.g., Rumann & Hamrick, 2010). A single qualitative study was located that

sampled SVSMs in West Virginia who attended college before and after the passage of state legislation mandating veteran-friendly campuses. Positive experiences on campus was a more common theme among SVSMs attending college after the passage of the legislation than it was among SVSMs who attended the same institutions prior to the legislation (Adkins, 2015).

Military climate and well-being. Two studies were located that examined the relation between military workplace climate and well-being in active service members. In a survey of over 5,000 female service members (Offermann & Malamut, 2002), military workplace climate displayed small-medium correlations with two indicators of domain-specific well-being: organizational commitment ($r = .25, p < .01$) and job satisfaction ($r = .26, p < .01$). Russell and colleagues (2014) surveyed 1,132 Army National Guard soldiers and found small to medium correlations (r s from $-.10$ to $-.27, ps < .001$) between several indicators of workplace climate (e.g., unit cohesion, unit morale) and negative indicators of global well-being (e.g., depression, anxiety, alcohol abuse).

Campus climate and well-being. The linkage between campus climate and well-being has received more attention in the broader college student population. Five studies were located that analyzed the relation between campus climate and indicators of global well-being (Byrd & McKinney, 2012; Gloria, Castellanos, & Orozco, 2005; Gloria & Ho, 2003; Gloria, Kurpius, Hamilton, & Willson, 1999; Woodford et al., 2015). The relation was statistically significant in three of the studies, with correlations ranging from $.12$ to $.31$ ($ps < .05$). Six studies were located that analyzed the relation between campus climate and indicators of academic well-being (Brown et al., 2005; Edman & Brazil, 2009; Gloria & Ho; Gloria et al., 1999; Murray, Lombardi, & Kosty, 2014; Woodford & Kulick, 2015). The relation was statistically significant in five of the studies, with correlations ranging from $.15$ to $.52$ ($ps < .05$). In sum, climate measures have

demonstrated positive relations with well-being measures in both military and college student samples. The final SVSM-specific contextual factors included in the present study pertained to veteran identity.

Veteran Identity

All SVSMs have unique experiences of their military service, and these experiences intersect with other lived experiences and identities to establish a sense of veteran identity. Harada and colleagues (2002, p. 1118) are credited with offering the first cogent definition of veteran identity in the peer-reviewed literature: “veterans' self-concept that derives from his or her military experience within a sociohistorical context.” Thus, while there are undoubtedly some basic similarities among SVSMs (e.g., experience working within hierarchical organizations oriented toward national defense and public service), significant heterogeneity exists among the experiences and identities of SVSMs (Vaccaro, 2015).

Di Leone, Wang, Kressin, and Vogt (2016) conceptualized veteran identity as having two dimensions: centrality and positive regard. Centrality refers to how salient a person’s veteran status is to their self-concept, whereas positive regard refers to the affective valence a person holds toward their veteran status. In line with other identity scholars (e.g., Ashmore, Deaux, & McLaughlin-Volpe, 2004), Di Leone and colleagues found that veteran identity centrality and positive regard were related but distinct constructs in their veteran sample, correlating significantly at $r = .49$. That is, greater veteran identity centrality was *typically* associated with higher positive regard for veteran identity, but their relation was not perfect. This is bolstered by previous findings that negative experiences associated with a salient identity may lead to decreased (or negative) regard for that identity (e.g., Rüsçh et al., 2009). For these reasons, veteran identity centrality and positive regard were measured separately in the present study.

This study was the first to examine the relation between veteran identity and SVSM well-being. Literature relating other cultural identities to well-being is reviewed in turn.

Cultural identity and well-being. Five studies were located that examined the relation between racial/ethnic identity and global well-being. Two (Fan, Meng, Zhao, & Patel, 2012; Griffin et al., 2012) sampled college students, and both found significant relations between racial identity centrality and global well-being ($r_s = .15$ to $.33$, $p_s < .05$) as well as between positive regard for racial identity and global well-being ($r_s = .25$ to $.34$, $p_s < .01$). A meta-analysis of racial/ethnic minority children and adolescent samples (Rivas-Drake et al., 2014) also found a significant relation between positive regard for racial/ethnic identity and global well-being ($r = .26$, $p < .001$, $k = 27$, $N = 6089$). The remaining two studies (Liu & Zhao, 2016; Yap, Settles, & Pratt-Hyatt, 2011) sampled racial/ethnic minority adolescents and adults from the general population and found significant relations between racial/ethnic identity centrality and global well-being ($r = .23$, $p < .05$) as well as between positive regard for racial/ethnic identity and global well-being ($r_s = .20$ to $.29$, $p_s < .05$).

Three studies were located that examined the relation between racial/ethnic identity and academic well-being. The only study that sampled college students (Griffin et al., 2012) did not find a significant relation between racial identity centrality or positive regard and academic well-being. However, a meta-analysis of racial/ethnic minority children and adolescent samples (Rivas-Drake et al., 2014) did find a modest but significant relation between positive regard for racial/ethnic identity and academic well-being ($r = .18$, $p < .001$, $k = 25$, $N = 7822$). The final study (Santos & Collins, 2016) also found significant relations between positive regard for ethnic identity and multiple indicators of academic well-being in a sample of Latino children ($r_s = .19$ to $.25$, $p_s < .01$). Taken together, these studies suggest that cultural identity centrality and

positive regard for cultural identity are significant predictors of well-being, although further research is needed to better tease apart the relative importance of identity centrality and positive regard and to extend this line of inquiry to other populations (e.g., SVSMs).

Summary

The well-being of SVSMs occurs in particular contexts, and the extant literature suggests that OVMS support, perception of campus veteran friendliness, and veteran identity (i.e., centrality and positive regard) may be useful in predicting SVSM well-being. The present study filled an important hole by providing a quantitative analysis of these veteran-specific contextual factors. In addition, the literature in this area has largely lacked a guiding theoretical model. The next section details how this hole was filled by using self-determination theory (SDT) as a tool for explaining relations between contextual factors and SVSM well-being.

Self-Determination Theory

SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) is a meta-theoretical approach to human motivation and personality. It explains how people actualize their tendency for growth, function optimally, and attain well-being through intrinsically-motivated action in both broad and specific domains. Deci and Ryan (2000) described SDT as operating within an organismic dialectical framework in that it posits people do not passively receive support from their environments, but rather are active in constructing meaning from it and integrating it with an evolving sense of self. SDT has guided basic and applied research in a wide variety of disciplines, including education, business/management, human resources, athletics and physical activity, religion/spirituality, medicine, parenting, media, and clinical/counseling psychology (Deci & Ryan, 2012). Of note, SDT has guided a corpus of well-being research in college students and has been implemented in

a small number of military/veteran-related studies. For all of these reasons, SDT was a promising framework for understanding the complex and dynamic construct of SVSM well-being.

Academic Intrinsic Motivation

Ryan and Deci (2000) described intrinsic motivation as “the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn” (p. 70), and it can alternatively be described as engaging in an activity (e.g., college education) *for its own sake*. Intrinsic motivation is contrasted with extrinsic motivation, which involves engaging in a behavior for any of a number of reasons other than its inherently satisfactory nature (e.g., compliance with authority, avoiding anxiety or guilt, obtaining prestige or wealth), and amotivation, which is the absence of intention to act (Ryan & Deci). People can be considered to hold a general motivational orientation toward life, but the extent to which behavior is extrinsically versus intrinsically motivated can vary across domains, so it is common to assess motivation specific to the domain of interest (Deci & Ryan, 2000). Academic intrinsic motivation (AIM) has emerged as a construct to illustrate a pursuit of education characterized by curiosity, mastery, and immersion in the academic material. The Academic Motivation Scale (Vallerand et al., 1992) is the predominant SDT-consistent measure of academic motivation, and its three intrinsic subscales are typically averaged to produce a single AIM score. Consistent with the approach taken by other academic well-being scholars (e.g., Garriott et al., 2015) the present study focused exclusively on AIM, conceptualizing increased AIM to also signify decreased extrinsic motivation for academics and to take primacy over any extrinsic motivation that is present; the subsequent sections will review literature specific to AIM wherever possible.

AIM and well-being. Consistent with the core tenets of SDT, AIM has been positively associated with both global well-being and academic well-being in college students. Three

studies were located that related AIM to indices of global well-being in college students (Burton et al., 2006; Garriott, et al., 2015; Pisarik, 2009), with all finding significant correlations ranging from .19 to .42 ($ps < .001$). Four additional studies were located that related composite indicators of academic motivation (including AIM) to global well-being in college students (Litalien, Lüdtke, Parker, & Trautwein, 2013; Miquelon, Vallerand, Grouzet, & Cardinal, 2005; Niemiec et al., 2006; Ratelle, Senècal, Vallerand, & Provencher, 2005). The relation was statistically significant in all of the studies, with correlations ranging from .20 to .29 ($ps < .01$).

A recent meta-analysis was located that examined the relation between academic motivation and the specific academic well-being indicator of achievement in elementary, high school, and college students. Taylor and colleagues (2014), electing to convert all effect size estimates to Cohen's d , found that AIM had a small, significant relation with academic achievement across all age groups ($d = .27$, 95% $CI = .23 - .32$, $k = 10$, $N = 4270$). Further, AIM had a significantly stronger relation with academic achievement in high school and college students than in elementary school students, indicated by a significant between-class goodness-of-fit statistic ($Q_B(2) = 6.53$, $p < .05$). Four additional studies were located that examined relations between AIM and other indicators of academic well-being in college students: Black and Deci (2000) found a medium correlation between AIM and academic interest/enjoyment ($r = .45$, $p < .001$), Garriott et al. (2015) found a medium correlation between AIM and academic satisfaction ($r = .40$, $p < .001$), Látalová & Pilárik (2015) found small to medium correlations between AIM and multiple adaptive career decision-making behaviors ($rs = .20 - .46$, $ps < .01$), and Ratelle, Guay, Vallerand, Larose, & Senécal (2007) found a small correlation between AIM and academic persistence ($r = .25$, $p < .01$).

AIM as a mediating variable. Intrinsic motivation has also been found to relate to well-being by mediating relations between satisfaction of basic psychological needs (i.e., competence, autonomy, and relatedness) and well-being across various domains, including education. One study was located that examined academic motivation as a mediator of this relation in an adult sample. Using hierarchical linear modeling, Milyavskaya & Koestner (2011) found that a composite measure of academic motivation in which higher scores reflected intrinsic motivation was a significant, partial mediator of the relation between domain-specific need satisfaction and academic well-being (i.e., vitality and positive affect in the academic domain). Intrinsic motivation has also been found to significantly mediate relations between psychological need satisfaction and well-being in the domains of sports/exercise (full mediation: Moreno-Murcia & Hernández, 2013; Sylvester et al., 2014; partial mediation: Álvarez, Balaguer, Castillo, & Duda, 2009), interpersonal relationships (full mediation: Patrick, Knee, Canevello, & Lonsbary, 2007; partial mediation: Milyavskaya & Koestner), work (partial mediation: Milyavskaya & Koestner), and leisure (partial mediation: Milyavskaya & Koestner).

Basic Psychological Needs

SDT asserts that intrinsic motivation and well-being are facilitated by the satisfaction of three basic psychological needs (Ryan & Deci, 2000): perceived competence, volitional autonomy, and perceived relatedness. Three SDT sub-theories help to clarify the proposed relations among these constructs. Cognitive Evaluation Theory (Deci & Ryan, 1985) was presented to explain variability in intrinsic motivation. It stipulates that contextual factors are crucial predictors of intrinsic motivation and that these relations are often fully mediated by psychological need satisfaction. Basic Psychological Needs Theory (Ryan & Deci, 2002) was introduced to clarify the relations between psychological need satisfaction and well-being,

positing that need satisfaction relates directly to well-being and that in many cases it also fully mediates relations between contextual factors and well-being. Recently, Relationships Motivation Theory (Deci & Ryan, 2014) was added to SDT to underscore the relation between relatedness need satisfaction and well-being and identify characteristics of interpersonal relationships that are most supportive of this need and, in turn, well-being.

SDT research has examined the extent to which the basic psychological needs are satisfied in general in one's life, as well as in specific domains; the present study examined participants' need satisfaction in the context of their college education. That is, this study measured the extent to which participants felt competent, autonomous, and related to others with regard to their role as college students. Of note, the emphasis in SDT is on the *perception* of need satisfaction (Ryan & Deci, 2000); as such, measurement targets participants' subjective internal experience rather than, or in addition to, objective external circumstances. Importantly, SDT posits that these needs are universal (Ryan & Deci, 2002), and recent international research has corroborated this claim by finding that satisfaction of the psychological needs has similar outcomes across diverse cultures (Chen et al., 2015; Church et al., 2013). Each need is introduced in turn, along with evidence for their predictive utility. Evidence specific to perceived need satisfaction in the academic domain is presented whenever possible, otherwise empirical support was also drawn from studies that measured general need satisfaction (i.e., not specific to any domain).

Perceived competence. Perceived competence refers to a sense of self-efficacy or mastery (Ryan & Deci, 2000), and the present study considered this perception in the context of participants' college experience. As stated above, this construct relates to the perception that one is efficacious in collegiate academics rather than their actual academic achievement, with

achievement instead being an indicator of academic well-being. Perceived competence is particularly salient for SVSMs, as many have either delayed entry into college or experienced gaps in their education due to their military service, which poses a challenge to feeling like they are “keeping up” with their peers academically (e.g., DiRamio, Ackerman, & Mitchell, 2008). Of note, academic self-efficacy was considered as synonymous with perceived academic competence for the purpose of this literature review.

Relation to contextual factors. As mentioned previously, OVMS support has received minimal empirical investigation, and no studies were located that related OVMS support or utilization to perceived competence or a close analogue. One study was located in the broader college student literature that found a medium correlation ($r = .28, p < .001$) between disability services support and efficacy for self-advocating (Murray et al., 2014). As increasing academic competence is part of the mission of most OVMSs (Abel, Bright, & Cooper, 2013), the present study filled an important hole by examining the relation between OVMS support and the perceived competence of SVSMs.

No studies were located that related veteran-friendly campus perception or a close analogue to perceived competence or a close analogue. One study (Haile, 2007) was located that examined the relation between training climate and general perceived competence in a sample of Reserve Officers' Training Corps (ROTC) cadets, finding a medium-large correlation ($r = .42, p < .001$). Five studies were located that analyzed the relation between campus climate and indicators of perceived academic competence in the broader college student population (Byars-Winston, et al., 2010; Gloria & Ho, 2003; Gloria et al., 1999; Murray et al., 2014; Reid & Radhakrishnan, 2003). The relation was statistically significant in four of the studies, with correlations ranging from .27 to .56 ($ps < .01$).

No studies were located that related veteran identity or a close analogue to perceived competence or a close analogue. One study was located that examined the relation between racial identity and general perceived competence in a sample of Asian American college students. Kim and Omizo (2005) found that positive regard for racial identity had a small but significant relation with general perceived competence ($r = .22, p < .001$), whereas the relation between racial identity centrality and general perceived competence was not significant. Alternatively, racial identity centrality did display significant relations with general perceived competence in a sample of Asian American adolescents ($r = .27, p < .01$; Kim & Omizo, 2010) and with perceived occupational competence in a sample of African American adolescents ($r = .15, p < .05$; Lease, 2006).

Relation to academic intrinsic motivation. Five studies were located that analyzed the relation between perceived academic competence and AIM in college student samples (Black & Deci, 2000; Garriott et al., 2015; Simon, Aulls, Dedic, Hubbard, & Hall, 2015; Young-Jones, Cara, & Levesque-Bristol, 2014; Zook & Herman, 2011). The relation was statistically significant in all of the studies, with correlations ranging from .27 to .58 ($ps < .01$). Additionally, Simon and colleagues reported a significant path from perceived academic competence to AIM ($\beta = .14, p < .05$) in a marginally-fitting structural equation model of academic persistence and achievement (CFI = .94, RMSEA = .05). Two additional studies analyzed the relation between general perceived competence and AIM in college student samples (Ciani et al., 2011; Niemiec et al., 2009) and found significant correlations of .21 and .38 ($ps < .01$), respectively. No studies were located that examined the linkage between perceived competence and intrinsic motivation in a military sample.

Relation to well-being. Seven studies were located that examined the relation between perceived academic competence in college students and life satisfaction, which is the global well-being indicator that was used in the present study (Coffman & Gilligan, 2002; Garriott et al., 2015; Ojeda, Flores, & Navarro, 2011; O’Sullivan, 2011; Renshaw & Bolognino, 2016; Sheu et al., 2017; Vela et al., 2016). The relation was statistically significant in all of the studies, with correlations ranging from .21 to .44 ($ps < .05$). An additional 11 studies were located that examined the relation between general perceived competence and life satisfaction in college students (Byrd, Hageman, & Isle, 2007; León & Núñez, 2013; Niemiec et al., 2009; Reed et al., 2016; Saleh, Camart, & Romo, 2017; Schiffrin et al., 2014; Sivis-Cetinkaya, 2013; Smeets, Neff, Alberts, & Peters, 2014; Tracey & Rohlfing, 2010; Zhang, 2016; Zumberg, Chang, & Sanna, 2008). The relation was statistically significant in all of the studies, with correlations ranging from .25 to .59 ($ps < .01$). One study was located that examined the relation between perceived competence and life satisfaction in a U.S. veteran sample, finding a large correlation ($r = .60, p < .001$; Seligowski et al., 2012). Perceived competence has also demonstrated significant relations with other indicators of global well-being. For example, a recent meta-analysis (Lee et al., 2013) found a large correlation between perceived competence and psychological resilience in the general population (weighted $r = .61, k = 3, N = 1317$).

One study was located that examined the relation between perceived academic competence and academic satisfaction, which is the academic well-being indicator that was used in the present study, in a sample of military students (Artino, 2008). It found a moderate correlation ($r = .47, p < .001$). Seven studies were located that examined the relation between perceived academic competence and academic satisfaction in the general college student population (Garriott et al., 2015; Lent et al., 2005; Murray et al., 2014; Ojeda et al., 2011;

Renshaw & Bolognino, 2016; Sheu et al., 2017; Vela et al., 2016). The relation was statistically significant in all of the studies, with correlations ranging from .39 to .56 ($p < .05$). Perceived competence has also demonstrated significant relations with other indicators of academic well-being. A recent meta-analysis (Credé & Phillips, 2011) found small to moderate correlations between perceived academic competence and two indicators of academic well-being in college students: current-semester grades ($\rho = .37, k = 39, N = 8123$) and cumulative GPA ($\rho = .21, k = 9, N = 3798$). Another meta-analysis (Robbins et al., 2004) found moderate to large correlations between perceived academic competence and two indicators of academic well-being in college students: cumulative GPA ($\rho = .50, k = 18, N = 9598$) and persistence ($\rho = .36, k = 6, N = 6930$). Also, one study was located that examined the relation between perceived competence and military domain-specific well-being. Delahaij and colleagues (2014) found a large correlation between perceived competence and training persistence ($r = .55, p < .01$) in their sample of Dutch military recruits.

Perceived competence as a mediating variable. One study was located that tested a path model predicting AIM in college students and found perceived academic competence fully mediated the relation between an academic contextual factor (i.e., instructor support) and AIM (Zook & Herman, 2011); overall fit statistics for the model were not reported. Perceived competence has also been found to mediate relations between contextual factors and intrinsic motivation for adults in the domain of physical activity (partial mediation: Edmunds, Ntoumanis, & Duda, 2006; Markland & Tobin, 2010), including collegiate athletics (full mediation: Amorose & Anderson-Butcher, 2007).

Two studies using college samples were located that found general perceived competence to mediate relations between contextual factors and indicators of global well-being. Reed and

colleagues (2016) tested a structural equation model predicting college student well-being and found that general perceived competence fully mediated relations between parental support and life satisfaction; their overall model yielded a marginal fit (CFI = .91, RMSEA = .05). Schiffrin and colleagues (2014) tested a path model predicting college student well-being and found that general perceived competence fully mediated relations between parental support and both life satisfaction and mental health; their overall model yielded a good fit (CFI = .99, RMSEA = .06, SRMR = .02). Two additional studies using college samples were located that found composite measures of psychological need satisfaction (including perceived competence) mediated relations between contextual factors and indicators of global well-being, including life satisfaction (full mediation: Kasser et al., 2014; partial mediation: Niemiec et al., 2009), positive affect (full mediation: Kasser et al.; partial mediation: Niemiec et al.), and mental health (partial mediation: Niemiec et al.).

One study was located that tested a path model predicting the academic well-being indicator of persistence intentions in a college student sample. Byars-Winston and colleagues (2010) found that perceived academic competence fully mediated the relation between the contextual factor of campus climate and persistence intentions; the overall model yielded a good fit according to the available metric (CFI = .97). Another study was located that tested a path model predicting the military-domain well-being indicator of persistence intentions in a Dutch military sample and found that perceived competence fully mediated the relation between the contextual factor of training instructor support and persistence intentions (Delahaij et al., 2014); overall fit statistics for the model were not reported.

Volitional autonomy. Volitional autonomy refers to a sense of freedom to make one's own choices (Ryan & Deci, 2000), and the present study considered this perception in the

context of participants' college experience. Again, this construct relates to the *perception* that one is free to make choices related to their educational experience, regardless of the actual number or extent of choices they are afforded.

Relation to contextual factors. No studies were located that related OVMS support or utilization to volitional autonomy or a close analogue. Likewise, no studies were located that related support from other campus culture or resource centers to volitional autonomy. Hence, this represents another area where the present study made novel contributions to the SVSM and general college student literatures.

The relation between veteran-friendly campus perception and volitional autonomy has not been analyzed in the SVSM population, although two studies support similar relations in other populations. One study was located that analyzed the relation between learning climate and academic volitional autonomy in the broader college student population, finding a large correlation ($r = .57, p < .01$; Núñez, León, Grijalvo, & Albo, 2012). One study (Bann, Williams-Piehota, & Whittam, 2011) was located that examined the relation between leadership climate and volitional autonomy in a sample of U.S. Navy personnel, finding a moderate correlation ($r = .48, p < .001$).

No studies were located that related veteran identity to volitional autonomy or a close analogue. Likewise, no studies were located that related other cultural identities to volitional autonomy.

Relation to academic intrinsic motivation. Three studies were located that analyzed the relation between academic volitional autonomy and AIM in college student samples (Núñez et al., 2012; Young-Jones et al., 2014; Zook & Herman, 2011). The relation was statistically significant in all of the studies, with correlations ranging from .19 to .58 ($ps < .01$). Ciani et al.

(2011) also found a significant correlation between general volitional autonomy and AIM ($r = .36, p < .01$) in their college student sample. No studies were located that examined the linkage between volitional autonomy and intrinsic motivation in a military sample.

Relation to well-being. No studies were located that examined the relation between academic volitional autonomy and life satisfaction in college students, but six studies were located that examined the relation between general volitional autonomy and life satisfaction in college students (Haase, Heckhausen, & Silbereisen, 2012; León & Núñez, 2013; Merino & Privado, 2014; Niemiec et al., 2009; Paradnikė & Bandzevičienė, 2015; Schiffrin et al., 2014). The relation was statistically significant in all of the studies, with correlations ranging from .19 to .50 ($ps < .05$). No studies were located that examined the relation between volitional autonomy and life satisfaction in military or veteran samples. Volitional autonomy has also demonstrated significant relations with other indicators of global well-being. For example, a recent meta-analysis (Ng et al., 2012) found a moderate correlation between volitional autonomy and the global well-being indicator of vitality in healthcare and health promotion contexts (weighted $r = .35, k = 5, N$ not reported).

Volitional autonomy and academic well-being have not been analyzed conjointly in the SVSM population. However, two studies were located that support similar relations in other populations. Bann and colleagues (2011) examined the relation between volitional autonomy and the domain-specific well-being indicator of job satisfaction in a sample of U.S. Navy personnel, finding a moderate correlation ($r = .44, p < .001$). Paradnikė and Bandzevičienė (2015) analyzed the relation between general volitional autonomy and the academic well-being indicator of major satisfaction in the general college student population, finding a small correlation ($r = .21, p < .01$).

Volitional autonomy as a mediating variable. One study was located that tested a path model predicting AIM in college students and found academic volitional autonomy fully mediated the relation between an academic contextual factor (i.e., instructor support) and AIM (Zook & Herman, 2011); overall fit statistics for the model were not reported. Volitional autonomy has also been found to mediate relations between contextual factors and intrinsic motivation for adults in the domain of physical activity (partial mediation: Markland & Tobin, 2010), including collegiate athletics (full mediation: Amorose & Anderson-Butcher, 2007).

Schiffirin and colleagues (2014) tested a path model predicting college student well-being and found that general volitional autonomy fully mediated the relation between parental support and the global well-being indicator of mental health; their overall model yielded a good fit (CFI = .99, RMSEA = .06, SRMR = .02). Two additional studies using college samples were located that found composite measures of psychological need satisfaction (including volitional autonomy) mediated relations between contextual factors and indicators of global well-being, including life satisfaction (full mediation: Kasser et al., 2014; partial mediation: Niemiec et al., 2009), positive affect (full mediation: Kasser et al.; partial mediation: Niemiec et al.), and mental health (partial mediation: Niemiec et al.).

Volitional autonomy has not been examined as a mediator of relations between contextual factors and domain-specific well-being in college student or military samples. However, two studies were located that support similar indirect effects in other populations. Tian, Tian, & Huebner (2016) tested a structural equation model of academic well-being in middle and high school students and found that academic volitional autonomy fully mediated the relation between classmate support and the latent academic well-being variable, which included academic satisfaction as an indicator. Academic volitional autonomy also partially mediated the

relation between teacher support and academic well-being, and the overall model yielded a good fit (CFI = .96, RMSEA = .05). Chiniara and Bentein (2016) tested a structural equation model of domain-specific well-being in a sample of working Canadian adults and found that volitional autonomy fully mediated the relations between supervisor support and the workplace well-being indicators of task performance and organizational citizenship behavior; the overall model yielded a marginal fit (CFI = .91, RMSEA = .05).

Perceived relatedness. Perceived relatedness refers to a sense of mutual caring, concern, and connection with others (Ryan & Deci, 2000), and the present study considered this perception in the context of participants' college experience. Again, this construct relates to the *perception* that one has sufficient social connection on campus, regardless of the actual number or type of relationships they have on campus. Perceived relatedness is another highly salient consideration for SVSMs, as they represent a typically invisible minority population that often differs from traditional college students in terms of age, lived experience, and in some cases political views (e.g., DiRamio et al., 2008).

Relation to contextual factors. No quantitative studies were located that related OVMS support or utilization to perceived relatedness or a close analogue. One qualitative study was located that provided some support for this linkage. Zinger & Cohen (2010) found that several of their student veteran participants reported feeling socially disconnected on campus, but that support from their structured Veteran Club (their closest analogue to an OVMS) provided a place that they could experience social connection, even if only with other veterans. Three qualitative studies were located that related support from other campus culture or resource centers to perceived relatedness (Jones et al., 2002; Patton, 2006; Turner, 1994), with a recurrent theme being the provision of a "home away from home." This conceptual relation represents another

area where the present study made novel contributions to the SVSM and general college student literatures by providing a quantitative analysis.

No quantitative studies were located that related veteran-friendly campus perception or a close analogue to perceived relatedness or a close analogue. A single qualitative study was located that sampled SVSMs in West Virginia and found that SVSMs attending college after the passage of state legislation mandating veteran-friendly campuses more frequently reported a sense of belonging on campus than their peers who attended the same institutions prior to the legislation (Adkins, 2015). No studies were located that related military climate to perceived relatedness or a close analogue.

Eight studies were located that related campus climate to perceived academic relatedness in the broader college student population. Two studies (Hurtado & Ponjuan, 2005; Wells & Horn, 2015) reported correlations of .17 to .38 ($ps < .01$), respectively. Three studies (Johnson, 2012; Soria & Bultmann, 2014; Stebleton, Soria, Huesman, & Torres, 2014) reported regression coefficients ranging from .18 to .27 ($ps < .05$). Three studies reported significant paths from campus climate to perceived academic relatedness (β s from .12 to .43, $ps < .05$) in well-fitting structural equation models of perceived academic relatedness (CFI = .98, RMSEA = .04, Locks, Hurtado, Bowman, & Oseguera, 2008; CFI = .97, RMSEA = .03, Maramba & Museus, 2013), as well as a marginally-fitting structural equation model of perceived academic relatedness (CFI = .92, RMSEA = .03; Nuñez, 2009). Fleming and colleagues (2017) found a significant correlation between campus climate and general perceived relatedness ($r = .27, p < .01$) in their college student sample.

No studies were located that related veteran identity or a close analogue to perceived relatedness or a close analogue. Two studies were located that examined the relation between

other cultural identities and perceived relatedness in college student samples. Dueñas & Gloria (2017) found a large correlation between positive regard for ethnic identity and perceived academic relatedness ($r = .53, p < .001$). Miville, Romans, Johnson, & Lone (2004) found a medium correlation between positive regard for cultural identity (broadly defined) and general perceived relatedness ($r = .37, p < .001$), whereas the correlation between cultural identity centrality and general perceived relatedness was not significant. Alternatively, cultural identity centrality did display significant correlations with perceived relatedness in non-college samples of African American adults ($r = .48, p < .05$; Yap et al., 2011) and sexual minority adults ($r = .16, p < .001$; Dunn & Szymanski, 2018).

Relation to academic intrinsic motivation. Two studies were located that analyzed the relation between perceived academic relatedness and AIM in college student samples (Young-Jones et al., 2014; Zook & Herman, 2011). The relation was statistically significant in both of the studies, with correlations ranging from .22 to .45 ($ps < .01$). Ciani et al. (2011) analyzed the relation between general perceived relatedness and AIM in a college student sample and found a significant correlation ($r = .32, p < .01$). No studies were located that examined the linkage between perceived relatedness and intrinsic motivation in a military sample.

Relation to well-being. Four studies were located that examined the relation between perceived academic relatedness in college students and life satisfaction (Elliott & Doane, 2015; Harris, English, Harms, Gross, & Jackson, 2017; Ng et al., 2013; Renshaw & Bolognino, 2016). The relation was statistically significant in all of the studies, with correlations ranging from .23 to .62 ($ps < .05$). An additional seven studies were located that examined the relation between general perceived relatedness and life satisfaction in college students (Haase et al., 2012; Huynh, Devos, & Smalarz, 2011; León & Núñez, 2013; Niemiec et al., 2009; Pillow, Malone, & Hale,

2015; Schiffrin et al., 2014; Smeets, et al., 2014). The relation was statistically significant in all of the studies, with correlations ranging from .15 to .57 ($ps < .01$). One study was located that examined the relation between perceived relatedness and life satisfaction in a U.S. veteran sample, finding a large correlation ($r = .50, p < .01$; Tsai et al., 2012). Perceived relatedness has also demonstrated significant relations with other indicators of global well-being. For example, a recent meta-analysis (Lee et al., 2013) found a moderate correlation between perceived relatedness and psychological resilience in the general population (weighted $r = .41, k = 5, N = 1140$).

Five studies were located that examined the relation between perceived academic relatedness in college students and the academic well-being indicator of academic satisfaction (Fleming et al., 2017; Harris et al., 2017; McKinney, McKinney, Franiuk, & Schweitzer, 2006; Renshaw & Bolognino, 2016; Thompson et al., 2007). All studies found small to medium relations between perceived academic relatedness and academic satisfaction (rs from .23 to .42, $ps < .05$). No studies were located that examined the relation between perceived relatedness and domain-specific well-being in a military sample.

Perceived relatedness as a mediating variable. No studies were located that found perceived relatedness to mediate relations between the collegiate academic context and AIM. However, perceived relatedness was found to fully mediate the relation between the contextual factor of coach support and athletic intrinsic motivation in a sample of college athletes (Amorose & Anderson-Butcher, 2007), and it also mediated relations between contextual factors and motivation for exercise in adolescent samples (full mediation: Koka & Hagger, 2010; Moreno-Murcia & Hernández, 2013; partial mediation: Riley & Smith, 2011).

One study was located that tested a structural equation model predicting college student well-being and found that perceived academic relatedness fully mediated relations between the contextual factor of discrimination and the latent global well-being variable, which included indicators of life satisfaction and mental health (Elliott & Doane, 2015); the overall model yielded a good fit (CFI = .97, RMSEA = .06, SRMR = .06). Using hierarchical regression, Mounts (2004) also found that perceived academic relatedness fully mediated relations between the contextual factors of parental support and campus climate and the global well-being indicator of mental health in their college student sample. Two additional studies using college samples were located that found composite measures of psychological need satisfaction (including perceived relatedness) mediated relations between contextual factors and indicators of global well-being, including life satisfaction (full mediation: Kasser et al., 2014; partial mediation: Niemiec et al., 2009), positive affect (full mediation: Kasser et al.; partial mediation: Niemiec et al.), and mental health (partial mediation: Niemiec et al.).

One study was located that tested a structural equation model predicting the academic well-being indicator of persistence in a college sample and found that perceived academic relatedness partially mediated the relation between the contextual factor of parental support and academic persistence (Ratelle, Larose, et al., 2005); the overall model yielded a good fit (CFI = .97, RMSEA = .04). Two additional studies were located that sampled adolescent students. Tian and colleagues (2016) tested a structural equation model of academic well-being in middle and high school students and found that perceived academic relatedness fully mediated the relation between classmate support and the latent academic well-being variable, which included academic satisfaction as an indicator. Perceived academic relatedness also partially mediated the relation between teacher support and academic well-being, and the overall model yielded a good

fit (CFI = .96, RMSEA = .05). Using multilevel regression analyses in a sample of middle and high school students, Taylor and Lonsdale (2010) found that perceived academic relatedness fully mediated the relation between teacher support and the academic well-being indicator of effort.

Summary

SDT posits that contextual factors relate to well-being through perceived satisfaction of basic psychological needs (i.e., competence, autonomy, and relatedness) and the facilitation of intrinsic motivation. Overall, the available literature supports these relations in college and military populations, but it has provided minimal quantitative examination of well-being in the SVSM subpopulation and SVSM-specific contextual factors. The literature is particularly clear in supporting direct, positive relations between psychological need satisfaction, AIM, and well-being. The evidence is less abundant in supporting the mediation effects that SDT stipulates, and it has also been mixed as to whether the psychological needs and AIM serve as full or partial mediators of relations with well-being. The present study sought to bring greater clarity to the broader college student SDT literature and provide a novel extension to the SVSM subpopulation.

Need for the Present Study

This chapter described each of the constructs that were included in the hypothesized model of SVSM well-being and reviewed the literature supporting their hypothesized relations. An overarching theme of this chapter was that SDT represented a promising theoretical framework for explaining relations between contextual factors and SVSM well-being, and it was bolstered by extensive empirical support. The present study thus represented a timely and justified extension of SDT to a new population whose well-being has received insufficient

quantitative investigation. In addition to this broad area of novel contribution, the present study filled multiple other holes in the extant literature including:

- Providing a quantitative portrait of the felt impact of OVMS services at four-year universities and their relation to SVSM well-being; the novel OVMS support measure (detailed in the next chapter) may also inform how other campus culture/resource centers measure their outcomes/efficacy.
- Examining the relation between OVMS support and veteran-friendly campus perception, which can also help frame similar investigations regarding support services and campus climate for other minority student populations.
- Quantifying individuals' *perception* of campus veteran friendliness across multiple dimensions, which is a departure from previous investigations that have mostly just quantified the number of military/veteran-supportive resources and policies on campus.
- Providing a quantitative investigation of SVSMs' veteran identity centrality and positive regard for veteran identity and how they relate to numerous other psychological constructs, which can inform student affairs professionals' outreach and service delivery efforts.

CHAPTER 3. METHOD

This chapter outlines the methodology that was used in the present study. The research design, participants, measures, procedure, and hypotheses are described in turn. Chapter 4 will present the results of the study.

Design

This study used a cross-sectional correlational design. The predictor variables were office of veterans and military services (OVMS) support, veteran-friendly campus perception, veteran identity centrality, positive regard for veteran identity, perceived competence, volitional autonomy, perceived relatedness, and academic intrinsic motivation. The criterion variables were academic well-being and global well-being. The mediator variables were perceived competence, volitional autonomy, perceived relatedness, and academic intrinsic motivation. Figure 1 shows the predicted relations between variables.

Participants

The target population for this study was full-time college student veterans and service members (SVSMs). The sample was collected at the start of the Fall 2018 semester and included full-time SVSMs from Iowa State University, the University of Iowa, and the University of Northern Iowa, all of whom were at least 18 years of age. Full-time status was defined by each institution's Registrar and was the same for all of the participant institutions: 12 or more credits for undergraduates and 9 or more credits for graduate students. Further, distance learners (i.e., students enrolled exclusively in online courses) were excluded from participation. Part-time and distance learner students were excluded because their experience of the campus environment is qualitatively different from that of full-time, in-person students. The initial eligible sample included 215 participants that met the inclusion criteria (i.e., at least 18 years old, currently or

previously served in the U.S. military, full-time status, taking at least one class in-person on campus). The total estimated enrollment of full-time SVSMs across the three participating institutions was 854 at the start of the Fall 2018 semester, so the initial sample represented a total response rate of 25.2%. Response rates varied by institution, with Iowa State University having a 34.0% response rate, the University of Iowa having a 20.4% response rate, and the University of Northern Iowa having a 10.6% response rate.

Following the data cleaning that will be described in Chapter 4, the final sample included 182 participants. The distribution of participants by institution was 106 from Iowa State University (58.2%), 65 from the University of Iowa (35.7%), and 11 from the University of Northern Iowa (6.0%). Ninety-six participants identified as current members of the U.S. military (52.7%), and 86 participants identified as veterans (i.e., previously served but currently separated from the U.S. military; 47.3%). Participant ages ranged from 18 to 56 ($M = 25.47$, $SD = 7.20$), 129 identified as male (70.9%), 52 identified as female (28.6%), and one participant did not provide a gender identity (0.5%). Regarding racial diversity of the sample, 161 identified as White/European American (88.5%), seven identified as multiracial (3.8%), four identified as Black/African American (2.2%), four identified as Asian American (2.2%), two identified as American Indian or Alaska Native (1.1%), and four participants did not provide a racial identity (2.2%). Regarding ethnicity, 152 identified as not Hispanic or Latino/a (83.5%), 22 identified as Hispanic or Latino/a (12.1%), and eight participants did not provide an ethnic identity (4.4%). All participants reported having U.S. citizenship. Descriptive statistics for all demographic and military background variables are included in Table 2. Regarding military educational benefits, 85.7% of participants reported using at least one benefit, with 30.1% of participants reporting

using multiple benefits. Descriptive statistics for military educational benefit utilization are included in Table 3.

Regarding statistical power, a sample size of 150 to 200 was recommended to detect mediation effects in models with small to medium path coefficients, which is what was expected in the present study (Fritz & MacKinnon, 2007). This recommendation was also consistent with Bentler & Chou's (1987) recommendation to have five participants for each estimated parameter (present study: 33 parameters \times 5 = 165). The present sample ($N = 182$) was in the upper half of this range and was thus considered to provide adequate statistical power for the main analyses.

Measures

Demographics

Participants were asked to indicate their age, current military affiliation, full-time classification, distance learner status, institution, class standing, race, ethnicity, citizenship status, gender, sexual orientation, relationship status, parental status, branches they served in, components they served in, combat deployment history, veteran/military educational benefits they are currently using, and the extent to which they have used various services provided by their university's OVMS. The demographic questionnaire is shown in Appendix A.

Office of Veterans and Military Services Support

Office of veterans and military services (OVMS) support was measured using the OVMS Support Scale, the author's adaption of another measure that was used to operationalize participants' perceptions of a parenting skills program called the Social Support Scale (SSS; Hughes & Gottlieb, 2004), namely in item content. The original SSS items were as follows:

1. Do you think you have enough support as a parent?
2. How helpful is the support you get?

3. How satisfied are you with the support you get?

The OVMS Support Scale had five items and used a five-point Likert scale ranging from 1 to 5, with the item content including amount of support, helpfulness, and satisfaction with services. A higher score indicated more perceived support from the participant's OVMS. The wording of the items varied to include the name of the OVMS at each participant's institution (e.g., Iowa State University students were asked "Overall, how supported do you feel by *the ISU Veterans Center?*"). The original three-item SSS displayed acceptable internal consistency ($\alpha = .69$) in its validation sample of mothers in a parenting skills program. No other studies were located that have used the SSS. Studies in the extant literature have measured utilization of environmental supports, including campus resource and culture centers (e.g., Patton, 2010), but studies measuring the extent to which students *perceive* they are supported by these entities are essentially non-existent, hence the need to adapt a measure from outside of the college student literature. Coefficient alpha for this scale in the present study was .95. The items for the OVMS Support Scale are included in Appendix B.

Veteran-Friendly Campus Perception

Veteran-friendly campus perception was measured using the Veteran-Friendly Campus Scale (VFCS), a composite scale created by the author. No measure of perceived campus friendliness for veterans could be located in the psychological or educational literatures, so two general campus climate measures were adapted to serve this purpose. This included the Racial Climate Subscales (RCS; Reid & Radhakrishnan, 2003), which comprises racial experiences and university perceptions subscales, and the cultural validation subscale of the Culturally Engaging Campus Environments Scale (CECE; Museus, Zhang, & Kim, 2016). The RCS subscales displayed acceptable internal consistency in their validation samples (α s ranging from .70 to .79),

as did the CECE cultural validation subscale ($\alpha = .91$). The VFCS was 13 items, using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Item content concerned interactions with other students, faculty, and the campus as a whole; recruitment efforts, respect, and inclusion toward SVSMs; and perceived valuing by the campus community of the presence, experiences, and knowledge of SVSMs. An example item was “I have experienced insensitivity related to my military/veteran status from faculty.” After reverse scoring some of the items, a higher score on the VFCS indicated greater perception that the campus is friendly for SVSMs. Coefficient alpha for this scale in the present study was .92. The items for the VFCS are included in Appendix C.

Veteran Identity Centrality

Veteran identity centrality was measured using the Veteran Identity Centrality Scale (VICS; Di Leone et al., 2016). The VICS was five items and uses a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with a higher score indicating that the participant’s veteran identity is more central to their overall self-concept. An example item was “Being a veteran is a central part of who I am.” The VICS was adapted for use with veterans from the Centrality scale of the Multidimensional Inventory of Black Identity (Sellers, Rowley, Chavous, Shelton, & Smith, 1997), a psychometrically sound, landmark identity measure. In Di Leone and colleagues’ sample of 407 female U.S. veterans of the wars in Iraq and Afghanistan, the VICS displayed acceptable internal consistency ($\alpha = .73$) and correlated moderately with the Positive Regard for Veteran Identity Scale ($r = .49, p < .001$) suggesting they measure related yet distinct constructs. The VICS demonstrated criterion validity by relating significantly to entitlement to use Veterans Health Administration (VHA) services ($r = .34, p < .001$) and perceived fit within the VHA setting ($r = .35, p < .001$). Further, participants with higher versus

lower VICS scores were almost twice as likely to have used the VHA for medical care ($OR = 1.89, p < .001$) and were twice to three times more likely to have used the VHA for mental health care ($OR = 2.51, p = .02$) in the past six months. These outcomes are relevant to the present study because they link veteran identity centrality to a veteran-specific environmental support. No other studies were located that have used the VICS. Coefficient alpha for this scale in the present study was .73. The items for the VICS are included in Appendix D.

Positive Regard for Veteran Identity

Positive regard for veteran identity was measured using the Positive Regard for Veteran Identity Scale (PRVIS; Di Leone et al., 2016). The original PRVIS had three items and used a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with a higher score indicating more positive feelings toward the participant's identity as a veteran. An example item was "I am proud to be a veteran." The PRVIS was adapted for use with veterans from the Collective Self-Esteem–Revised scale (Luhtanen & Crocker, 1992), a psychometrically sound, landmark measure of esteem (i.e., positive regard) toward a collective identity (e.g., military veteran). The PRVIS demonstrated criterion validity by relating significantly to entitlement to use Veterans Health Administration (VHA) services ($r = .25, p < .001$). The PRVIS was not significantly related to past use of VHA services. However, it was significantly related to reported likelihood of using VHA services in the future ($r = .15, p = .002$). As with veteran identity centrality, these outcomes are relevant to the present study because they link positive regard for veteran identity to a veteran-specific environmental support. The PRVIS had marginal internal consistency ($\alpha = .67$) in its validation sample of female veterans, likely due to having only three items. Two additional items were added in the present study to improve the internal consistency of the measure. No other studies were located that have used the PRVIS. Coefficient

alpha for this scale in the present study was .75. The items for the PRVIS are included in Appendix E.

Psychological Need Satisfaction

Perceived satisfaction of the three psychological needs was measured using the Basic Psychological Need Satisfaction Scale – General Measure (BPNS-G; Gagné, 2003), which measures satisfaction of the psychological needs posited by self-determination theory (SDT) in general in one’s life using subscales for competence, autonomy, and relatedness. No measure of psychological need satisfaction specific to the academic domain was located in the extant literature, so the wording of the BPNS-G items was modified to reflect perceived need satisfaction in the context of participants’ college education. For example, “I feel like I am free to decide for myself how to live my life” was changed to “I feel like I am free to make my own decisions about my college education.” The present study was the first to adapt the BPNS-G specifically to the collegiate academic domain.

The BPNS-G had 21 total items, and all items used a seven-point scale ranging from 1 (not at all true) to 7 (very true). After some of the items were reverse scored, higher scores indicated greater satisfaction of the corresponding psychological need. In its initial validation sample of 121 undergraduates, the BPNS-G demonstrated good overall internal consistency ($\alpha = .89$), and the subscales all correlated strongly (r s between .61 and .66, p s < .001; Gagné, 2003). It is noteworthy that the psychological need subscales have correlated less strongly in the context of specific domains; for example, the subscales correlated between .38 and .50 when assessed specifically for the work domain using a similar measure (Deci et al., 2001). The original BPNS-G has been used in five other studies, including a sample of recent college graduates in the U.S. (Niemic et al., 2009). The items for the adapted BPNS-G are included in Appendix F.

Perceived competence. The adapted competence subscale was six items and measured on the 1 to 7 scale mentioned above, with higher scores indicating more perceived self-efficacy or mastery in the academic domain. The item wording was modified to reflect the focus on the academic domain. For example, “Most days I feel a sense of accomplishment from what I do” was changed to “Most days I feel a sense of accomplishment from my schoolwork.” The original competence subscale demonstrated acceptable internal consistency in college samples ($\alpha = .71$ in Gagné, 2003; $\alpha = .73$ in Niemiec et al., 2009). Of relevance to the present study, competence correlated strongly ($r = .59, p < .01$) with life satisfaction (an indicator of global well-being), and moderately to strongly (r s between .38 and .52, p s $< .01$) with the pursuit of four different types of intrinsic aspirations (e.g., personal growth) in Niemiec et al. Coefficient alpha for this scale in the present study was .66.

Volitional autonomy. The adapted autonomy subscale was seven items and measured on the 1 to 7 scale mentioned above, with higher scores indicating more perceived control over one’s academic choices. The item wording was modified to reflect the focus on the academic domain. For example, “There is not much opportunity for me to decide for myself how to do things in my daily life” was changed to “There is not much opportunity for me to decide for myself how to do things in my courses.” The original autonomy subscale demonstrated acceptable internal consistency in college samples ($\alpha = .69$ in Gagné, 2003; $\alpha = .73$ in Niemiec et al., 2009). Of relevance to the present study, autonomy correlated strongly ($r = .50, p < .01$) with life satisfaction and moderately to strongly (r s between .37 and .62, p s $< .01$) with the pursuit of intrinsic aspirations in Niemiec et al. In the present study, one item (“In my daily college experience, I frequently have to do what I am told) had a very low corrected item-total

correlation ($r = .09$) and was excluded from further analyses. Coefficient alpha for the final six-item scale was .63 in the present study.

Perceived relatedness. The adapted relatedness subscale was eight items and measured on the 1 to 7 scale mentioned above, with higher scores indicating more perceived belonging and interpersonal connection on campus. The item wording was modified to reflect the focus on the academic domain. For example, “I pretty much keep to myself and don't have a lot of social contacts” was changed to “I pretty much keep to myself and don't have a lot of social contacts on campus.” The original relatedness subscale demonstrated good internal consistency in college samples ($\alpha = .86$ in Gagné, 2003; $\alpha = .83$ in Niemiec et al., 2009). Of relevance to the present study, relatedness correlated strongly ($r = .57, p < .01$) with life satisfaction and moderately to strongly (r s between .30 and .55, p s $< .01$) with the pursuit of intrinsic aspirations in Niemiec et al. Coefficient alpha for this scale in the present study was .86.

Academic Intrinsic Motivation

Academic intrinsic motivation was measured using the intrinsic motivation subscales (i.e., to know, toward accomplishment, and to experience stimulation) of the Academic Motivation Scale (AMS; Vallerand et al., 1992), a landmark measure of students' motivations for pursuing college education across the SDT motivational taxonomy. The AMS has consistently demonstrated good internal consistency and has been predictive of a wide array of academic and personal outcomes in college students (e.g., Clark, Middleton, Nguyen, & Zwick, 2014; Vallerand et al., 1993).

The three intrinsic motivation subscales were combined to form a single Academic Intrinsic Motivation Scale (AIMS) containing 12 items on a seven-point scale ranging from 1 (does not correspond) to 7 (corresponds exactly), with higher scores indicating stronger intrinsic

motivation for attending college. An example item was “Because my studies allow me to continue to learn about many things that interest me.” This approach was previously used in a sample of 414 college students across the U.S., and the AIMS demonstrated good internal consistency ($\alpha = .94$; Garriott et al., 2015). The AIMS also correlated significantly with multiple variables in Garriott et al. that are relevant to the present study: academic self-efficacy ($r = .52, p < .001$), academic satisfaction ($r = .40, p < .001$), and life satisfaction ($r = .19, p < .001$). Of note, academic and life satisfaction were measured using the same scales that were used in the present study. Coefficient alpha for this scale in the present study was .91. The items for the AIMS are included in Appendix G.

Academic Well-Being

Academic well-being was measured using the Academic Satisfaction Scale (ASS; Lent et al., 2005), a measure of college students’ satisfaction across several aspects of their academic experience (e.g., major, coursework, intellectual stimulation). The ASS had seven items that used a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), with higher scores suggesting greater satisfaction with the student’s collegiate academic experience. An example item was “I feel satisfied with the decision to major in my intended field.” In its initial validation sample of 177 undergraduates at a large eastern U.S. university, the ASS demonstrated good internal consistency ($\alpha = .87$) and significantly correlated with two variables that are relevant to the present study: academic self-efficacy ($r = .56, p < .05$) and life satisfaction ($r = .36, p < .05$; Lent et al.). The ASS was also used in Garriott and colleagues’ (2015) college student sample, where it again demonstrated good internal consistency ($\alpha = .88$) and correlated significantly with the relevant variables academic self-efficacy ($r = .47, p < .001$), academic intrinsic motivation

($r = .40, p < .001$), and life satisfaction ($r = .36, p < .001$). Coefficient alpha for this scale in the present study was .87. The items for the ASS are included in Appendix H.

Global Well-Being

Global well-being was measured using the Satisfaction with Life Scale (SWLS; Diener et al., 1985), a landmark measure of global satisfaction with one's life (currently and in retrospect) that has been used extensively across the social sciences, including in the investigation of college student and military/veteran well-being. The SWLS had five items that used a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), with higher scores suggesting greater overall satisfaction with life. An example item was "In most ways my life is close to my ideal." In its initial validation sample of 176 undergraduates at a large university in the Midwestern U.S., the SWLS demonstrated good internal consistency ($\alpha = .87$) and two-month test-retest reliability ($r = .82$), and all items loaded on a unitary factor with factor loadings between .61 and .84 (Diener et al.).

The SWLS has continued to demonstrate good internal consistency in recent college student samples (e.g., $\alpha = .89$ in Garriott et al., 2015; $\alpha = .92$ in Lent et al., 2005; $\alpha = .87$ in Niemiec et al., 2009). As mentioned previously, it has also demonstrated significant correlations in college student samples with other measures that will be used in the present study: the BPNS-G competence subscale ($r = .59, p < .01$ in Niemiec et al.), the BPNS-G autonomy subscale ($r = .50, p < .01$ in Niemiec et al.), the BPNS-G relatedness subscale ($r = .57, p < .01$ in Niemiec et al.), the Academic Satisfaction Scale ($r = .36, p < .001$ in Garriott et al.; $r = .36, p < .05$ in Lent et al.), and the Academic Intrinsic Motivation Scale ($r = .19, p < .001$ in Garriott et al.).

The SWLS has also demonstrated good internal consistency in recent military/veteran samples: 221 Swiss military officers ($\alpha = .85$; Proyer, Annen, Eggimann, Schneider, & Ruch,

2012), 200 Canadian military officer candidates ($\alpha = .75$; Skomorovsky & Sudom, 2011), 493 recently-separated U.S. veterans and current National Guardsmen/Reservists ($\alpha = .90$; Hammer, Wan, Brockwood, Mohr, & Carlson, 2017), and 562 older adult U.S. veterans ($\alpha = .91$; Seligowski et al., 2012). Of relevance to the present study, the SWLS correlated moderately with a measure of domain-specific well-being (work satisfaction; $r = .45, p < .01$) in Proyer et al. The SWLS also had significant relations with job satisfaction (r s from .29 to .42, p s $< .001$) and veteran-supportive supervisor behaviors (a relevant contextual factor; r s from .19 to .21, p s $< .05$) across the active military and veteran subsamples in Hammer et al. In the Seligowski et al. sample, the SWLS demonstrated concurrent validity by correlating strongly with a measure of mental health ($r = .57, p < .001$), and it also had significant relations with social support (a relevant contextual factor; $r = .51, p < .001$) and an analogue for perceived competence (sense of mastery; $r = .60, p < .001$). Coefficient alpha for this scale in the present study was .82. The items for the SWLS are included in Appendix I.

Procedure

This study was declared exempt by the Iowa State University Institutional Review Board (IRB) on March 22nd, 2018 (see Appendix J). Per Iowa State IRB's request, the IRBs at the University of Iowa and the University of Northern Iowa were asked if they required any form of review prior to survey distribution to their SVSMs. The University of Northern Iowa IRB did not require independent review but asked to be provided with the Iowa State IRB application and exempt status letter for their files. The University of Iowa IRB required its own review for exempt status with a collaborator from their campus and declared the study exempt on June 1st, 2018 (see Appendix K). Correspondence with the IRBs at all three institutions is included in Appendices L through N.

At the start of the Fall 2018 semester, the directors/coordinators of the OVMS at each of the three institutions invited their constituent SVSMs to participate via email and provided a link to the Qualtrics survey. A script is included in Appendix O that provides wording for the invitation. Participation was incentivized by offering participants the opportunity to enter their email address in a random drawing for one of four \$25 Amazon gift cards. The prize drawing was conducted using a different Qualtrics survey that kept participants' identifying information completely separate from their study responses. All three OVMS directors/coordinators sent a follow-up email approximately two weeks later to encourage SVSMs who had not yet participated to complete the survey. The Iowa State University OVMS director sent an additional follow-up email approximately four weeks after the initial invitation, but the directors/coordinators at the two other institutions declined to do so. A script is included in Appendix P that provides wording for the follow-up invitations.

When participants clicked on the survey link, they were first presented with an informed consent statement (see Appendix Q) and required to indicate their agreement before proceeding to the demographic questionnaire. The initial demographic questions verified that all participants were at least 18 years of age, veterans or current service members, full-time status, not distance learners, and currently enrolled at Iowa State University, the University of Iowa, or the University of Northern Iowa. Minors, non-veterans/service members, part-time students, distance learners, and students enrolled at other institutions were thanked for their willingness to participate and exited from the survey. After participants selected their institution, they were branched so that the remaining questions in the survey referred to their specific OVMS when applicable.

After completing the remaining demographic questions, Qualtrics survey logic presented the conceptual measures (i.e., the OVMS Support Scale, the Veteran-Friendly Campus Scale, the Veteran Identity Centrality Scale, the Positive Regard for Veteran Identity Scale, the Basic Psychological Need Satisfaction Scale- General Measure, the Academic Intrinsic Motivation Scale, the Academic Satisfaction Scale, and the Satisfaction with Life Scale) in randomized order. Upon completing the survey, participants were debriefed regarding the purpose of the study (see Appendix R) and provided a link to the prize drawing survey. After data collection was completed in October 2018, four participants were randomly selected and sent \$25 Amazon gift cards via email.

Hypotheses

The overarching hypothesis for this study was that the path model depicted in Figure 1 would yield a good fit. This model allowed the three psychological needs to relate directly to the well-being variables, as well as indirectly via academic intrinsic motivation. It was also predicted that the hypothesized model would yield a better fit than the alternative path model depicted in Figure 2. This alternative model only allowed the three psychological needs to relate indirectly to the well-being variables via academic intrinsic motivation. It was otherwise identical to the hypothesized model, making it a nested model.

The following were the specific hypothesized relations, as outlined in Table 1:

Hypothesis 1. OVMS support, veteran-friendly campus perception, veteran identity centrality, and positive regard for veteran identity would display significant, positive, direct relations with all three psychological needs.

Hypothesis 2. All three psychological needs would display significant, positive, direct relations with academic intrinsic motivation, academic well-being, and global well-being.

Hypothesis 3. All three psychological needs would fully mediate relations between all four contextual factors and academic intrinsic motivation, and fully mediate relations between all four contextual factors and both indices of well-being.

Hypothesis 4. Academic intrinsic motivation would display significant, positive, direct relations with academic well-being and global well-being.

Hypothesis 5. Academic intrinsic motivation would partially mediate relations between the three psychological needs and both indices of well-being.

CHAPTER 4. RESULTS

Data Cleaning

Eligibility

In total, 284 students responded to the survey (i.e., indicated their consent to participate on the initial page of the survey). Eight respondents were excluded because they did not respond to any items after the informed consent page. One respondent was excluded because they indicated they were under the age of 18. Forty-seven respondents were excluded because they did not indicate their veteran status or indicated they never served in the military. Nine part-time respondents were excluded. Four exclusively distance-learner respondents were excluded. This yielded an initial eligible sample of 215 participants.

Missing Data and Outliers

First, all conceptual items were screened to confirm that they did not have excessive missing data; response rates for each item were at least 84%. Next, each participant was screened for excessive missing responses to the 72 conceptual items. A majority of participants ($n = 152$) did not omit any items. Thirty-four participants omitted items at nearly all rates between 1% and 23%, and then there was a clear break where the next observed rate of missed items was 30%. Because of this break and because none of the participants who exceeded 23% missed items completed the entire survey, the 29 participants with more than 23% missed items were excluded, leaving 186 observations.

Mean scores were then computed for each of the ten conceptual scales that required at least 50% of data be present to obtain a valid score. Z-scores were examined for each participant's mean scale scores to identify univariate outliers using the conventional cutoff of $z > 3.29$ or $z < -3.29$ (Tabachnick & Fidell, 2001). Four participants were identified as univariate

outliers on one scale each (including positive regard for veteran identity, academic intrinsic motivation, and academic well-being) and were excluded from further analysis, reducing the usable sample size to 182. Mahalanobis distances (Tabachnick & Fidell) were computed to check for multivariate outliers; no multivariate outliers were evident.

For the final sample of 182 participants, rates of missing data for the conceptual items ranged from 0% to 5.4%. Little's (1988) missing completely at random (MCAR) test was conducted on the mean conceptual scale scores, and the result suggested that missing data points were not randomly distributed among the mean scores, $\chi^2(69, N = 182) = 128.16, p < .001$. To examine possible selection bias, dummy variables were computed to indicate whether participants had a valid or missing response for each of the predictor variables, and *t*-tests were then conducted to examine whether scores on the dependent variables varied significantly between participants with valid versus missing responses on any of the predictor variables. Using a Bonferroni correction to account for multiple comparisons (Rupert, 2012), none of the *t*-tests were significant. This supports the assumptions that the data were still missing at random (MAR) and that maximum likelihood estimation consequently yielded unbiased parameter estimates for missing data points (Schlomer, Bauman, & Card, 2010).

Preliminary Analyses

Means, standard deviations, and correlations for all observed variables are presented in Table 4. OVMS support had small correlations with veteran-friendly campus perception, perceived relatedness, and global well-being. Veteran-friendly campus perception had small correlations with perceived competence and global well-being, a medium correlation with volitional autonomy, and a medium-large correlation with perceived relatedness. Veteran identity centrality had a large correlation with positive regard for veteran identity. Positive regard for

veteran identity had small correlations with perceived competence, volitional autonomy, and global well-being. All of the psychological needs had large correlations with each other. Perceived competence additionally had a small correlation with academic intrinsic motivation (AIM), a medium correlation with global well-being, and a large correlation with academic well-being. Volitional autonomy and perceived relatedness also had medium correlations with AIM, academic well-being, and global well-being. AIM had a medium correlation with academic well-being. Academic well-being had a medium correlation with global well-being.

To examine whether scores on any of the predictor, mediator, or outcome variables significantly differed according to any of the demographic variables, a series of analyses of variance were conducted using a Bonferroni correction to account for multiple comparisons (Rupert, 2012). One analysis including all conceptual variables was conducted on each demographic variable (i.e., gender, age, military affiliation, university, race, ethnicity, sexual orientation, relationship status, parent status, deployment history). Nearly all of these analyses were nonsignificant, so no demographic variables were included in the main analyses. The only exception was that participants who were currently serving in the military endorsed higher perceived relatedness than their veteran counterparts, $F(1, 180) = 10.60, p = .001$.

Comparison to Other Samples

The means and standard deviations of this sample for the conceptual measures were compared to available college student and military/veteran samples. The means were within ½ standard deviation of comparable college student samples for the BPNS-G competence subscale (Gagné, 2003; Niemiec et al., 2009), BPNS-G autonomy subscale (Gagné; Niemiec et al.), the Academic Satisfaction Scale (Garriott et al.), and the Satisfaction with Life Scale (SWLS; Garriott et al.; Lent et al., 2005; Niemiec et al.). The mean was also within ½ standard deviation

of a comparable military sample for the SWLS (Proyer et al., 2012). The only substantial differences were between the present sample and comparable college student samples on the BPNS-G relatedness subscale (the present mean was more than $\frac{1}{2}$ standard deviation lower than the Gagné ($d = -.64, p < .05$) and Niemiec et al. ($d = -.71, p < .05$) means) and the Academic Intrinsic Motivation Scale (the present mean was more than $\frac{1}{2}$ standard deviation lower than the Garriott et al., 2015 ($d = -.50, p < .05$) mean). Overall, these comparisons suggest that the present sample was in many ways comparable to other college student and military samples, with the exception that the present participants appeared to feel significantly less belongingness on campus and intrinsic motivation for their studies than traditional college student samples.

The demographic composition of the present sample was also compared to a recent nationwide survey of 1,352 student veterans across various types of post-secondary institutions (Cate & Davis, 2016). Of note, Cate & Davis only referred to their respondents as “student veterans,” did not indicate whether current service members were included in their sample, and did not respond to email requests for clarification. Results of chi square analyses suggested that the two samples did not differ with regard to gender and branch of service representation. The total sample for the present study was younger and less likely to be married than the nationwide sample, but these differences disappeared when students currently serving in the military were excluded. Both the total sample and separated (i.e., no longer serving) veteran subsample for the present study had greater proportions of White, non-Latino participants and were less likely to be parents and have deployed overseas than the nationwide sample. Overall, the present sample appears at least partially representative of the SVSM population; it is likely even more representative of the subpopulation that resides in the Midwest and attends public, four-year institutions.

VFCS Validation

As the Veteran-Friendly Campus Scale (VFCS) is a novel adaptation of multiple existing measures, exploratory factor analysis was conducted to examine its factor structure. All of the VFCS items loaded on a unitary factor with factor loadings between .52 and .81. As indicated in Table 4, the VFCS also had good internal consistency ($\alpha = .92$) and correlated significantly with OVMS support, all three psychological needs, AIM, and both well-being outcomes. These data provide preliminary evidence for the convergent validity of the VFCS and suggest it is appropriate to include it in the main analyses without modification.

Main Analyses

Models were estimated in MPlus version 7.4 (Muthén & Muthén, 2012) using robust maximum likelihood (MLR) to estimate casewise parameters for missed items. MLR is robust to non-normality and was used because multiple independent variables violated assumptions of normality, which were tested using a Shapiro-Wilk test of univariate normality (Shapiro & Wilk, 1965). Further, the data was not multivariate normal, as indicated by significant results for Mardia's (1970) tests of multivariate skewness and kurtosis. Goodness of fit for the models was assessed using the guidelines of Hu and Bentler (1999): comparative fit index (CFI) of .95 or greater, root-mean-square error of approximation (RMSEA) or .06 or less, and standardized root-mean-square residual (SRMR) of .08 or less.

The hypothesized path model was examined first and yielded a good fit, $\chi^2(12, N = 182) = 17.77, p = .12, CFI = .98, RMSEA = .05, SRMR = .03$. The Satorra-Bentler corrected chi-square statistic for this model was $\chi^2(12, N = 182) = 20.49, p = .06$. Figure 3 displays the results in terms of standardized beta coefficients, with statistically significant parameters ($p < .05$)

indicated by solid lines and nonsignificant parameters indicated by dashed lines. Figure 4 displays the results with nonsignificant parameters removed for visual clarity.

Regarding contextual factors, veteran-friendly campus perception had significant direct relations with all three psychological needs. Positive regard for veteran identity had significant direct relations with perceived competence and volitional autonomy. OVMS support had a significant direct relation with perceived relatedness, whereas veteran identity centrality did not have significant direct relations with any of the psychological needs.

Regarding the SDT needs relating to AIM, only perceived relatedness directly related to it. Regarding the direct paths to academic well-being and global well-being, perceived competence and perceived relatedness had significant direct relations with both well-being variables. Volitional autonomy did not have significant direct relations with either well-being variable. AIM had a significant direct relation with only academic well-being. This model, as portrayed in Figure 3, explained 44% of variance in academic well-being and 22% of variance in global well-being.

Next, an alternative path model was examined in which the three SDT needs were not allowed to relate directly to the well-being variables, but rather could only relate to them indirectly through AIM. It did not yield a good fit, $\chi^2(18, N = 182) = 119.39, p < .001, CFI = .71, RMSEA = .18, SRMR = .13$. The Satorra-Bentler corrected chi-square statistic for this model was $\chi^2(18, N = 182) = 131.55, p < .001$. Figure 5 displays the results in terms of standardized beta coefficients, with statistically significant parameters ($p < .05$) indicated by solid lines and nonsignificant parameters indicated by dashed lines. Figure 6 displays the results with nonsignificant parameters removed for visual clarity. The same contextual factor to psychological needs paths were significant in this model as in the hypothesized model. Perceived

relatedness again had a significant direct relation with AIM, as did AIM with academic well-being. This model, as portrayed in Figure 5, explained 11% of variance in academic well-being and 1% of variance in global well-being.

A chi-square difference test using the Satorra-Bentler chi-square statistics (Satorra & Bentler, 2010) was conducted to compare the fit of the hypothesized model with that of the alternative model, which was nested within the hypothesized model. The test result was significant, $\Delta\chi^2(6, N = 182) = 102.84, p < .001$, which indicates the hypothesized model yielded a significantly superior fit compared to the alternative model. That is, the model was a better fit when the psychological needs were freed to relate directly to the well-being variables.

Bootstrap tests using bias-corrected 95% confidence intervals were used to test the mediation hypotheses (Hypotheses 3 & 5; see Table 1). These tests were conducted on the hypothesized model given its superior fit compared to the alternative model. Bootstrapping repeats the calculation of the indirect effects with 1,000 samples to yield parameter estimates for total and specific indirect effects. A confidence interval not containing zero indicated that the mean indirect effect across the samples was significant ($p < .05$). Bootstrap analysis is optimal for testing these hypotheses because it provides greater statistical power and does not make any assumptions regarding multivariate normality (Preacher & Hayes, 2008).

Table 5 presents the magnitude and statistical significance of the specific and total indirect effects using the bootstrapping procedure. Table 5 is organized so that the first 12 specific mean indirect effects concern perceived competence as a mediator; the next 12 specific mean indirect effects concern volitional autonomy as a mediator; the next 12 specific mean indirect effects concern perceived relatedness as a mediator; the next six mean indirect effects concern AIM as a mediator; the next eight mean indirect effects concern both perceived

competence and AIM as mediators; the next eight mean indirect effects concern both volitional autonomy and AIM as mediators; the final eight mean indirect effects concern both perceived relatedness and AIM as mediators.

Perceived competence significantly mediated relations between veteran-friendly campus perception and both well-being outcomes (effects 1e and 1f in Table 5). Perceived competence also significantly mediated relations between positive regard for veteran identity and both well-being outcomes (effects 1k and 1l). This is evidenced by the 95% bias-corrected confidence intervals (BC CI) for their specific mean indirect effects not including zero. Perceived relatedness significantly mediated relations between veteran-friendly campus perception and AIM (effect 3d), as well as between veteran-friendly campus perception and academic well-being (effect 3e). AIM was a significant mediator of the path between perceived relatedness and academic well-being (effect 4e). The path from veteran-friendly campus perception to academic well-being was also significantly mediated by both perceived relatedness and AIM (effect 7c). Non-significant paths are shown in Table 5.

Supplementary Analyses

Psychological Needs Multicollinearity

The lack of significant direct relations from volitional autonomy to AIM, to academic well-being, and to global well-being was unexpected; all three paths had empirical support from previous college student and/or military samples, and the predictive ability of volitional autonomy has extensive theoretical and empirical support in the broader SDT literature. Given the large correlations observed amongst the three psychological needs (r s from .51 to .63, p s < .001), it was possible that multicollinearity obscured the predictive abilities of volitional autonomy in the present study.

To examine this possibility, the hypothesized path model was re-tested with all six possible combinations of psychological needs removed. That is, it was tested with three different pairs of needs present, as well as with each of the three needs individually. All six models demonstrated acceptable fit to the data. The only appreciable changes in the predictive utility of the model occurred when perceived competence was removed (individually and combined with the other two variables). In particular, the percentage of variance explained for academic well-being dropped from 44% to between 22% and 26%.

When perceived competence alone was removed from the model, volitional autonomy demonstrated newly-significant direct relations with academic well-being and global well-being. When perceived relatedness alone was removed from the model, volitional autonomy demonstrated newly-significant direct relations with AIM and global well-being. When both perceived competence and relatedness were removed from the model, volitional autonomy had significant relations with AIM and both well-being variables, as displayed in Figure 7. Additionally, several indirect effects involving volitional autonomy became significant when perceived competence and relatedness were removed from the model, as displayed in Table 6. Of note, the removal of perceived relatedness did not result in any unique changes in the statistical significance of indirect effects beyond that caused by the removal of perceived competence.

In sum, it does appear that there was a substantial degree of multicollinearity amongst the three psychological needs in the hypothesized model. Each psychological need, alone and in conjunction with other combinations of needs, contributed to well-fitting statistical models and appeared to at least partially explain variance that was previously accounted for by other needs. This degree of multicollinearity is a highly plausible explanation for volitional autonomy's weak effects in the hypothesized model, especially considering that volitional autonomy had

significant bivariate correlations ($ps < .01$) with AIM and both well-being variables as indicated in Table 4.

Structural Equation Model

An SDT-informed structural equation model (SEM; see Figure 8) was also tested to determine its fit to the data. SEM was chosen as a supplementary analysis given its ability to account for measurement error, relatively high correlations amongst some of the observed variables (e.g., the three psychological needs, both veteran identity variables), and marginal internal consistency for the perceived competence and volitional autonomy subscales. This model included latent variables for the veteran environment (comprising OVMS support and veteran-friendly campus perception), veteran identity (comprising veteran identity centrality and positive regard for veteran identity), psychological need satisfaction (comprising competence, autonomy, and relatedness), AIM, and well-being (comprising academic and global well-being).

Because the psychological need satisfaction and AIM measures used in the present study each had three validated subscales, those subscales were used as the indicators for their respective latent variables. That is, psychological need satisfaction was indicated by the subscales: competence, autonomy, and relatedness; AIM was indicated by the subscales: to know, toward accomplishment, and to experience stimulation. This approach carried the conceptual advantage of keeping the multidimensional nature of these variables explicit (Little, Cunningham, Shahar, & Widaman, 2002). Three parcels were created to indicate the remaining latent variables of veteran environment, veteran identity, and well-being using the procedure outlined by Russell, Kahn, Spoth, & Altmaier (1998). This constituted conducting exploratory factor analyses on the items comprising each variable, extracting a single factor using the maximum-likelihood method, rank-ordering the items according to the absolute value of their

factor loadings, and distributing the items among the three parcels such that each parcel had an approximately equal average loading on its respective factor.

Before testing the structural model, confirmatory factor analysis was conducted on the measurement model in MPlus version 7.4 (Muthén & Muthén, 2012) to determine whether it demonstrated acceptable fit to the data using the aforementioned criteria from Hu and Bentler (1999). Results suggested that the measurement model yielded a good fit, $\chi^2(84, N = 182) = 125.07, p = .001, CFI = .97, RMSEA = .06, SRMR = .05$, with the exception of the χ^2 which is not unexpected given the large sample size (e.g., Bergh, 2015). The loadings of the observed indicators on each latent variable were statistically significant ($p < .001$; see Table 7).

Correlations amongst the latent variables are listed in Table 8. These findings support the validity of the measurement model and its appropriateness for structural equation modeling.

The structural model was then tested and evaluated using the Hu and Bentler (1999) goodness-of-fit criteria. The results indicated that the structural model yielded a good fit, $\chi^2(84, N = 182) = 143.09, p < .001, CFI = .96, RMSEA = .06, SRMR = .05$, again with the exception of the χ^2 which is not unexpected given the large sample size. Figure 9 displays the results in terms of standardized beta coefficients, with statistically significant parameters ($p < .05$) indicated by solid lines and nonsignificant parameters indicated by dashed lines. Regarding contextual factors, veteran environment had a significant direct relation with psychological need satisfaction, whereas the direct relation between veteran identity and psychological need satisfaction was not significant. Psychological need satisfaction had significant direct relations with both AIM and well-being. The direct relation between AIM and well-being was not significant. This model explained 56% of variance in well-being.

Table 9 presents the magnitude and statistical significance of the specific and total indirect effects using the bootstrapping procedure. Table 9 is organized so that the first four specific mean indirect effects concern psychological need satisfaction as a mediator; the next mean indirect effect concerns AIM as a mediator; the final two mean indirect effects concern both psychological need satisfaction and AIM as mediators. Psychological need satisfaction significantly mediated relations between veteran environment and both AIM and well-being (effects 1a and 1b in Table 9). Psychological need satisfaction was not a significant mediator of relations between veteran identity and AIM or well-being. AIM was not a significant mediator of the relation between psychological need satisfaction and well-being. Neither indirect effect involving both psychological need satisfaction and AIM was significant.

Alternative OVMS Measurement

Given OVMS support was not as robust of a predictor in the path model as hypothesized, an alternative variable was computed to measure each participant's frequency of OVMS utilization. This variable was computed by averaging participants' responses across all items pertaining to services offered at their OVMS, with response options ranging from 0 ("never" used the service) to 4 (use it "very often"). These items are listed in Appendix A. Thus for Iowa State University and University of Iowa students this scale comprised seven items, whereas for University of Northern Iowa students it comprised five items.

The overall mean OVMS utilization in the present sample was 0.76, with a *SD* of 0.93. Mean OVMS utilization did not significantly differ across institutions, $F(2,178) = 1.26, p = .29$. Bivariate correlations were computed between OVMS utilization and all of the conceptual variables included in the hypothesized model; the only statistically significant correlations were with OVMS support ($r = .50, p < .001$) and veteran identity centrality ($r = .27, p < .001$). This

suggests that students who used their OVMS more frequently were more likely to perceive it as supportive and to have their veteran identity be salient to their overall self-concept. It differs from the correlations listed in Table 4, in which OVMS support significantly correlated with veteran-friendly campus perception, perceived relatedness, and global well-being. Thus, OVMS support and utilization had a substantial correlation yet still appear to be distinct constructs with distinct relations with other constructs of interest.

The hypothesized path model was re-tested with OVMS utilization substituted for OVMS support. It yielded an excellent fit, $\chi^2(12, N = 182) = 11.09, p = .52, CFI = 1.00, RMSEA < .01, SRMR = .02$. This model explained 53% of variance in academic well-being and 28% of variance in global well-being. However, OVMS utilization did not have significant direct effects on any of the psychological needs, whereas OVMS support had a significant direct effect on perceived relatedness in the hypothesized model.

Veteran-Friendly Campus Perception as a Mediator

While OVMS support had a significant direct relation with only perceived relatedness in the hypothesized path model, as shown in Figure 3, it was possible it might have significant *indirect* relations with the other needs via its relation with veteran-friendly campus perception. This was suspected given the significant correlation observed between OVMS support and veteran-friendly campus perception ($r = .16, p < .05$), the significant direct relations veteran-friendly campus perception had with all three psychological needs, and the fact that increasing campus friendliness toward veterans is an explicit component of many OVMS's missions (Abel et al., 2013).

To test this post hoc hypothesis, the truncated path model identified in Figure 10 was analyzed in MPlus version 7.4 (Muthén & Muthén, 2012). It yielded a good fit, $\chi^2(3, N = 182) =$

3.11, $p = .37$, CFI = 1.00, RMSEA = .01 SRMR = .03; however, the direct path from OVMS support to veteran-friendly campus perception was not significant, nor were any of the indirect effects that used veteran-friendly campus perception as a mediator. This test was repeated with OVMS utilization substituted for OVMS support, and the model yielded a marginal fit, $\chi^2(3, N = 182) = 6.64$, $p = .08$, CFI = .99, RMSEA = .08 SRMR = .03. As with the previous model, the direct path from OVMS utilization to veteran-friendly campus perception was not significant, nor were any of the indirect effects that used veteran-friendly campus perception as a mediator.

Veteran Identity Interaction

Given the inconclusive findings regarding veteran identity centrality and positive regard for veteran identity in the present study, as well as the dearth of empirical literature examining their associations with other constructs, further exploration of potential interaction effects was indicated. Multiple regression analyses were conducted in SPSS to test whether there was a significant interaction between veteran identity centrality and positive regard for veteran identity in predicting the other constructs included in the present study. Using a Bonferroni correction to account for multiple comparisons (Rupert, 2012), the interaction term was not significant in any of these additional analyses.

At the less stringent criterion of $p < .05$, the interaction term was a significant predictor of perceived relatedness ($p = .02$). This relationship is plotted Figure 11 using Aiken & West's (1991) convention of dichotomizing responses to the predictor variables as low (1 *SD* below the mean) vs. high (1 *SD* above the mean). Respondents with low veteran identity centrality and high positive regard for veteran identity demonstrated the highest mean relatedness, whereas respondents with high veteran identity centrality and high positive regard for veteran identity

demonstrated the lowest mean relatedness. However, this finding should be replicated prior to interpretation given it was uncovered through multiple comparisons.

CHAPTER 5. DISCUSSION

The purpose of the present study was to better understand the well-being of student veterans and service members (SVSMs), a nascent area in the psychological and educational literatures that pertains to a unique and growing subpopulation of college students. Self-report data was collected through an online survey from full-time SVSMs at the three Regent universities in Iowa. Following screening for eligibility criteria, missing data, and outliers, the final sample included 182 SVSMs. Comparisons with other veteran and college student samples suggested that the present sample was at least partially representative of the SVSM population in terms of demographics, and that participants responded to the conceptual measures in a similar manner to their military and college student peers.

Hypothesis Testing

Data from the present SVSM sample was used to test the central hypothesis that the path model depicted in Figure 1, rooted in Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), would yield a good fit to the data. This model was grounded in a corpus of conceptual and empirical literature that suggested psychological need satisfaction should relate both directly to academic and global well-being and indirectly via the facilitation of academic intrinsic motivation (AIM). The hypothesized model was also tested against the alternative path model depicted in Figure 2 that forced all relations between psychological need satisfaction and well-being to be mediated by AIM, which is an alternative SDT conceptualization with some empirical support. Of note, the present study was the first to use SDT to model SVSM well-being.

The overarching hypothesis was confirmed in that the hypothesized model surpassed the landmark goodness-of-fit guidelines recommended by Hu and Bentler (1999). This broadly

suggests that SDT is a viable conceptual tool for explaining some but not all relations between SVSM-specific contextual factors, some components of psychological need satisfaction, AIM, and well-being (globally and specific to the academic domain). Its practical utility is also evidenced by the fact that this model explained 44% of variance in academic well-being and 22% of variance in global well-being, which are considered large and medium-large effect sizes, respectively (Cohen, 1988). More specifically, the results for this model tentatively support AIM serving as a partial mediator of the relation between perceived relatedness and domain-specific (i.e., academic) well-being. As expected, the hypothesized path model also yielded a superior fit compared to the alternative path model, lending additional support to the conceptualization of AIM as a partial mediator and of the psychological needs as direct predictors of well-being. Results in relation to the specific hypothesized effects are discussed in turn. Table 1 delineates each predictor variable's hypothesized relations.

Hypothesis 1

It was hypothesized that office of veterans and military services (OVMS) support, veteran-friendly campus perception, veteran identity centrality, and positive regard for veteran identity would display significant, positive, direct relations with all three psychological needs.

Veteran-friendly campus perception. Veteran-friendly campus perception emerged as a particularly robust predictor in that it had significant direct relations with all three psychological needs. Thus, SVSMs that perceived their campus as being friendlier toward veterans were more likely to endorse greater feelings of competence, autonomy, and interpersonal connection in the context of their college experience. This lends important empirical support to recent efforts to improve the “veteran friendliness” of college campuses (e.g., Obama, 2012), which until now have only been bolstered by qualitative or anecdotal evidence (e.g., Adkins, 2015). It also

supports the convergent validity of the Veteran-Friendly Campus Scale (created for the present study) and advances the broader college student literature, where the available findings have supported positive relations between campus climate and satisfaction of all three psychological needs, albeit to varying degrees. That is, the linkages between campus climate and both perceived competence (e.g., Byars-Winston, et al., 2010; Murray et al., 2014) and volitional autonomy (Núñez, León, Grijalvo, & Albo, 2012) have received less attention than the linkage between campus climate and perceived relatedness (e.g., Fleming et al., 2017; Hurtado & Ponjuan, 2005; Wells & Horn, 2015).

Positive regard for veteran identity. Positive regard for veteran identity had significant direct relations with perceived competence and volitional autonomy. There is no prior literature specific to veteran identity to juxtapose these findings; however, they can be compared against a modest body of literature examining other cultural identities in college students. The significant relation with perceived competence is consistent with Kim & Omizo's (2005) finding that positive regard for racial identity had a small but significant relation with perceived competence in a sample of Asian American college students. No prior studies have examined the relation between volitional autonomy and cultural identity in college students. The absence of a significant relation with perceived relatedness contradicts two prior studies (Dueñas & Gloria, 2017; Miville et al., 2004) that found medium to large correlations between positive regard for ethnic/cultural identity and perceived relatedness. At present, it appears that holding one's identity as a veteran in higher esteem is associated with greater perceptions of academic competence and autonomy, although this finding would greatly benefit from replication.

OVMS support. Of the three psychological needs, OVMS support only had a significant direct relation with perceived relatedness. This finding is difficult to interpret in light of the

dearth of literature examining relations between OVMS support or support from other campus culture/resource centers and psychological need satisfaction. However, it does tentatively suggest that SVSMs who endorse feeling more supported by their OVMS are more likely to experience a sense of belongingness on campus, which is consistent with the mission of arguably all OVMSs (Abel et al., 2013) and some qualitative findings in the general college student literature (Jones et al., 2002; Patton, 2006; Turner, 1994). The absence of significant direct relations with perceived competence and volitional autonomy may suggest the influence of OVMSs is limited to fostering community amongst SVSMs and advocating for their integration with the broader campus community, or it may alternatively suggest that perceived support is not the most salient aspect of SVSMs' involvement with their OVMS.

To test the latter possibility, an alternative variable was computed to measure each participant's frequency of OVMS utilization. This variable had a significant correlation with OVMS support ($r = .50, p < .001$), which suggested that the constructs are highly related yet distinct constructs and that OVMS utilization may evidence different predictive utility when substituted for OVMS support in the hypothesized model. The model did continue to fit the data well; however, OVMS utilization did not have significant direct effects on any of the psychological needs. Of note, low overall rates of OVMS utilization ($M = 0.76$ on a 0-4 scale) may have attenuated these relations. At present, OVMS support tentatively appears to be a more useful predictor of perceived relatedness than OVMS utilization, which is consistent with the SDT supposition that the personal significance of an environmental support is more salient to a person than the support's mere presence (Deci & Ryan, 2000). Further research is needed to clarify the relations between these constructs and with other conceptual variables, particularly in larger samples with broader distributions on their measures.

Veteran identity centrality. Veteran identity centrality did not have a significant direct relation with any of the psychological needs. In fact, it did not have a significant correlation with any of the conceptual variables other than positive regard for veteran identity ($r = .62, p < .01$). Given the complete absence of significant bivariate correlations with the other conceptual variables, it was not suspected that multicollinearity with positive regard for veteran identity obscured direct relations between veteran identity centrality and the psychological needs. This was confirmed when the hypothesized path model was re-tested with positive regard for veteran identity removed, and veteran identity centrality still did not have a significant direct relation with any of the psychological needs. In this sample, veteran identity centrality appeared to truly not have a significant relation with psychological need satisfaction.

There are no military/veteran studies with which to compare these findings and very few in the general college student population. The relation between racial identity centrality and perceived competence was not significant in Kim and Omizo's (2005) sample of Asian American college students, the only study to examine that relation in college students. No studies have examined the relation between cultural identity centrality and volitional autonomy in college students. The correlation between cultural identity centrality and perceived relatedness was not significant in Miville and colleagues' (2004) general college student sample. The relation between cultural identity centrality and perceived competence has modest support in adolescent samples (Kim & Omizo, 2010; Lease, 2006). The relation between cultural identity centrality and perceived relatedness has modest support in non-college adult samples (Dunn & Szymanski, 2018; Yap et al., 2011).

A tentative interpretation of the direct effect findings with regard to both veteran identity variables is that overall, having greater positive regard for one's veteran identity is more

associated with psychological need satisfaction than having one's veteran identity central to their self-concept. Worded differently, in the context of psychological need satisfaction, it may not matter whether one has a salient veteran identity as long as they have positive feelings toward that identity. Since these relations were largely equivocal in the extant literature, it was worth investigating whether researchers have missed an interaction effect between the cultural identity variables. Post hoc analyses examined whether veteran identity centrality and positive regard for veteran identity interacted in predicting any of the other conceptual variables, but the findings were nonsignificant after accounting for multiple comparisons. Finally, as neither veteran identity variable had significant direct relations with perceived relatedness, an alternative possibility that future research can examine is that veteran identity may be significantly related to perceived relatedness *within the SVSM community*, as opposed to relatedness within the broader campus community.

Hypothesis 2

It was hypothesized that all three psychological needs would display significant, positive, direct relations with academic intrinsic motivation (AIM), academic well-being, and global well-being.

Perceived competence. Perceived competence had a particularly strong direct relation with academic well-being ($\beta = .55, p < .001$), and its direct relation with global well-being was also significant ($\beta = .26, p < .01$). These findings are consistent with prior college student samples in which perceived competence was repeatedly found to significantly predict various indicators of both academic well-being (e.g., Garriott et al., 2015; Lent et al., 2005; Murray et al., 2014) and global well-being (e.g., Renshaw & Bolognino, 2016; Sheu et al., 2017; Vela et al., 2016). They also corroborate significant relations between perceived competence and

academic well-being in military students (Artino, 2008), as well as between perceived competence and global well-being in a recent veteran sample (Seligowski et al., 2012). As such, the present study provides compelling evidence that the extent to which SVSMs feel competent in their academic work is a robust predictor of their well-being globally and specific to the academic domain.

To the contrary, the direct relation between perceived competence and AIM was not significant. There were no military samples with which to compare this finding, although it does contradict the seven college student studies (e.g., Simon et al., 2015; Young-Jones et al., 2014; Zook & Herman, 2011) that examined this relation and found it was significant. This may suggest that perceived competence is not salient to predicting intrinsic motivation for academics in SVSMs like it is in the broader college student population. Alternatively, the relation between perceived competence and AIM may have been obscured in the path model due to multicollinearity with the two other psychological needs, as the bivariate correlation between perceived competence and AIM was significant ($r = .25, p < .01$). Future SVSM research is needed to clarify the relation between these constructs.

Perceived relatedness. Perceived relatedness had significant direct relations with AIM and both well-being variables. This is consistent with the college student literature in which perceived relatedness had significant relations with AIM (Ciani et al., 2011; Young-Jones et al., 2014; Zook & Herman, 2011), academic well-being (e.g., Fleming et al., 2017; Harris et al., 2017; McKinney et al., 2006) and global well-being (e.g., Elliott & Doane, 2015; Ng et al., 2013; Renshaw & Bolognino, 2016) every time those relations were measured. The significant relation with global well-being is also consistent with Tsai and colleagues' (2012) findings in a sample of U.S. veterans. Thus, perceived relatedness tentatively appears to be uniquely predictive of AIM

in SVSMs, as neither of the other two needs had a significant relation with AIM. The extent to which SVSMs feel like they belong on campus is also a useful predictor of their well-being on campus and in life in general.

Volitional autonomy. Volitional autonomy did not have significant direct relations with AIM, academic well-being, or global well-being. This was unexpected given prior college student studies found significant relations between academic volitional autonomy and AIM (Núñez et al., 2012; Young-Jones et al., 2014; Zook & Herman, 2011). Prior college student studies also found significant relations between general volitional autonomy and both academic well-being (Paradnikė & Bandzevičienė, 2015) and global well-being (e.g., Haase et al., 2012; Niemiec et al., 2009; Schiffrin et al., 2014). Further, the relation between volitional autonomy and occupational well-being was significant in a recent sample of U.S. Navy personnel (Bann et al., 2011). However, it is noteworthy that with the exception of Niemiec et al., these studies used different volitional autonomy measures than the present study, and that none of the direct linkages with well-being were measured specifically in terms of academic volitional autonomy. Beyond the empirical evidence in support of the predictive utility of volitional autonomy, the present findings also contradict SDT theoretical literature, which has in some instances posited that autonomy is the most salient predictor of the three psychological needs (Deci & Ryan, 1985; Ryan & Deci, 2000).

It is possible that volitional autonomy was not a salient predictor of these outcomes in SVSMs like it was in the broader college student population, especially compared to the other two psychological needs. However, the more likely explanation for the null findings relative to volitional autonomy was its multicollinearity with the other two needs. In fact, volitional autonomy had significant bivariate correlations with AIM, academic well-being, and global well-

being, and it also had significant direct paths to all three of those variables when perceived competence and perceived relatedness were removed from the model. Again, more SVSM research is needed to clarify the relations between these constructs, incorporating both the BPNS-G autonomy subscale and domain-specific volitional autonomy measures.

Hypothesis 3

It was hypothesized that all three psychological needs would fully mediate relations between all four contextual factors and AIM, academic well-being, and global well-being. Seven of these indirect effects were confirmed via the bootstrapping procedure, as indicated in Table 5. Overall, these findings were partially supportive of the core SDT supposition that psychological need satisfaction fully mediates relations between contextual factors and well-being (Ryan & Deci, 2000, 2002), as perceived competence and perceived relatedness (but not volitional autonomy) significantly mediated multiple indirect effects. The SDT supposition that psychological need satisfaction fully mediates relations between contextual factors and intrinsic motivation (Deci & Ryan, 1985; Ryan & Deci, 2000) was minimally supported. The equivocal relations of the veteran identity variables with the core SDT constructs may represent a limitation in the ability of SDT to explain relations between cultural identities and well-being and warrants replication in SVSM and other multicultural samples. Specific mediation findings for each psychological need are discussed in turn.

Perceived competence. Similar to the direct effect findings, perceived competence was the most robust mediator in the present study. It fully mediated relations between veteran-friendly campus perception and both well-being outcomes, as well as between positive regard for veteran identity and both well-being outcomes. This is consistent with prior college student studies that found perceived competence fully mediated relations between contextual factors and

both academic well-being (Byars-Winston et al., 2010) and global well-being (Reed et al., 2016; Schiffrin et al., 2014). Additionally, perceived competence fully mediated the relation between the contextual factor of training instructor support and military-domain well-being in a Dutch military sample (Delahaij et al., 2014). As such, it tentatively appears that greater campus veteran friendliness and positive regard for one's veteran identity may be indirectly associated with greater well-being (globally and specific to the academic domain) through their positive relations with perceived competence. OVMS support and veteran identity centrality in this study do not appear to indirectly relate to either well-being outcome via this psychological need.

The absence of a significant indirect effect from any contextual factors to AIM via perceived competence is not surprising given the nonsignificant direct relation observed between perceived competence and AIM in the present study; however, it does contradict the one available college student study that found perceived competence fully mediated the relation between instructor support and AIM (Zook & Herman, 2011). In the present sample, it does not appear that perceived competence explained any indirect relations between veteran-specific contextual factors and AIM.

Perceived relatedness. Perceived relatedness fully mediated the relation between veteran-friendly campus perception and academic well-being. The significance of the mediation effect is consistent with the one available college student study that found perceived relatedness significantly mediated the relation between the contextual factor of parental support and academic well-being (Ratelle, Larose, et al., 2005); however, Ratelle and colleagues found that perceived relatedness served as a partial rather than full mediator. Additionally, in the current study perceived relatedness combined with AIM to significantly mediate the other indirect effect from veteran-friendly campus perception to academic well-being in the present study. Perceived

relatedness was not a significant mediator of any of the other contextual factors to well-being. The absence of significant indirect effects involving global well-being contradicts the two available college student studies (Elliott & Doane, 2015; Mounts, 2004) that found perceived relatedness fully mediated relations between contextual factors and global well-being. This may suggest that for SVSMs, perceived relatedness is not a mechanism by which contextual factors relate to global well-being. Rather, as noted in the preceding section, perceived competence was more robust in explaining relations between contextual factors and global well-being in the present sample.

Perceived relatedness was the only psychological need to fully mediate the relation between veteran-friendly campus perception and AIM. No prior studies examined this mediation effect in the context of collegiate academics; however, the present finding is consistent with Amorose & Anderson-Butcher (2007), who found that perceived relatedness fully mediated the relation between the contextual factor of coach support and athletic intrinsic motivation in a sample of college athletes. Perceived relatedness was not a significant mediator of any of the other contextual factor to AIM indirect effects in the present study. In sum, perceived relatedness appears to have significantly explained relations between veteran-friendly campus perception and both academic well-being and AIM in this sample. To the contrary, perceived relatedness did not appear to significantly explain relations between veteran-specific contextual factors and global well-being. More SVSM research is needed to clarify the ability of perceived relatedness to explain relations between contextual factors, AIM, and well-being.

Volitional autonomy. None of the hypothesized indirect effects involving volitional autonomy were confirmed. This was not surprising, as volitional autonomy did not have significant direct relations with AIM or either well-being variable in the hypothesized model

results. However, it did contradict prior college student studies that found volitional autonomy significantly mediated relations between contextual factors and both AIM (Zook & Herman, 2011) and global well-being (Schiffirin et al., 2014). Volitional autonomy had not been examined as a mediator of relations between contextual factors and academic well-being in college students; however, it did significantly mediate relations between contextual factors and academic well-being in middle and high school students (Tian et al., 2016), as well as between contextual factors and workplace well-being in working adults (Chiniara & Bentein, 2016). Volitional autonomy's inability to significantly mediate relations between contextual factors and AIM or well-being also conflicts with core SDT theoretical literature, which stipulates that autonomy may in fact be the most robust mediator of the three psychological needs in explaining these indirect effects (Deci & Ryan, 1985; Ryan & Deci, 2000).

As with the null direct effect findings involving volitional autonomy, multicollinearity with the other two needs is a potential explanation for the absence of significant indirect effects. In fact, when perceived competence and perceived relatedness were removed from the model, volitional autonomy significantly mediated the following relations, as indicated in Table 6: veteran-friendly campus perception to AIM, academic well-being, and global well-being; positive regard for veteran identity to AIM, academic well-being, and global well-being. Additionally, volitional autonomy combined with AIM to serve as a significant mediator of the other indirect effects from veteran-friendly campus perception and positive regard for veteran identity to academic well-being. Again, more SVSM research is needed to clarify the relations between these constructs.

Hypothesis 4

It was hypothesized that AIM would display significant, positive, direct relations with academic well-being and global well-being. This was partially confirmed in that AIM had a significant direct relation with academic well-being, whereas the path from AIM to global well-being was nonsignificant. The present findings are consistent with prior college student studies that found AIM had a significant direct relation with academic well-being (Black & Deci, 2000; Garriott et al., 2015; Látalová & Pilárik, 2015; Ratelle et al., 2007). However, they contradict prior college student studies that found AIM had a significant direct relation with global well-being (Burton et al., 2006; Garriott, et al., 2015; Pisarik, 2009). At present, the extent to which SVSMs are intrinsically motivated for their studies appears to be a modest predictor of well-being specific to the academic domain but not a significant predictor of participants' global sense of well-being.

This difference from the general college student findings may be related to the fact that SVSMs as a group tend to have more varied life experiences and responsibilities (e.g., parenting, employment) than traditional college students (DiRamio et al., 2008). As such, their global appraisal of their well-being may be less influenced by factors specific to the academic domain (e.g., AIM) than their traditional college student peers. Further, it may be appropriate for SVSMs to have extrinsic motivations for attending college (e.g., to increase earning potential in support of raising a family) given their often nontraditional life circumstances. These possibilities have not been explored in other nontraditional college samples. As such, future research needs to examine whether broader (i.e., not domain-specific) measures of intrinsic motivation are related to global well-being, as well as whether other types of academic motivation (e.g., subtypes of

extrinsic motivation) are related to global well-being in SVSMs and other nontraditional college student populations.

Hypothesis 5

It was hypothesized that AIM would partially mediate relations between the three psychological needs and both indices of well-being. The only partial mediation effect that was confirmed was AIM significantly mediating the relation between perceived relatedness and academic well-being. Additionally, AIM combined with perceived relatedness to serve as a significant mediator of the indirect effect from veteran-friendly campus perception to academic well-being. AIM had not been tested as a mediator of this indirect effect in a strictly college student sample, but the present finding is consistent with Milyavskaya and Koestner (2011), who sampled college students and working adults combined and found that a composite measure of academic motivation in which higher scores reflected intrinsic motivation was a significant, partial mediator of the relation between domain-specific need satisfaction and academic well-being. AIM had not been examined as a mediator of relations between contextual factors and global well-being in any prior samples.

The importance of intrinsic motivation, central to the SDT subtheory of Cognitive Evaluation Theory (Deci & Ryan, 1985), was thus only partially confirmed in the present study, as AIM was only able to explain relations between perceived relatedness and academic well-being. This, combined with the direct effect findings, may suggest that for SVSMs, psychological need satisfaction (especially competence and relatedness) is a more useful predictor of academic well-being and global well-being than AIM, and that it is critical to examine their direct relations with well-being in addition to any indirect relations via AIM. Additional SVSM research is needed to replicate these findings.

Structural Equation Model Findings

Direct Effects

Review of the post hoc structural equation model (SEM) results (see Figure 9) sheds additional light on many of the hypothesized relations discussed above. Veteran environment (comprising OVMS support and veteran-friendly campus perception) had a significant direct relation with the latent psychological need satisfaction variable (comprising all three needs), which is consistent with veteran-friendly campus perception's robust direct effects on all three needs and OVMS support's significant direct relation with perceived relatedness in the path model. The direct relation between veteran identity (comprising veteran identity centrality and positive regard for veteran identity) and psychological need satisfaction was not significant in the SEM, despite the significant direct relations between positive regard for veteran identity and both perceived competence and volitional autonomy in the path model.

Psychological need satisfaction, as one construct rather than three constructs, had significant direct relations with both AIM and well-being (comprising academic and global well-being). This finding, combined with the significant factor loadings of the three need subscales onto the latent psychological need variable (see Table 7), is supportive of the interpretation that multicollinearity obscured some of the relations between the individual needs (most notably volitional autonomy), AIM, and well-being in the path model. It also suggests that it is empirically viable to combine the three psychological needs into a single latent variable, and that the latent variable is a robust predictor of both AIM and well-being in SVSMs.

AIM did not have a significant direct relation with well-being in the SEM; in fact, their relation bordered on nominal. This is contrasted with the path model, in which AIM had a significant direct relation with academic well-being but not global well-being. These findings

suggest that in this SVSM sample, AIM is not as robust as psychological need satisfaction in predicting well-being (the latent construct or separated into academic and global domains), and that AIM appears to be a modest predictor of well-being specific to the academic domain but is not a significant predictor of participants' global sense of well-being. As noted previously, these results contradict SDT's theoretical proposition that intrinsic motivation is vital to predicting well-being (Deci & Ryan, 1985) and warrant replication.

Indirect Effects

Bootstrap analysis of the SEM provided a more concise portrait of the indirect effects in the present sample, as displayed in Table 9. It found that psychological need satisfaction fully mediated relations between the veteran environment and AIM, as well as between the veteran environment and well-being. Of note, veteran identity did not have significant indirect relations with AIM or well-being, and AIM was not a significant mediator of relations between psychological need satisfaction and well-being.

The indirect effect findings from both the path and structural equation models represent a partial confirmation of SDT. They underscore the importance of psychological need satisfaction in directly predicting well-being (conjointly and specific to the academic and global domains), although the path model suggested that perceived competence and perceived relatedness have unique predictive roles and volitional autonomy was not a significant predictor of well-being. Findings from both models also highlight the value of psychological need satisfaction in explaining relations between appraisal of the external environment and well-being, although again to varying degrees. That is, a supportive and friendly campus environment appears to facilitate SVSM well-being through satisfying their fundamental psychological needs (particularly competence and relatedness), which is consistent with the previously-discussed

theoretical and empirical literature. The importance of intrinsic motivation, central to the SDT subtheory of Cognitive Evaluation Theory (Deci & Ryan, 1985), was not confirmed in the present study, as AIM was not a significant mediator of the relation between psychological need satisfaction and well-being in the SEM, and it only significantly mediated one need to well-being relation in the path model. Veteran identity's relations with the core SDT constructs were equivocal in the path model and absent in the SEM. This may represent a limitation in the ability of SDT to explain relations between cultural identities and well-being and warrants replication in SVSM and other multicultural samples.

Conclusions and Implications

This study provided preliminary support for SDT as a conceptual model of SVSM well-being. It was supportive of the centrality of the basic psychological needs (particularly perceived competence and perceived relatedness) in predicting SVSM well-being directly and explaining relations between contextual factors (most notably veteran-friendly campus perception and positive regard for veteran identity) and SVSM well-being. This represents an important contribution to the literature because the small number of studies in this area has lacked a guiding theoretical model. Of equal or greater importance, higher education professionals have been designing and implementing policies and services for this population without a sound theoretical or empirical basis. Thus, the present study provided a conceptual tool to guide their efforts that is both empirically sound and practically accessible to lay audiences.

In terms of contextual factors, veteran-friendly campus perception emerged as an especially robust direct predictor of psychological need satisfaction and indirect predictor of AIM and both well-being outcomes (i.e., global and specific to the academic domain). This lends quantitative support to an area that has until now been bolstered by only anecdote and intuition,

and it bears important implications. First, in order for higher education professionals to provide a valid assessment of their campus veteran friendliness and the impact of new policies or services, they need to actually measure the extent to which SVSMs perceive their campus as friendly toward veterans. The veteran-friendly campus scale, created for the present study, demonstrated good initial psychometric properties and represents a brief measure that can be used across various institution types for this purpose. Second, institutions need to implement policies and support structures designed to increase veteran friendliness on their campuses. The Environmental Evaluation for Veterans Index (EEVI; Griffin & Gilbert, 2012), derived from a national qualitative study of SVSMs and higher education professionals, is a useful tool for identifying potential holes in an institution's SVSM support infrastructure.

OVMS support was not as robust of a predictor in the model, although it did have a significant path to perceived relatedness and significant bivariate correlations with veteran-friendly campus perception and global well-being. Supplementary analyses investigated whether OVMS support indirectly related to the psychological needs via veteran-friendly campus perception, but the results were nonsignificant. Thus, it can tentatively be concluded that support received from the OVMS is related to SVSM well-being and salient to promoting SVSM belongingness on campus. As such, institutions should ensure that a dedicated office with at least one dedicated staff member is present to provide social and instrumental support to SVSMs, which is consistent with the recommendations of Griffin & Gilbert (2012). Future research should continue to explore the mechanisms by which OVMSs are supportive and their relation to salient indicators of well-being (e.g., academic satisfaction, retention, GPA, mental health, etc.) to assist in program development and advocating for financial support.

With regard to the veteran identity variables, positive regard for veteran identity had significant direct relations with perceived competence and volitional autonomy, and it indirectly related to both well-being outcomes via perceived competence. To the contrary, veteran identity centrality was not involved in any significant direct or indirect effects. Pending replication, these findings suggest that targeted resources for SVSMs (e.g., OVMSs) should seek to promote feelings of positive affect and pride toward their constituents' veteran identities, regardless of how salient that identity is to their overall self-concept. This might be accomplished by organizing events that acknowledge and celebrate the value of SVSMs' military service and contributions to the campus community, or perhaps through ensuring that culturally-competent mental health providers are available (on campus or in the surrounding community) to assist SVSMs in processing their military experiences and integrating potentially adverse experiences with their broader sense of self. Additionally, OVMSs or other dedicated SVSM support structures might consider screening incoming SVSMs' levels of positive regard for veteran identity using the Positive Regard for Veteran Identity Scale (Di Leone et al., 2016) to identify constituents that may benefit from early intervention.

While there was compelling evidence for the psychological needs to be considered conjointly (i.e., as indicators of a latent psychological need satisfaction construct), it is still worth noting that each of the needs played a different predictive role in the path model. Perceived competence was the most robust direct predictor of both well-being outcomes, while perceived relatedness directly predicted AIM in addition to both well-being outcomes. Volitional autonomy did not have significant direct relations with AIM or either well-being outcome, although that may have been an artifact of multicollinearity with the other needs. Tentatively, this suggests that targeted resources for SVSMs (e.g., OVMSs) should continue to tailor their services toward

promoting academic competence and a sense of belongingness on campus. This can take the form of tutoring/academic coaching, academic skills workshops, early intervention for SVSMs placed on academic probation, educating the campus community about military/veteran culture and unique SVSM needs, and offering social events that are inclusive of the broader campus community. A key challenge for OVMSs and institutional policy makers in promoting relatedness on campus is one shared by other campus culture/resource centers: to simultaneously provide a “sanctuary” for targeted students while advocating for their integration in the greater campus community (e.g., Patton, 2006). Offering the diversity of services mentioned above and making regular efforts to collaborate with other campus organizations is a promising approach to maintaining that balance.

AIM was also not as robust of a predictor or mediator as expected. It had a modest direct relation with academic well-being and significantly mediated the relation between perceived relatedness and academic well-being, but it did not have a significant direct relation with global well-being. As these linkages had not previously been examined in the SVSM population, the present findings may suggest that intrinsic motivation for academics is salient only to domain-specific well-being for SVSMs and that psychological need satisfaction is the more robust predictor of their well-being (whether measured in separate domains or as a latent construct). Tentative implications of these findings are that higher education professionals and SVSM support services should direct greater resources toward facilitating psychological need satisfaction than AIM per se, and any efforts to bolster AIM would be enhanced by facilitating a sense of belonging on campus. Clearly, further research is needed to more specifically tailor these recommendations.

Limitations and Future Directions

As this study was the first to extend SDT to the investigation of SVSM well-being, further research is needed to replicate and extend its findings. This is particularly true considering that several of the individually hypothesized effects had not been examined in SVSMs and had received minimal attention in the broader college student literature. The generalizability of these findings is also limited by the fact this sample was predominantly European American and was drawn exclusively from large, public universities in a single Midwestern state. Future research needs to sample SVSMs across the U.S. and across institution types to better capture the demographic representation and educational experiences of the SVSM population and generate more appropriately generalizable findings. Larger, more diverse samples would also enable examination of more subtle mediation and moderation effects, as well as other more sophisticated analyses (e.g., hierarchical linear modeling) of effects at the individual and institutional levels.

This area of the literature would also benefit greatly from longitudinal research. Such research would provide a portrait of SVSM well-being over the course of their college education and beyond and enable investigators to relate changes in their environment to changes in reported well-being. While this would not determine any causal relationships because it is not an experimental design, it would provide more compelling evidence than the present study's cross-sectional design. Additionally, researchers may consider collaborating with student affairs professionals in conducting experimental field studies to potentially draw causal conclusions with regard to SVSM well-being. An example design would be to randomly assign incoming SVSMs to support programming through their OVMS versus a control condition (e.g., general

freshman learning community), measuring their psychological need satisfaction, AIM, and well-being before, during, and after the intervention period.

The present study measured a limited scope of the SVSM context, focusing on constructs that were explicitly tied to their veteran status. Future research should incorporate additional contextual factors that may relate to psychological need satisfaction. This could include academic support received from faculty and academic advisers, vocational support from campus career services, and emotional support received from partners or close family/friends. Researchers may choose to give special attention to predictors of perceived competence, as it was a robust predictor of well-being yet the present study was only able to explain 9% of its variance. Given the proliferation of OVMSs and the fact they are designed to support the well-being of SVSMs, more research is also needed to better understand the impact of their services. Future studies should include samples with a broader range of OVMS utilization and develop alternative measures of support received from the OVMS.

Veteran-friendly campus perception represents a promising area for further inquiry. The novel veteran-friendly campus scale (VFCS) demonstrated good initial psychometric properties and would benefit from formal development. Researchers would then be able to use this measure to predict a wide array of outcomes (well-being and otherwise) and refine our understanding of how a veteran-friendly campus is salutary for SVSMs. The VFCS should also be used concurrently with an objective measure such as the EEVI (Griffin & Gilbert, 2012) to discern the correlation between the number of ostensibly “veteran-friendly” policies/services and the extent to which the campus is perceived as friendly for SVSMs. Future research may also use the VFCS as a pre/post measure to examine the felt impact of new policies and services.

Given the high correlations observed among the three basic psychological needs in the present study and the marginal internal consistency of the perceived competence and volitional autonomy subscales, future research should consider using the total Basic Psychological Need Satisfaction Scale- General Measure score (in the case of path models) or the latent psychological need satisfaction variable (in the case of structural equation models). Those approaches would provide a more stable measure of psychological need satisfaction and obviate the interpretive issues raised by multicollinearity among the individual needs. Researchers may also consider using the Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015), which measures the frustration of respondents' psychological needs in addition to need satisfaction and may increase the predictive utility of well-being models.

Despite the fact that AIM has been a viable stand-alone predictor of well-being in previous college student samples (e.g., Garriott et al., 2015), it was not a particularly robust predictor in the present sample. Future research should consider using the entire Academic Motivation Scale (Vallerand et al., 1992) to examine whether other subtypes of academic motivation (e.g., external regulation, identified, amotivation) are significant predictors of well-being in SVSMs and the broader college student population. Alternatively, researchers may consider incorporating the Relative Autonomy Index (Sheldon, Osin, Gordeeva, Suchkov, & Sychev, 2017), which is a recently-developed unidimensional measure of the SDT motivational taxonomy intended to be adapted across diverse behavioral or role domains (e.g., college education). This type of instrument bears the additional advantage of being able to measure more global versus domain-specific motivation, which could help to clarify whether SVSM global well-being would be more strongly associated with a broader measure of motivation.

The present study was also limited in its construct coverage of well-being and reliant upon self-report measures. Future research should examine other domains of SVSM well-being (e.g., health, financial, social, spiritual) and also incorporate objective measures (e.g., grade point average, academic persistence/drop-out, graduation rates) and other-report measures (e.g., academic competence ratings from faculty, emotional well-being ratings from a partner or close friend). Implementation of these recommendations would result in a more holistic understanding of SVSM well-being that is less biased by mono-method measurement.

A Final Word

It is worth reiterating that the present SVSM sample endorsed mean levels of academic and global well-being that were comparable to recent college student samples. This suggests that despite some potential barriers that are unique to this subpopulation (e.g., delayed entry into college, interruption of studies due to mobilization, atypical and sometimes difficult/traumatic life experiences, potential ideological differences with non-military peers), they are able to attain well-being in their life overall and specifically in their student role to the same extent as their non-military peers. This bears testament to the resiliency, adaptability, and work ethic of SVSMs and underscores their potential to make unique and meaningful contributions to the landscape of higher education in the U.S. They should be welcomed in all aspects of the academy and granted the support to which they are entitled given the selfless service they have provided to the nation.

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Table 1
Predictor Variables and Corresponding Hypotheses

Variable	Hypothesis	Direct Relation(s) to	Fully Mediates Relation(s)	Partially Mediates Relation(s)
OVMS Support	1	Competence, Autonomy, and Relatedness		
VFC Perception	1	Competence, Autonomy, and Relatedness		
Veteran Identity Centrality	1	Competence, Autonomy, and Relatedness		
Positive Regard for Veteran Identity	1	Competence, Autonomy, and Relatedness		
Perceived Competence	2, 3	Academic Intrinsic Motivation, Academic Well-Being and Global Well-Being	OVMS Support, VFC Perception, Veteran Identity Centrality, and Positive Regard for Veteran Identity to Academic Intrinsic Motivation, Academic Well-Being and Global Well-Being	
Volitional Autonomy	2, 3	Academic Intrinsic Motivation, Academic Well-Being and Global Well-Being	OVMS Support, VFC Perception, Veteran Identity Centrality, and Positive Regard for Veteran Identity to Academic Intrinsic Motivation, Academic Well-Being and Global Well-Being	
Perceived Relatedness	2, 3	Academic Intrinsic Motivation, Academic Well-Being and Global Well-Being	OVMS Support, VFC Perception, Veteran Identity Centrality, and Positive Regard for Veteran Identity to Academic Intrinsic Motivation, Academic Well-Being and Global Well-Being	
Academic Intrinsic Motivation	4, 5	Academic Well-Being and Global Well-Being		Competence, Autonomy, and Relatedness to Academic Well-Being and Global Well-Being

Note. OVMS = Office of Veterans and Military Services; VFC = Veteran Friendly Campus

Table 2
Demographic Characteristics of the Sample

Characteristic	Percentage	Characteristic	Percentage
Age (in years)		Race	
Under 25	57.7	White/European American	88.5
25 & older	42.3	Multiracial	3.8
Military affiliation		Black/African American	2.2
Current military member	52.7	Asian American	2.2
Veteran (separated from military)	47.3	American Indian/Alaska Native	1.1
Institution		Did not provide	2.2
Iowa State University	58.2	Ethnicity	
University of Iowa	35.7	Not Hispanic or Latino/a	83.5
University of Northern Iowa	6.0	Hispanic or Latino/a	12.1
Class Standing		Did not provide	4.4
Freshman	12.6	Parent Status	
Sophomore	16.5	No children	84.6
Junior	22.0	At least one child	13.2
Senior	31.9	Did not provide	2.2
Graduate Student	16.5	Branch of Service (past or present)	
Did not provide	0.5	Army	47.3
Gender Identity		Navy	19.2
Male	70.9	Marine Corps	19.2
Female	28.6	Air Force	12.6
Did not provide	0.5	Multiple	1.0
Sexual Orientation		Coast Guard	0.5
Straight/Heterosexual	90.7	Component of Service (past or present)	
Bisexual	2.2	National Guard	34.1
Gay	2.2	Active Duty	32.4
Lesbian	1.1	Multiple	20.3
Other	1.1	Reserves	13.2
Did not provide	2.7	Combat Deployment History	
Relationship Status		None	72.5
Single	39.0	At least one deployment	27.5
In a committed relationship (unmarried)	36.8		
Married	24.1		

Note. $N = 182$. Age: $M = 25.47$, $SD = 7.20$.

Table 3
Military Educational Benefits Used in the Present Sample

Military Educational Benefit	Percentage
Post-9/11 GI Bill	42.5
Iowa National Guard Education Assistance Program	22.1
Montgomery GI Bill: Selected Reserves (Chapter 1606)	19.0
Reserve Officers' Training Corps (ROTC) Scholarship	10.3
Federal Tuition Assistance	10.0
Department of Veterans Affairs Work Study	5.3
Department of Veterans Affairs Vocational Rehabilitation and Employment	4.4
Montgomery GI Bill: Active Duty & Veteran (Chapter 30)	3.7
Miscellaneous other programs	3.6
Reserve Educational Assistance Program (Chapter 1607)	1.1

Note. $N = 182$. Cumulative percentage is greater than 100 because participants were allowed to select multiple responses.

Table 4

Means, Standard Deviations, Internal Consistencies, and Intercorrelations for All Observed Variables

	1	2	3	4	5	6	7	8	9	10
1. OVMS Support	<i>.95</i>									
2. Veteran-Friendly Campus Perception	.16*	<i>.92</i>								
3. Veteran Identity Centrality	.13	-.04	<i>.73</i>							
4. Positive Regard for Veteran Identity	.13	.07	.62**	<i>.75</i>						
5. Perceived Competence	.08	.25**	.03	.16*	<i>.66</i>					
6. Volitional Autonomy	.12	.37**	.03	.19*	.62**	<i>.63</i>				
7. Perceived Relatedness	.19*	.48**	-.04	.02	.51**	.63**	<i>.86</i>			
8. Academic Intrinsic Motivation	.12	.17*	.05	-.01	.25**	.29**	.32**	<i>.91</i>		
9. Academic Well-Being	.08	.19*	-.06	.10	.63**	.42**	.44**	.33**	<i>.87</i>	
10. Global Well-Being	.25**	.20**	-.01	.16*	.42**	.39**	.37**	.10	.34**	<i>.82</i>
<i>M</i>	3.80	3.68	3.03	3.52	4.97	5.00	4.86	4.84	4.14	4.99
<i>SD</i>	1.02	0.79	0.98	0.97	0.91	0.95	1.13	1.15	0.60	1.19

Note. $N = 182$. OVMS = Office of veterans and military services. Cronbach's alpha for each measure is displayed on the diagonal in italics. OVMS Support, Veteran-Friendly Campus Perception, Veteran Identity Centrality, Positive Regard for Veteran Identity, and Academic Well-Being are scored on 1 to 5 scales, with higher scores indicating a greater degree of the variable. Perceived Competence, Volitional Autonomy, Perceived Relatedness, Academic Intrinsic Motivation, and Global Well-Being are scored on 1 to 7 scales, with higher scores indicating a greater degree of the variable. * $p < .05$, ** $p < .01$.

Table 5

Bootstrap Analysis of Magnitude and Statistical Significance of Indirect Effects in the Hypothesized Path Model

Indirect Effects			β and product	Mean Indirect Effect (b) ^a	SE of Mean ^a	95% BC CI Lower, Upper ^a
1a. OVMS Support	Competence	AIM	(.03) X (.06) = .002	.002	.01	-.012, .040
1b. OVMS Support	Competence	Academic Well-Being	(.03) X (.55) = .017	.010	.02	-.038, .054
1c. OVMS Support	Competence	Global Well-Being	(.03) X (.26) = .008	.009	.03	-.032, .066
1d. VFC Perception	Competence	AIM	(.23) X (.06) = .014	.021	.05	-.054, .140
1e. VFC Perception	Competence	Academic Well-Being	(.23) X (.55) = .127	.096	.05	.023, .202*
1f. VFC Perception	Competence	Global Well-Being	(.23) X (.26) = .060	.092	.05	.021, .217*
1g. Veteran Identity Centrality	Competence	AIM	(-.09) X (.06) = -.005	-.006	.02	-.092, .016
1h. Veteran Identity Centrality	Competence	Academic Well-Being	(-.09) X (.55) = -.050	-.030	.03	-.101, .031
1i. Veteran Identity Centrality	Competence	Global Well-Being	(-.09) X (.26) = -.023	-.028	.04	-.116, .028
1j. Positive Regard for Vet. Identity	Competence	AIM	(.19) X (.06) = .011	.014	.03	-.042, .086
1k. Positive Regard for Vet. Identity	Competence	Academic Well-Being	(.19) X (.55) = .105	.065	.04	.001, .143*
1l. Positive Regard for Vet. Identity	Competence	Global Well-Being	(.19) X (.26) = .049	.061	.04	.006, .179*
2a. OVMS Support	Autonomy	AIM	(.05) X (.13) = .007	.006	.02	-.011, .061
2b. OVMS Support	Autonomy	Academic Well-Being	(.05) X (-.06) = -.003	-.002	.01	-.019, .004
2c. OVMS Support	Autonomy	Global Well-Being	(.05) X (.15) = .008	.008	.02	-.010, .054
2d. VFC Perception	Autonomy	AIM	(.34) X (.13) = .044	.062	.07	-.053, .223
2e. VFC Perception	Autonomy	Academic Well-Being	(.34) X (-.06) = .020	-.015	.02	-.072, .026
2f. VFC Perception	Autonomy	Global Well-Being	(.34) X (.15) = .051	.074	.06	-.015, .222
2g. Veteran Identity Centrality	Autonomy	AIM	(-.11) X (.13) = -.014	-.016	.03	-.103, .013
2h. Veteran Identity Centrality	Autonomy	Academic Well-Being	(-.11) X (-.06) = .007	.004	.01	-.006, .036

Table 5 (continued)

2i. Veteran Identity Centrality	Autonomy	Global Well-Being	$(-.11) \times (.15) = -.017$	-.019	.03	-.114, .012
2j. Positive Regard for Vet. Identity	Autonomy	AIM	$(.23) \times (.13) = .030$	.034	.04	-.017, .127
2k. Positive Regard for Vet. Identity	Autonomy	Academic Well-Being	$(.23) \times (-.06) = -.014$	-.008	.01	-.042, .012
2l. Positive Regard for Vet. Identity	Autonomy	Global Well-Being	$(.23) \times (.15) = .035$	.041	.04	-.005, .145
3a. OVMS Support	Relatedness	AIM	$(.12) \times (.21) = .025$	.028	.02	.000, .091
3b. OVMS Support	Relatedness	Academic Well-Being	$(.12) \times (.15) = .018$	.010	.01	.000, .035
3c. OVMS Support	Relatedness	Global Well-Being	$(.12) \times (.16) = .019$	.022	.02	-.001, .079
3d. VFC Perception	Relatedness	AIM	$(.46) \times (.21) = .097$	.137	.06	.028, .274*
3e. VFC Perception	Relatedness	Academic Well-Being	$(.46) \times (.15) = .069$	.052	.03	.002, .116*
3f. VFC Perception	Relatedness	Global Well-Being	$(.46) \times (.16) = .074$	.111	.06	-.004, .225
3g. Veteran Identity Centrality	Relatedness	AIM	$(-.02) \times (.21) = -.004$	-.005	.03	-.055, .043
3h. Veteran Identity Centrality	Relatedness	Academic Well-Being	$(-.02) \times (.15) = -.003$	-.002	.01	-.028, .015
3i. Veteran Identity Centrality	Relatedness	Global Well-Being	$(-.02) \times (.16) = -.003$	-.004	.02	-.069, .032
3j. Positive Regard for Vet. Identity	Relatedness	AIM	$(-.02) \times (.21) = -.004$	-.004	.02	-.064, .030
3k. Positive Regard for Vet. Identity	Relatedness	Academic Well-Being	$(-.02) \times (.15) = -.003$	-.001	.01	-.028, .014
3l. Positive Regard for Vet. Identity	Relatedness	Global Well-Being	$(-.02) \times (.16) = -.003$	-.003	.02	-.057, .030
4a. Competence	AIM	Academic Well-Being	$(.06) \times (.16) = .010$	.007	.01	-.019, .035
4b. Competence	AIM	Global Well-Being	$(.06) \times (-.06) = -.004$	-.005	.02	-.060, .013
4c. Autonomy	AIM	Academic Well-Being	$(.13) \times (.16) = .021$	.013	.01	-.009, .047
4d. Autonomy	AIM	Global Well-Being	$(.13) \times (-.06) = -.008$	-.009	.02	-.074, .010
4e. Relatedness	AIM	Academic Well-Being	$(.21) \times (.16) = .034$	.018	.01	.003, .043*

Table 5 (continued)

4f. Relatedness	AIM	Global Well-Being		(.21) X (-.06) = -.013	-.013	.02	-.060, .012
5a. OVMS Support	Competence	AIM	Academic Well-Being	(.03) X (.06) X (.16) = < .001	< .001	< .01	-.001, .004
5b. OVMS Support	Competence	AIM	Global Well-Being	(.03) X (.06) X (-.06) = > -.001	< .001	< .01	-.006, .001
5c. VFC Perception	Competence	AIM	Academic Well-Being	(.23) X (.06) X (.16) = .002	.002	< .01	-.004, .014
5d. VFC Perception	Competence	AIM	Global Well-Being	(.23) X (.06) X (-.06) = -.001	-.001	.01	-.021, .003
5e. Veteran Identity Centrality	Competence	AIM	Academic Well-Being	(-.09) X (.06) X (.16) = -.001	-.001	< .01	-.009, .001
5f. Veteran Identity Centrality	Competence	AIM	Global Well-Being	(-.09) X (.06) X (-.06) = < .001	< .001	< .01	-.001, .012
5g. Positive Regard for Vet. Identity	Competence	AIM	Academic Well-Being	(.19) X (.06) X (.16) = -.002	.001	< .01	-.003, .010
5h. Positive Regard for Vet. Identity	Competence	AIM	Global Well-Being	(.19) X (.06) X (-.06) = -.001	-.001	< .01	-.014, .002
6a. OVMS Support	Autonomy	AIM	Academic Well-Being	(.05) X (.13) X (.16) = .001	.001	< .01	-.001, .006
6b. OVMS Support	Autonomy	AIM	Global Well-Being	(.05) X (.13) X (-.06) = > -.001	< .001	< .01	-.012, .001
6c. VFC Perception	Autonomy	AIM	Academic Well-Being	(.34) X (.13) X (.16) = .007	.005	.01	-.003, .025
6d. VFC Perception	Autonomy	AIM	Global Well-Being	(.34) X (.13) X (-.06) = -.003	-.004	.01	-.039, .004
6e. Veteran Identity Centrality	Autonomy	AIM	Academic Well-Being	(-.11) X (.13) X (.16) = -.002	-.001	< .01	-.012, .001
6f. Veteran Identity Centrality	Autonomy	AIM	Global Well-Being	(-.11) X (.13) X (-.06) = .001	.001	< .01	-.001, .015
6g. Positive Regard for Vet. Identity	Autonomy	AIM	Academic Well-Being	(.23) X (.13) X (.16) = -.005	.003	< .01	-.001, .014
6h. Positive Regard for Vet. Identity	Autonomy	AIM	Global Well-Being	(.23) X (.13) X (-.06) = -.002	-.002	< .01	-.019, .001
7a. OVMS Support	Relatedness	AIM	Academic Well-Being	(.12) X (.21) X (.16) = .004	.002	< .01	.000, .009

Table 5 (continued)

7b. OVMS Support	Relatedness	AIM	Global Well-Being	(.12) X (.21) X (-.06) = -.002	-.002	< .01	-.013, .001
7c. VFC Perception	Relatedness	AIM	Academic Well-Being	(.46) X (.21) X (.16) = .015	.011	.01	.002, .028*
7d. VFC Perception	Relatedness	AIM	Global Well-Being	(.46) X (.21) X (-.06) = -.006	-.008	.01	-.042, .008
7e. Veteran Identity Centrality	Relatedness	AIM	Academic Well-Being	(-.02) X (.21) X (.16) = -.001	< .001	< .01	-.006, .004
7f. Veteran Identity Centrality	Relatedness	AIM	Global Well-Being	(-.02) X (.21) X (-.06) = < .001	< .001	< .01	-.003, .008
7g. Positive Regard for Vet. Identity	Relatedness	AIM	Academic Well-Being	(-.02) X (.21) X (.16) = -.001	< .001	< .01	-.006, .003
7h. Positive Regard for Vet. Identity	Relatedness	AIM	Global Well-Being	(-.02) X (.21) X (-.06) = < .001	< .001	< .01	-.002, .010

Note. $N = 182$. OVMS = Office of Veterans and Military Services. VFC = Veteran-Friendly Campus. AIM = Academic Intrinsic Motivation. BC CI = Bias-Corrected Confidence Interval. ^aThese values are based on the unstandardized path coefficients. *95% Confidence interval does not include zero and therefore is significant at $p < .05$.

Table 6

Bootstrap Analysis of Magnitude and Statistical Significance of Indirect Effects in the Modified Path Model with Perceived Competence and Perceived Relatedness Removed

Indirect Effects			β and product	Mean Indirect Effect (b) ^a	SE of Mean ^a	95% BC CI Lower, Upper ^a
1a. OVMS Support	Autonomy	AIM	(.05) X (.29) = .015	.015	.03	-.032, .069
1b. OVMS Support	Autonomy	Academic Well-Being	(.05) X (.36) = .018	.009	.02	-.021, .038
1c. OVMS Support	Autonomy	Global Well-Being	(.05) X (.40) = .020	.021	.03	-.044, .091
1d. VFC Perception	Autonomy	AIM	(.34) X (.29) = .099	.146	.07	.038, .295*
1e. VFC Perception	Autonomy	Academic Well-Being	(.34) X (.36) = .122	.092	.04	.034, .176*
1f. VFC Perception	Autonomy	Global Well-Being	(.34) X (.40) = .136	.203	.08	.065, .389*
1g. Veteran Identity Centrality	Autonomy	AIM	(-.11) X (.29) = -.032	-.037	.04	-.125, .038
1h. Veteran Identity Centrality	Autonomy	Academic Well-Being	(-.11) X (.36) = -.040	-.024	.03	-.076, .023
1i. Veteran Identity Centrality	Autonomy	Global Well-Being	(-.11) X (.40) = -.044	-.052	.06	-.176, .037
1j. Positive Regard for Vet. Identity	Autonomy	AIM	(.23) X (.29) = .067	.080	.04	.009, .158*
1k. Positive Regard for Vet. Identity	Autonomy	Academic Well-Being	(.23) X (.36) = .083	.051	.03	.004, .110*
1l. Positive Regard for Vet. Identity	Autonomy	Global Well-Being	(.23) X (.40) = .092	.112	.06	.006, .229*
2a. Autonomy	AIM	Academic Well-Being	(.29) X (.22) = .064	.041	.02	.014, .080*
2b. Autonomy	AIM	Global Well-Being	(.29) X (-.02) = -.006	-.006	.03	-.069, .045
3a. OVMS Support	Autonomy	AIM	Academic Well-Being (.05) X (.29) X (.22) = .003	.002	< .01	-.003, .009
3b. OVMS Support	Autonomy	AIM	Global Well-Being (.05) X (.13) X (-.02) = > -.001	< .001	< .01	-.009, .003
3c. VFC Perception	Autonomy	AIM	Academic Well-Being (.34) X (.29) X (.22) = .022	.017	.01	.004, .044*
3d. VFC Perception	Autonomy	AIM	Global Well-Being (.34) X (.29) X (-.02) = -.002	-.003	.01	-.036, .020

Table 6 (continued)

3e. Veteran Identity Centrality	Autonomy	AIM	Academic Well-Being	(-.11) X (.29) X (.22) = -.007	-.004	.01	-.019, .003
3f. Veteran Identity Centrality	Autonomy	AIM	Global Well-Being	(-.11) X (.29) X (-.02) = .001	.001	< .01	-.005, .014
3g. Positive Regard for Vet. Identity	Autonomy	AIM	Academic Well-Being	(.23) X (.29) X (.22) = -.015	.009	.01	.001, .026*
3h. Positive Regard for Vet. Identity	Autonomy	AIM	Global Well-Being	(.23) X (.29) X (-.02) = -.001	-.001	.01	-.018, .011

Note. $N = 182$. OVMS = Office of Veterans and Military Services. VFC = Veteran-Friendly Campus. AIM = Academic Intrinsic Motivation. BC CI = Bias-Corrected Confidence Interval. ^aThese values are based on the unstandardized path coefficients. ^{*}95% Confidence interval does not include zero and therefore is significant at $p < .05$.

Table 7
Factor Loadings for the Measurement Model

Measure and variable	Unstandardized factor loading	SE	Z	Standardized factor loading
Veteran Environment ($\alpha = .93$)				
Parcel 1	0.59	.07	8.27	0.90***
Parcel 2	0.65	.07	10.02	0.95***
Parcel 3	0.62	.07	8.75	0.91***
Veteran Identity ($\alpha = .77$)				
Parcel 1	0.70	.12	5.84	0.71***
Parcel 2	0.81	.13	6.25	0.80***
Parcel 3	0.92	.09	10.40	0.91***
Psychological Need Satisfaction ($\alpha = .80$)				
Competence	0.69	.07	9.86	0.76***
Autonomy	0.75	.06	11.93	0.80***
Relatedness	0.84	.08	11.21	0.74***
Academic Intrinsic Motivation ($\alpha = .78$)				
To know	1.11	.11	10.19	0.87***
Toward accomplishment	1.14	.10	11.28	0.91***
To experience stimulation	0.83	.12	7.19	0.53***
Well-Being ($\alpha = .86$)				
Parcel 1	0.61	.06	9.96	0.72***
Parcel 2	0.72	.05	16.00	0.90***
Parcel 3	0.56	.04	14.71	0.87***

Note. $N = 182$. Alpha statistics are based on each variable's three indicators.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 8
Correlations among Latent Variables

	1	2	3	4	5
1. Veteran Environment	—				
2. Veteran Identity	.11	—			
3. Psychological Need Satisfaction	.54***	.13	—		
4. Academic Intrinsic Motivation	.21***	-.04	.45***	—	
5. Well-Being	.36***	.11	.75***	.33***	—

Note. $N = 182$. Higher scores indicate greater perception of the veteran environment being supportive and friendly, greater centrality and positive regard of veteran identity, greater satisfaction of basic psychological needs, greater intrinsic motivation for academics, and a greater degree of well-being.

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

Table 9

Bootstrap Analysis of Magnitude and Statistical Significance of Indirect Effects in the Structural Equation Model

Indirect Effects				β and product	Mean Indirect Effect (b) ^a	SE of Mean ^a	95% BC CI Lower, Upper ^a
1a. Veteran Environment	Psych. Need Satisfaction	AIM		(.52) X (.44) = .229	.423	.11	.252, .667*
1b. Veteran Environment	Psych. Need Satisfaction	Well-Being		(.52) X (.75) = .390	.395	.07	.269, .551*
1c. Veteran Identity	Psych. Need Satisfaction	AIM		(.07) X (.44) = .031	.046	.07	-.073, .187
1d. Veteran Identity	Psych. Need Satisfaction	Well-Being		(.07) X (.75) = .053	.043	.06	-.063, .182
2a. Psych. Need Satisfaction	AIM	Well-Being		(.44) X (.01) = .004	< .001	.03	-.079, .060
3a. Veteran Environment	Psych. Need Satisfaction	AIM	Well-Being	(.52) X (.44) X (.01) = .002	< .001	.02	-.049, .038
3b. Veteran Identity	Psych. Need Satisfaction	AIM	Well-Being	(.07) X (.44) X (.01) = < .001	< .001	< .01	-.011, .007

Note. $N = 182$. AIM = Academic Intrinsic Motivation. BC CI = Bias-Corrected Confidence Interval. ^aThese values are based on the unstandardized path coefficients. *95% Confidence interval does not include zero and therefore is significant at $p < .05$.

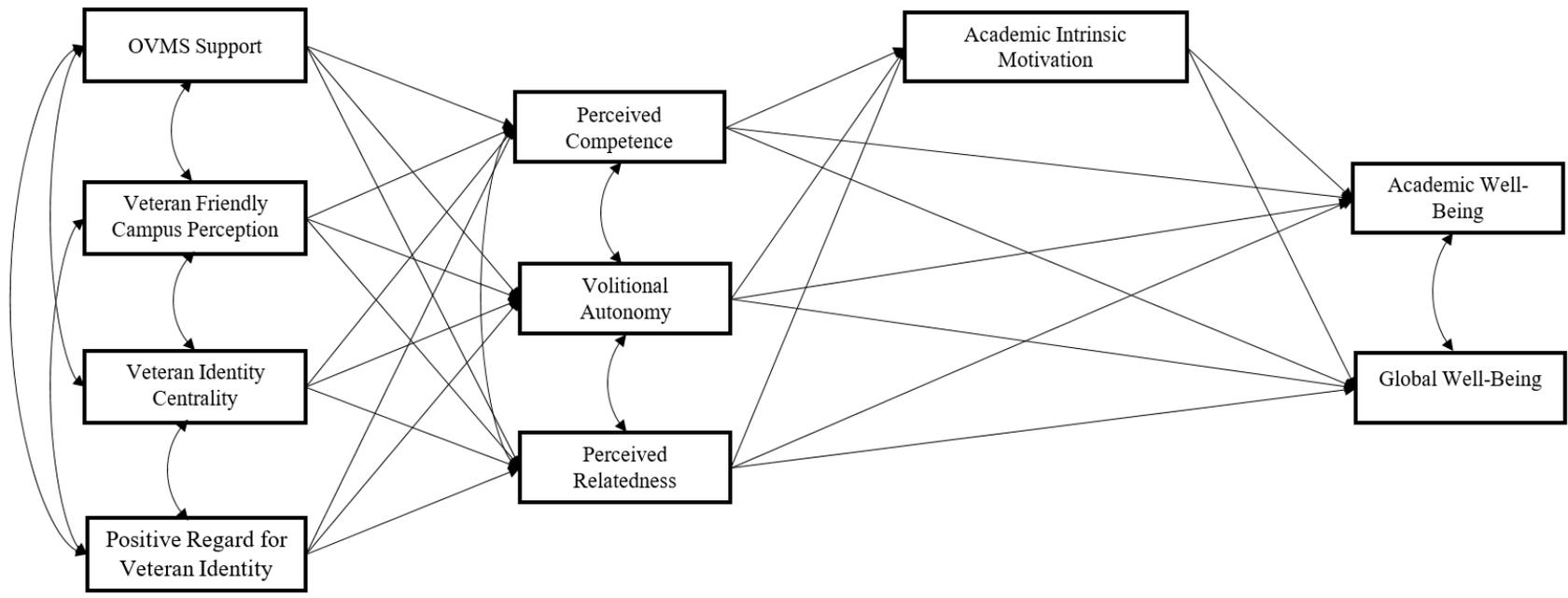


Figure 1. The hypothesized path model.

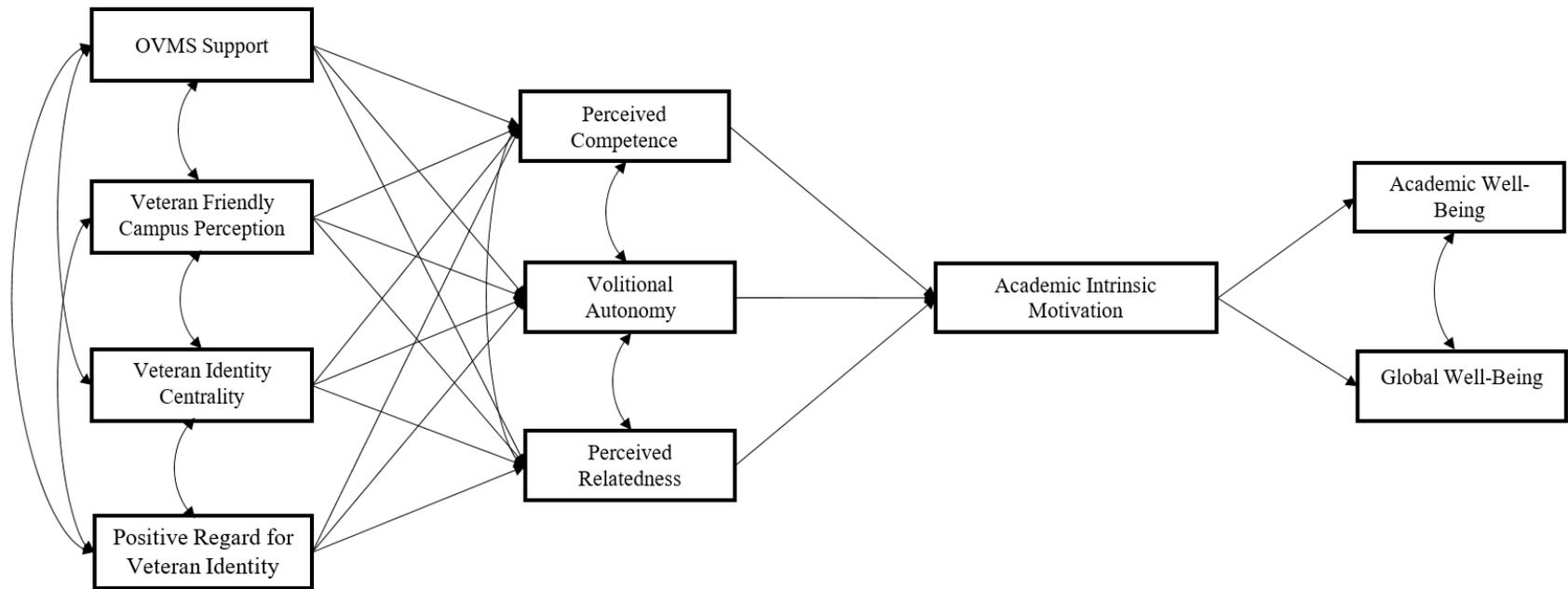


Figure 2. The alternative path model.

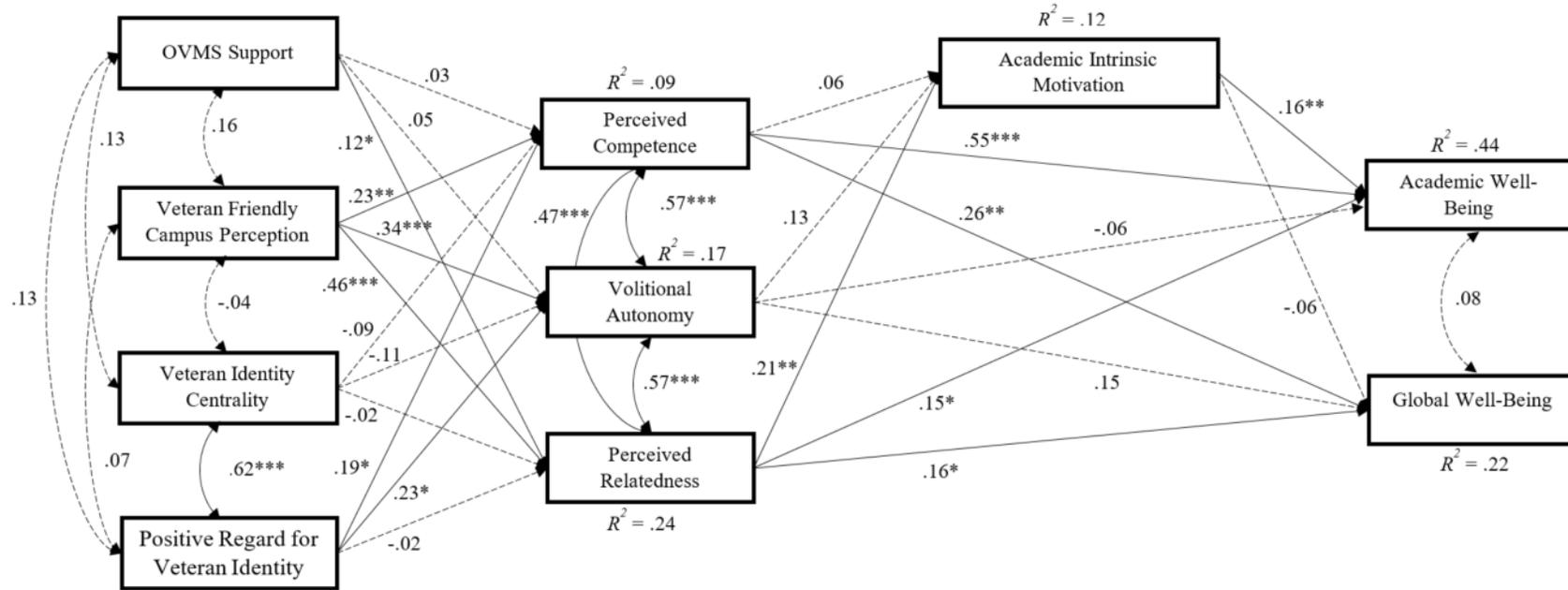


Figure 3. Hypothesized path model results.

Note. Dashed lines indicate nonsignificant paths.

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

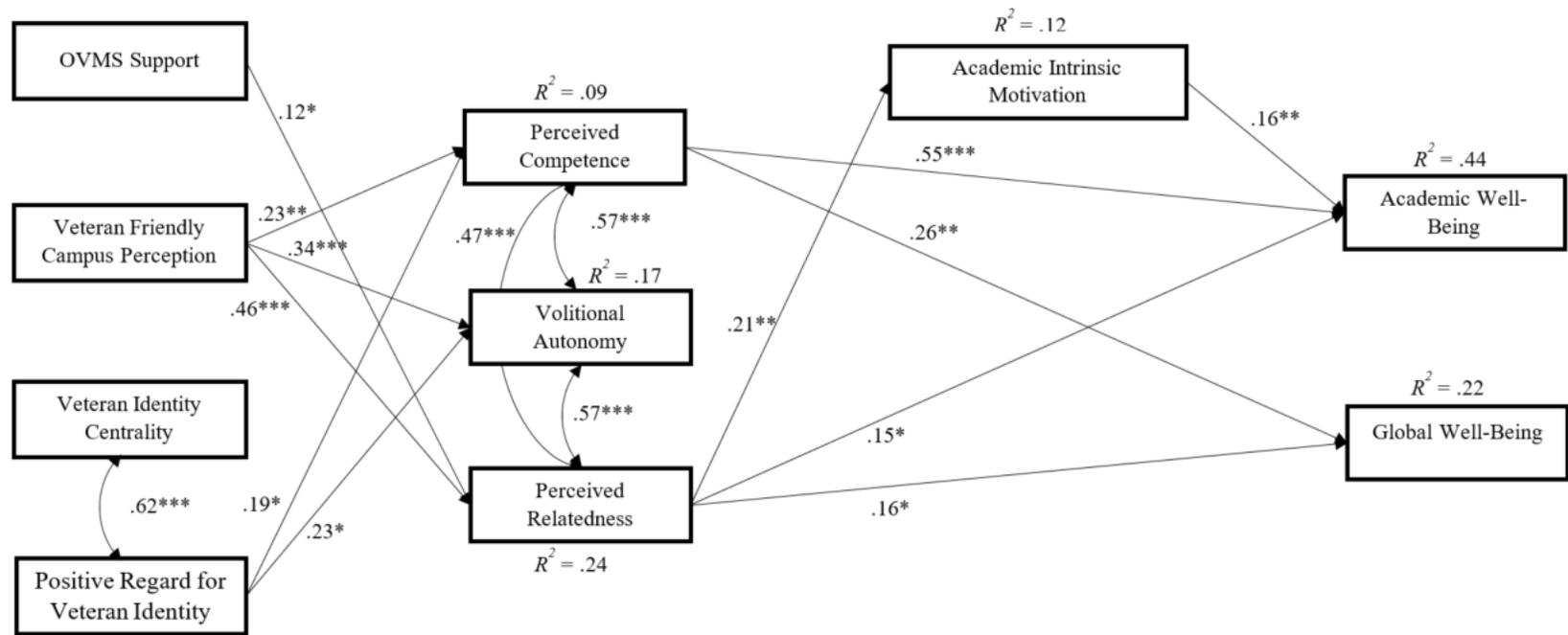


Figure 4. Hypothesized path model results with nonsignificant paths omitted for visual clarity.

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

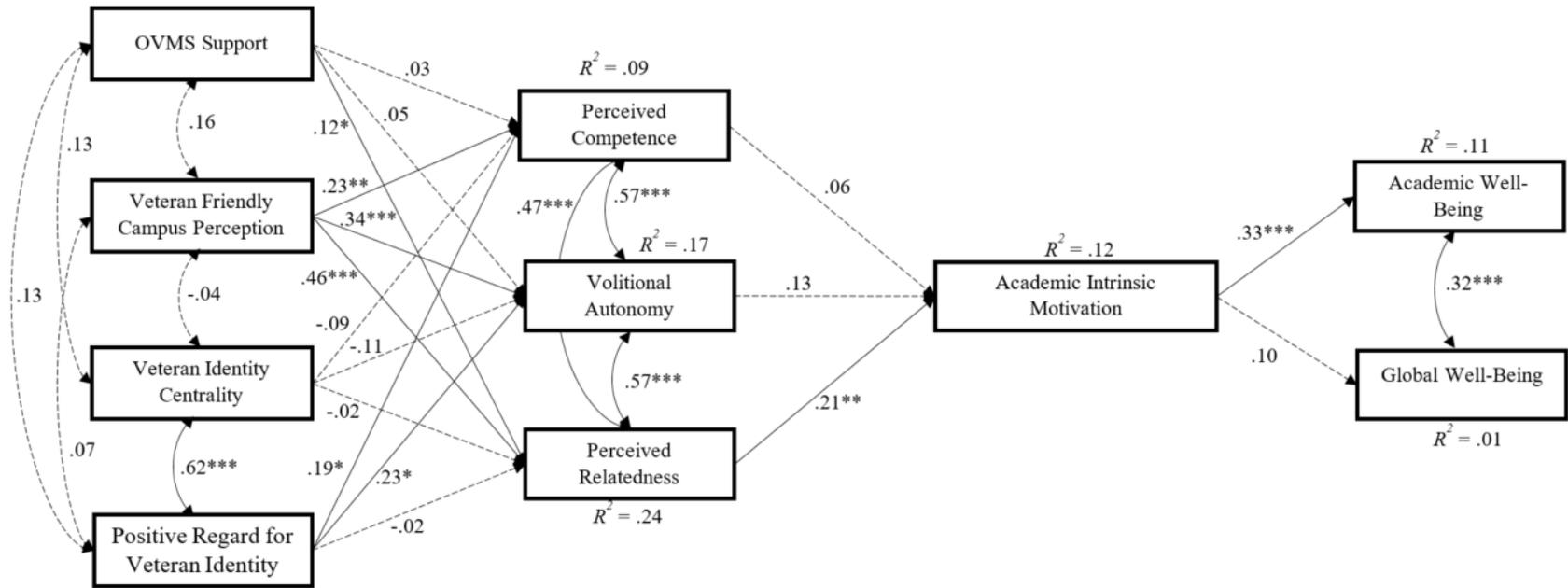


Figure 5. Alternative path model results.
 Note. Dashed lines indicate nonsignificant paths.
 * $p < .05$, ** $p < .01$, *** $p < .001$.

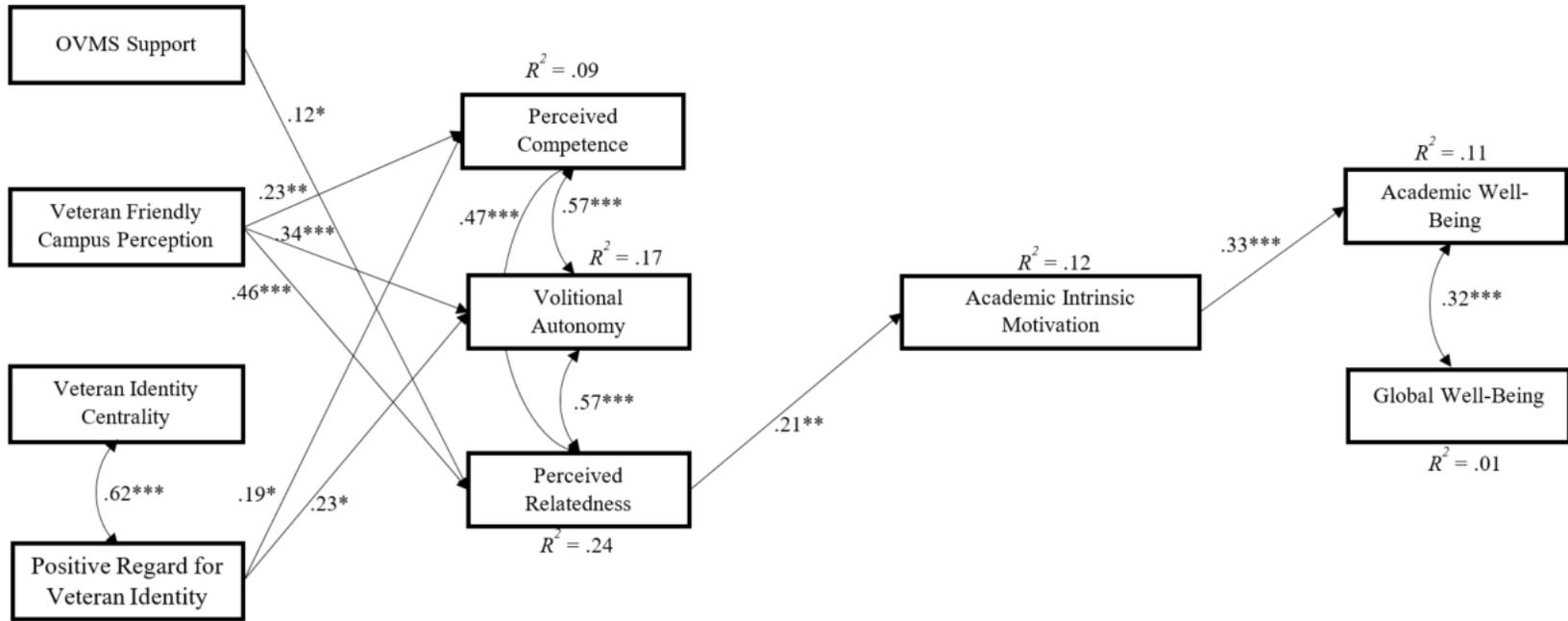


Figure 6. Alternative path model results with nonsignificant paths omitted for visual clarity.
 * $p < .05$, ** $p < .01$, *** $p < .001$.

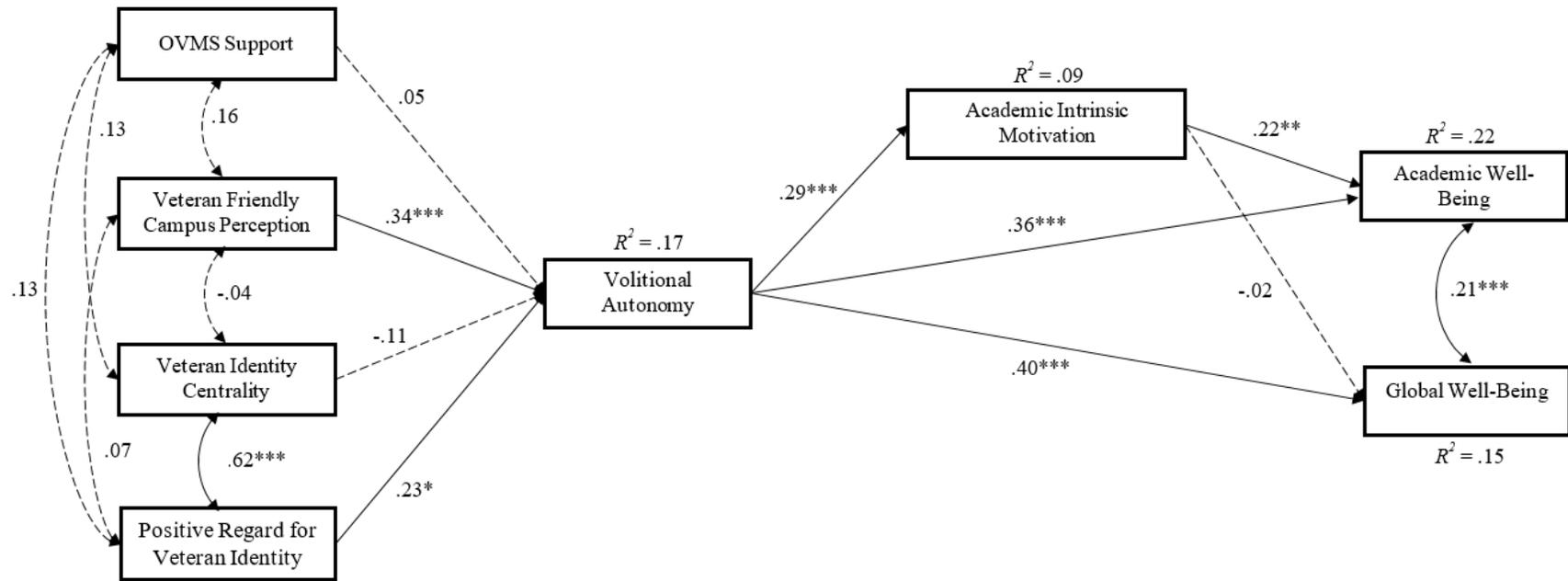


Figure 7. Modified path model results with perceived competence and perceived relatedness removed.

Note. Dashed lines indicate nonsignificant paths.

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

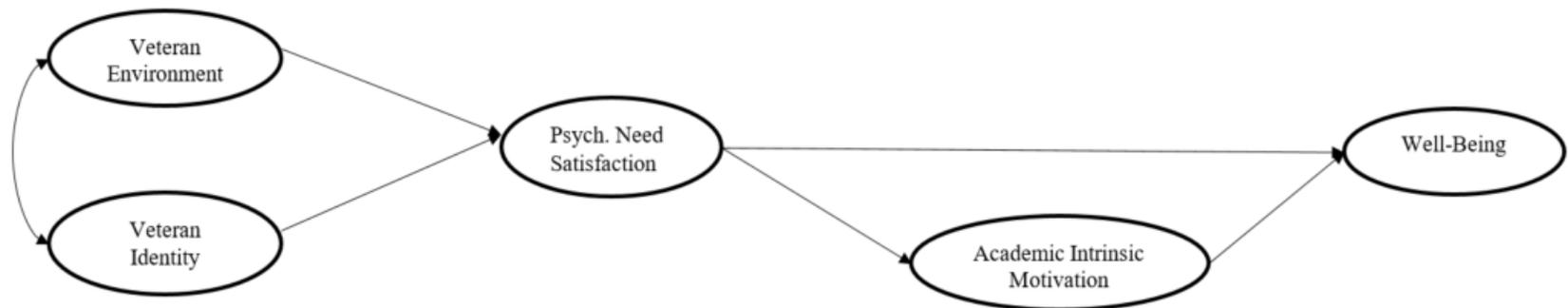


Figure 8. The post hoc structural equation model.

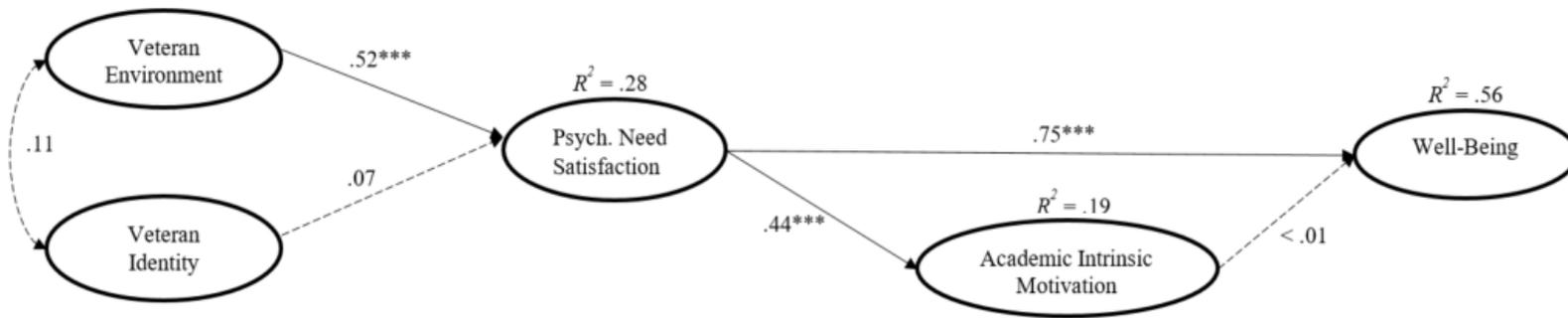


Figure 9. Structural equation model results.
 Note. Dashed lines indicate nonsignificant paths.
 $*p < .05$, $**p < .01$, $***p < .001$.

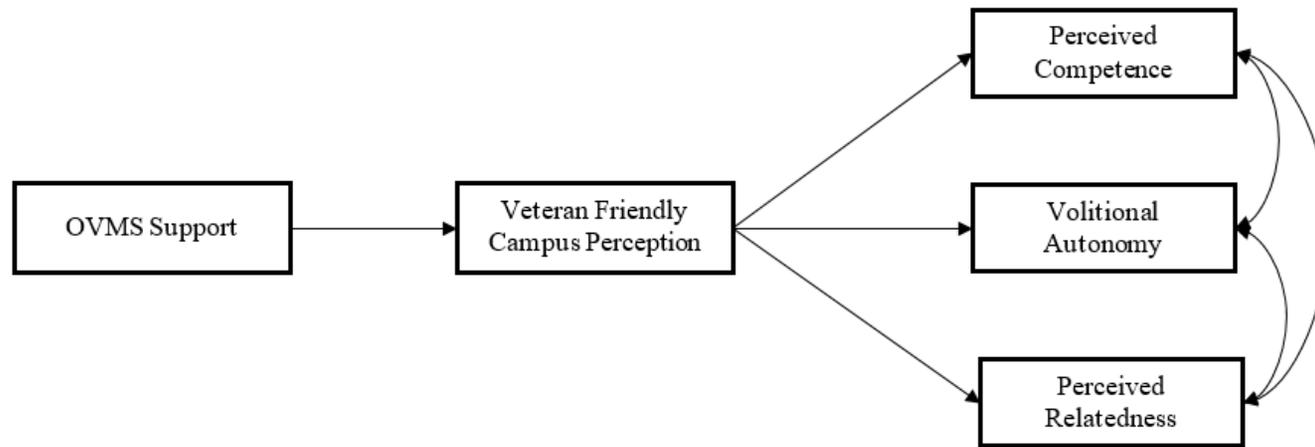


Figure 10. The post hoc mediation model.

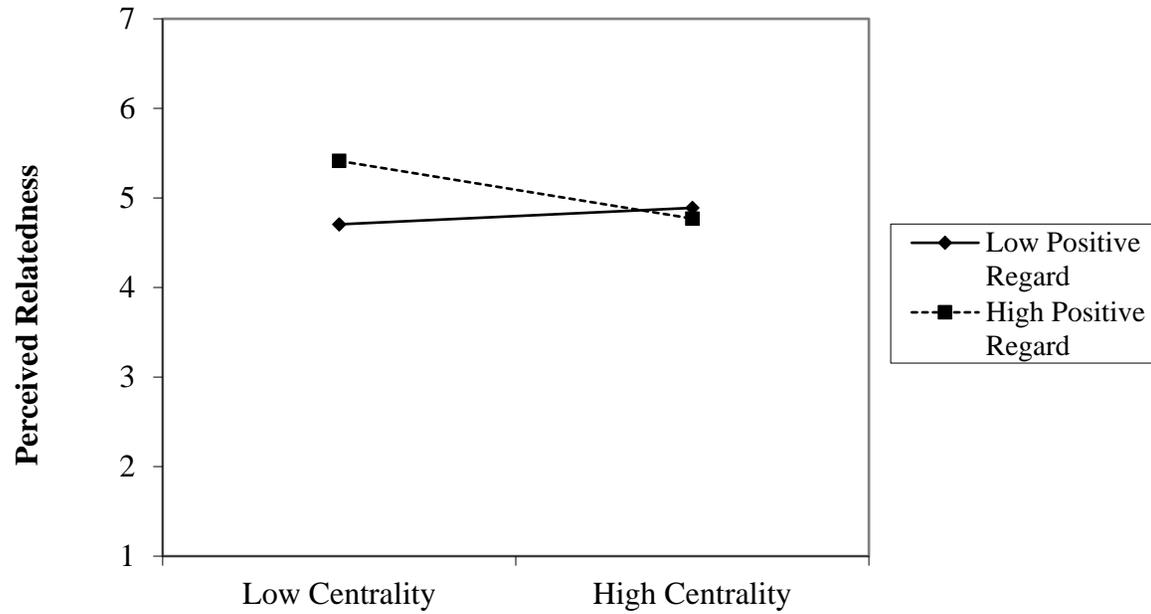


Figure 11. Interaction between veteran identity centrality and positive regard for veteran identity in predicting perceived relatedness.

APPENDIX A

DEMOGRAPHIC QUESTIONNAIRE

Age (in years):

Current military affiliation:

Currently serving in the military

Veteran

I have never served in the military

Are you currently a **full-time student**? Full-time status is at least 12 credits for undergraduates and at least 9 credits for graduate students.

Yes, I am a full-time student.

No, I am not a full-time student.

Are you taking your classes **exclusively online**?

Yes, all of my current classes are online

No, I am taking one or more classes in-person on campus

University you attend:

Iowa State University

University of Iowa

University of Northern Iowa

Other (please specify):

Class standing:

Freshman

Sophomore

Junior

Senior

Graduate Student

Race:

White

Black/African American

Asian

Native Hawaiian or Other Pacific Islander

American Indian or Alaska Native

Multiracial

Ethnicity:

Hispanic or Latino

Not Hispanic or Latino

Are you a U.S. citizen?

Yes

No

If No: Please enter your visa classification:

Gender:

Male

Female

Transgender

Other (please specify):

Sexual orientation:

Straight/Heterosexual

Gay

Lesbian

Bisexual

Other (please specify):

Relationship status:

Unmarried/divorced, single

Unmarried/divorced, in a committed relationship

Married

Married but currently separated

Do you currently have at least partial custody of any children under the age of 18?

Yes

No

Please select all of the branches you have served in:

Army

Navy

Air Force

Marines

Coast Guard

Please select all components you have served in:

Active Duty

Reserves

National Guard

Have you ever been deployed to a combat zone?

Yes

No

Educational Benefits you currently use (select all that apply)

I am not currently using any veteran/military educational benefits.

Post-9/11 GI Bill

Montgomery GI Bill: Active Duty & Veteran (Chapter 30)

Montgomery GI Bill: Selected Reserves (Chapter 1606)

Reserve Educational Assistance Program (REAP; Chapter 1607)

Veterans Educational Assistance Program (VEAP)

Iowa National Guard Education Assistance Program (NGEAP)

Federal Tuition Assistance

VA Work Study

ROTC Scholarship

Other (please specify):

For Iowa State University Students

How familiar are you with the ISU Veterans Center?

0 (Never heard of it) – 4 (I know exactly where it is and have been there at least once)

I attended a military/veteran-specific orientation when I started my studies at ISU.

Yes

No

During the past academic year, or since the start of this year if you are new to ISU, how often have you used the following Veterans Center programs/services?

0 (never) - 4 (very often)

Note: These questions pertain specifically to the Veterans Center, not other support resources on campus (e.g., Veterans Certifying Official, Academic Support Center, Office of Financial Aid)

1. Veterans Center website (for information or support)
2. Veterans lounge in the Memorial Union (for socializing)
3. Veterans lounge in the Memorial Union (for studying)
4. Academic coaching
5. Academic skills workshops
6. Social programming (for example: Thursday Night Dinners, start-of-semester “welcome back” events)
7. Help with military/veteran benefits or financial aid questions (by e-mail, phone, or in-person)

For University of Iowa Students

How familiar are you with the UI Military and Veterans Service Center?

0 (Never heard of it) – 4 (I know exactly where it is and have been there at least once)

I attended the military/veteran-specific session during orientation when I started my studies at UI.

Yes

No

During the past academic year, or since the start of this year if you are new to UI, how often have you used the following Military and Veterans Service Center programs/services?

0 (never)-4 (daily)

Note: These questions pertain specifically to the Military and Veterans Service Center, **not** other support resources on campus (e.g., Veterans Certifying Official, Academic Resource Center, Office of Financial Aid)

1. Military and Veterans Service Center website (for information or support)
2. Military and Veterans Service Center lounge (for socializing)
3. Military and Veterans Service Center lounge or computer lab (for studying)
4. Tutoring/study groups
5. Career development workshops
6. Social programming/events (hosted by the Military and Veterans Service Center or UI Veterans Association)
7. Help with military/veteran benefits or financial aid questions (by e-mail, phone, or in-person)

For University of Northern Iowa Students

How familiar are you with UNI Military and Veteran Student Services?

0 (Never heard of it) – 4 (I know exactly where it is and have been there at least once)

During the past academic year, or since the start of this year if you are new to UNI, how often have you used the following Military and Veteran Student Services programs/services?

0 (never)-4 (daily)

Note: These questions pertain specifically to Military and Veteran Student Services, **not** other support resources on campus (e.g., Veterans Certifying Official, Academic Learning Center, Office of Financial Aid)

1. Military and Veteran Student Services website (for information or support)
2. Military and Veteran Student Services lounge (for socializing)
3. Military and Veteran Student Services lounge or study space (for studying)
4. Social programming/events (for example: Camaraderie and Coffee, BBQs, Annual Veterans Ball, volunteer outings)
5. Help with military/veteran benefits or financial aid questions (by e-mail, phone, or in-person)

APPENDIX B

OFFICE OF VETERANS AND MILITARY SERVICES SUPPORT SCALE

Strongly
disagree
1

2

3

4

Strongly agree
5

1. I am satisfied with the services offered by (*name of OVMS*).
2. The services offered by (*name of OVMS*) have been helpful in meeting my needs as a military/veteran student.
3. I feel supported by (*name of OVMS*).
4. I am pleased with the services (*name of OVMS*) has to offer.
5. (*name of OVMS*) provides sufficient support to me as a military/veteran student.

APPENDIX C

VETERAN-FRIENDLY CAMPUS SCALE

The following statements pertain to your experience **at your current institution**.

Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
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1. I have experienced insensitivity related to my military/veteran status from other students.
2. I have experienced insensitivity related to my military/veteran status from faculty.
3. Relations between military/veteran students and non-military/veteran students on this campus are tense.
4. In my opinion, this campus is hostile for military/veteran students.
5. Non-military/veteran students seem uncomfortable around me.
6. The university makes a genuine effort to recruit military/veteran students.
7. The university fosters respect for military/veteran students.
8. The university has made a special effort to help military/veteran students feel like they “belong” on campus.
9. People on campus value the experience that military/veteran students possess.
10. Military/veteran students are valued on campus.
11. People on campus do NOT value the military/veteran student community.
12. People on campus value the experiences of people in the military/veteran student community.
13. People on campus do NOT value the knowledge possessed by the military/veteran student community.

APPENDIX D

VETERAN IDENTITY CENTRALITY SCALE

(Di Leone, Wang, Kressin, & Vogt, 2016)

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

1. Being a veteran is a central part of who I am.
2. My status as a veteran is rarely on my mind.
3. I relate best to other veterans.
4. I feel more connected to civilians than to other veterans.
5. I spend most of my time with other veterans.

APPENDIX E

POSITIVE REGARD FOR VETERAN IDENTITY SCALE

(Di Leone, Wang, Kressin, & Vogt, 2016)

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

Original Items

1. I am proud to be a veteran.
2. When I meet other veterans, I prefer to keep my veteran status to myself.
3. I like it when people know I'm a veteran.

Added Items

4. I regret that I am a veteran.
5. I feel good when I introduce myself as a veteran.

APPENDIX F

BASIC PSYCHOLOGICAL NEED SATISFACTION SCALE – GENERAL MEASURE
(Gagné, 2003)

Please read each of the following items carefully, thinking about how it relates to your college experience, and then indicate how true it is for you.

Not at all true				Somewhat true			Very true
1	2	3	4	5	6	7	

1. I feel like I am free to make my own decisions about my college education.
2. I really like the people I interact with on campus.
3. Often, I do not feel very competent with my schoolwork.
4. I feel pressured in my college education.
5. People I know tell me I am a good student.
6. I get along with people I come into contact with on campus.
7. I pretty much keep to myself and don't have a lot of social contacts on campus.
8. I generally feel free to express my ideas and opinions on campus.
9. I consider the people I regularly interact with on campus to be my friends.
10. I have been able to learn interesting new skills recently in my courses.
11. In my daily college experience, I frequently have to do what I am told.
12. People on campus care about me.
13. Most days I feel a sense of accomplishment from my schoolwork.
14. People I interact with on a daily basis on campus tend to take my feelings into consideration.
15. In my courses I do not get much of a chance to show how capable I am.
16. There are not many people that I am close to on campus.
17. I feel like I can pretty much be myself in daily situations on campus.
18. The people I interact with regularly on campus do not seem to like me much.
19. I often do not feel very capable with my schoolwork.
20. There is not much opportunity for me to decide for myself how to do things in my courses.
21. People on campus are generally pretty friendly towards me.

APPENDIX G

ACADEMIC MOTIVATION SCALE – INTRINSIC SUBSCALES

(Vallerand et al., 1992)

Please indicate to what extent each of the following items presently corresponds to one of the reasons why you go to college.

Does not correspond			Corresponds moderately			Corresponds exactly
1	2	3	4	5	6	7

1. Because I experience pleasure and satisfaction while learning new things.
2. For the pleasure I experience when I discover new things never seen before.
3. For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.
4. Because my studies allow me to continue to learn about many things that interest me.
5. For the pleasure I experience while surpassing myself in my studies.
6. For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments.
7. For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.
8. Because college allows me to experience a personal satisfaction in my quest for excellence in my studies.
9. For the intense feelings I experience when I am communicating my own ideas to others.
10. For the pleasure that I experience when I read interesting authors.
11. For the pleasure that I experience when I feel completely absorbed by what certain authors have written.
12. For the “high” feeling that I experience while reading about various interesting subjects.

APPENDIX H
ACADEMIC SATISFACTION SCALE
(Lent et al., 2005)

Strongly disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

1. I feel satisfied with the decision to major in my intended field.
2. I am comfortable with the educational atmosphere in my major field.
3. For the most part, I am enjoying my coursework.
4. I am generally satisfied with my academic life.
5. I enjoy the level of intellectual stimulation in my courses.
6. I feel enthusiastic about the subject matter in my intended major.
7. I like how much I have been learning in my classes.

APPENDIX I

SATISFACTION WITH LIFE SCALE
(Diener, Emmons, Larsen, & Griffin, 1985)

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
1	2	3	4	5	6	7

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

APPENDIX J

IOWA STATE UNIVERSITY IRB EXEMPTION LETTER

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 03/22/2018

To: Matthew T Seipel Lisa Larson, Ph.D.

From: Office for Responsible Research

Title: Supporting Student Veteran & Service Member Well-Being

IRB ID: 18-097

Submission Type: Initial Submission **Exemption Date:** 03/22/2018

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

2: Research involving use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observations of public behavior, unless (i) Information obtained is recorded in such a manner that human subjects can be identified, and (ii) Any disclosure of the human subjects' responses outside the research could reasonably place the subject at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any *modifications to the research procedures* (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the *inclusion of participants from vulnerable populations*, and/or any *change that may increase the risk or discomfort to participants*. *Changes to key personnel* must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

IRB 03/2018

Please note that you must submit all research involving human participants for review. **Only the IRB or its designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed**. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

Please be advised that your research study may be subject to **post-approval monitoring by Iowa State University's Office for Responsible Research**. In some cases, it may also be subject to formal audit or inspection by federal agencies and study sponsors.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

APPENDIX K

UNIVERSITY OF IOWA IRB EXEMPTION LETTER


**Human Subjects Office/
Institutional Review Board (IRB)**

105 Hardin Library for the Health Sciences
600 Newton Road
Iowa City, Iowa 52242-1098
319-335-6564 Fax 319-335-7310
irb@uiowa.edu
<http://research.uiowa.edu/hso>

IRB ID #: 201804800
To: Christopher Patterson
From: IRB-02 DHHS Registration # IRB00000100,
Univ of Iowa, DHHS Federalwide Assurance # FWA00003007
Re: Supporting Student Veteran & Service Member Well-Being

Approval Date: 06/01/18

**Next IRB Approval
Due Before:** N/A

Type of Application:

- New Project
 Continuing Review
 Modification

Type of Application Review:

- Full Board:
Meeting Date:
 Expedited
 Exempt

Approved for Populations:

- Children
 Prisoners
 Pregnant Women, Fetuses, Neonates

Source of Support:

This approval has been electronically signed by IRB Chair:
John Wadsworth, PHD
06/01/18 1420

OFFICE OF THE VICE PRESIDENT
FOR RESEARCH

APPENDIX L

IOWA STATE UNIVERSITY IRB CORRESPONDENCE

Matthew Seipel
To: IRB@iastate.edu

Fri, Jan 19, 2018 at 2:35 PM

Hello,

As part of my dissertation (not yet submitted to IRB) I am planning to survey student veterans at the Universities of Iowa and Northern Iowa in addition to ISU. The directors of the veteran centers at UI and UNI have agreed to e-mail their student veterans a link to my Qualtrics survey once my study been approved by ISU IRB, so I will not be in direct contact with their students.

Given these conditions, I am wondering if I need to obtain formal approval from these other institutions before my contacts can distribute my survey to their student veterans. Any information or guidance you have to offer is greatly appreciated!

Respectfully,

Matthew Seipel, MS
Counseling Psychology PhD Candidate
Iowa State University

IRB Committee [ORR] <irb@iastate.edu>
To: "Seipel, Matthew T [PSYCH]"

Mon, Jan 22, 2018 at 9:03 AM

Hi Matthew,

We usually ask that you contact their IRB offices to see if they require any IRB oversight. Often they don't require additional review beyond ISU's IRB review if you are simply forwarding a recruitment email to their student population. However, each institution's policies are different and we cannot speak for them.

Feel free to contact me if you have any other questions.

Best,

Roxanne
Roxanne Bappe
Institutional Review Board (IRB) Administrator
Office for Responsible Research | Iowa State University

APPENDIX M

UNIVERSITY OF IOWA IRB CORRESPONDENCE

Matthew Seipel
To: irb@uiowa.edu

Mon, Jan 22, 2018 at 12:42 PM

Hello,

I am an Iowa State University doctoral student in psychology that is currently writing my dissertation proposal for a study that will involve surveying veteran and military students using Qualtrics. I have been in contact with Matthew Miller, your Director of Military and Veteran Student Services, and he agreed to send a link to my survey to his constituents once it has been approved by the ISU IRB. I wanted to clarify with you whether this requires any review or oversight from your institution's IRB. Thank you in advance for your assistance, and please let me know if I can provide any additional information.

Respectfully,

Matthew Seipel, MS
Counseling Psychology PhD Candidate
Iowa State University

Institutional Review Board <irb@uiowa.edu>
To: Matthew Seipel

Mon, Feb 5, 2018 at 11:44 AM

Matthew:

You would likely need some type of IRB approval from the University of Iowa. This would depend on the type of survey you're proposing to send.

There are a couple of different ways this can be accomplished. You could get a collaborator (possibly the director you mentioned below) here at the University of Iowa to submit a IRB application for this survey. This would likely be a very simple application from what you're describing.

Another option would be to have a collaborator submit an application here and a reliance agreement could be established between ISU and UI. I would think the first option would be easier as an online survey would be a fairly simple application at both universities.

I've included Anna Mertes on this email as she is our coordinator when external IRB's are involved. Let me know if you have questions.

Tony J. Quinlan, MBA, CIP
Interim IRB Administrator
University of Iowa

APPENDIX N

UNIVERSITY OF NORTHERN IOWA IRB CORRESPONDENCE

Matthew Seipel

To: [redacted]@uni.edu

Mon, Jan 22, 2018 at 12:45 PM

Hello,

I am an Iowa State University doctoral student in psychology that is currently writing my dissertation proposal for a study that will involve surveying veteran and military students using Qualtrics. I have been in contact with Chiquita Loveless, your new Coordinator of Military and Veteran Student Services, and she agreed to send a link to my survey to her constituents once it has been approved by the ISU IRB. I wanted to clarify with you whether this requires any review or oversight from your institution's IRB. Thank you in advance for your assistance, and please let me know if I can provide any additional information.

Respectfully,

Matthew Seipel, MSCounseling Psychology PhD Candidate
Iowa State University**Anita M Gordon**

To: Matthew Seipel

Tue, Jan 23, 2018 at 11:39 AM

Hi, Matthew -

Thank you for checking in with us about this. Your study will not require IRB review here at UNI. However, I would appreciate it if you would send a copy of your IRB application and approval letter for our files.

All the best -

Anita Gordon
IRB Administrator

Matthew Seipel

Thu, Mar 22, 2018 at 2:59 PM

To: Anita M Gordon

Hi Anita,

My dissertation study has been granted exempt status by the ISU IRB, and I am attaching a PDF that includes the exempt status notification letter and a copy of my application. I will have Chiquita Loveless send a survey link to your military and veteran students at the start of the Fall 2018 semester. Please let me know if you have any questions or if I can provide any additional information.

Respectfully,

Matt

Matthew Seipel, MS

Counseling Psychology PhD Candidate

Iowa State University

Anita Gordon

Fri, Mar 23, 2018 at 10:49 AM

To: Matthew Seipel

Great, thanks, Matt. Please feel free to proceed.

Anita Gordon

APPENDIX O

EMAIL INVITATION TO PARTICIPATE

Hello,

You are receiving this email because you have been identified as a veteran or military-affiliated student. I am inviting you to participate in a study that a fellow veteran at Iowa State University is conducting for his dissertation research. His name is Matthew Seipel, and he served six years in the Army National Guard and is planning to receive an active duty commission as a psychologist. Matt's study can provide our campus with valuable information about how we can better support our veteran and military-affiliated students. The purpose of the study is to analyze the well-being of veteran and military-affiliated students and how your well-being is related to various aspects of your college experience.

You are eligible to participate if you meet the following criteria:

- Currently enrolled at (*name of institution*)
- At least 18 years of age
- Previously served or currently serving in the U.S. military
- Full-time status (12 or more credits for undergraduates, 9 or more credits for graduate students)
- Enrolled in at least one face-to-face course (i.e., not taking exclusively online courses)

Your participation in this study is completely voluntary. Participation will entail completion of an online survey that will require approximately 10-15 minutes of your time. The survey can be completed on any computer, tablet, or smartphone with internet access. Your responses will be anonymous and never connected to any personally identifiable information (name, email address, etc.). At the end of the survey, you will have the opportunity to provide your email address in a separate web form to be entered in a drawing for one of four \$25 Amazon gift cards.

This study is being supervised by Dr. Lisa Larson (Iowa State University Department of Psychology), and it has been approved by the Iowa State University and the University of Iowa Institutional Review Boards.

If you are interested in participating, please click this link to be directed to the informed consent for the survey: [redacted]

If you have any questions, please contact Matthew Seipel at [redacted].

Matt and I are both grateful for your time and consideration.

Very respectfully,

(*signature of OVMS director/coordinator*)

APPENDIX P

FOLLOW-UP EMAIL INVITATION TO PARTICIPATE

Hello,

I reached out to you at the start of the semester about a dissertation study that a fellow veteran is conducting about our military and veteran study community. If you have already completed Matt's survey, thank you for your time and please disregard the rest of this message. If you have not yet participated, please read the rest of this message and consider completing the survey.

You are receiving this email because you have been identified as a veteran or military-affiliated student. I am inviting you to participate in a study that a fellow veteran at Iowa State University is conducting for his dissertation research. His name is Matthew Seipel, and he served six years in the Army National Guard and is planning to receive an active duty commission as a psychologist. Matt's study can provide our campus with valuable information about how we can better support our veteran and military-affiliated students. The purpose of the study is to analyze the well-being of veteran and military-affiliated students and how your well-being is related to various aspects of your college experience.

You are eligible to participate if you meet the following criteria:

- Currently enrolled at (*name of institution*)
- At least 18 years of age
- Previously served or currently serving in the U.S. military
- Full-time status (12 or more credits for undergraduates, 9 or more credits for graduate students)
- Enrolled in at least one face-to-face course (i.e., not taking exclusively online courses)

Your participation in this study is completely voluntary. Participation will entail completion of an online survey that will require approximately 10-15 minutes of your time. The survey can be completed on any computer, tablet, or smartphone with internet access. Your responses will be anonymous and never connected to any personally identifiable information (name, email address, etc.). At the end of the survey, you will have the opportunity to provide your email address in a separate web form to be entered in a drawing for one of four \$25 Amazon gift cards.

This study is being supervised by Dr. Lisa Larson (Iowa State University Department of Psychology), and it has been approved by the Iowa State University and the University of Iowa Institutional Review Boards.

If you are interested in participating, please click this link to be directed to the informed consent for the survey: [redacted]

If you have any questions, please contact Matthew Seipel at [redacted].

Matt and I are both grateful for your time and consideration.

Very respectfully,

(*signature of OVMS director/coordinator*)

APPENDIX Q

INFORMED CONSENT

Title of Study: Veteran and Military Student Well-Being
Investigators: Matthew Seipel, M.S., Principal Investigator
 Lisa Larson, Ph.D., Study Supervisor

This is a research study. Please take your time in deciding if you would like to participate.

INTRODUCTION

The purpose of this study is to learn more about the well-being of veteran and military students.

ELIGIBILITY

You are eligible to participate in this study if you meet the following criteria:

- At least 18 years of age
- Veteran of the U.S. military or currently serving in the U.S. military
- Full-time status (at least 12 credits for undergraduates; at least 9 credits for graduate students)
- Enrolled in at least one in-person class on campus
- Currently enrolled at Iowa State University, the University of Iowa, or the University of Northern Iowa

The initial survey questions will verify that you meet these criteria. If you do not meet all of the criteria, you will be exited from the study.

DESCRIPTION OF PROCEDURES

If you agree to participate, you will be asked to complete several survey questions. First you will be asked to fill out some demographic information, then you will be asked to answer questions relating to your identity, your experience on campus as a whole and in relation to specific services, your motivation for going to college, and your satisfaction with college and life in general.

The whole survey will take about 10-15 minutes to complete. You will not be able to save your responses and finish at another time. If you intend to complete the survey you must finish it within a few hours of opening the survey.

RISKS

There are no foreseeable risks to participating in this survey. However, if you should feel uncomfortable or have concerns regarding the survey, please contact the primary investigator, Matthew Seipel (email: [redacted]) or the study supervisor, Lisa Larson, Ph.D. (email: [redacted]).

BENEFITS

If you decide to participate in this study there may be no direct benefit to you. It is hoped that the information gained in this study will contribute to the understanding of well-being in military and veteran students, as well as how college campuses can support them.

COSTS AND COMPENSATION

You will not have any costs from participating in this study. Upon completion of all pages of the survey, you will have the option to be entered in a random drawing for one of four \$25 Amazon gift cards.

PARTICIPANT RIGHTS

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. However, if you decide to not participate in the study or leave the study before completing all of the survey pages, you will not be eligible for the gift card drawing. You can choose not to respond to any questions that you do not wish to answer.

CONFIDENTIALITY

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies, auditing departments of Iowa State University, and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken:

- Your name or student ID number will not be reported on study materials. If you choose to enter the gift card drawing, you will be directed to enter your contact information in a separate survey that will not be connected to your study responses.
- All data will be kept on a password-protected ISU computer.
- If the results are published, only aggregate data will be presented.

QUESTIONS OR PROBLEMS

You are encouraged to contact the principal investigator with questions at any time during this survey.

- For further information about the study, contact the primary investigator, Matthew Seipel (email: [redacted]) or the study supervisor, Lisa Larson, Ph.D. (email: [redacted]).
- If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, [redacted], or Director, [redacted], Office for Responsible Research, Iowa State University.

PARTICIPANT CONSENT

By clicking the icon next to “I understand this information” you are indicating that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document, and that your questions have been satisfactorily answered. After clicking “Consent” you will be led to a page with the study information and your consent information.

APPENDIX R

DEBRIEFING STATEMENT

The research study you just participated in was designed to study how different aspects of the college environment and experience relate to the well-being of veteran and military students. We hope that our findings can better equip colleges and universities to meet the needs of veteran and military students.

If you have questions about the research study you just completed, you may contact the principal investigator, Matthew Seipel or the study supervisor, Dr. Lisa Larson.

If you have any questions about the rights of research subjects or research-related injury, please contact the Iowa State University IRB Administrator, whose contact information is as follows:

[redacted]