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Perceived cadre behavior, basic psychological need satisfaction, and motivation of US Army ROTC cadets: A self-determination theory perspective

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ABSTRACT

Since its inception in 1916 the Reserve Officers' Training Corps (ROTC) has trained and commissioned more than half a million individuals and, therefore, produced more officers for the United States (US) Army than any other commissioning source (US Army, 2020a). However, there have been high attrition rates among cadets. While the reasons for people's engagement in the military are complex and include a multitude of tangible and intangible factors, motivation has been found to be a vital contributor to individuals' ongoing service in the armed forces. Accordingly, utilizing the framework of self-determination theory, the current research was designed to: (a) examine the validity and reliability of existing instruments in measuring cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation, (b) assess cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation, and (c) explore potential differences in cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation based on their class in the program, age, gender, and race. A total of 728 US Army ROTC cadets participated in this survey-based study. Overall, individuals reported relatively high levels of involvement from their cadre, need fulfillment, and self-determined motivation. In contrast, they perceived limited autonomy support from their cadre. In sum, further research appears warranted to gain an in-depth understanding of cadets' motivation.

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Within the United States (US) Army's organizational structure, commissioned officers hold a fundamental position because they "are responsible for leading and training enlisted Soldiers, planning missions, and organizing the internal and external affairs of the Army" (US Army, 2020b). Approximately 60% of these officers are developed through the Reserve Officers' Training Corps – better known as ROTC – before commissioning into the US Army at the rank of Second Lieutenant. Currently, more than 20,000 cadets are enrolled in 273 ROTC programs located at over a thousand universities and colleges across the US (US Army, 2020a). These cadets receive specific military training and education while simultaneously obtaining a four-year undergraduate degree from their respective academic host institution. The time in ROTC is considered an imperative part of Second Lieutenants' development because "the pre-commissioning phase of an officer's training will lay the framework and foundation for lifelong learning" (Wiedmann, 2005, p. 1).

However, there have been high attrition rates among cadets in ROTC. For example, Doganca (2006) reported

that approximately 10.3% of the cadets on four-year scholarships quit following their freshman year. Furthermore, officers who commission through ROTC are less likely to stay in the military past their initial Active Duty Service Obligation than those trained through other US Army sources (e.g., Military Academy, Officer Candidate School; Doganca, 2006). While the reasons for people's engagement in the military are complex and include a multitude of tangible and intangible factors (e.g., monetary benefits; Griffith, 2008; Woodruff, Kelty, & Segal, 2006), motivation has been found to be a vital contributor to individuals' ongoing service in the armed forces (Ngaruiya, Knox Velez, Clerkin, & Taylor, 2014). More specifically, previous researchers have found that a lack of intrinsic motivation (Card, 1976; Ngaruiya et al., 2014) and low achievement motivation (Mathieu, 1988) are significantly related to lower levels of commitment to the military.

Self-determination theory (Deci & Ryan, 2000) holds promise in comprehensively understanding the antecedents, mediators, and consequences of motivated

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behavior such as individuals' engagement in ROTC. The majority of "contemporary theories of motivation assume that people initiate and persist at behaviors to the extent that they believe the behaviors will lead to desired outcomes or goals" (Deci & Ryan, 2000, p. 227). The underlying assumption of self-determination theory is that in order to gain an in-depth understanding of individuals' thoughts, feelings, and behaviors, it is important to not only consider the quantity but also the quality of motivation. People experience the highest quality of motivation when they are intrinsically motivated, which means they are not outcome-oriented but rather motivated by participation in and enjoyment of the activity itself. In contrast, amotivated people show no interest to engage in the target behavior. Between these two ends of the motivational continuum there is a spectrum of extrinsic regulations that can contribute to individuals' reasons to participate in an activity. External (to receive rewards or avoid punishment) and introjected regulations (to avoid negative internalized feelings) are characterized as non-self-determined behaviors because people's actions are controlled by sources completely or partially external to them. Identified (to aid in the achievement of another related goal) and integrated regulations (to confirm one's sense of identity) are considered to be self-determined because individuals participate in behaviors with a sense of free will (Deci & Ryan, 2000).

Although self-determination theory has, to the authors' knowledge, yet to be applied to the context of ROTC, researchers have found benefits associated with fostering self-determined extrinsic and intrinsic motivation in other domains (e.g., academics, music, and sport). For example, and of particular interest for the current study, nurturing these optimal forms of motivation has been shown to increase the persistence (i.e., lower dropout rates) of athletes (e.g., Calvo, Cervello, Jimenez, Iglesias, & Murcia, 2010), musicians (e.g., Evans, McPherson, & Davidson, 2012), and students (e.g., Alivernini & Lucidi, 2011) while simultaneously decreasing burnout (e.g., Cheval, Chalabaev, Quesed, Courvoisier, & Sarrazin, 2017).

According to Deci and Ryan (2000), individuals' quality of motivation is determined by the satisfaction of their inherent basic psychological needs of competence, autonomy, and relatedness. Applied to the context of ROTC, competent cadets have a sense of confidence in their ability to successfully accomplish the tasks that are demanded of them (e.g., land navigation). That is, they feel capable of performing effectively within their squad, class, and battalion. Cadets who are autonomous have a certain amount of choice in decisions and actions rather than such decisions and actions being dictated

solely by others (e.g., cadre). They also perceive their behaviors to align with their own values. Finally, cadets feel related when they are accepted and valued as a member of the group, are meaningfully connected and close to the people they interact with, and experience comfort in their respective role (Deci & Ryan, 2000).

In turn, need fulfillment is affected by various motivational determinants or social factors in the environment. In ROTC, cadets operate within a hierarchical organization that is led by cadre. These are active-duty, noncommissioned and commissioned officers who serve as the US Army's representatives and maintain legal and administrative authority within the program. They are the main instructors and mentors who ensure that cadets are developing according to the regulations and expectations for their academic class. Thus, cadre's primary purpose is to provide "assessment and feedback arranged around the attributes and core leader competencies" (US Army Cadet Command, 2011, p. 7). Given this essential function, it seems warranted to suggest that cadre also play an important role in the development of cadets' motivation.

While there is currently no empirical evidence to explain how cadre can influence cadets' basic psychological need satisfaction, the literature in sport psychology offers a reasonable starting point regarding the role of authority figures as social factors. This research includes investigations of, among others, coaches (e.g., Cheval et al., 2017), PE teachers (e.g., Cheon & Reeve, 2015), and parents (e.g., Gagne, Ryan, & Bargmann, 2003). In general, authority figures can either adopt a controlling style characterized by a highly-directive manner or an autonomy-supportive style which empowers individuals to act upon their own interests and leaves room for input (Mageau & Vallerand, 2003). In the sport setting, numerous researchers have concluded that the more athletes evaluated their social environment to be autonomy-supportive as opposed to controlling, the more competent, autonomous, and related they felt (e.g., Cheval et al., 2017; Gagne et al., 2003). Similar conclusions can be found across other contexts (e.g., public service; workforce) in which interpersonal styles that are more autonomy-supportive in nature (e.g., transformational leadership) have shown a positive effect on individuals' need fulfillment (e.g., Breevaart, Bakker, Demerouti, Sleebos, & Maduro, 2014; Jensen & Bro, 2018).

An autonomy supportive style is most beneficial when it is combined with optimal structure and involvement (Curran, Hill, & Niemiec, 2013; Mageau & Vallerand, 2003). Individuals typically feel more confident in their ability and are more likely to achieve

desired outcomes when they receive a certain structure that supports their development and guides them toward the achievement of important objectives. In this process, structure should not be confused with control, which is characterized by demands, insistences, sanctions, and inflexible rules. Instead, optimal structure is aimed at avoiding the chaos that occurs when authority figures are confusing or contradictory and fail to provide individuals with the means necessary to meet their expectations (e.g., intermediate goals, constructive feedback; Jang, Reeve, & Deci, 2010). With regard to involvement, it is generally easier for athletes to feel meaningfully connected when coaches focus their efforts on developing the athlete as a competitor, but also as a person. In order to develop a trusting relationship, athletes require coaches who show an interest in them on a personal level or can have a conversation about something non-sport related (Beenie & O'Connor, 2012). In sum, autonomy support, structure, and involvement appear to provide a reasonable starting point for an investigation into the behavior of cadre.

Purpose

As stated previously, the motivational tenets of self-determination theory (Deci & Ryan, 2000) have yet to be explored in ROTC. Because of that, none of the existing instruments that have been used in research to assess social factors, need fulfillment, and motivation have been applied in the context of ROTC. Therefore, the current study was exploratory in nature and designed to accomplish the following three objectives: (a) examine the validity and reliability of existing instruments in measuring cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation, (b) assess cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation, and (c) explore potential differences in cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation based on their class in the program (i.e., Military Science [MS] I through IV), age, gender, and race.

Methods

Participants

A total of 728 US Army ROTC cadets participated in the current study. This sample included 568 male (78%) and 160 female (22%) cadets, who were between 18 and 43 years old ($M = 20.37$; $SD = 3.01$). Individuals self-identified as White/Caucasian ($n = 541$; 74.3%), Asian/Pacific Islander ($n = 43$; 5.9%), Hispanic/Latino ($n = 38$;

5.2%), African-American ($n = 30$; 4.1%), Native American/Eskimo/Aleut ($n = 18$; 2.5%), Two or more races ($n = 10$; 1.4%), and Other ($n = 17$; 2.3%); 31 people (4.3%) preferred not to self-identify in regard to their race. At the time of their participation 203 cadets were MSIV (27.9%), 160 were MSIII (22.0%), 172 were MSII (23.6%), and 188 were MSI (25.8%). Five cadets (.6%) did not indicate their class.

Procedures

Following approval by the Institutional Review Board and US Army Cadet Command, US Army ROTC cadets were recruited to participate in the current study. The fifth author contacted Professors of Military Science at nine ROTC programs across the US via e-mail. These institutions were intentionally chosen to obtain participants from a variety of demographic locations. In the e-mail, the Professors of Military Science were provided with information about the study and asked to forward the link for the online survey to their cadets. Cadets who accessed the survey link were invited to participate, provided with information about the project, and informed that their involvement was voluntary and anonymous. They were also informed that by completing the survey they indicated their consent to participate in the research.

Instrumentation

Since no instruments exist to measure cadre behavior, basic psychological need satisfaction, and motivation in ROTC, existing scales commonly utilized in the context of sport and academics were modified to fit the purpose of the current research. The survey used in this study consisted of a: (a) set of demographic items (i.e., class, age, gender, and race), (b) modified version of the Teacher as a Social Context Questionnaire (TASCQ; Belmont, Skinner, Wellborn, & Connell, 1988), (c) modified version of the Basic Need Satisfaction Scale (BNSS; Deci, Connell, & Ryan, 1989), and (d) modified version of the Sport Motivation Scale-6 (SMS-6; Mallett, Kawabata, Newcombe, Otero-Forero, & Jackson, 2007). Before conducting the study, three current and one former US Army commissioned officer reviewed all modified scales for their applicability to the military setting.

TASCQ

The TASCQ is a 24-item instrument that assesses students' perceptions of their teacher's behavior on three subscales: autonomy support (8 items), structure (8 items), and involvement (8 items; see supplemental

online material). Participants are asked to indicate their perception of their teacher's behavior using a 4-point scale from 1 (*not true at all*) to 4 (*very true*). The score for each subscale is computed by averaging the respective items. For the current study, the word "teacher" was replaced with "cadre" on all items. For example, the autonomy support item "My teacher listens to my ideas" was changed to "My cadre listen to my ideas." Similar adjustments were made for items on the structure and involvement subscales.

BNSS

The BNSS is a 21-item instrument aimed at assessing individuals' perceptions of competence (6 items), autonomy (7 items), and relatedness (8 items; see supplemental online material). Items within each subscale are rated using a 7-point scale from 1 (*not at all true*) to 7 (*very true*). The score for each subscale is computed by averaging the respective items. For the purpose of the current research, the scale was slightly modified to make the questions more relevant for ROTC cadets (i.e., "as a cadet" or "in the military" was added to items). For example, within the competence subscale, "Often, I do not feel very competent" was changed to "Often, I do not feel very competent as a cadet." Subscale items for autonomy (e.g., "In my daily life, I frequently have to do what I am told" was modified to "In my life as a cadet, I frequently have to do what I am told") and relatedness (e.g., "I like the people I interact with" was modified to "I like the people in the military I interact with") included similar revisions.

SMS-6

The SMS-6 evaluates individuals' reasons for practicing their sport. The 24-item instrument is organized into six subscales that measure different types of motivation: amotivation (4 items), external regulation (4 items), introjected regulation (4 items), identified regulation (4 items), integrated regulation (4 items), and intrinsic motivation (4 items; see supplemental online material). For the current study, items that included the phrase "in my sport" were rewritten to include the phrase "in the military" (e.g., "Because participation in my sport is consistent with my deepest values" was modified to "Because participation in the military is consistent with my deepest values"). Using a 7-point scale from 1 (*does not correspond at all*) to 7 (*corresponds exactly*), participants were asked to indicate to what extent each item corresponded to the reasons they were in ROTC. The score for each subscale is computed by averaging the respective items.

Results

Objective 1

This study's first objective was to examine the validity and reliability of existing instruments in measuring cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation. Initially, the statistical package MPlus (Version 7.2; WLSMV estimation) was used to conduct a Confirmatory Factor Analysis (CFA) in order to investigate the psychometric properties of all modified scales that were utilized in the current research. Specifically, each instrument was assessed individually by entering the respective subscales as independent factors. A three-factor CFA for the TASCQ (i.e., autonomy support, involvement, and structure; $\chi^2 = 2320.09$, $p < .001$; $RMSEA = .11$, 95% CI [.10; .11], $p < .001$; $CFI = .87$; $TLI = .86$), a three-factor CFA for the BNSS (i.e., competence, autonomy, and relatedness; $\chi^2 = 2347.17$, $p < .001$; $RMSEA = .13$, 95% CI [.12; .13], $p < .001$; $CFI = .84$; $TLI = .82$), and a six-factor CFA for the SMS-6 (i.e., amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation; $\chi^2 = 3553.08$, $p < .001$; $RMSEA = .14$, 95% CI [.13; .14], $p < .001$; $CFI = .83$; $TLI = .80$) all revealed poor model fit.

Consequently, a decision was made to reevaluate the hypothetical structure of the items on all three instruments, as well as the overall measurement model, before running any further analyses. In order to conduct both Exploratory Factor Analysis (EFA; Geomin rotation) and CFA the data set was randomly split in half (i.e., 364 participants for the EFA and 364 participants for the CFA). EFA and CFA were initially conducted separately for each individual instrument (i.e., TASCQ, BNSS, and SMS-6) to increase the ratio of participants to latent variables. Four criteria were implemented to determine the factors and their related items in EFA: (a) examination of Scree plot, (b) retention of items with standardized factor loadings $\geq .50$, (c) deletion of items with cross-loadings (difference $\leq .20$), and (d) retention of items conceptually related to the factor with the highest factor loading (Fabrigar & Wegener, 2012). Subsequently, an overall CFA was conducted to assess the fit of the entire measurement model.

EFA and CFA results for the TASCQ

Examination of the Scree plot for one- through nine-factor EFAs indicated a two-factor solution, which was supported through multiple EFAs in which items that did not meet the criteria were eliminated. The two-factor solution included 10 of the 24 analyzed items,

with statistically significant loadings on the factors autonomy support (five items; $.67 \leq \beta \leq .80$; $p < .05$) and involvement (five items; $.72 \leq \beta \leq .80$; $p < .05$). All items related to structure were eliminated. The final solution demonstrated acceptable model fit ($\chi^2 = 145.58$, $p < .001$; $RMSEA = .11$, 95% CI [.10; .13], $p < .001$; $CFI = .94$; $TLI = .90$).

In the subsequent CFA, one item related to autonomy support was eliminated due to significant cross-loadings. The resulting final solution demonstrated acceptable model fit ($\chi^2 = 68.95$, $p < .001$; $RMSEA = .07$, 95% CI [.05; .09], $p = .066$; $CFI = .98$; $TLI = .98$). The final two-factor solution revealed statistically significant loadings on the factors autonomy support (four items; $.63 \leq \beta \leq .80$; $p < .001$) and involvement (five items; $.71 \leq \beta \leq .85$; $p < .001$). Cronbach's alpha was .75 and .83, respectively, for perceived autonomy support and involvement.

EFA and CFA results for the BNSS

Examination of the Scree plot for one- through nine-factor EFAs indicated a two-factor solution, which was supported through multiple EFAs in which items that did not meet the criteria were eliminated. The two-factor solution included seven of the 21 analyzed items, with statistically significant loadings on the factors competence (three items; $.51 \leq \beta \leq .85$; $p < .05$) and autonomy (four items; $.62 \leq \beta \leq .81$; $p < .05$). All items related to relatedness were eliminated. The final solution demonstrated good model fit ($\chi^2 = 11.23$, $p = .189$; $RMSEA = .03$, 95% CI [.000; .08], $p = .698$; $CFI = 1.00$; $TLI = 1.00$).

The subsequent CFA confirmed the model fit of the two-factor solution ($\chi^2 = 55.09$, $p < .001$; $RMSEA = .09$, 95% CI [.07; .12], $p = .002$; $CFI = .97$; $TLI = .96$), with statistically significant loadings on the factors competence (three items; $.53 \leq \beta \leq .85$; $p < .001$) and autonomy (four items; $.51 \leq \beta \leq .88$; $p < .001$). Cronbach's alpha was .76 and .68, respectively, for perceived autonomy and competence.

EFA and CFA results for the SMS-6

Examination of the Scree plot for one- through nine-factor EFAs indicated a two-factor solution, which was

supported through multiple EFAs in which items that did not meet the criteria were eliminated. The two-factor solution included 16 of the 24 analyzed items, with statistically significant loadings on the factors self-determined motivation (11 items; $.59 \leq \beta \leq .89$; $p < .05$) and non-self-determined motivation (five items; $.57 \leq \beta \leq .84$; $p < .05$). The factor self-determined motivation included items related to identified regulation (e.g., "Because it is one of the best ways I have chosen to develop other aspects of my life"), integrated regulation (e.g., "Because it is an extension of me"), and intrinsic motivation (e.g., "For the excitement I feel when I am really involved in the military"). The factor non-self-determined motivation included items related to external (e.g., "For the material and/or social benefits of being a cadet") and introjected regulation (e.g., "Because I must be in the military to feel good about myself"). All items related to amotivation were eliminated. The final solution demonstrated acceptable model fit ($\chi^2 = 582.01$, $p < .001$; $RMSEA = .12$, 95% CI [.114; .133], $p < .001$; $CFI = .931$; $TLI = .907$).

In the subsequent CFA, one item related to the factor self-determined motivation was eliminated due to significant cross-loadings. The resulting final solution demonstrated acceptable model fit ($\chi^2 = 381.97$, $p < .001$; $RMSEA = .10$, 95% CI [.08; .10], $p < .001$; $CFI = .96$; $TLI = .95$). The final two-factor solution revealed statistically significant loadings on the factors self-determined motivation (10 items; $.69 \leq \beta \leq .85$; $p < .05$) and non-self-determined motivation (five items; $.62 \leq \beta \leq .83$; $p < .05$). Cronbach's alpha was .91 and .78, respectively, for self-determined motivation and non-self-determined motivation.

Overall measurement model

A six-factor CFA was conducted to determine the fit of the overall measurement model (see Table 1). This included two factors from the modified TASCQ (i.e., autonomy support and involvement), two factors from the modified BNSS (i.e., competence and autonomy), and two factors from the modified SMS-6 (i.e., self-determined and non-self-determined motivation). The CFA revealed statistically significant positive loadings for all items on the expected factors and demonstrated

Table 1. Results for final factors and overall measurement model.

Instrument	RMSEA	CFI	TLI	Final factors
TASQ	.07 ($p = .066$)	.98	.98	Autonomy Support (4 items) Involvement (5 items)
BNSS	.09 ($p = .002$)	.97	.96	Competence (3 items) Autonomy (4 items)
SMS-6	.12 ($p < .001$)	.96	.95	Self-determined motivation (10 items) Non-self-determined motivation (5 items)
Overall measurement model	.06 ($p = .037$)	.95	.95	

acceptable model fit ($\chi^2 = 889.05, p < .001; RMSEA = .06, 95\% CI [.05; .06], p = .037; CFI = .95; TLI = .95$). Accordingly, all further analyses were conducting using a measurement model that included four items related to autonomy support, five items related to involvement, three items related to competence, four items related to autonomy, 10 items related to self-determined motivation, and five items related to non-self-determined motivation. There were significant correlations between all six variables ($p < .05$).

Objective 2

This study's second objective was to assess cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation. Participants' evaluation of their cadre's behavior revealed relatively high levels of perceived involvement ($M = 3.16$ out of 4; $SD = .57$) and low levels of perceived autonomy support ($M = 1.71$ out of 4; $SD = .61$). When completing questions about basic psychological need satisfaction, individuals indicated a relatively high fulfillment of competence ($M = 5.22$ out of 7; $SD = 1.20$) and autonomy ($M = 4.87$ out of 7; $SD = 1.14$). Lastly, cadets reported fairly high levels of self-determined motivation ($M = 5.52$ out of 7; $SD = 1.11$) and relatively low levels of non-self-determined motivation ($M = 2.81$ out of 7; $SD = 1.36$) with respect to their engagement in ROTC.

Objective 3

This study's third objective was to explore potential variations in cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation based

on their class in the program (i.e., MSI-IV), age (as a continuous variable), gender, and race. All dependent variables were significantly correlated ($p < .05$). Therefore, separate Multivariate Analyses of Variance (MANOVA) were conducted to examine mean differences based on the demographic variables. For the variable academic standing, results indicated a significant difference in cadets' motivational tenets based on their class (Wilks Lambda = .91, $F(1, 723) = 3.65, p < .001$). Univariate follow-up analysis revealed these differences to be significant for participants' perceived involvement from cadre ($F(1, 723) = 5.20, p < .01$), competence ($F(1, 723) = 3.69, p < .05$), and non-self-determined motivation ($F(1, 723) = 6.37, p < .001$). A post hoc Tukey test showed the most significant differences when comparing MSI cadets to participants from other classes, indicating small effect sizes (Cohen, 1988; see Figure 1). Specifically, MSI cadets felt less involvement from their cadre than MSII ($d = .33, p < .01$), MSIII ($d = .38, p < .01$), and MSIV ($d = .31, p < .05$). They also perceived themselves as less competent than MSIV ($d = .29, p < .05$) and experienced more non-self-determined motivation than MSIII ($d = .29, p < .05$) and MSIV ($d = .43, p < .001$). In addition, MSII indicated lower levels of competence ($d = .29, p < .05$) and higher levels of non-self-determined motivation ($d = .28, p < .05$) than MSIV.

Similarly, mean differences in individuals' motivational tenets were significant based on participants' age (Wilks Lambda = .74, $F(1, 728) = 1.73, p < .001$). Univariate follow-up analysis revealed that older cadets perceived significantly higher levels of involvement from cadre ($F(1, 728) = 2.03, p < .01$), competence ($F(1, 728) = 1.95, p < .01$), and self-determined motivation ($F(1, 728) = 1.89, p < .01$). With respect to participants' gender, no significant differences in

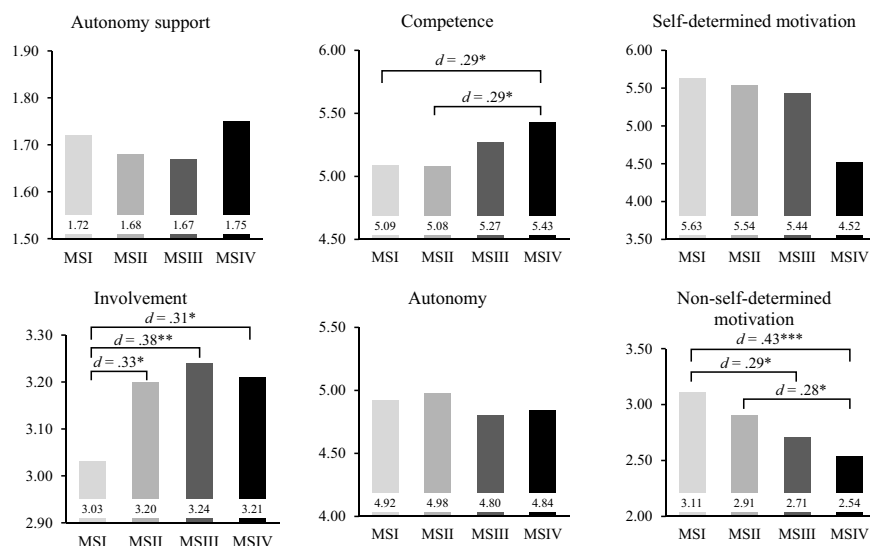


Figure 1. Descriptive statistics separated by cadets' class (* $p < .05$; ** $p < .01$; *** $p < .001$).

cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation were found (Wilks Lambda = .99, $F(1, 728) = 1.65, p = .130$). Lastly, for the MANOVA exploring mean differences based on cadets' race, all participants who chose not to self-identify were excluded ($n = 31$). Furthermore, since 74.3% of the sample self-identified as White/Caucasian, the variable race was recoded dichotomously (i.e., White/Caucasian and Non-White/Caucasian). Results indicated significant differences in cadets' motivational tenets based on their race (Wilks Lambda = .96, $F(1, 697) = 4.70, p < .001$). Univariate follow-up analysis revealed that individuals who self-identified as White/Caucasian perceived significantly more competence ($F(1, 697) = 15.61, p < .001$) and less non-self-determined motivation ($F(1, 697) = 7.70, p < .01$).

Discussion

The current research was exploratory in nature and designed to gain an initial understanding of ROTC cadets' perceived cadre behavior, basic psychological need satisfaction, and motivation. The following discussion will be dedicated to the study's three main objectives.

Measurement model

This study utilized instruments that have been used frequently to measure autonomy support, structure, involvement, basic psychological need satisfaction, and motivation in a variety of settings (e.g., sport, academics). However, to the authors' knowledge, prior to the current research, the TASCQ, BNSS, and SMS-6 had not been employed in the US Army in general or ROTC in particular. Preliminary analyses identified problems with the measurement model and, therefore, the hypothetical structure of the items on all three instruments was reevaluated. While EFA and CFA helped to provide valid and reliable measurements, these analyses revealed several issues that need to be addressed in future research.

First, all items that were related to the structure provided by cadre were eliminated. The TASCQ was originally developed to measure students' perceptions of the structure they receive from their teacher. While the instrument has been found to provide valid and reliable measurements in other settings (e.g., organized sport; Curran et al., 2013), it seems reasonable to suggest that the environment, demands, and tasks in academics and the military are meaningfully different. Accordingly, the way optimal structure is provided in these contexts likely differs and items on the TASCQ might not effectively represent the construct as it pertains to ROTC.

This assumption is supported by the fact that Cronbach's alphas for the TASCQ found in sport ($\alpha = .76$; Curran et al., 2013) and academics ($\alpha = .85$; Jang et al., 2010) are meaningfully higher than in the current study ($\alpha = .41$). As a result, it is likely that items need to be substituted or reworded to more accurately represent how structure is implemented in ROTC. Thus, researchers should explore the behaviors cadre can employ to provide optimal structure for cadets (e.g., how can they make sure that feedback is not only offered but done so in an informational manner; Mageau & Vallerand, 2003) in order to create items that allow for an exploration of this construct in the ROTC setting.

Second, all items related to cadets' perceptions of relatedness were eliminated. For the current research, items on the BNSS were modified to ask cadets about the influence of "people in the military." Only 7 of 21 items were retained. It is possible that participants perceived the influence of cadre, fellow cadets, and other important people in ROTC as too fundamentally different to adequately respond to these items. For example, in the sport setting, Raabe and Zakrajsek (2017) examined the difference between coaches' and teammates' influence on collegiate athletes' need fulfillment and found significant differences. By exploring the impact of social factors in ROTC separately, researchers may be able to gain a more in-depth understanding of cadets' perception of all three basic psychological needs.

Third, the SMS-6 was developed to assess categorically different types of motivation (i.e., amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation). However, current analyses revealed a two-factor solution with statistically significant loadings on the factors self-determined motivation (e.g., because it is an integral part of individuals' life and they enjoy it) and non-self-determined motivation (e.g., to obtain material rewards or social recognition), which hinders an examination of nuanced differences in the behavioral regulation of cadets. In sum, the present findings indicate the necessity of further revising existing instruments or, ideally, developing novel scales that specifically assess motivational constructs in the military setting.

Cadets' perceived cadre behavior, need fulfillment, and motivation

Although the current results indicate a promising trend with respect to cadets' motivational patterns (i.e., relatively high levels of perceived competence, autonomy, and self-determined motivation), participants also highlighted limitations in their interactions with cadre. That is, cadets

in the current study reported low levels of autonomy-supportive behavior from cadre. Hence, it appears that cadre are potentially missing an opportunity to further nurture cadets' need fulfillment as they are involved in cadets' participation but do not seem to use that involvement to provide autonomy support. In the sport setting, coaches are primarily shaped in their professional development through formal and informal interactions with other coaches and mentors (Erickson, Bruner, MacDonald, & Cote, 2008). This can, unfortunately, often lead to the promotion of more dominant, autocratic coaching behaviors (Cushion, Ford, & Williams, 2012), which many have traditionally evaluated as more effective (Mageau & Vallerand, 2003). Such misperceptions create a disconnect between empirical evidence and applied practice (Cushion et al., 2012) as researchers have shown the direct, positive influence of an autonomy-supportive climate on individuals' perception of competence, autonomy, and relatedness (e.g., Cheval et al., 2017; Gagne et al., 2003). Especially with the growing prominence of mentoring in the military (Johnson & Andersen, 2010), it is possible that similar theory-practice gaps exist with respect to cadre's leadership style.

The promotion of optimal (i.e., need-fulfilling) cadre-cadet interactions has a number of important benefits. It is likely that a more positive perception of cadre behavior can help to lower attrition rates among cadets. More specifically, there is ample evidence in the literature highlighting the vital role authority figures play in determining people's persistence across various settings (e.g., Alivernini & Lucidi, 2011; Calvo et al., 2010; Evans et al., 2012). Specifically, in the context of the military, Mathieu (1988) found that cadets' satisfaction with their training – which included their perceptions of cadre – played a significant role in determining their organizational commitment. Similarly, Card (1976) concluded that cadets' relationship with cadre is one of the primary factors contributing to their commitment to an officer career in the military. Theoretically, such findings may be explained by the fact that while human beings have a naturally tendency to “integrate themselves into larger social structures” (Deci & Ryan, 2000, p. 229), the degree to which they ultimately attempt “to transform socially sanctioned mores or requests into personally endorsed values and self-regulations” (Deci & Ryan, 2000, pp. 235–236) depends on their satisfaction of the three basic psychological needs. Thus, it appears that cadre are missing an opportunity to support cadets' internalization of US Army values and emersion into the military's organizational culture. In other words, without this internalization individuals are less likely to “evaluate themselves using the qualities, beliefs, values, and norms of the organization” (Woodruff, 2017,

p. 584). In addition, need fulfillment helps to enhance cadets' psychological health as researchers have found a link between high perceptions of competence, autonomy, and relatedness and a variety of benefits, including increased well-being (e.g., Cheval et al., 2017).

Cadre's inadequate use of autonomy-supportive behavior is likely also a meaningful limitation in cadets' training because both experiential (i.e., via an accumulation of feedback regarding both success and failure) and vicarious learning (i.e., observation of role models) are highly prominent building blocks in individuals' leadership development (Popper & Maysesless, 2007). More specifically, cultivating need-fulfilling environments seems to align with the introduction of “mission command” and the associated fundamental shift in the nature of the US Army's approach to organizational leadership. By replacing the concept of “command and control” the US Army strove to empower leaders to succeed in complex and ambiguous environments in which “decisions must be made quickly at the point of action” (Headquarters, Department of the Army, 2012, p. 2) instead of attempting to shape these environments into ones that fit their philosophical viewpoints. In particular, “when existing orders no longer fit the situation, or when unforeseen opportunities or threats arise” (Headquarters, Department of the Army, 2012, p. 4) mission command requires soldiers to “exercise disciplined initiative to respond to unanticipated problems” (Headquarters, Department of the Army, 2012, p. 2). However, for future leaders to be able to fully embody the fundamentals of mission command and feel confident in their use of such autonomy they need to develop the motivation to lead (Popper & Maysesless, 2007) and, in particular, the ability to independently act and make decisions first. Such confidence has been found to be a meaningful predictor of leadership performance among cadets (e.g., Gilson, Dix, & Lochbaum, 2017). Thus, as Wiedmann (2005) suggested “the focus must be on training someone how to think and not what to think” (p. 7). Ideally, autonomous decision-making is developed early during the pre-commissioning phase in which core values are shaped (Wiedmann, 2005) that “affect a soldier's subsequent value to the Army in terms of organizational identification and citizenship behavior” (Woodruff, 2017, p. 529). In short, by nurturing autonomy-supportive climates cadre not only foster cadet need fulfillment in ROTC but also support their development into confident, empowered leaders.

Despite these limitations, it should not be neglected that the present findings mainly highlighted positive

trends as participants reported relatively high levels of competence, autonomy, and self-determined motivation. These results suggest that cadre are an important foundation for experiences of need fulfillment but there are likely additional social factors that meaningfully contributed to cadets' experiences in ROTC. This assumption is supported by previous research. For example, Raabe and Zakrajsek (2017) concluded that the influence of social factors can vary in magnitude as they revealed that teammates had a significantly more positive effect on collegiate athletes' competence, autonomy, and relatedness than coaches. It is possible that similar dynamics exist in ROTC as cadets spend many hours learning, training, and socializing with other cadets in their battalion. Positive peer interactions have not only been shown to nurture individuals' need fulfillment (e.g., Kipp & Weiss, 2013; Raabe & Zakrajsek, 2017), but also positively influence their performance as well as internalization of organizational values, goals, and behaviors (e.g., Filho, Dobersek, Gershoren, Becker, & Tenenbaum, 2014; Raabe, Zakrajsek, & Readdy, 2016). Specific to the military, researchers have already made extensive contributions to the understanding of team processes (see Goodwin, Blacksmith, & Coats, 2018 for an overview) and it appears valuable to extend such scholarship to the ROTC setting. This call for research is further supported by the conceptual assumptions of self-determination theory as "a secure relational base appears to provide a needed backdrop . . . for intrinsic motivation, a sense of security that makes the expression of this innate growth tendency more likely and more robust" (Deci & Ryan, 2000, p. 235). Cadre and peers are in an ideal situation to provide this relational foundation for cadets in ROTC.

Difference in cadets' perceived cadre behavior, need fulfillment, and motivation

With the exception of low autonomy support, the current findings highlight positive trends with respect to cadets' perceived cadre behavior, need fulfillment, and motivation. However, there were also meaningful variances in these perceptions based on participants' class, age, and race. These mean differences were significant for cadets' perceived cadre involvement, competence, and motivation. What appears to have the most meaningful practical implications is the apparent disparity in cadets' perceived cadre involvement. That is, it would seem that younger cadets need more involvement from their cadre in order to adjust to the military context. In fact, future leaders, such as ROTC cadets, "no matter how gifted, initially

enter organizations as novices. Thus, they lack basic concepts that provide them with an understanding of the work, organizational contexts, and leadership roles" (Mumford, Marks, Connelly, Zaccaro, & Reiter-Palmon, 2000, p. 89), which can result in low levels of perceived competence.

Low scores on items such as "my cadre spend time with me" or "my cadre talk with me" indicate that there seems to be a particular lack in emotional support (i.e., listening, comforting, and challenging; Bianco & Eklund, 2001). Although it was not possible to measure cadets' relatedness in the current study it seems reasonable that this shortage of involvement might also have a meaningful influence on young cadets' feelings of connectedness. In this context, it is important to note that while people are often concerned about over-involvement and cadre may merely want to allow young cadets the opportunity to adjust to the new surroundings first, Anderson, Manoogian, and Reznick (1976) concluded that a lack of involvement was even worse for individuals' motivational patterns than controlling behavior. Cadre may turn to the literature on social support (e.g., Bianco & Eklund, 2001) for recommendations on how to become more optimally involved in young cadets' lives. Exposure to communication skills, patience, honesty, and trustworthiness have been highlighted as essential for mentors (Popper & Maysless, 2007).

It goes beyond the scope of the current research to explain why there were disparities in competence and non-self-determined motivation between participants who self-identified as White/Caucasian and those who did not. Thus, the impact of cadets' race on their experience in ROTC should be explored in future research. Furthermore, while discrepancies in competence across different classes and age should be monitored, such incongruities are probably to be expected as younger individuals in the first or second year in the program have not had the time to fully immerse themselves in the culture of ROTC and develop their knowledge and skills. It is promising that cadets' behavioral regulation appears to become less non-self-determined as they progress through ROTC. However, this finding also highlights that MSI and MSII cadets' behavioral regulation is – at least partially – determined by external factors, such as rewards, punishment, and guilt. In addition, given the high attrition rates in MSI (Doganca, 2006), it is possible that lower means in non-self-determination motivation are not a reflection of improvements in cadre's behavior, but rather the type of individuals who stay in ROTC. Again, this points to the need for cadre to develop a more autonomy-supportive interpersonal style to help these individuals "identify with the importance of social regulations, assimilate them into their integrated sense of

self, and thus fully accept them as their own” (Deci & Ryan, 2000, p. 236). This internalization requires the simultaneous rather than independent provision of involvement and autonomy support because a cadet whose cadre “... is autonomy supportive but not close and emotionally supportive may feel uncared for, while an involved [cadre] who is not autonomy supportive may be perceived as controlling” (Reynolds & McDonough, 2015, p. 52).

Practical implications

If the current findings are reasonably accurate, there appears to be a disconnect between *what is known* and *what is done*. More specifically, despite empirical evidence for the benefits of fostering individuals’ perceptions of competence, autonomy, and relatedness (e.g., Cheval et al., 2017), cadre do not seem to meaningfully engage in behaviors that support cadets’ basic psychological needs. Thus, the present results highlight a need to further educate cadre members regarding ways to foster optimal interactions and relationships with cadets. While it should not be questioned that cadre are qualified commissioned and noncommissioned officers with years of experience leading soldiers, motivational tenets are context-specific (Deci & Ryan, 2000). This suggests that cadets’ perceptions and needs are likely different from those of active duty soldiers. Hence, the US Army should further invest in the context-specific education of officers before they begin their duty within a ROTC program. A possible starting point in the education of cadre is provided by Mageau and Vallerand (2003) who identified seven classes of autonomy support. Moreover, future research is needed to explore what such an autonomy-supportive interpersonal style constitutes in the US Army in general and ROTC in particular.

Limitations

The current research offers valuable insight into the motivational tenets of cadets in accordance to self-determination theory (Deci & Ryan, 2000). Nevertheless, there were significant issues with the measurement model. While EFA and CFA helped to reevaluate the hypothetical structure of the items, more research appears warranted to develop instruments that offer valid and reliable measurement of cadets’ perceived cadre behavior, basic psychological need satisfaction, and motivation. In addition, the present sample comprised individuals who primarily self-identified as male and White/Caucasian. Thus, it would be valuable to further explore these constructs among female cadets and those of other races. Lastly, the present research was cross-sectional in nature

and longitudinal follow-up studies would help to explore potential causal relationships between the assessed variables.

Conclusion

This study was the first to investigate the tenets of self-determination theory (Deci & Ryan, 2000) in the context of US Army ROTC. Overall, the present findings show a promising trend as cadets reported positive levels across most variables. One exception were the low levels of perceived autonomy support from cadre which highlight an important area for improvement in ROTC (i.e., the training of cadre). This study also indicated issues with the measurement model of existing instruments to measure cadets’ perceived cadre behavior, basic psychological need satisfaction, and motivation. Thus, further research is needed to develop novel instruments and further explore the motivational tenets of individuals in ROTC.

Disclosure statement

No potential conflict of interest was reported by the authors.

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