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Henning Bang*, Fredrik Nilsen, Ole Boe, Dag Erik Eilertsen, Ole Christian Lang-Ree

Predicting army cadets' performance: The role of character strengths, GPA and GMA

DOI 10.2478/jms-2021-0016

Received: October 21, 2019; Accepted: April 01, 2021

Abstract: The purpose of this study was to examine how well a set of 12 character strengths (Leadership, Integrity, Open-Mindedness, Bravery, Teamwork, Persistence, Social Intelligence, Love of Learning, Fairness, Self-Regulation, Perspective and Creativity) will predict academic performance (AP) and military performance (MP), compared to high school grade point average (GPA) and general mental ability (GMA). The study sample comprised 123 army cadets of two cohorts from the three-year bachelor's degree programme at the Norwegian Military Academy (NMA). GPA predicted AP ($r = 0.32, p \leq 0.05$), but not MP ($r = 0.14, n.s.$), while GMA correlated significantly with neither AP nor MP. All 12 character strengths correlated significantly with MP (r s ranging from 0.27 to 0.65), and all except for Fairness correlated significantly with AP (r s ranging from 0.18 to 0.58). An average score of the 12 character strengths showed incremental validity beyond GMA and GPA in predicting both AP and MP. Our results suggest that character strengths should be considered when selecting and training army cadets.

Keywords: character strengths, performance, GPA, GMA, OBSCIF

Introduction

In a three-year bachelor's degree programme in military studies, the Norwegian Military Academy (NMA) aims to educate and develop highly skilled military officers so that they are able to cope with difficult and dangerous

*Corresponding author: **Henning Bang**, Department of Psychology, University of Oslo, P.O.Box 1094 Blindern, N-0317 OSLO.

The Norwegian Defense University College

E-mail: henning.bang@psykologi.uio.no

Fredrik Nilsen, The Norwegian Defense University College

Ole Boe, The Norwegian Defense University College, and University of South-Eastern Norway

Dag Erik Eilertsen, University of Oslo, Department of Psychology

Ole Christian Lang-Ree, Norwegian Armed Forces Joint Medical Services

situations and execute leadership under extreme conditions. According to Cornum et al. (2011, p. 4), 'modern warfare is characterised by demanding missions, extreme climates, sleep deprivation, cultural dissonance, physical fatigue, prolonged separation from family, and the ever-present threat of serious bodily injury or death'. One of the main challenges of military leadership is to be willing and able to make decisions that may result in the taking of lives and risking those of oneself and one's comrades in military operations. The Norwegian Chief of Defence states that military leadership is about doing those things that are uncomfortable and being able to cope with them, overcoming powerlessness, and avoiding emotional breakdown. Military leadership requires a certain degree of robustness that would facilitate clear and effective thinking and that would permit officers to cope with their feelings when facing complex and difficult situations (Forsvaret 2012).

What personal qualities characterise army cadets who succeed in their education and training to become military leaders well-suited for these demanding challenges?

Theoretical background and hypotheses

Three different predictors are often examined in the studies of factors predicting academic achievement in undergraduate and graduate programmes: high-school grade point average (GPA; e.g. Allensworth and Clark 2020; Hiss and Franks 2014; Hodara and Cox 2016; Hodara and Lewis 2017; Wagerman and Funder 2007), general mental ability (GMA; e.g. Duckworth et al. 2019; Kobrin et al. 2008; Køber et al. 2017; Lounsbury et al. 2003; Roth et al. 2015; Schmidt and Hunter 1998; Strenze 2007) and Big Five personality traits – particularly conscientiousness (e.g. Chamorro-Premuzic and Furnham 2003; Conard 2006; Farsides and Woodfield 2003; Komarraju et al. 2009; Lounsbury et al. 2003; Poropat 2009).

This article will address two of these common predictors – GPA and GMA – and suggest another set of predictors that can be relevant for academic achievement, and particularly in military settings. Since the early 2000s, a growing number of studies indicate that certain character traits (e.g. character strengths, grit, hardiness, self-discipline and self-control) can also function as important predictors of both academic achievement and job performance (e.g. Duckworth and Seligman 2005; Harzer and Ruch 2014; Harzer et al. 2021; Lounsbury et al. 2009). Harzer et al. (2021) found, for example, that ‘perseverance, teamwork and leadership seemed to be especially relevant for numerous dimensions of job performance’, and that these three character strengths explained a substantial amount of variance in job performance even after controlling for GMA and personality. Lounsbury et al. (2009) found positive and significant correlations between college academic performance (AP) on the one hand, and Persistence, Open-Mindedness, Love of Learning, Self-Regulation and Prudence on the other.

Character strengths are suggested to be particularly relevant for performance in military settings, which often requires *in extremis* leadership (Kolditz 2010). A small, but growing number of studies have started examining the importance of character strengths for succeeding in military settings (e.g. Cosentino and Solano 2012; Duckworth et al. 2007; Gayton and Kehoe 2015a, 2015b; Gosnell et al. 2020; Kelly et al. 2014; Maddi et al. 2012; Matthews 2008; Matthews et al. 2006). Matthews (2008) claimed that ‘from the *in extremis* perspective, leadership under conditions of mortality salience, that is, conditions where risk of serious injury or death is present, may require different skills sets than leadership in the corporate world or on a sports team’. (p. 165). Building on these studies, we suggest that succeeding as a military officer requires something more than high GMA and good high school average grades. The extremely challenging conditions military officers face in live military operations including ‘sleep deprivation, high physical workload, stress, circadian disruption and fear of death or severe bodily harm’ (Laurence and Matthews 2012, p. 208) require strong character strengths that may not be reflected in GMA and GPA. Hence, we hypothesise that compared to GMA and GPA, character strengths will be able to function as better predictors for cadets’ AP and military performance (MP) during their three-year military training programme.

Character strengths can be defined as ‘positively valued trait-like individual differences with demonstrable generality across different situations and stability across time that manifest in the range of individuals’ thoughts, feelings, and behaviors’ (Harzer and Ruch 2014, p. 184).

They are recognised and valued across cultures and religious traditions as morally valued behaviour patterns (Peterson and Seligman 2004).

There seems to be a lack of empirical studies examining the relationship between character strengths and cadet performance (academic and military) in military academies. One exception is the study by Cosentino and Castro Solano (2012), which found a positive association between a set of character strengths and AP or MP among cadets in the Argentinean military (Persistence, Leadership, Love of Learning, Perspective and Creativity), and a negative relationship for other character strengths (e.g. Teamwork and Fairness). Albeit significant, the correlations were in the low end of the scale, with no correlations higher than that of $r = 0.25$.

The main purpose of this article is to examine to what extent certain character strengths predict MP and AP among army cadets in their bachelor’s degree programme, and whether character strengths are better predictors compared to GPA and GMA.

Building on Peterson and Seligman’s (2004) classification of 6 virtues and 24 character strengths (see Table 1), previous studies have suggested 12 character strengths as particularly important for succeeding as a military officer, and thus these are to be further developed in army cadets during their bachelor’s degree programme (Boe 2016; Boe and Bang 2017; Boe et al. 2015a; Boe et al. 2015b). In 4 different studies, 173 experienced military officers were asked to rate each of Peterson and Seligman’s 24 character strengths on a 5-point scale, ranging from 1 (*not at all important*) to 5 (*very important*), according to how important the respective character strengths were for military officers. To differentiate between important and less important character strengths, a cut-off score of 4.00 was used in the analyses. Twelve character strengths were given a score of 4.00 or higher by the military officers across the four different samples (Boe 2016). The 12 character strengths, ranked from highest ($M = 4.90$) to lowest score ($M = 4.09$) were, respectively, *Leadership, Integrity, Open-Mindedness, Bravery, Teamwork, Persistence, Social Intelligence, Love of Learning, Fairness, Self-Regulation, Perspective* and *Creativity*.

Since the set of character strengths selected for this study were identified to be particularly important for success as a military officer, we would argue that these 12 character strengths define the ‘ideal military character’. Hence, we suggest that army cadets’ average scores on an aggregate of these 12 character strengths are strongly associated with their AP and MP, and that the score of average character strengths shows incremental validity beyond GMA and GPA.

Tab. 1: Overview of Peterson and Seligman's (2004) classification of virtues and character strengths.

1. Wisdom and knowledge – cognitive strengths that entail the acquisition and use of knowledge

**Creativity* (originality, adaptivity, ingenuity)

Curiosity (interest, novelty-seeking, exploration, openness to experience)

**Open-Mindedness* (judgement, critical thinking, thinking things through)

**Love of Learning* (mastering new skills and topics, systematically adding to knowledge)

**Perspective* (wisdom, providing wise counsel, taking the big picture view)

2. Courage – emotional strengths that involve the exercise of will to accomplish goals in the face of opposition

**Bravery* (valour, not shrinking from fear, speaking up for what's right)

**Persistence* (perseverance, industriousness, finishing what one starts)

**Integrity* (authenticity, honesty, speaking the truth, presenting oneself and acting in a genuine and sincere way)

Vitality (zest, enthusiasm, vigour, energy, feeling alive, and activated)

3. Humanity – interpersonal strengths that involve tending and befriending others

Love (valuing close relations with others, both loving and being loved, being close to people)

Kindness (generosity, nurturance, care, compassion, altruistic love, niceness, helping others)

**Social Intelligence* (emotional intelligence, being aware of the motives/feelings of self/others)

4. Justice – civic strengths that underlie healthy community life

**Teamwork* (citizenship, social responsibility, loyalty, doing one's share, working well as a team member)

**Fairness* (just, treating all people the same according to notions of fairness and justice, not letting feelings bias decisions about others)

**Leadership* (organising group activities, encouraging a group to get things done and at the same time maintaining good relations within the group)

5. Temperance – strengths that protect against excess

Forgiveness and Mercy (accepting others' shortcomings, giving people a second chance, not being vengeful)

Humility/Modesty (letting one's accomplishments speak for themselves, not regarding oneself to be more special than oneself)

Prudence (careful, cautious, not taking undue risks, not saying or doing things that might later be regretted)

**Self-Regulation* (self-control, discipline, controlling one's appetites, impulses and emotions)

6. Transcendence – strengths that forge connections to the larger universe and provide meaning

Appreciation of Beauty and Excellence (awe, wonder, elevation, noticing and appreciating beauty, excellence and/or skilled performance in various domains of life)

Gratitude (being aware of and thankful for the good things that happen, feeling blessed)

Hope (optimism, future-mindedness, future orientation, believing a good future is something that can be brought about)

Humour (playfulness, liking to laugh and tease, bringing smiles to others, light-heartedness)

Spirituality (religiousness, faith, having coherent beliefs about the higher purpose and meaning of the universe)

Note: The 12 character strengths suggested as particularly important for succeeding as a military officer are marked with an asterisk.

We test the following three hypotheses in this study:

Hypothesis 1: GMA and GPA are positively related to cadets' academic and military performance.

Hypothesis 2: Each of the 12 character strengths – Leadership, Integrity, Open-Mindedness, Bravery, Teamwork, Persistence, Social Intelligence, Love of Learning, Fairness, Self-Regulation, Perspective and Creativity – is positively related to cadets' academic and military performance.

Hypothesis 3: A Military Average Character Strengths-score consisting of an average score of the 12 character strengths will show incremental validity beyond GMA and GPA in predicting academic and military performance.

Methods

Participants

The study used data from two consecutive cohorts of army cadets from the three-year bachelor's degree programme at the NMA: one cohort of army cadets graduated in 2016, and the other graduated in 2017. The total sample consisted of 123 army cadets (112 male and 11 female), with an average age of 26 years (range 22–35 years) at graduation.

Measures and procedures

The predictor variables were measured at different points in time (see Figure 1 for a timeline of the different measures). Data on high school GPA and GMA were measured and collected prior to the cadets' attendance at the NMA. Data on character strengths were measured for 22 months into the three-year bachelor's degree programme.

High-school GPA was calculated as an average of the grades received on all high school courses taken by each cadet. These grades were reported in the cadets' final

high-school diploma, and GPA of each of the applicants was registered in the NMA. The Norwegian high school grading scale ranges from 1 (very low competency) to 6 (outstanding competency). The cadets' GMA scores were based on a combined measure of the cadets' performance on three mental ability tests commonly used in the Norwegian armed forces: Arithmetic, Word Similarities and Figures (Sundet et al. 2004). The cadets' GMA scores were calculated as the mean Stanine score of the three tests. GMA scores were collected as the cadets were assessed for intellectual, psychological and physical suitability when they applied for admission to the three-year bachelor's degree programme at the NMA, 2 months prior to the start of the programme.

In this study, we were particularly interested in measuring the character strengths cadets displayed in an extreme setting, assuming cadets might not be aware which character strengths they actually possessed until confronted physically and psychologically with an extreme situation. One year before graduation, cadets attended a nearly two-week long, highly stressful combat fatigue course consisting of hard physical and psychological stress, sleep deprivation and inadequate amounts of food. Data were collected on cadets' character strengths immediately after attending this combat fatigue course.

Previous studies have indicated that character strengths displayed in extreme settings are measured most reliably and validly through observer evaluation. These observations should be made close in time to a live setting where cadets are exposed to situations requiring a range of different character strengths (Bang et al. 2015; Bang et al. 2016, 2019). In this study, each of the army cadets' character strengths was rated by 7–9 peers from their own squad. Ratings were done with an observational instrument – OBSCIF (OBServation of Character In the Field) – developed at the NMA especially for evaluating character strengths *in situ* (Bang et al. 2016; Boe et al. 2016). OBSCIF consists of 38 items – 3 to 4 items for each of the

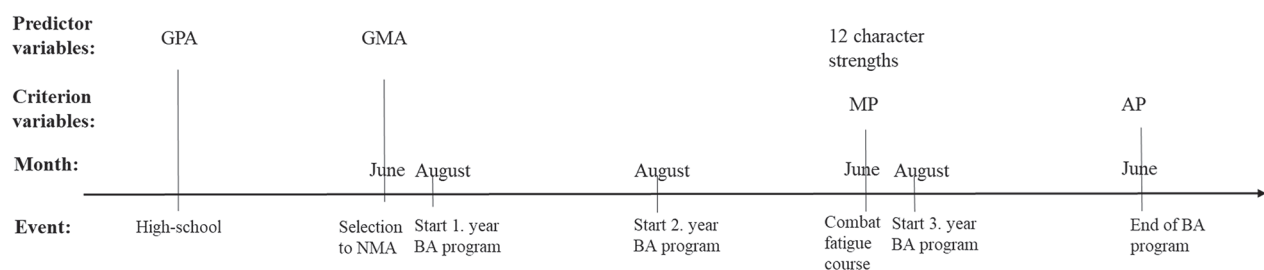


Fig. 1: Timeline for Collection of Data on Predictor and Criterion Variables.

Note. AP, Academic performance as GPA from the NMA; GMA, General mental ability; GPA, Grade point average (high school); MP, Military performance (during the combat fatigue course); NMA, Norwegian Military Academy.

12 character strengths. One day after finishing the combat fatigue course, cadets were asked to rate their peers on the items belonging to the respective character strengths on a scale from 1 (*to a very little degree*) to 5 (*to a very high degree*), reflecting cadet behaviour described by the items during the combat fatigue course. For example, 'Puts the needs of the team above own needs' is one of the items measuring Teamwork. The peer-rated character strength scores were based on average scores from their squad peers (see Appendix 1 for the items in OBSCIF).

We created a Military Average Character Strengths-score (MACS-score) consisting of an average score of the 12 character strengths, based on the assumption that they can be seen as *formative* – not *reflective* – indicators for 'the ideal military character' (Bollen and Lennox 1991; Bollen and Diamantopoulos 2017; Diamantopoulos and Siguaw 2006). As formative indicators, there is no requirement that the 12 character strengths show high inter-correlations or high internal consistency (e.g. load on one common factor).

MP and AP served as criterion variables in the study. MP was evaluated by two supervisors. Each squad, consisting of 8–10 army cadets, had 2 supervisors following them 24/7 during the combat fatigue course. The supervisors rated each of the cadets for MP on a scale ranging from 5 to 1 (5 = *above norm*, 4 = *slightly above norm*, 3 = *on norm*, 2 = *slightly below norm*, 1 = *below norm*). The final MP evaluation was completed individually by the two supervisors immediately after the combat fatigue course, and their scores were combined into an average MP score for each cadet.

AP was measured by averaging each cadet's grades from the graded courses and academic activities (Basic officer competence, Leadership of complex operations, Suitability as military leader and Bachelor's thesis) during their three-year bachelor's degree programme.

Statistical analyses

Data were analysed with IBM SPSS Statistics (Version 26). We calculated bivariate correlations to examine the predictive validity of GPA, GMA and character strengths on AP and MP. We used hierarchical multiple regression analysis to estimate to what extent a composite-score of 'the ideal military character' (MACS) showed incremental validity beyond GMA and GPA in predicting MP and AP. GPA was entered at step 1, GMA at step 2, while the MACS-score was entered at step 3 of the analysis.

Table 2 presents descriptive statistics for the variables in the study, as well as reliability estimates (Cronbach's alpha for OBSCIF) and measures of interrater agreement:

Tab. 2: Means, standard deviations, Cronbach's α , *Rwg* and *ICC(2)* for the variables.

| Variables | <i>M</i> | <i>SD</i> | Cronbach's α | <i>Rwg</i> | <i>ICC(2)</i> |
|---------------------|----------|-----------|---------------------|------------|---------------|
| GPA | 4.18 | 0.50 | | | |
| GMA | 6.19 | 1.23 | | | |
| Perspective | 3.52 | 0.53 | 0.77 | 0.77 | 0.85 |
| Open-mindedness | 3.51 | 0.39 | 0.74 | 0.77 | 0.73 |
| Creativity | 3.44 | 0.37 | 0.76 | 0.79 | 0.73 |
| Love of learning | 3.62 | 0.41 | 0.81 | 0.71 | 0.69 |
| Leadership | 3.49 | 0.55 | 0.76 | 0.78 | 0.87 |
| Teamwork | 3.90 | 0.47 | 0.84 | 0.75 | 0.80 |
| Fairness | 3.71 | 0.40 | 0.79 | 0.69 | 0.64 |
| Integrity | 3.87 | 0.46 | 0.79 | 0.75 | 0.78 |
| Bravery | 3.73 | 0.45 | 0.61 | 0.74 | 0.77 |
| Persistence | 3.88 | 0.55 | 0.87 | 0.74 | 0.84 |
| Self-regulation | 3.60 | 0.50 | 0.79 | 0.76 | 0.83 |
| Social intelligence | 3.61 | 0.41 | 0.78 | 0.75 | 0.74 |
| MACS | 3.66 | 0.36 | | | |
| MP | 3.51 | 0.93 | | 0.97 | 0.85 |
| AP | 4.29 | 0.66 | | | |

Note: *N* = 112–121. AP, Academic performance (measured as GPA from the three-year Bachelor's degree programme, scale 1–6); GMA, General mental ability (scale 1–9, Stanine); GPA, Grade point average (from high school, scale 1–6); MP, Military performance (during the combat fatigue course, scale 1–5).

Rwg (James et al. 1984), and interrater reliability: *ICC(2)* (McGraw and Wong 1996), for the 12 observer measured character strengths and for the MP evaluation.

The reliability estimates for the scores on OBSCIF were acceptable, ranging from $\alpha = 0.87$ for Persistence, to $\alpha = 0.61$ for Bravery. Agreement among peer-raters was strong to moderate (LeBreton and Senter 2008), with *Rwg* ranging from 0.79 for Creativity, to 0.69 for Fairness. Interrater reliability was good to moderate (Koo and Li 2016), with *ICC(2)* values up to 0.87 for Leadership and 0.64 for Fairness. Reliability estimates and agreement among the two supervisors evaluating the cadets' performance during the combat fatigue course were very good, with *Rwg* = 0.97, and *ICC(2)* = 0.85.

Results

Table 3 shows the bivariate correlations between all variables in the study. As expected, GPA and GMA correlated positively ($r = 0.25$, $p \leq 0.01$), although their values were lower than those indicated by other studies. In a recent meta-analysis, Roth et al. (2015) found a population correlation of $\rho = 0.58$ between intelligence and high-school GPA. The 12 character strengths showed either no or low correlations with GMA and GPA, but were rather highly inter-correlated (r_s ranging from 0.17 to 0.87).

Tab. 3: Bivariate correlations between variables in the study.

| Variables | AP | MP | GPA | GMA | Leadership | Integrity | Persistence | Fairness | Bravery | Open-mindedness | Social intelligence | Teamwork | Self-regulation | Perspective | Creativity | Love of learning |
|---------------------|--------|--------|--------|-------|------------|-----------|-------------|----------|---------|-----------------|---------------------|----------|-----------------|-------------|------------|------------------|
| AP | – | | | | | | | | | | | | | | | |
| MP | 0.52** | – | | | | | | | | | | | | | | |
| GPA | 0.32** | 0.14 | – | | | | | | | | | | | | | |
| GMA | 0.06 | -0.10 | 0.25** | – | | | | | | | | | | | | |
| Leadership | 0.52** | 0.63** | 0.08 | 0.02 | – | | | | | | | | | | | |
| Integrity | 0.40** | 0.46** | 0.03 | 0.15 | 0.82** | – | | | | | | | | | | |
| Persistence | 0.30** | 0.65** | 0.21* | 0.15 | 0.59** | 0.45** | – | | | | | | | | | |
| Fairness | 0.18 | 0.27** | 0.04 | 0.15 | 0.25** | 0.17 | 0.54** | – | | | | | | | | |
| Bravery | 0.36** | 0.50** | 0.03 | 0.17 | 0.78** | 0.84** | 0.58** | 0.20* | – | | | | | | | |
| Open-mindedness | 0.43** | 0.32** | -0.05 | 0.21* | 0.48** | 0.45** | 0.33** | 0.47** | 0.41** | – | | | | | | |
| Social intelligence | 0.25** | 0.31** | -0.11 | 0.06 | 0.56** | 0.37** | 0.42** | 0.61** | 0.31** | 0.63** | – | | | | | |
| Teamwork | 0.28** | 0.59** | 0.07 | 0.16 | 0.62** | 0.48** | 0.86** | 0.66** | 0.52** | 0.45** | 0.65** | – | | | | |
| Self-regulation | 0.42** | 0.58** | 0.07 | 0.11 | 0.74** | 0.73** | 0.69** | 0.37** | 0.78** | 0.57** | 0.45** | 0.64** | – | | | |
| Perspective | 0.58** | 0.58** | 0.02 | 0.04 | 0.82** | 0.77** | 0.54** | 0.28** | 0.79** | 0.63** | 0.47** | 0.56** | 0.87** | – | | |
| Creativity | 0.45** | 0.50** | -0.01 | 0.08 | 0.74** | 0.67** | 0.54** | 0.48** | 0.68** | 0.68** | 0.66** | 0.59** | 0.70** | 0.77** | – | |
| Love of learning | 0.44** | 0.50** | 0.13 | 0.16 | 0.58** | 0.46** | 0.60** | 0.54** | 0.48** | 0.61** | 0.58** | 0.65** | 0.49** | 0.54** | 0.70** | – |

Note: N = 105–120. AP, Academic performance; GMA, General mental ability; GPA, Grade point average; MP, Military performance.

**Correlation is significant at the.01 level (2-tailed).

*Correlation is significant at the.05 level (2-tailed).

We first examined to what extent GPA and GMA predicted the cadets' AP and MP. As shown in Table 3, GPA correlated $r = 0.32$ ($p \leq 0.01$) with AP and $r = 0.14$ ($p = 0.14$) with MP. GMA correlated $r = 0.06$ (*n.s.*) with AP and $r = -0.10$ (*n.s.*) with MP. Since both GPA and GMA are part of the criteria used for selecting the army cadets, the correlations may have been influenced by restriction of range due to the selection process. The restriction of range problem occurs when the observed correlation in the range-restricted sample is lower than it would be if data from the entire possible range of candidates for the programme had been analysed. Applicants were screened for GPA prior to the selection process. Hence, the group of candidates competing for a place in the bachelor's degree programme had slightly lower score on GPA ($M = 4.06$, $SD = 0.60$) and higher variance in GPA, compared to the army cadets admitted to the programme ($M = 4.18$, $SD = 0.50$).

Concerning GMA, the selection criterion was a minimum score of 5 on the Stanine scale used for measuring GMA. The GMA-score for all the applicants to the programme ($N = 1118$) was $M = 5.86$ ($SD = 1.23$), while the GMA-score for our sample of army cadets that was admitted to the programme ($N = 123$) was $M = 6.19$ ($SD = 1.24$) – a higher average GMA-score, but with equal variance in the two samples.

When using Thorndike's Case II method for correcting for range restriction (Thorndike 1949; Wiberg and Sundström 2009) in GPA and GMA, the corrected

correlations between GMA and AP/MP remained the same as the uncorrected correlations, due to the nearly identical standard deviations for the population and the sample. The corrected correlations between GPA and performance increased from $r = 0.32$ (uncorrected) to $r = 0.37$ (corrected) for the relationship between GPA and AP, and from $r = 0.14$ (uncorrected) to $r = 0.17$ (corrected) for the

Tab. 4: Hierarchical regression with MP as dependent variable.

| Step | R | R ² | Adj. R ² | SE of Est. | R ² Δ | F Δ | df1 | df2 | Sig. F Δ |
|------|-------------------|----------------|---------------------|------------|------------------|------|-----|-----|----------|
| 1 | 0.14 ^a | 0.02 | 0.01 | 0.92 | 0.02 | 2.1 | 1 | 103 | 0.15 |
| 2 | 0.20 ^b | 0.04 | 0.02 | 0.92 | 0.02 | 1.9 | 1 | 102 | 0.17 |
| 3 | 0.69 ^c | 0.48 | 0.47 | 0.68 | 0.44 | 86.4 | 1 | 101 | 0.00 |

Note: GMA, General mental ability; GPA, Grade point average; MACS, Military Average Character Strengths; MP, Military performance.

^aPredictors: (Constant), GPA

^bPredictors: (Constant), GPA, GMA

^cPredictors: (Constant), GPA, GMA, MACS

Tab. 5: Hierarchical regression with AP as dependent variable.

| Step | R | R ² | Adj. R ² | SE Est. | R ² Δ | F Δ | df1 | df2 | Sig. F Δ |
|------|-------------------|----------------|---------------------|---------|------------------|------|-----|-----|----------|
| 1 | 0.32 ^a | 0.10 | 0.10 | 0.63 | 0.10 | 11.9 | 1 | 103 | 0.00 |
| 2 | 0.32 ^b | 0.10 | 0.09 | 0.63 | 0.00 | 0.1 | 1 | 102 | 0.80 |
| 3 | 0.58 ^c | 0.34 | 0.32 | 0.55 | 0.24 | 36.2 | 1 | 101 | 0.00 |

Note: GMA, General mental ability; GPA, Grade point average; MACS, Military Average Character Strengths; AP, Academic performance.

^aPredictors: (Constant), GPA

^bPredictors: (Constant), GPA, GMA

^cPredictors: (Constant), GPA, GMA, MACS

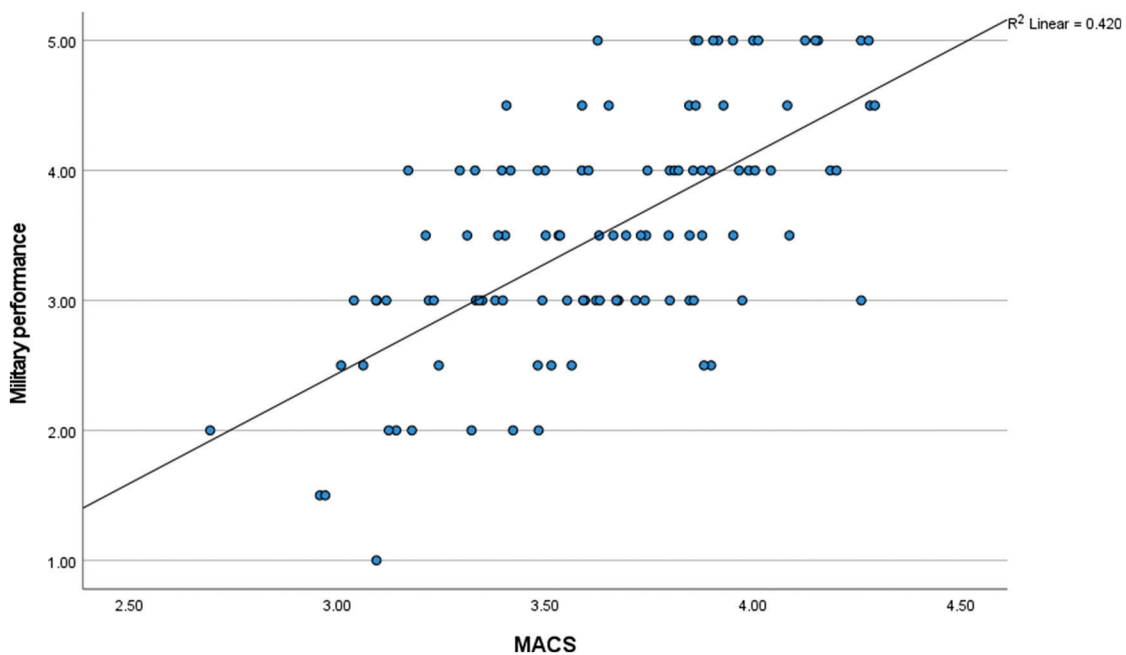


Fig. 2: Scatterplot of the relationship between MACS and MP. MACS, Military Average Character Strengths; MP, Military performance.

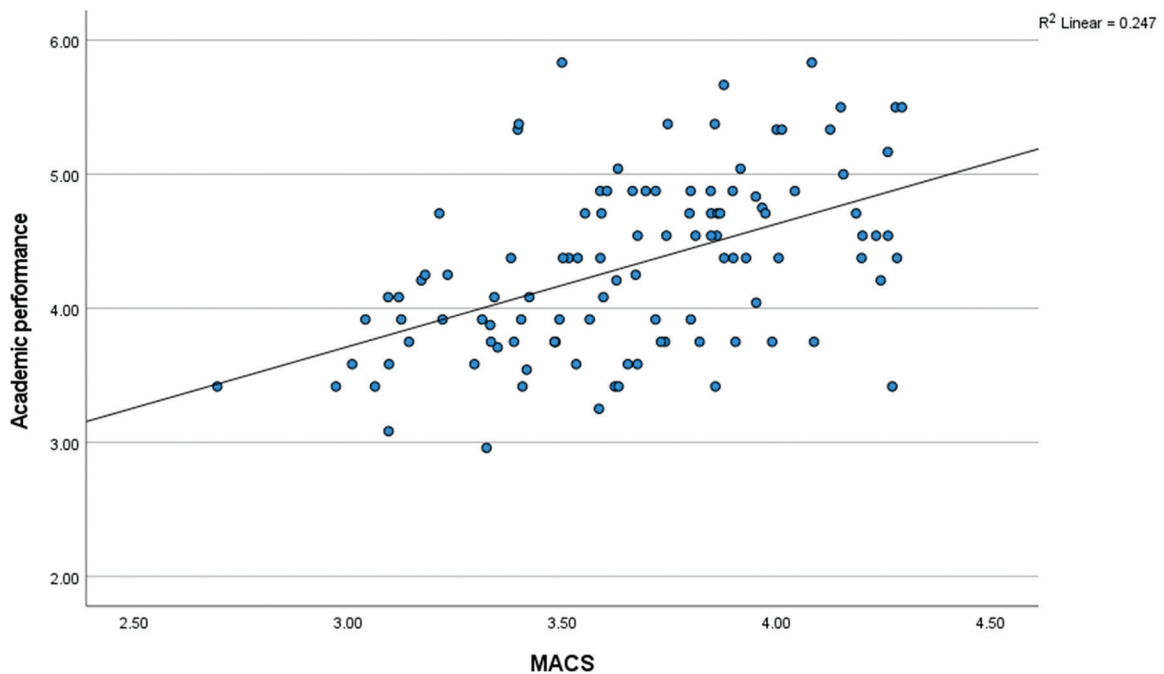


Fig. 3: Scatterplot of the relationship between MACS and AP. MACS, Military Average Character Strengths; AP, Academic performance.

relationship between GPA and MP. Hence, Hypothesis 1, stating that GPA and GMA are positively related to AP and MP, was supported for one of the predictors – GPA – and only for predicting AP.

Hypothesis 2, stating that the 12 character strengths would be positively associated with both MP and AP, was mostly supported. Table 3 shows that all 12 character strengths correlated positively and significantly with MP (r s ranging from 0.27 to 0.65, with an average $r = 0.49$), and that they all served as stronger MP predictors compared to GPA and GMA. Eight character strengths – Persistence, Leadership, Teamwork, Self-Regulation, Perspective, Bravery, Love of Learning and Creativity – showed large correlations (r s ≥ 0.50 , see Cohen 1988), three – Integrity, Open-Mindedness and Social Intelligence – showed medium correlations (r s between 0.30 and 0.49), and one – Fairness – correlated low (r between 0.10 and 0.29) with MP. Eleven character strengths (all except for Fairness) correlated positively and significantly with AP (r s ranging from 0.18 to 0.58, with an average $r = 0.38$). GPA was a stronger predictor for AP than Bravery, Persistence, Teamwork, Social Intelligence and Fairness, but correlated lower with AP compared to the seven other character strengths. Perspective and Leadership showed large correlations, while Creativity, Love of Learning, Open-Mindedness, Self-Regulation, Integrity, Bravery and Persistence showed medium correlations with AP. Teamwork, Social Intelligence and Fairness showed small correlations with AP.

Hypothesis 3 stated that an average score of all 12 the character strengths (MACS-score) would show incremental validity beyond GMA and GPA in predicting AP and MP. To test this hypothesis, we conducted two hierarchical regressions with AP and MP as outcome variables. In step 1, only high-school GPA was entered. In step 2, GMA was added, and finally, MACS was added in step 3.

As shown in Tables 4 and 5, MACS showed incremental validity beyond GPA and GMA as a predictor for both types of performance. GPA and GMA explained 4% of the variance in MP, while MACS added 44% explained variance. GPA and GMA explained 10% of the variance in AP, while adding MACS increased explained variance by 24%. Hence, Hypothesis 3 was supported. Figures 2 and 3 show scatter plots of the relationships of MACS with MP and AP, respectively.

Discussion

This study indicates that GPA predicts AP, but not MP, and further that character strengths predict both AP and MP among army cadets. Surprisingly, GMA predicted neither AP nor MP.

Eleven of the 12 character strengths (all except for Fairness) were positively and significantly associated with *both* MP and AP. However, we found that most of the character strengths were stronger predictors of MP

compared to AP. For ten character strengths (all except for Open-Mindedness and Perspective) the magnitude of the correlations was higher between character strengths and MP, compared to the correlations between character strengths and AP. The average correlation between the 12 character strengths and MP was $r = 0.49$, and 8 of these correlations were large (Cohen 1988), while the average correlation between the 11 significant character strengths predictors and AP was $r = 0.38$, and only 2 of the correlations were large. One possible explanation for this finding could be that the criteria the supervisors used for evaluating cadet performance during the combat fatigue course were rather similar to the 12 character strengths on which the cadets rated each other (showing bravery, teamwork, persistence, self-regulation, leadership, etc.).

Three studies lend support to our findings of a strong relationship between certain character strengths and MP. Park (2005) did a content analysis of citations accompanying the Medal of Honor given to 123 soldiers, sailors, or airmen since the First World War (see Matthews 2008). Parks found that Bravery was most frequently mentioned (100%), followed by Self-Regulation (80%), Persistence (67%), Leadership (49%), Teamwork (39%) and Creativity (18%).

Matthews et al. (2006) examined the role of character strengths of West Point cadets in basic training. Self-ratings of Peterson and Seligman's (2004) 24 character strengths were compared between cadets who were retained through basic training ($n = 1135$) and those who had departed ($n = 73$). Cadets who were retained rated themselves significantly higher on nine strengths compared to those who ultimately left: Bravery, Zest, Fairness, Integrity, Persistence, Hope, Leadership, Self-Regulation and Teamwork. A factor analysis of the 24 self-rated character strengths revealed five factors. Only the first factor, consisting of the strengths Leadership, Persistence and Bravery, differentiated significantly between those who stayed and those who departed.

Gayton and Kehoe (2015b) found that applicants who passed selection into the Australian army's special forces had Teamwork, Integrity and Persistence among their top-ranked character strengths, significantly more often than those who did not pass the selection. All of the applicants who did not include any of those three strengths in their top ranks failed to complete the selection process.

The character strengths found as particularly important for MP in these three studies – Bravery,

Persistence, Teamwork, Leadership, Integrity, Self-Regulation, and Creativity – were all strong predictors of MP in our study.

We found that an average score of the 12 character strengths (MACS) showed incremental validity beyond GPA and GMA, and added a substantial and significant amount of explained variance in both MP and AP after controlling for GPA and GMA. Since data on GPA and GMA were collected prior to the cadets' attending the NMA, while data on character strengths was collected 22 months into the study programme, one should be careful when interpreting this finding. However, there are a couple of other studies indicating that character strengths might outperform other commonly used performance predictors, such as GMA and personality (e.g. Duckworth and Seligman 2005; Harzer et al. 2021), in predicting both job and academic achievement.

Theoretical and practical implications

The present study makes three important theoretical contributions to the research field. The first is that researchers should consider including character strengths as one of the predictors when wanting to predict MP and AP among army cadets. The research on character strengths is still in its infancy, but there are an increasing number of empirical studies linking character strengths to both job and academic achievement (e.g. Gosnell et al. 2020; Harzer et al. 2021; Karris Bachik et al. 2020; Wagner et al. 2020). When studying performance in extreme settings where occasionally crucial decisions that might have fatal consequences, must be taken (e.g. the military, police force or fire brigades), there is growing evidence that character strength is particularly important.

The second contribution is the finding that the way character strengths are measured matters. Even though Connelly and Ones (2010) found robust evidence for the supremacy of other-ratings compared to self-ratings when measuring personality, most studies of personality related characteristics (like character strengths) rely on self-ratings. The present study indicates that observer ratings may represent a reliable and valid predictor of MP and AP. Future studies on the relationship between personality-related characteristics and different types of outcomes should therefore make more frequent use of observer-ratings instead of solely relying on self-reports.

The third theoretical contribution of this study is the design of an OBSCIF (Bang et al. 2016; Boe et al. 2016) –

to evaluate 12 of Peterson and Seligman's (2004) 24 character strengths. Although OBSCIF was designed for measuring character strengths displayed during extreme situations in a military context, the items in OBSCIF are rather generically phrased to stay close to the original theoretical content of each of the 12 character strengths. Hence, OBSCIF can easily be applied to a range of different settings where observation of the 12 character strengths is useful.

We suggest three practical implications of our study. First, when recruiting and selecting cadets for military officer training, certain character strengths should be considered as selection criteria in addition to high school GPA. Second, military academies should design specific measures to enhance these character strengths during cadet training programmes. Character strengths are not fixed personality traits: they can be honed and developed (Peterson and Seligman 2004). A number of exercises and interventions have been designed to develop different character strengths (e.g. Niemiec 2018). Military academies could incorporate some of these interventions in their training programmes. The U.S. Army has already implemented a programme ('The Comprehensive Soldier Fitness program'), based on research findings from positive psychology and character strengths, 'to increase psychological strength, resilience and positive performance and to reduce the incidence of maladaptive responses' among army soldiers (Cornum et al. 2011, p. 4).

Third, knowing which specific character strengths are important performance predictors can help military officers to enhance their skills, by making them aware of which character strengths they need to strengthen or develop to further progress as military leaders.

Limitations and future research

This study has a number of limitations that should be acknowledged. First, character strengths were measured closer in time to the measures of MP and AP, as compared to the time when data on GPA and GMA were collected. While GPA and GMA were measured prior to the army cadets' attendance at the three-year bachelor's degree programme, character strengths of the cadets were measured 22 months into the programme, at the same time as their MP was measured, and 12 months prior to the final evaluation of their AP. This will probably increase the magnitude of the correlations between character strengths and the performance measures, compared to the correlations for GPA and GMA. Future studies should collect data on character strengths prior the cadets' attendance at the military

study programme (e.g. during the weeklong selection process for applicants to the programme).

Second, our data was based on responses from a relatively small sample of 123 army cadets, comprising mainly males. The cadets came from two different cohorts and attended the same military academy in Norway. Future studies should use a larger sample of cadets from more cohorts, preferably from different military academies (e.g. naval and air force cadets), from other countries, and with more gender-balanced samples, to examine the robustness and generalisability of our findings.

Third, although the 12 OBSCIF-scales had good reliability estimates, correlated significantly with the corresponding scales in VIA-IS (Values in Action Inventory of Strengths), and showed high levels of inter-rater agreement (Bang et al. 2015; Bang et al. 2016), one can question the discriminatory validity of the scales. The inter-correlations between the 12 peer-rated character strengths were rather high, with bivariate correlations ranging from $r = 0.17$ to $r = 0.87$, and with most correlations above 0.50. The high inter-correlations between most of the peer-rated character strengths could indicate that the cadets did not differentiate sufficiently between the character strengths when rating each other. It may also indicate that behaviours displayed by the different cadets during the combat fatigue course were highly correlated, and that the cadets varied in 'military prototypical behaviour'. Some cadets may have been very good at displaying a set of behaviours that are in accordance with the 12 character strengths (which might be seen as a set of prototypical military traits), while others may have been less adept at displaying this set of behaviours. Another explanation could be a *halo-effect* (Thorndike 1920) underlying the cadets' perception of one another (e.g. 'the degree to which I like you as a person'), making them less able to differentiate between the character strengths when evaluating their peers.

Conclusion

This study indicates that certain character strengths can serve as important predictors of cadets' MP and AP during their bachelor's degree programme. 11 of the character strengths that were analysed in this study, namely Perspective, Leadership, Self-Regulation, Love of Learning, Creativity, Integrity, Bravery, Open-Mindedness, Persistence, Teamwork and Social Intelligence, were all positively and significantly related to both MP and AP among cadets. Further, we found that a combination of the 12 character strengths explained substantial additional

variance beyond GPA and GMA in predicting both MP and AP among army cadets. The cadets' GPA from high school served as a good predictor of AP, but not of MP. Surprisingly, GMA showed low correlations with the cadets' performance, even after correcting for restriction of range. While we certainly need more studies to examine the robustness of our results, military academies should consider using these character strengths as one of the selection criteria when selecting cadets, and also aim to further develop these character strengths through their education programmes.

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Appendix 1.



1 OBSCIF – Peer evaluation at the Combat Fatigue Course (CFC)

Your name: _____

Name of the peer you are evaluating: _____

Team: _____ Date: _____

Instructions: You are asked to evaluate all your team peers on the different behaviours described below. Fill in one form for each peer. Specifically, you are to assess **to what degree the cadet has displayed the particular behaviours described during the combat fatigue course (CFC)**. Use the following scale:

| 1 | 2 | 3 | 4 | 5 |
|---|---|--|--|---|
| Has displayed this behaviour during the CFC to a very little degree | Has displayed this behaviour during the CFC to a small degree | Has displayed this behaviour during the CFC to some degree | Has displayed this behaviour during the CFC to a high degree | Has displayed this behaviour during the CFC to a very high degree |

Please note: If you feel you have no basis for evaluating a particular behaviour, you do not tick any box.

| Behaviours | 1 To a very little degree | 2 To a small degree | 3 To some degree | 4 To a high degree | 5 To a very high degree |
|--|------------------------------|------------------------|---------------------|-----------------------|----------------------------|
| 1. Takes charge, organises tasks, gives orders, delegates, makes decisions. (Lead) | | | | | |
| 2. Motivates, is supportive, maintains good relations within the team. (Lead) | | | | | |
| 3. Presents him/herself as a typical leader. (Lead) | | | | | |
| 4. Presents him/herself in a genuine, authentic and sincere manner, without pretence. (Integr) | | | | | |
| 5. Communicates in an open, direct and honest way. (Integr) | | | | | |
| 6. Has the courage to advocate for unpopular views and decisions. (Integr) | | | | | |
| 7. Shows perseverance and commitment, is a hard worker. (Persis) | | | | | |
| 8. Does not give up, persists in a course of action in spite of obstacles. (Persis) | | | | | |
| 9. Puts in a lot of effort without complaining. (Persis) | | | | | |
| 10. Is willing to take on extra responsibilities. (Persis) | | | | | |
| 11. Treats others equally and fairly, gives everyone a fair chance. (Fair) | | | | | |
| 12. Does not give preferential treatment to anyone in the team. (Fair) | | | | | |
| 13. Does not let personal bias affect decisions about others. (Fair) | | | | | |

(Continued)

| Behaviours | 1 To a very little degree | 2 To a small degree | 3 To some degree | 4 To a high degree | 5 To a very high degree |
|--|---------------------------------|------------------------|------------------------|--------------------------|----------------------------|
| 14. Is courageous, does not avoid frightening and/or uncomfortable situations. (Brave) | | | | | |
| 15. Has the courage to withstand group pressure and challenge the majority. (Brave) | | | | | |
| 16. Does not shy away from threats or difficulties. (Brave) | | | | | |
| 17. Faces up to unpleasant situations. (Brave) | | | | | |
| 18. Thoroughly assesses problems and challenges that arise, demonstrating critical thinking when solving tasks. (Open) | | | | | |
| 19. Is open to multiple perspectives on issues and able to change his/her mind accordingly. (Open) | | | | | |
| 20. Evaluates all aspects of an issue equally, does not jump to conclusions. (Open) | | | | | |
| 21. Is sensitive to and understands the feelings and motives of others. (Soc.int.) | | | | | |
| 22. Creates good relations with others. (Soc.int.) | | | | | |
| 23. Adapts own behaviour to the situation. (Soc.int.) | | | | | |
| 24. Is a typical team player. (Team) | | | | | |
| 25. Puts the team's need above his/her own needs. (Team) | | | | | |
| 26. Works hard for the good of the team. (Team) | | | | | |
| 27. Is good at controlling his/her impulses, desires, appetites and emotions. (Self-reg) | | | | | |
| 28. Keeps calm under stress. (Self-reg) | | | | | |
| 29. Shows good self-discipline. (Self-reg) | | | | | |
| 30. Demonstrates wisdom, is able to see the bigger picture, shows good judgement. (Perspec) | | | | | |
| 31. Demonstrates realistic confidence in his/her own skills and strengths. (Perspec) | | | | | |
| 32. Is frequently sought out for advice by other team members. (Perspec) | | | | | |
| 33. Demonstrates originality in problem solving. (Crea) | | | | | |
| 34. Is solution-focused. (Crea) | | | | | |
| 35. Is imaginative and creative. (Crea) | | | | | |
| 36. Is eager to acquire new knowledge and skills. (Lovelearn) | | | | | |
| 37. Asks questions and shows interest in learning. (Lovelearn) | | | | | |
| 38. Demonstrates ability to learn from his/her own mistakes and to adjust if necessary. (Lovelearn) | | | | | |