CONTEMPORARY ISSUES IN SOUTH AFRICAN MILITARY PSYCHOLOGY

NM Dodd, PC Bester & J van der Merwe
EDITORS

MEASURING CONSCIENTIOUSNESS SUBSCALES IN THE MILITARY ACADEMY

Yolika Kleynhans

The Faculty of Military Science based at the Military Academy (SAMA) in Saldanha offers military-related education at undergraduate and postgraduate levels to employees of all four arms of service of the SANDF: the Military Health Service, the Air Force, the Navy, and the Army. Within this diverse environment, individuals are expected to perform in their professional military capacity and as students. Determining what personal factors lead to better performance and success is an important ongoing task for the armed forces. Considering their personnel requirements, and the effort and resources invested in military recruitment, selection and training processes (Sellman, Born, Strickland & Ross, 2010; Shamir, 2011), the identification of valid and reliable predictors within the military environment is important for optimising these processes.

PERSONALITY AND THE FIVE-FACTOR MODEL

Personality tests have regained popularity since the 1980s, as researchers found support for their use in predicting work-related outcomes (Barrick & Mount, 1991; Salgado, 1997). 'Personality' refers to the extent to which individuals display high levels of specific traits (Nye, Orel & Kochergina, 2013). Personality research has produced abundant literature and efforts to measure and quantify personality constructs have made it necessary to advance classification frameworks that consolidate the range of individual variances in personality. One such effort to effectively categorise the dimensions of personality led to the development of the five-factor structure. The five-factor structure, or five-factor model (FFM), proposes that there are five primary factors (also referred to as the Big Five) that are fundamental elements of human personality.

The FFM has functioned as a scale for defining personality structure for many years (Costa & McCrae, 1988; Hendriks, Hofstee & De Raad, 2002), and has come to be the model of choice for many companies aiming to recruit staff. It affords a simple and easily understandable model of personality (John & Srivastava, 1999). Salgado (2003) compared inventories that are framed by the FFM and those that are not. He established that the latter inventories had lower criterion validity in the conscientiousness and agreeableness dimensions, which indicates that the FFM upholds more validity in measurements of personality. Salgado's findings lend weight

CONTEMPORARY ISSUES IN SA MILITARY PSYCHOLOGY

to the argument that the FFM is a more comprehensive model of personality than others, despite efforts by various researchers to produce alternative taxonomies for personality (Kumar, 2019).

Numerous personality measures have been developed drawing from the framework of the Big Five (Cattell & Mead, 2008). The most common labels given to the Big Five personality dimensions are: neuroticism (N, as juxtaposed with emotional stability), extraversion (E), openness (O), agreeableness (A), and conscientiousness (C). These labels can vary from one instrument to another, depending on the dimension's theoretical content, but the Big Five conscientiousness domain is arguably the most important in the workplace, given that it is the most consistent and robust personality-related predictor of factors relating to performance (Barrick, Mount & Judge, 2001; Caprara et al., 2011; Poropat, 2009).

Conscientiousness

When considering aspects of personality, conscientiousness is a popular variable in personnel recruitment and selection research, as it relates to work and academic performance criteria (Mount & Barrick, 1998; Sümer, Sümer, Demirutku & Çifci, 2001). In this regard, the most extensively used personality measuring instrument is the Neuroticism Extraversion Openness (NEO) Five-Factor Inventory (the NEO-PI) (Costa & McCrae, 1992), a wide-ranging and thorough assessment measure of typical adult personality attributes, which is aimed to test explicitly for the five-factor model (FFM). The initial version comprised only three factors (neuroticism, extraversion, and openness to experience), but was later expanded to include the current five factors of the FFM. The subsequent version, known as the NEO Personality Inventory-Revised (NEO-PI-R), comprises a 240-item questionnaire examining six trait facets within each of the FFM personality dimensions (McCrae, Costa & Martin, 2005; Kumar, 2019).

The current study examines the psychometric properties of NEO-PI-R for students at SAMA, to assess its utility as a psychometric tool for this population.

TABLE 7.1 Dimensions of the NEO Personality Traits

NEO Dimensions	High	Low
• Neuroticism (N)	Anxious, nervous, social fear, emotional, temperamental, worrying, vulnerable, self-conscious, self-pitying	Emotionally stable, confident, calm, even-tempered, self-satisfied, comfortable, unemotional, hardy
• Extraversion (E)	Outgoing, energetic, open, ambitious, assertive, sociable, affectionate, active, fun-loving, passionate	Introvert, reserved, work individually, shy, quiet
• Openness (O)	Broadminded, inventive, curious, creative, imaginative, prefer variety, liberal	Cautious, simple, narrow, concrete, conventional, conservative
Source: Adapted from Kwon & Song (2011), and Block (1995).		

TABLE 7.1 Dimensions of the NEO Personality Traits

NEO Dimensions	High	Low
• Agreeableness (A)	Friendly, tolerant, compassionate, flexible, cooperative, trusting, soft-hearted, generous	Competitive, outspoken, sceptical, obstinate, ruthless, suspicious, irritable, antagonistic
• Conscientiousness (C)	Careful, thorough, organised, diligent, hard-working, ambitious, methodical, competent, punctual, persevering	Easy-going, careless, inconsistent, impulsive, undisciplined, unreliable, lazy, disorganised, negligent, late, aimless
Source: Adapted from Kwon & Song (2011), and Block (1995).		

Personality traits can be described as consistent patterns of thoughts, feelings, motives and behaviour that a person typically exhibits in different situations (Fleeson & Gallagher, 2009). Someone with a high score on a specific trait will demonstrate a psychological state that manifests that trait more frequently and with greater magnitude than those with lower scores on that trait. As depicted in Table 7.1, an example would be that an individual who scores high on conscientiousness would tend to be more careful as opposed to a low-scorer, who would be more careless.

The NEO-PI-R as developed by Costa and McCrae (1988; and Costa Jr & McCrae, 2010) incorporates a set of Big Five markers in an inventory that offers six-facet scales measuring each of the five domains, as set out in Table 7.2. Conscientiousness relates to an individual's ability to control their impulses, to exhibit task- and goal-directed behaviour, to plan, delay gratification, and to follow norms and rules (John & Srivastava, 1999).

TABLE 7.2 NEO-PI-R Domain and Associated Facet Scales

Domains	Facets			
• Neuroticism	N1 N2 N3	Anxiety Angry hostility Depression	N4 N5 N6	Self-consciousness Impulsiveness Vulnerability
• Extraversion	E1 E2 E3	Warmth Gregariousness Assertiveness	E4 E5 E6	Activity Excitement seeking Positive emotions
• Openness to experience	O1 O2 O3	Fantasy Aesthetics Feelings	O4 O5 O6	Actions Ideas Values
• Agreeableness	A1 A2 A3	Trust Straightforwardness Altruism	A4 A5 A6	Compliance Modesty Tender-mindedness
• Conscientiousness	C1 C2 C3	Competence Order Dutifulness	C4 C5 C6	Achievement–striving Self-discipline Deliberation

The following provides a breakdown of the six facets of conscientiousness as portrayed in Table 7.2 (Costa & McCrae, 1992; Roberts et al., 2005; Costa Jr & McCrae, 2010):

- C1 *Competence*. The ability to complete tasks successfully, or an individual's confidence in their ability to accomplish things.

CONTEMPORARY ISSUES IN SA MILITARY PSYCHOLOGY

- C2 *Order*. The extent to which one prefers structure and is well-organised, tidy and neat as opposed to leaving a mess.
- C3 *Dutifulness*. Following the rules or fulfilling one's obligation as opposed to breaking rules.
- C4 *Achievement-striving*. Dedicating time and effort to achieve excellence, as opposed to doing just enough to get by.
- C5 *Self-discipline*. Persistence with difficult or unpleasant tasks until completion, as opposed to wasting one's time.
- C6 *Deliberation*. Avoiding mistakes by thinking carefully before acting; avoiding precipitate actions.

Cross-cultural considerations

Various researchers have questioned the cross-cultural generalisability of the NEO-PI-R structure. In their research, McCrae and Costa (1997) drew samples from a range of countries, including China, Germany, Portugal, Israel, Korea, and Japan, and then compared them to the NEO-PI-R structure found in American samples. They established that there is acceptable congruence among the factors. The only disconcerting factors were extraversion and agreeableness within the Japanese sample. Rolland (2002) more recently revised the existing evidence and determined that there is cross-cultural structural equivalence for the neuroticism, openness, and conscientiousness scales. He upholds that the FFM can justifiably be used to measure personality constructs, even in non-westernised countries, where the agreeableness and extraversion scales remain problematic. The universality of the Big Five factors in trait psychology was, and is, accepted by the majority of researchers, among whom there tends to be ongoing consensus on the basic structure of personality (as cited in Boyle et al., 2008).

Some psychological professionals support the notion that the basic traits, as depicted in the FFM, would prove to be universal to all humans regardless of the countries they reside in or the cultural background and beliefs they may have. Supporting research indicates that there is a universal biological basis for human personality traits that transcends educational background, ethnicity and gender, giving rise to numerous studies that examine the impact on personality of neurological, biological, genetic and environmental factors. Such research has highlighted the significant impact that these factors have on how personality and intelligence are expressed (Boyle et al., 2008).

Ohlsson, Johansen and Larsson (2017) describe how organisations such as the military, operating within the public sector, concentrate on performance factors to improve service, production and effectiveness as a whole. In the military context, performance development revolved around 'hard factors' (hierarchy, routines, training exercises, and set procedures); but with the changing needs and complexity of

organisations, 'soft factors' (leadership styles, interpersonal skills, team performance, and personality) have gained considerable importance (Blass & Ferris, 2007; Bartone et al., 2009; Laker & Powell, 2011; Ohlsson, Hedlund & Larsson, 2016). Scroggins, Thomas and Morris (2008) highlighted that with this rising complexity, researchers and psychologists are increasingly concerned with utilising statistically sound techniques and methods that will prove to be valid and reliable in testing individuals' or employees' personality factors.

PERSONALITY AND THE ORGANISATION

In many organisations, the personality test has become an integral part of the selection and hiring processes, mainly because it helps to determine whether potential candidates have the necessary traits to perform, and are an ideal fit, a particular job (Stabile, 2002). There is a tendency for greater retention and commitment in an organisation when candidates with the necessary traits for success are earmarked and employed (Anderson, Spataro & Flynn, 2008). Although some professionals are still opposed to the use of these tests in personnel selection processes, organisations that do use them gain financial and legal advantages because they avoid the cost and legal risks of poor hiring decisions (Stabile, 2002).

Barrick and Mount (1991) conducted a meta-analysis of 15 research findings from five occupational clusters in America consisting of professionals, managers, police, salespeople, and skilled and semi-skilled workers to examine the validity of the Big Five personality factors. The conscientiousness domain of personality emerged as the most accurate predictor of performance in all these occupational clusters. Studies in other countries yielded similar results (Kumar, 2019).

Tett, Jackson and Rothstein (1991) cautioned against generalising personality results in the military environment where validity in the previous studies was established on the basis of samples from the civilian population. However, it may be argued that their concerns point to the need to review military-related research in this field. Gade, Lakhani, and Kimmel (1991) established that military personnel who possess high levels of traits such as independence, self-discipline and confidence (which form part of the conscientiousness domain) are more inclined to positively rate and value their military experiences as opposed to members who scored lower. When United States Army officers were faced with realistic scenario testing and interviewing, it became apparent that conscientiousness influenced leadership performance positively and created a greater motivation towards leading others (Van Iddekinge, Ferris & Heffner, 2009).

THE MILITARY AND PERSONALITY TESTING

The popularity of personality testing surged during World War II (Vinchur & Koppes Bryan, 2012). At the time, the US military had to rapidly identify and exclude

candidates who displayed traits that could hamper their abilities to perform their duty as aviators and soldiers (Gibby & Zickar, 2008). Later, Tupes and Christal (1961) took personality research forward in the military context, identifying five personality factors that emerged from evaluations in the United States Air Force. Their research led to the development of the Air Force Self Descriptive Inventory (AFSDI). Subsequently, the AFSDI has been adapted and utilised in selection and recruitment processes by various military establishments. In line with mainstream research, conscientiousness was the main predictor of job performance among military personnel (Ohlsson, Hedlund & Larsson, 2016).

Sümer et al. (2001), in a study among military officers on behalf of the Turkish Armed Forces, argued that, in the light of personality variables possessing generalisable validity across occupations, there would be a likelihood that military occupations would require individuals to possess certain personality attributes that would be specific to their military jobs. Their study also suggested that conscientiousness was an important personality factor to consider in officer-related jobs within the structure of the military, and had considerable predictive value.

Following identification by DeYoung, Quilty and Peterson (2007) of ten mid-level aspects (facets) under the Big Five domains, French researchers Congard, Antoine & Gilles (2012) proposed a new personality test, TAMI-P, for use as an admission test for military personnel in the French Navy. The five factors of their scale, essentially the same as FFM, were: emotional stability, ascendancy, openness, agreeableness, and conscientiousness. They assigned two facets to each domain, and each facet comprised seven items, so that their scales comprised 70 items, which they found to be “internally consistent and temporally stable” (Congard et al., 2012). Their research demonstrated that FFM domains do correspond to the skills needed for personnel to adapt to military structures, and have relevance not only to recruitment, but in terms of the conscientiousness factor also to life in the Navy, where personnel must follow orders, instructions and procedures to the letter.

Solomon (1954) conceptualised aspects of successful military life and concluded that it involved integrating and adopting new behaviours and attitudes while conforming to the expectations set out by superiors and instructors. Military professions tend to be physically and psychologically more demanding than the majority of civilian occupations (Krueger, 2001). Military professions also tend to value conscientiousness-related characteristics such as obedience and respect for the chain of command, together with secrecy, order and discipline, more highly than civilian professions.

In a factor analysis of performance ratings, Pulakos, White, Oppler, and Borman (1989), compared 19 military occupational specialities and found three dominant factors. Two of these factors, namely personal discipline (abiding by the rules, exerting self-control, and displaying integrity) and military bearing (upholding proper military form), were uniquely associated with what is expected and required from military members as opposed to the civilian workforce. These factors also reflect aspects of conscientiousness.

According to Bartone, Roland, Picano and Williams (2008), high levels of conscientiousness and agreeableness have been found to lead to better leadership performances. Halfhill, Nielsen, Sundstrom and Weilbaecher (2005) found that the military service teams that displayed higher levels of agreeableness and conscientiousness also had the highest effectiveness outcomes (DeRue, Nahrgang, Wellman & Humphrey, 2011; Judge, Bono, Ilies & Gerhardt, 2002). In a meta-analysis of 73 studies, conscientiousness and leader efficiency were significantly correlated (Judge et al., 2002). John and Srivastava (1999) highlighted that these dimensions are also suitable predictors of team-related behaviour and performance, which is imperative in the effective functioning of the armed forces. Kumar (2019) demonstrated that conscientiousness positively correlates with organisational cultures dominated by hierarchy (typically orientated towards detail and reliability), which is prominent in the military.

CONSCIENTIOUSNESS AND ACADEMIC PERFORMANCE

In terms of the academic context, O'Connor and Paunonen (2007) established that conscientiousness, neuroticism and extraversion (ambition) are essential contributing factors to performance in work and study settings. Conscientiousness has proved to be predictive of academic performance (Kappe & Van der Flier, 2010). Salgado (2002) pointed out that individuals who tend to steal, break the rules and have ill-discipline have lower conscientiousness, while Judge, Martocchio and Thoresen (1997) linked low conscientiousness to higher levels of absenteeism. These findings highlight how important the conscientiousness domain is for SAMA, as the Academy wishes to avoid delinquent behaviours that could tarnish the institution's reputation and performance outcomes.

Poropat (2009) conducted a meta-analysis of 80 studies that drew samples from over 70 000 students. In that analysis, conscientiousness was the Big Five trait that best correlated with academic performance. Conscientious people are more engaged and work harder toward attaining their goals. Bandura (1994) refers to conscientiousness as being a contributing factor towards individuals experiencing a greater sense of accomplishment and better regulation of their negative emotions, which then creates the potential to perform even better.

Armed forces including those in Norway, Australia, France and the United States of America are utilising and developing personality tests for the purpose of enhancing the effectiveness of military education (McCormack & Mellor, 2002; Congard, Antoine & Gilles, 2012; Chappelle, Novy, Sowin & Thompson, 2010).

In Norway's Army, Air and Sea War Colleges, much as at SAMA, military education entails mastering theory conveyed by lectures and in practical training exercises. When longitudinal data of the three military academies in Norway were explored both academic and military performance related to conscientiousness, and the findings suggested that academic and military performance may be predicted and enhanced through personality testing.

When considering the positive outcomes associated with being conscientious, it is unsurprising to discover that conscientious individuals tend to occupy themselves with many constructive behaviours. These competencies include self-management and self-directed studying in both educational and workplace settings. Conscientious individuals also tend to have a greater sense of right and wrong, which in effect means they will normally observe social rules and meet moral obligations (Fosse, Buch, Säfvenbom & Martinussen, 2015), as opposed to less conscientious individuals, who have been found to cheat in academic contexts (Williams, Nathanson & Paulhus, 2010).

Duckworth, Peterson, Matthews and Kelly (2007) found that conscientiousness predicts numerous academic outcomes. O'Connor & Paunonen (2007) also established, in their meta-analysis of post-secondary education, that the conscientiousness domain in its entirety proved to be valuable in predicting academic success. The two most influential conscientiousness facets were identified as achievement-striving and self-discipline. Additionally, Kelly (2001) concluded a study of undergraduate students indicating that more conscientious students were more able to acquire information and more focused on their academic tasks, in comparison to less conscientious students.

Fosse et al. (2015) commented on the compensatory role that certain features of conscientiousness play when an individual possesses lower intellectual abilities: beyond expectations, the self-discipline facet surpassed intellect in predicting academic performance among adolescents (Duckworth & Seligman, 2005). Credé and Kuncel (2008) indicated that conscientiousness traits influenced attitudes and habits that enable self-directed studying such as engaging in study sessions regularly, reviewing study materials, setting goals, and effective time management. The findings suggest that intellectual aptitude is only effectively exploited if there is a sufficient level of conscientiousness.

Zimmerman (2001) believes that even though personality traits are viewed as stable over time, study habits (specific behavioural patterns) are more malleable, and as a result, can be developed. Study skill interventions may be implemented to assist less conscientious students in developing useful study habits. These interventions could be of great value in SAMA to increase the throughput rate and increase graduation statistics.

Cheung (2016) reported unpublished research on conscientiousness in a sample of undergraduate nursing students. It indicated that the highly conscientious individuals (especially on the facets of self-discipline and organisation), generally had better academic performance outcomes. Additionally, more hours were dedicated to finding placements in hospitals by the students who scored higher on the achievement-focused (striving) facet. Achievement-focused individuals have greater aspirations and more drive to reach their goals (Baron & Dale, 2015). On the contrary, dropout rates correlated with lower conscientiousness scores (Cheung, 2016). Dudley, Orvis, Lebiecki and Cortina (2006) illustrated that focusing on specific facets of conscientiousness,

such as achievement and order, generated better incremental validity predictions in areas of contextual performance that include interpersonal facilitation, job dedication and deviant workplace behaviours. Overall job performance among sales employees and managers were also better predicted by specific facets of conscientiousness (Dudley et al., 2006).

As extensive research has linked specific facets of the conscientiousness domain to specific academic and work outcomes, it becomes imperative for institutions such as SAMA to consider which facets are most relevant to achieve maximum success rates. Such research creates an opportunity to select stronger military and academic candidates and also to tailor interventions to individual needs.

RESEARCH OBJECTIVE

This main objective of this study was to examine the validity and reliability of the conscientiousness domain subscales as a predictor of success in work and study for military students at SAMA, and to ascertain whether they can be applied in selection processes in order to optimise the processes of recruitment, selection and training in the environment of the Military Academy.

RESEARCH METHOD

This study examines the psychometric properties of the six facets of conscientiousness derived from the NEO-PI-R conscientiousness scales. The scales were tested for internal consistency before using the test, to ensure that the items all measure the same construct. The scales were then factor analysed to determine the factorial stability of the scales.

Instrument

The study utilised a quantitative, cross-sectional, non-experimental research design, using self-administered assessments. Participants completed a battery of NEO-PI-R self-report questionnaires (self-report measures), on paper, by hand, in assessment settings.

The NEO-PI-R is a widely used and researched measure, and attested to by a wealth of research as being widely applicable across different cultures (McCrae & Costa, 1997; Rolland, 2002). It was operationalised by Costa and McCrae (1988) to measure the five factors (neuroticism, extraversion, openness, agreeableness and conscientiousness) of the five-factor model of personality, and was used for its appropriateness in eliciting detailed information about key concepts in the five domains (Laher, 2010).

CONTEMPORARY ISSUES IN SA MILITARY PSYCHOLOGY

DATA COLLECTION

Participants

Participants consisted of a sample of undergraduate students from SAMA. Stratified random sampling was used to select SAMA students from across three study areas (Human and Organisational Development, Security and Africa Studies, and Technology and Defence Management). The sample provided a confidence level of 95%. Undergraduate participants were selected from both genders (65% males, and 29% females) and varied ethnic backgrounds (Black 83%; Coloured 6%, Indian/Asian 2%, and White 3%) (Table 7.3). Most students at the Military Academy who participated in this study were males from the Army, the Military Health Services, the Air Force and the Navy between the ages of 18-25. The largest student complement stems from the SA Army and SAAF. The sample for this study comprised undergraduate students (males=108; females=47, missing=10). The sample's ages ranged from 18-47. Most students were Black males in their late twenties ($M=27.47$, $SD=4.56$).

TABLE 7.3 Demographic Variables of Faculty of Military Science Students (N=165)		
Variables	N	%
Race		
• African	137	83.03%
• Coloured	9	5.45%
• Indian/Asian	4	2.42%
• White	5	3.03%
• Missing	10	6.06%
Gender		
• Female	47	28.48%
• Male	108	65.45%
• Missing	10	6.06%

Ethical compliance

Individuals were voluntary participants who were informed of the risks and benefits of the study. In accordance with professional psychological practice, the participants' rights to confidentiality and privacy were protected by practical security measures: confidential records were stored in a secure area; all identifying personal information was stripped from records; each participant was assigned a case identifier, and the list with full identifying information was stored in a password-protected file. The participants were told in advance what data would be shared and how research findings would be disseminated. All feedback was conducted in a secure, discreet venue where conversations could not be overheard.

Validity and reliability

The reliability and validity of the NEO-PI-R has been found to be acceptable both in South Africa and internationally among non-Western countries (Costa & McCrae, 1988; Rolland 2002; Laher, 2010), although some subscales such as 'openness to experience' have been found to be imperfectly applicable in the South African context (Laher, 2010). This study, however, analysed only the conscientiousness subscales, which have not been deemed problematic in previous research.

Procedure

Using a sampling frame that listed undergraduate residential students at SAMA, sorted by academic programme, a stratified random sample of $N=165$ was drawn. Each participant who agreed to contribute to the study completed a structured background questionnaire to collect biographical and historical data. Between 10 and 30 individuals were assessed at a time in group assessment conditions, in a well-lit, quiet and ventilated venue. The instructions for each assessment were read verbatim from the instruction manuals. All participants completed the NEO-PI-R inventory.

Once completed, the instruments were hand scored and the data captured in MS Excel, then imported into the computer-based Statistical Package for the Social Sciences (SPSS) version 24 (IBM Corp, 2016) to generate descriptive and inferential statistics. The validity and reliability of the instruments were assessed using factor analysis and Cronbach's coefficient alpha.

Scoring

The NEO-PI-R is a self-report instrument consisting of 240 items that take approximately 40 minutes to complete. Items are scored on a five-point Likert scale where zero is 'strongly disagree' and four is 'strongly agree'. For the purposes of this study, only the conscientiousness subscale was analysed.

RESULTS

The sample demonstrated a high score on conscientiousness ($M=81.85$, $SD=8.227$). Cronbach's coefficient alpha is the most commonly used objective measure of reliability. Developed by Lee Cronbach in 1951, the alpha offers a means of assessing the internal consistency of a test or scale, alpha being a number between zero and one.

There are differing opinions about what constitutes an acceptable Cronbach's coefficient alpha, with a range between $\alpha=.70$ and $\alpha=.95$. A low alpha could be due to a low number of questions, poor inter-relatedness between items, or heterogeneous constructs. If the alpha is too high, then some items may be redundant. A maximum alpha value of $\alpha=.90$ has been recommended (Cohen & Swerdlik, 2009; Thompson, 2003).

CONTEMPORARY ISSUES IN SA MILITARY PSYCHOLOGY

TABLE 7.4 Correlation Coefficients

Variable	1	2	3	4	5	6
1. Competence	–					
2. Order	.447	–				
3. Dutifulness	.739	.442	–			
4. Achievement–striving	.709	.429	.653	–		
5. Self-discipline	.783	.523	.654	.655	–	
6. Deliberation	.79	.445	.808	.623	.680	–

Note:
Correlation for all data significant at the 0.01 level

The correlations between the items according to the inter-item correlation matrix (Table 7.4) are all above .60, except for the correlation between ‘achievement-striving’ and ‘order’; ‘order’ did not have significant correlation with any of the other items. If deleted from the scale, the Cronbach’s alpha for conscientiousness will increase. The Cronbach’s alpha for the SAMA sample is $\alpha=.90$. The reliability test results in Table 7.5 show that the reliability coefficient has exceeded the minimum value of $\alpha=.70$. The Kaiser-Meyer-Olkin test score was 0.87, indicating sampling adequacy and the data’s suitability for factor analysis.

TABLE 7.5 Conscientiousness Components and Cronbach’s Alpha (α)

Conscientiousness	$\alpha=.897$
Components	α
• Competence	.678
• Order	.678
• Dutifulness	.715
• Achievement–striving	.561
• Self-discipline	.638
• Deliberation	.821

Numbering is comparable to numbering in Table 7.6

Factor analysis

According to Rummel (1970), factor analysis helps when one needs to identify the relationship between variables in complicated concepts such as psychological assessments. Factor analysis enables researchers to investigate concepts that are not easily measured directly, by collapsing many variables into their underlying factors, based on the assumption that the observed variables have similar response patterns because they all reflect a latent variable.

In every factor analysis, there are as many factors as there are underlying or latent variables. Every factor explains some of the variances in the observed variables. Eigenvalues communicate how much variance each factor explains.

Any factor with an eigenvalue that is greater than 1 explains more variance than a single observed variable on its own. What this means is that the combined items explain more variance than any single item in the questionnaire. When factors explain very little of the variance, then they tend to be discarded (Bartholomew, Knott & Moustaki, 2011). Other uses of factor analysis include data transformation, hypothesis-testing, mapping, and scaling (Rummel, 1970). Factor loadings are moderately high if they are above 0.30 and high if they are greater than 0.60.

The six components of conscientiousness are set out in order in Table 7.5; variance is demonstrated in Table 7.6.

Table 7.6 Total Variance Explained						
Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.088	68.129	68.129	4.088	68.129	68.129
2	.690	11.497	79.626			
3	.481	8.012	87.638			
4	.327	5.449	93.087			
5	.238	3.968	97.055			
6	.177	2.945	100.000			
Note: Extraction method: principal component analysis. Components are numbered as displayed in Table 7.5.						

Component 1 (competence) has a loading of 68%, thus loading the most out of all the factors, as displayed in Table 7.6. Furthermore, when extraction of items was done, it indicated that if items 35, 95 and 155 are removed from the competence subscale, the Cronbach's alpha will increase from $\alpha=.68$ to $\alpha=.80$. The alpha of component 4 (achievement-striving) increases from $\alpha=.56$ to $\alpha=.87$ if items 20, 80, 230 and 140 are discarded. Component 5 (self-discipline) has $\alpha=.63$ alpha with an increase to $\alpha=.79$ if items 85, 55, 115, 175 and 205 are removed. The NEO-PI-R conscientiousness scale can, therefore, be shortened further to improve reliability and validity within the SAMA context.

Reliability and validity of NEO-PI-R

As per Table 7.5, the Cronbach alpha score for the NEO-PI-R scale is $\alpha=.90$, which means that this scale has high internal consistency and is reliable and valid. It meets the minimum required level of $\alpha=.70$.

Analysis of internal consistency of scales revealed that the scales with the highest internal consistency measured deliberation (eight items; $\alpha=.82$) and dutifulness (eight items; $\alpha=.72$). Competence and order each with eight items had Cronbach's alphas of $\alpha=.68$, followed by self-discipline (eight items; $\alpha=.64$) and achievement striving (eight items; $\alpha=.56$). As noted by Nunnally (1978), scales with internal

CONTEMPORARY ISSUES IN SA MILITARY PSYCHOLOGY

reliabilities of $\alpha=.70$ to $\alpha=.80$ are acceptable for research purposes because correlations with such scales are not diminished to any great degree by measurement error. As indicated by Cronbach's alphas, two of the six conscientiousness scales demonstrated acceptable internal consistency for reliable scale construction. The scree plot confirmed the above findings showing the distinct presence of one main factor influencing a large portion of variance for all scales together. Thus, factor analysis confirms that conscientiousness is the main factor that influences scores on all six scales. Reliability analysis revealed that conscientiousness demonstrated sufficient alpha levels for use ($\alpha>.90$) (Foxcroft & Roodt, 2015).

Given the disciplined and structured nature of the military profession, it was in line with expectations that the Academy's students demonstrated very high levels of this trait ($M=133.02$, $SD=23.96$) when compared with Laher's (2010) Witwatersrand sample ($M=115.40$, $SD=21.45$) with $t(480)=5.73$, $p=.001$; and Costa and McCrae's (2010) international norm ($M=121.1$, $SD=19.9$) with $t(690)=4.25$, $p=.001$.

There was a significant difference in conscientiousness between the international norm group (Costa Jr & McCrae, 2010), Laher's (2010) Witwatersrand sample of students, and the Military Academy students at the $p<.05$ level [$F(2, 1.114)=22.34$, $p=.001$].

DISCUSSION

Scales constructed to evaluate the six facets of conscientiousness from the NEO-PI-R inventory were examined for their factorial stability and psychometric properties. Reliability analysis of each scale separately indicated that the reliability coefficients ranged from $\alpha=.64$ to $\alpha=.82$. Four scales fell below the target reliability of $\alpha=.70$ which was aimed for when the six scales were constructed. Overall, the size of the reliability coefficients indicated that scales were internally consistent, thereby leading to the conclusion that the conscientiousness scales have an acceptable level of internal consistency to be useful for personality research at SAMA.

Factor analysis was conducted to test the overall factorial stability of the six conscientiousness scales. Factor analysis of all six scales overall led to the extraction of a one-factor solution to describe conscientiousness data. This finding is in keeping with expectations that all six scales of conscientiousness measure one core facet of conscientiousness. Factor loadings and percentage of variance accounted for by the conscientiousness factor indicated that all six scales loaded on the main factor and were representative of the facet of conscientiousness.

Conscientious individuals, whether they are military professionals, students or part of the private sector workforce, tend to be driven and motivated towards achieving their goals and working hard to successfully attain those goals (Roberts et al., 2005). This being said, the conscientiousness domain possibly predicts military performance in military professionals to a greater extent, due to the nature of the military environment.

The military culture is one that necessitates the ability to adhere to rules, regulations and procedures, while also being able to persevere during challenging circumstances. Furthermore, military professionals, especially officers, are required to display and exercise self-control and integrity in their actions and conduct (Pulakos et al., 1989). This emphasises the utility that personality inventories may have in the military educational environment of SAMA.

The present study suggests that the scales measuring the six facets of conscientiousness in the NEO-P-IR are valid and reliable in the SAMA environment and become even more so when certain items are removed.

RECOMMENDATIONS

Descriptive statistics showed that SAMA students in general had high levels of conscientiousness. The data suggested that conscientiousness levels among SAMA students are higher than in other contexts within and outside of SA. These constructs can, therefore, be considered in the selection criteria for students at SAMA. The relationship between particular personality domains (such as conscientiousness and its respective facets) and performance of military personnel, indicates that personality should be considered in recruitment and selection processes. Furthermore, it provides information and guidance as to what types of interventions or skills training need to be addressed for military professionals to perform optimally in the daily execution of their duties.

Barrick et al. (2001) suggested that it would be ideal for organisations to identify and develop an understanding of relevant criteria that would predict desired organisational outcomes. By linking the personality factors and the relevant facets to the identified criteria, the validity of personality inventories in the military setting would improve. Once there is an understanding of why and how certain personality factors influence desired outcomes, it will be possible to identify items in the inventories that would be more relevant in predicting those outcomes. This will allow organisations such as SAMA to customise these inventories to increase their predictive capabilities, including by removing items that appear to be irrelevant or that hamper the results of the Cronbach alphas.

As already indicated, organisational and personnel research should continue to examine the utility of personality measures within the unique environment of the military, given the distinctive expectations and demands of military life. In conclusion, it can be positively asserted that the conscientiousness scale of the NEO-PI-R is valid as a measure to predict desirable personality traits and likely success of soldier-students in the SAMA context.

LIMITATIONS AND FUTURE RESEARCH

The research was conducted in the military education context, which limits the applicability of the findings to other contexts; but the uniqueness of the military education context makes this research appropriate and essential for this environment. The NEO-PI-R was distributed to students in English, and as SAMA consists of students with diverse ethnic and cultural backgrounds, this may have impeded the understanding or interpretations of certain questions. More culturally appropriate terms could be researched. Future research can also aim to determine the differences in conscientiousness levels and the experience thereof in other military education contexts.

Further research should replicate the study using larger sample sizes and in other academic and work contexts. Longitudinal research should also be conducted to determine how the constructs in the study change over time, and how changes in these constructs within individuals may influence the applicability and levels of the conscientiousness scale.

REFERENCES

- Anderson, C., Spataro, S.E. & Flynn, F.J. 2008. Personality and organizational culture as determinants of influence. *Journal of Applied Psychology*, 93(3):702-710. <https://doi.org/10.1037/0021-9010.93.3.702>
- Bandura, A. 1994. Self-efficacy. In: V. S. Ramachaudran (ed.), *Encyclopedia of human behavior*, Vol. 4, 71-81. New York: Academic Press. (Reprinted in Friedman, H. [Ed.], *Encyclopedia of mental health*. San Diego: Academic Press, 1998).
- Baron, H. & Dale, L.E. 2015. Validation of CPSQ for student recruitment in the City University School of Health. Cambridge Assessment, internal briefing document.
- Barrick, M.R. & Mount, M.K. 1991. The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44(1):1-26.
- Barrick, M.R., Mount, M.K. & Judge, T.A. 2001. Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment*, 9(1/2):9-30
- Bartholomew, D., Knott, M. & Moustaki, I. 2011. *Latent variable models and factor analysis: a unified approach*. Hoboken NJ: Wiley.
- Bartone, P.T., Eid, J., Johnsen, B.H., Laberg, J.C. & Snook, S.A. 2009. Big five personality factors, hardiness, and social judgment as predictors of leader performance. *Leadership & Organization Development Journal*, 30(6):498-521. <https://doi.org/10.1108/01437730910981908>
- Bartone, P.T., Roland, R.R., Picano, J.J. & Williams, T.J. 2008. Psychological hardiness predicts success in US Army Special Forces candidates. *International Journal of Selection and Assessment*, 16(1):78-81. <https://doi.org/10.1111/j.1468-2389.2008.00412.x>
- Blass, F. & Ferris, G. 2007. Leader reputation: The role of mentoring, political skill, contextual learning, and adaptation. *Human Resource Management*, 46(1):5-21. <https://doi.org/10.1002/hrm.20142>
- Block, J. 1995. A contrarian view of the Five-Factor Approach to personality description. *Psychological Bulletin*, 117(2):187-215.
- Caprara, G.V., Vecchione, M., Alessandri, G., Gerbino, M., Barbaranelli, C. 2011. The contribution of personality traits and self-efficacy beliefs to academic achievement: A longitudinal study. *British Journal of Educational Psychology*, 81(1):78-96.
- Cattell, H. & A.D., Mead. 2008. The Sixteen Personality Factor Questionnaire (16PF). In: Boyle, G.J., Matthews, G. & Saklofske, D.H. (eds), *The SAGE handbook of personality theory and assessment*, Vol. 2, pp.135-159. Los Angeles CA: Sage.
- Chappelle, W., Novy, P.L., Sowin, T.W. & Thompson, W.T. 2010. NEO PI-R normative personality data that distinguish U.S. Air Force female pilots. *Military Psychology*, 22(2):158-175

- Cheung, K.Y.F. 2016. Initial findings from a study of CPSQ predictive validity with undergraduate nursing. Cambridge Assessment, internal briefing document.
- Cohen R. & Swerdlik. M. 2009. *Psychological testing and assessment: An introduction to tests and measurement* (7th Edition). New York: McGraw-Hill Higher Education.
- Congard, A., Antoine, P. & Gilles, P.-Y. 2012. Assessing the structural and psychometric properties of a new personality measure for use with military personnel in the French Armed Forces. *Military Psychology*, 24(3):284- 307. <https://doi.org/10.1080/08995605.2012.678242>
- Costa, P.T. & McCrae, R.R. 1988. From catalog to classification: Murray's needs and the five-factor model. *Journal of Personality and Social Psychology*, 55(2):258-265.
- Costa, P.T. & McCrae, R.R. 1992a. *NEO PI-R: Professional Manual: Revised NEO PI-R and NEO-FFI*. Lutz FL: Psychological Assessment Resources.
- Costa, P.T. & McCrae, R.R. 1992b. Normal personality assessment in clinical practice: the NEO Personality Inventory. *Psychological Assessment*, 4(1):5-13.
- Costa, P.T. Jr & McCrae, R.R. . 2010. *NEO Inventories for the NEO Personality Inventory-3 (NEO-PI-3), NEO Five-Factor Inventory-3 (NEO-FFI-3), and NEO Personality Inventory-Revised (NEO-PI-R): Professional manual*. Lutz FL: Psychological Assessment Resources (PAR).
- Credé, M. & Kuncel, N.R. 2008. Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, 3(6):425-453.
- Cronbach, L. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika*. 16(3):297-334.
- Darr, W.A. 2009. *The Trait Self Descriptive (TSD) Inventory: A facet-level examination. Technical Memorandum 2009-010*. Ottawa, Canada: Director General Military Personnel Research and Analysis.
- DeRue, D. S., Nahrgang, J. D., Wellman, N. & Humphrey, S. E. 2011. Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Personnel Psychology*, 64(1):7-52.
- DeYoung, C.G., Quilty, L.C. & Peterson, J.B. 2007. Between facets and domains: 10 Aspects of the Big Five. *Journal of Personality and Social Psychology*, 93(5):880-896.
- Duckworth, A. L., Peterson, C., Matthews, M. D. & Kelly, D. R. 2007. Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6):1087-1101.
- Duckworth, A.L., Seligman, M.E.P. 2005. Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science*, 16(12):939-944.
- Dudley, N.M., Orvis, K.A., Lebiecki, J.E. & Cortina, J.M. 2006. A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits. *Journal of Applied Psychology*, 91(1):40-57. <https://doi.org/10.1037/0021-9010.91.1.40>

- Fleeson, W. & Gallagher, P. 2009. The implications of Big Five standing for the distribution of trait manifestation in behavior: Fifteen experience-sampling studies and a meta-analysis. *Journal of Personality and Social Psychology*, 97(6):1097-1114.
- Fosse, T., Buch, R., Säfvenbom, R. & Martinussen, M. 2015. The impact of personality and self-efficacy on academic and military performance: The mediating role of self-efficacy. *Journal of Military Studies*. 6(1):47-65. <https://doi.org/10.1515/jms-2016-0197>
- Foxcroft, C. & Roodt, G. 2015. *Introduction to psychological assessment in the South African context* (4th Edition). Cape Town: OUP
- Gade, P.A., Lakhani, H. & Kimmel, M. 1991. Military Service: A good place to start? *Military Psychology*, 3(4):251-267.
- Gibby, R.E. & Zickar, M.J. 2008. A history of the early days of personality testing in American industry: An obsession with adjustment. *History of Psychology*, 11(3):164-184. <https://doi.org/10.1037/a0013041>
- Halfhill, T., Nielsen, T.M., Sundstrom, E. & Weilbaeher, A. 2005. Group personality composition and performance in military service teams. *Military Psychology*, 17(1):41-54.
- Hendriks, A.A.J., Hofstee, W.K.B. & De Raad, B. 2002. The Five-Factor Personality Inventory: Assessing the Big Five by means of brief and concrete statements. In: de Raad, B. & Perugini, M. (eds), *Big five assessment*, pp.79-108. Seattle WA: Hogrefe & Huber.
- Hogan, T.P., Benjamin, A. & Brezinski, K.L. 2000. Reliability methods: A note on the frequency of use of various types. *Educational and Psychological Measurement*, 60(4):523-531. <https://doi.org/10.1177/00131640021970691>
- IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.
- John, O.P. & Srivastava, S. 1999. The Big Five Trait taxonomy: History, measurement, and theoretical perspectives. In: L. A. Pervin & O.P. John (eds), *Handbook of personality: Theory and research* (2nd Edition) pp.102-139. New York: Guilford Press.
- Judge, T.A., Bono, J.E., Ilies, R., Gerhardt, M.W. 2002. Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87(4):765-780.
- Judge, T.A., Martocchio, J.J. & Thoresen, C.J. 1997. Five-factor model of personality and employee absence. *Journal of Applied Psychology*, 82(5):745-755. <https://doi.org/10.1037//0021-9010.82.5.745>
- Kappe, R. & Van der Flier, H. 2010. Using multiple and specific criteria to assess the predictive validity of the Big Five personality factors on academic performance. *Journal of Research in Personality*, 44(1):142-145. <https://doi.org/10.1016/j.jrp.2009.11.002>
- Krueger, G.P. 2001. Military psychology: United States. *International Encyclopedia of the Social & Behavioral Sciences*, pp.9868-9873. Oxford: Elsevier.

- Kumar, R. 2019. The use of personality testing in personnel selection. BA thesis, Claremont McKenna College, Claremont, California. https://scholarship.claremont.edu/cmhc_theses/2038
- Kwon, N. & Song, H. 2011. Personality traits, gender, and information competency among college students. *Malaysian Journal of Library & Information Science*, 16(1):87-107.
- Laher, S. 2010. Using exploratory factor analysis in personality research: Best-practice recommendations. *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde*, 36(1) article 873 (7 pages). <https://doi.org/10.4102/sajip.v36i1.873>
- Laker, D.R. & Powell, J.L. 2011. The difference between hard and soft skills and their relative impact on training transfer. *Human Resource Development Quarterly*, 22(1):111-122. <https://doi.org/10.1002/hrdq.20063>
- McCormack, L. & Mellor, D. 2002. The role of personality in leadership: An application of the five-factor model in the Australian military. *Military Psychology*, 14(3):179-197.
- McCrae, R.R. and Costa, P.T. 1997 'Personality trait structure as a human universal', *American Psychologist*, 52(5): 509-16.
- McCrae, R.R., Costa, J.P. & Martin, T.A. 2005. The NEO-PI-3: A more readable revised NEO Personality Inventory. *Journal of Personality Assessment*, 84(3):261-270. https://doi.org/10.1207/s15327752jpa8403_05
- Mount, M.K. & Barrick, M.R. 1998. Five reasons why the "Big Five" article has been frequently cited. *Personnel Psychology*, 51(4):849-857.
- Nunnally, J.C. 1978. *Psychometric Theory* (2nd Edition). New York: McGraw Hill.
- Nye, J., Orel, E. & Kochergina, E. 2013. *Big Five personality traits and academic performance in Russian universities*. Higher School of Economics (HSE), Research Paper No. WP BRP 10/PSY/2013. Moscow: National Research University, <https://doi.org/10.2139/ssrn.2265395>
- O'Connor, M.C. & Paunonen, S.V. 2007. Big Five personality predictors of post-secondary academic performance. *Personality and Individual Differences*, 43(5):971-990. <https://doi.org/10.1016/j.paid.2007.03.017>
- Ohlsson, A., Hedlund, E. & Larsson, G. 2016. Examining the relationship between personality, organizational political skill and perceived team performance in a multinational military staff exercise context. *Journal of Military Studies*, 7(1):24-30. <https://doi.org/10.1515/jms-2016-0003>
- Ohlsson, A., Johansen R.B., Larsson G. 2017. An exploratory study of the relationship between the Big-Five personality dimensions and political skills with military staff members' perceived performance. *Scandinavian Journal of Work and Organizational Psychology*, 2(1):1-7. <https://doi.org/10.16993/sjwop.31>
- Poropat, A. 2009. A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, 135(2):322-338.

- Pulakos, E.D., White, L.A., Oppler, S.H., Borman, W.C. 1989. Examination of race and sex effects on performance ratings. *Journal of Applied Psychology*, 74(5):770-780.
- Rankin, G. & Stokes, M. 1998. Reliability of assessment tools in rehabilitation: An illustration of appropriate statistical analyses. *Clinical Rehabilitator*, 12(3):187-199.
- Roberts, B.W., Chernyshenko, O.S., Stark, S.E. & Goldberg, L.R. 2005. The structure of conscientiousness: An empirical investigation based on seven major personality questionnaires. *Personnel Psychology*, 58(1):103-139.
- Rolland, J.P. 2002 'The cross-cultural generalizability of the Five-Factor Model of personality.' In: McCrae, R.R. & Allik, J. (eds), *The Five-Factor Model of Personality Across Cultures*, pp.7-28. New York: Kluwer Academic/Plenum Publishers.
- Rummel, R.J. 1970. *Applied factor analysis*. Evanston IL: Northwestern University Press.
- Salgado, J.F. 1997. The Five Factor Model of personality and job performance in the European Community. *Journal of Applied Psychology*, 82(1):30-43.
- Salgado, J.F. 2002. The Big Five personality dimensions and counterproductive behaviors. *International Journal of Selection and Assessment*, 10(1-2):117-125.
- Salgado, J.F. 2003. Predicting job performance using FFM and non-FFM personality measures. *Journal of Occupational and Organizational Psychology*, 76(3):323-346.
<https://doi.org/10.1348/096317903769647201>
- Scroggins, W.A., Thomas, S.L. & Morris, J.A. 2008. Psychological Testing in Personnel Selection, Part I: A Century of Psychological Testing. *Public Personnel Management*, 37(1):99-109.
<https://doi.org/10.1177/009102600803700107>
- Sellman, W.S., Born, D.H., Strickland, W.J. & Ross, J.J. 2010. Selection and Classification in the US Military. In: Farr, J.L. & Tippins, N.T. (eds), *Handbook of Employee selection*, pp.679-699. London: Routledge.
- Shamir, E. 2011. *Transforming Command. The Pursuit of Mission Command in the U.S., British and Israeli Armies*. Stanford CA: Stanford Security Studies (Stanford University Press).
- Solomon, D.N. 1954. Civilian to soldier: Three sociological studies of infantry recruit training. *Canadian Journal of Psychology*, 8(2):87-94. <https://doi.org/10.1037/h0083601>
- Stabile, S.J. 2002. The use of Personality Tests as a Hiring Tool: Is the Benefit worth the Cost? *University of Pennsylvania Journal of Business Law*, 4(2):279-313.
<https://scholarship.law.upenn.edu/jbl/vol4/iss2/1>
- Sümer, H., Sümer, N., Demirutku, K. & Çıfci, O. 2001. Using a personality-oriented job analysis to identify attributes to be assessed in officer selection. *Military Psychology*, 13(3):129-146.
https://doi.org/10.1207/S15327876MP1303_1

- Tett, R.P., Jackson D.N. & Rothstein, M. 1991. Personality measures as predictors of job performance: A meta-analytic review. *Personnel Psychology*, 44:703-742.
<https://doi.org/10.1111/j.1744-6570.1991.tb00696.x>
- Thompson, B. 2003. Understanding reliability and coefficient alpha, really. In: Thompson, B. (ed.), *Score reliability: Contemporary thinking on reliability issues*, pp.3-23. Thousand Oaks CA: Sage.
- Tupes, E.C. & Christal, R.E. 1961. Recurrent personality factors based on trait ratings (Originally released as an ASD Technical Report in 1961: No. 61-97). Lackland Air Force Base, Texas: Aeronautical Systems Division, Personnel Laboratory. Available at
<https://doi.org/10.1111/j.1467-6494.1992.tb00973.x>
- Van Aarde, N., Meiring, D. & Wiernik, B.M. 2017. 'The validity of the Big Five personality traits for job performance: Meta-analyses of South African studies', *International Journal of Selection and Assessment*, 25(3):223-239. <https://doi.org/10.1111/ijsa.12175>
- Van Iddekinge, C.H., Ferris, G.R. & Heffner, T.S. 2009. Test of a multistage model of distal and proximal antecedents of leader performance. *Personnel Psychology*, 62(3):463-495.
<https://doi.org/10.1111/j.1744-6570.2009.01145.x>
- Vinchur, A.J. & Koppes Bryan, L.L. 2012. A History of Personnel Selection and Assessment. In: Schmitt, N. (ed.), *The Oxford handbook of personnel assessment and selection*. Oxford Handbooks Online series. Available at
<https://doi.org/10.1093/oxfordhb/9780199732579.013.0002>
- Williams, K.M., Nathanson, C. & Paulhus, D.L. 2010. Identifying and profiling scholastic cheaters: their personality, cognitive ability, and motivation. *Journal of Experimental Psychology Applied*, 16(3):293-307.
- Zimmerman, B.J. 2001. Theories of self-regulated learning and academic achievement: An overview and analysis. In: Zimmerman, B.J. & Schunk, D. H. (eds), *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd Edition), pp.1-37. Mahwah NJ: Erlbaum.