Psychometric properties of the PID-5-BF in an undergraduate sample of South African university students

H Venema

orcid.org/ 0000-0001-7592-8821

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Supervisor: Dr R Spies

Co-supervisor: Prof L de Beer

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Ever since I was a child, I was fascinated by people and their different emotions and different personalities. Obviously, as I was still young, I didn't understand why people thought or felt or acted differently than I did. But from there, without it being purposeful, I found myself listening and talking to friends and family about their problems – and was dubbed the "little psychologist" (even though I didn't even know what a psychologist is). I am grateful that this interest of mine did not dissipate, but rather grew into a passion I knew I had to pursue.

It has not been an easy journey though, it was not how I thought the road would follow. There was a stage where I struggled so much and wanted to give up, just to find myself greatly dissatisfied with anything else. So I persevered, and finally, albeit after 8 years, I was selected for the Master's program. I would however not have made it to that point, or this final stage I am at now, if it wasn't for the amazing support from my friends and family.

First of all, to both my parents, Piet and Minda: I lack the vocabulary to properly thank you, but I will try. Thank you for your care and support throughout my process. Thank you for not having given up on me, but instead having always encouraged and motivated me to become what you also knew I was meant to be. The appreciation I have for you is more than even I can fathom, and I will never be able to say thank you enough!

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Eugene, my partner: Where to begin? You haven't been a part of my journey from the beginning, but I do think you entered at the most difficult and worst part of this process. Amidst all the chaos, my mood swings, the research-littered house, you were there and never said a word that was anything but encouraging. I know you didn't always understand the process, but thank you for the faith you had in me, and the hand you reached out to help me get where I am today. I can honestly say, that if you weren't part of my life, I would still be struggling with my studies. Thank you so much!

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SUMMARY

Personality is a central and indispensable concept within the field of Psychology, as it contributes to the clinical presentations and general functioning of clients/patients. It is furthermore imperative to understand the manner in which personality can become disordered. Although research has indicated influential factors for the development of pathology, including biological, social and psychological factors and traumas, there are still some discord regarding the measurement thereof.

Assessments or tests are important within the psychological field to help make a diagnosis, to confirm a diagnosis or to determine therapeutic process and progress. These assessments need to be of high quality and standardised within a South African context in order to yield valid and reliable results. Some tests for personality pathology are used in South Africa, but have been deemed too time-consuming and expensive.

The Personality Inventory for DSM-5 Brief Form (PID-5-BF) was developed to measure maladaptive personality traits (negative affect, detachment, antagonism, disinhibition, psychoticism), based on the "hybrid model" for personality disorders included in the DSM 5 Section III. The hybrid model was developed in response to various limitations presented by the Diagnostic and Statistical Manual of Mental Disorders (DSM) categorical model of personality disorders, such as poor validity of assessments, lack of clinical utility and high comorbidity between personality disorders. Literature has established reliability and validity for the PID-5-BF in other countries and in relation to other tests of similar nature (e.g. NEO-PI-R). Research furthermore indicates support for the DSM-5 hybrid model in comparison to other evidence-based systems of

personality and pathology (e.g. Five Factor Model of Personality), and that it aligns in a theoretically acceptable manner.

The aim of the study was to explore these psychometric properties within an undergraduate South African student population (n = 283) and we used the NEO-PI-R and MINI Subscale K as measures for comparison. The statistical analyses were implemented in Mplus 8.1, which allowed for the implementation of latent variable modelling in a structural equation modelling (SEM) framework.

Our findings showed to be in line with existing literature, and indicated support for the PID-5-BF, both within South Africa and in comparison with assessments of similar nature. Sufficient reliability ($\alpha = 0.69 – 0.84$), convergent and discriminant validity ($r = 0.35 – 0.72$) were found. Furthermore, hypothesised correlations between the constructs of the PID-5-BF, NEO-PI-R and MINI Subscale K, were adequately indicated.

More research is needed on the PID-5-BF, especially within the South African population and culture, but our findings suggest it to be a promising assessment tool that could greatly benefit clinicians in the mental health sector.

PREFACE

• This mini-dissertation forms part of the requirements for the completion of the degree Master of Arts in Clinical Psychology at the Potchefstroom Campus of the North-West University. It has been prepared in article format (manuscript to possibly be submitted for publication) with three chapters and complies with the requirements identified by the North-West University in rule: A.4.4.2.9.

• Chapter 1 includes an in-depth literature overview that aims to present the reader with background information and the defining concepts that are relevant to this study. Chapter 2 presents the manuscript that will be submitted to the South African Journal of Psychology for possible publication. The manuscript itself will include a short introduction, the aims of the study and the methodology followed, as well as the findings of the study and a discussion and conclusion on these. Finally, Chapter 3 presents a critical reflection by the researcher on the research process.

• The manuscript in Chapter 2 has been compiled in accordance with the requirements set out by the South African Journal of Psychology, with the goal of possibly submitting it for publication.

• The manuscript and the reference list have been styled according to the specifications of the APA (American Psychological Association, 6th edition) publication guidelines for the purpose of examination. Where journal specifications differ from the APA publication guidelines, the appropriate amendments will be made before submission for publication.

• For the purpose of examination, the pages will be numbered chronologically from the table of content page, ending with the addendum.

• A language practitioner conducted the language editing of this mini-dissertation.

• Data collection for the study (surveys) was conducted in the English language.

• Consent for the submission of this mini-dissertation for examination purposes (in fulfilment of the requirements for the Master of Arts Degree in Clinical Psychology) has been provided by the research supervisor, Dr Ruan Spies.

• Lastly, this mini-dissertation was submitted to Turn-it-in, which established that its content falls within the norms of acceptability regarding plagiarism.

GUIDELINES FOR AUTHORS

Description

This article is presented in the SAGE house style which complies with the requirements of the South African Journal of Psychology. The article will be submitted for possible publication in the South African Journal of Psychology. The South African Journal of Psychology is owned by SAGE Publications which publishes a variety of Southern African and African journal titles. The journal publishes contributions from all fields of psychology in English. Empirical research is emphasised; however, the journal accepts theoretical and methodological papers, review articles, short communications, book reviews and letters commenting on articles published in the journal. Articles relevant to Africa which address psychological issues of social change and development are prioritised.

Instructions for authors

General

In general, the manuscript must be written in a high grammatical standard in English. It must follow the specific technical guidelines that are stipulated in the submission guidelines. The American Psychological Association (APA) 6thedition is followed in the preparation of the manuscript. The research within the manuscript should comply with the accepted standards of ethical practice, presented by the Committee on Publication Ethics (COPE). The journal endeavours to publish accurate, transparent and ethically sound research.

Manuscript style

The South African Journal of Psychology follows the SAGE house style guidelines stipulated in the SAGE UK House Style guidelines. The following format is required for research-based manuscripts:

• The introductory/literature review section requires no heading.

• The following headings/subheadings are necessary:

o Method (Participants; Instruments; Procedure; Ethical considerations; Data analysis (which includes the statistical techniques or computerised analytic programmes, if applicable); Results; Discussion; Conclusion; References.

• Within the 'Ethical considerations' section, the name of the institution which granted ethical approval of the study must be stipulated.

Format. Only electronic files which adhere to the stipulated guidelines are accepted. The format of the manuscript may either be Microsoft Word or LaTex files. All manuscripts must be double spaced throughout and with a minimum of 3cm for left and right-hand margins as well as 5cm at the head and foot. The text should be a standard 12 points.

Keywords and abstracts. An abstract of no more than 250 words should be included and should aid readers in finding the article online. Up to six alphabetised keywords should be included in the abstract and always highlighted. Key descriptive phrases should be repeated and focused on in the abstract. Thus, the abstract must be written in such a way that it conveys the necessary information/data which assists search engines in finding the article and ranking it on the search results page.

Artwork, figures and other graphics. Illustrations, pictures and graphs, should be provided in the highest quality and in electronic format. Further guidelines include:

• Format: TIFF, JPEG: Common format for pictures (containing no text or graphs).

• EPS is the preferred format for graphs and line art as it retains quality when enlarging/zooming in.

• Placement: Figures/charts and tables created in MS Word should be included in the main text rather than at the end of the document.

• Figures and other files created outside Word (i.e. Excel, PowerPoint, JPG, TIFF, EPS, and PDF) should be submitted separately.

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• Last name and initials of all authors

• The year the reference item was published (in brackets)

• The title of the article

• The name of the publication

• The volume number

• An issue number (if provided)

• The inclusive pages

• Digital object identifier (DOI)

The Publication Manual of the American Psychological Association, 6th Edition can be consulted for accurate formatting of reference. The style and punctuation of the references should conform to the APA style. Illustrated below are examples of different styles:

• Journal Article

Gower, M. (2013). Revenge: Interplay of creative and destructive forces. *Clinical Social Work Journal, 41*(1), 112-118. https://doi.org/10.1007/s10615-012-0407-0

• Book

Calfee, R. C., & Valencia, R. R. (1991). *APA guide to preparing manuscripts for journal publication*. Washington, DC: American Psychological Association.

English language editing services. The language used in the manuscript has to be accurate and of adequate quality to be understood by the editors and reviewers during the assessment of the manuscript. The author should consider having a colleague (whose home language is English), review the manuscript for clarity. Submit the manuscript for professional editing. Consider utilising the SAGE Language Service, which can format the manuscript to the specifications of the journal.

CHAPTER 1

LITERATURE REVIEW

Introduction

Practitioners, within the psychological field, all use some form of assessment or test at some point to either help make a diagnosis, to confirm a diagnosis or to determine therapeutic process and progress. These assessments need to be of high quality and standardised within a South African context in order to yield results that are both valid and reliable (Foxcroft, Paterson, Le Roux & Herbst, 2004; Foxcroft & Roodt, 2009). In South Africa, the body responsible for classifying, registering, reviewing and standardising psychometric tests, questionnaires and other measures, is the Professional Board for Psychology of the Health Professions Council of South Africa (HPCSA). Their role is to ensure that measures are valid and reliable within a South African context that is to be culturally sensitive and appropriate to South African languages and norms – taking into account the Constitution of the RSA; Health Professions Act and other relevant regulations and legislation (Foxcroft et al., 2004).

In 2004, Foxcroft and colleagues conducted a survey to determine the need of psychometric tests in South Africa. They used a large sample of psychological practitioners to gather data through postal surveys, focus group meetings and individual interviews. Their results yielded an expressed urgency for tests to diagnose certain personality disorders and pathology. They (psychology practitioners) expressed a further need for measures to distinguish between different types of personality pathologies. This survey also indicated a shared concern amongst the test users about the cost of tests, claiming it to be too expensive. Finally, a need for shorter tests or scales were expressed, as assessment often has to be done within a short amount of time (Foxcroft et al., 2004).

Kumar (2007) reviewed studies on the burnout of psychiatrists, and concluded, that among other factors, high work demands and work overload with limited or inadequate resources are great

contributors to stress within the psychological profession. Furthermore, he stated that it would appear as if workload increases globally, as we are experiencing an increase in population, there now exists a more progressive inclination toward community-based treatment, and an increase in standards of practice (Kumar, 2007).

These studies are somewhat outdated, lacking in a body of research on this topic in more modern times. However, taking into account the seemingly 'rushed' manner in which modern day life is approached, and the deceleration in the rate of South Africa's economic growth (Statistics South Africa, 2016), it can surely be assumed that both Foxcroft and colleagues and Kumar's findings are still valid. For example, the Department of Health (2012), requires assessment of involuntary health care users within psychiatric hospitals or wards, to be done within 72-hours of admission. This is a short amount of time to assess an overcrowded hospital with inadequate measures, and with scales that take a vast amount of time to administer. Regarding statistics, South Africa bears a population of approximately 54 million people (Statistics South Africa, 2015). The registered number of psychologists in South Africa is 11 875 (HPCSA, 2016), clearly suggesting an imbalance between available resources and demand.

Current tests used to assess personality pathology and disorders are the Eysenck Personality Inventory/Profiler; Minnesota Multiphasic Personality Inventory - 2 (MMPI-2); Milon Clinical Multiaxial Inventory (MCMI-3); Mini International Neuropsychiatric Interview (MINI); NEO Personality Inventory Revised (NEO-PI-R); NEO Five Factor Inventory (NEO-FFI-3); and The Sixteen Personality Factor Questionnaire (16PF), which are all extensive in length and takes a long time to complete. These tests are also quite expensive to purchase and administer. This is why a short form of assessment, such as the Personality Inventroy for DSM-5 Brief Form (PID-5-BF) could greatly benefit a country such as South Africa's mental health sector, in providing a measure that is not only cost-free, but quick to administer and in line with current views of personality pathology as described by the DSM-5 (APA, 2013), yet needs to be validated and standardised first.

Though research shows validity for the PID-5 and PID-5-BF (as demonstrated above), this has not yet been done within a South African context.

Personality and Personality Development

Personality, within the field of psychology, is a central and indispensable concept. In order to understand and help a client, we need to also understand their personality and how it contributes to their clinical presentations and general functioning. Personality may be described as relatively stable and enduring patterns, or styles, of an individual's way of thinking, feeling and acting that differentiates that individual from another (APA, 2016; Briley & Tucker-Drob, 2014; Kandler 2012). Characteristics or traits, influenced by the individual's life experiences, his/her environment (i.e. life situations and surroundings) and genetics (APA, 2016; Bleidorn, Kandler & Caspi, 2014; Briley & Tucker-Drob, 2014; Neyer & Asendorpf, 2001; Roberts, Caspi & Moffitt, 2003), such as nervousness, optimism, flexibility or carefulness, are commonly used by an individual to describe him/herself or another individual known to them, as well as guide their behaviour in meaningfully consistent ways (Costa, McCrae & Kay, 1995; Roberts & Davis, 2016; Schofield et al., 2012). Personality traits are furthermore internalised and generalised tendencies reflected in most aspects of an individual's life (Costa et al., 1995; Roberts & Davis, 2016). Research has indicated evidence that most personality traits may be understood under the Five-Factor Model (FFM) of personality, comprised of five basic dimensions, namely extraversion, neuroticism, openness, conscientiousness and agreeableness (Caspi, Roberts & Shiner, 2005; Digman, 1990; Hopwood et al., 2011; Kandler, Zimmermann & McAdams, 2014; Roberts & DelVecchio, 2000; Roberts, Walton & Viechtbauer, 2006; Soto & John, 2014; Soto, John, Gosling & Potter, 2008; Tackett, Krueger, Iacono & McGue, 2008; Tackett et al., 2012; Terracciano, Costa & McCrae, 2006).

Studies focusing on the development and stability of personality have generally found the key period for personality change to be during late adolescence and early adulthood (Jackson, Hill, Payne, Roberts & Stine-Morrow, 2012; Josefsson et al., 2013; Kanacri et al., 2013; Roberts & Davis, 2016; Roberts & DelVecchio, 2000; Roberts & Mroczek, 2008; Roberts et al., 2006),

although it has further been found to be a lifelong process during which most traits continue to stabilise moderately through late adulthood (Caspi et al., 2005; Fraley & Roberts, 2005; Ganiban, Saudino, Ulbricht, Neiderhiser & Reiss, 2008; Hutteman, Hennecke, Orth, Reitz & Specht, 2014; Kandler, 2012; Klimstra, Hale, Raaijmakers, Branje & Meeus, 2009; Roberts & Davis, 2016; Roberts & DelVecchio, 2000; Roberts et al., 2006). This is also referred to as the plasticity principle (Jackson et al., 2012; Roberts & Davis, 2016).

In contrast to personality change during childhood, adolescence or middle to late adulthood, change during young adulthood is more dramatic and positively inclined (Roberts et al., 2006). These changes include a general incline in emotional stability, agreeableness, extraversion and conscientiousness, with a decrease in neuroticism (Donnellan & Lucas, 2008; Johnson, Hicks, McGue & Iacono, 2007; Josefsson et al., 2013; Klimstra et al., 2009; Ludtke, Roberts, Trautwein & Nagy, 2011; Roberts & Davis, 2016; Roberts et al., 2006; Robins, Fraley, Roberts & Trzesniewski, 2001; Soto, John & Gosling, 2011; Specht, Egloff & Schmukle, 2011; Van den Akker, Deković, Asscher & Prinzie, 2014; Vecchione, Alessandri, Barbaranelli & Caprara, 2012). Increases in levels of openness to experience have also been found, which is paramount in the identity exploration process (Ozer & Benet-Martinez, 2006; Van den Akker et al., 2014). Robins, Fraley, Roberts and Trzesniewski (2001) used the FFM traits in a sample of university students (assessed at the beginning of university and 4 years later, at the end of university), and found mean-level increases in conscientiousness and agreeableness, and a decline in neuroticism. In a study done by Roberts, Caspi and Moffitt (2003), change and stability of Multidimensional Personality Questionnaire (MPQ) personality traits were investigated (at age 18 and again at age 26). Results, at a primary-scale level, showed a decline in aggression and alienation; and a moderate increase in achievement, control and social potency. On the higher-order level, negative emotionality was found to have declined, and constraint and positive emotionality was found to have increased (Roberts et al., 2003). This is supported by findings of other studies showing declines in negative emotionality and increases in constraint (Blonigen, Carlson, Hicks, Krueger & Iacono, 2008). Further, more recent

studies have shown that the traits conscientiousness, agreeableness and openness decline during the period of transition from late childhood to early adolescence, while a rapid incline was found in these traits during late adolescence to early adulthood, which from there showed a gradual incline through to middle adulthood (Denissen, Van Aken, Penke & Wood, 2014; Kandler, 2012; Soto & Tackett, 2015; Soto et al, 2011; Van den Akker et al., 2014).

Research has also focused on the reason for personality change. Studies, including behavioural-genetic, longitudinal and cross-cultural research, stipulate it as being a process comprised of both biological factors, as in trait heritability, and environmental factors, such as learnt behaviours through observation and adapting to new social roles (Blonigen et al., 2008; Casey, Galvan & Hare, 2005; Clark, Kochanska & Ready, 2000; Collins, Maccoby, Steinberg, Hetherington & Bornstein, 2000; Costa & McCrae, 2006; De Fruyt et al., 2006; Galvan et al., 2006; Giedd et al., 1999; Hare et al., 2008; Hopwood et al., 2011; McCrae et al, 2000; Prinzie, Stams, Deković, Reijntjes & Belsky, 2009; Schofield et al., 2012; Shiner & Caspi, 2003; Somerville, Jones & Casey, 2010).

Although genetic or biological influences on personality cannot be discarded, research on longitudinal behavioural genetics has indicated that when genetic effects are controlled for, environmental effects greatly influence personality change and stabilisation (Bleidorn et al., 2014; Bleidorn, Kandler, Riemann, Angleitner & Spinath, 2009; Bleidorn et al., 2010; Briley & Tucker-Drob, 2014; Hopwood et al., 2011; Kandler et al., 2010). One approach supporting personality growth as means to maturation, is social investment theory (Roberts, Wood, & Smith, 2005). Social investment theory proposes that personality changes during early adulthood are stimulated by age-appropriate life transitions. In 1950, Erikson (as cited in Hutteman et al., 2014), already proposed that personality development occurs as the result of certain challenges and crises one must overcome during one's lifetime. Social investment theory may be seen as a derivation of Erikson's theory, in which social role investment is described as commitment to and investment in adult social roles, i.e. overcoming life's challenges and crises. These life transitions, mostly affiliated with

family, work and community domains (Lodi-Smith & Roberts, 2007; Roberts, Wood & Smith, 2005), such as starting a career or a serious relationship, drive individuals to commit to, but also invest in adult social roles. These social roles present the individual with new behavioural expectancies that may be formulated in terms of traits (such as behaving in a more agreeable, conscientious and emotionally stable manner); moral reasoning; and identity formation (Bleidorn, 2012; Bleidorn et al., 2013; Helson, Kwan, John & Jones, 2002; Hill & Roberts, 2010; Lenhart, Neyer & Eccles, 2010; Lodi-Smith & Roberts, 2007; Roberts et al., 2005). It is then postulated that these transitional experiences provide the individual with a reward structure supporting personality maturation, also known as the maturity principle (Arnett, 2000; Blonigen et al., 2008; Caspi et al., 2005; Hogan & Roberts, 2004; Hutteman et al., 2014; Josefsson et al., 2013; Reitz, Zimmermann, Hutteman, Specht & Neyer, 2014; Roberts & DelVecchio, 2000; Roberts & Jackson, 2008; Roberts & Mroczek, 2008; Roberts et al., 2005; Swann, 1987).

Support for the assumptions made by the social investment theory has been established through cross-sectional and longitudinal studies (Bleidorn et al., 2013; Helson et al., 2002; Lenhart et al., 2010; Lodi-Smith & Roberts, 2007; Roberts et al., 2005). In a study done by Bleidorn (2012), the process of personality maturation was investigated in a sample of German students during their transition into early adulthood, i.e. graduating from school and entering university. Most probably preceding the aforementioned life transitions, is the transition an individual has to make through graduating from school (Bleidorn, 2012). Of course, an individual's school career also serves as an arena for growth and maturation, as there is an expectation for the individual student to take responsibility and commit to the role of school student. These expectations continue to increase throughout the school career and culminate during final exams. The progressive goal of graduating successfully should then create a reward structure promoting personality trait changes towards psychosocial maturation (Bleidorn, 2012). In order to graduate successfully, a student has to be task and goal oriented, organised, needs to follow prescribed norms, be able to delay immediate gratification, and use effortful strategies, all of which are most likely to affect the trait of

conscientiousness regarding personality change and maturation (Bleidorn, 2012; Corker, Oswald & Donnellan, 2012; Jackson et al., 2010). Essentially, these changes will be internalised and the student may generalise it to other demands and domains apart from school (Bleidorn, 2012). The study done by Bleidorn (2012), indicated not only an increase in conscientiousness during the transition from graduating school to becoming a young adult, but also indicated an increase in openness. This has also been found in previous studies focused on personality development during early adulthood (Klimstra et al., 2009; Roberts, Walton, Bogg & Caspi, 2006b). The study furthermore indicated increases in extraversion and decreases in neuroticism (Bleidorn, 2012).

Following the completion of school and university, individuals are faced with the task of starting a career and family. Research has indicated that continuous investment into the individual's work and career domain, as well as positive work experiences, leads to personality change characterised by increased conscientiousness, extraversion, emotional stability and lowered aggressiveness (Bleidorn, 2012; Denissen, Asendorpf & van Aken, 2008; Roberts et al., 2003; Scollon & Diener, 2006; Specht et al., 2011; Sutin, Costa, Miech & Eaton, 2009; Wille & De Fruyt, 2014). Serious relationships, such as familial and romantic, commonly carry the expectation of more adaptable and stable emotion-regulation, and entering these roles have been found to lead to increased conscientiousness, emotional stability and extraversion, as well as decreased neuroticism (Lehnart et al., 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Noftle & Shaver, 2006; Scollon & Diener, 2006; Srivastava, John, Gosling & Potter, 2003; Terracciano, McCrae, Brant & Costa, 2005). High quality peer relationships have also been found to heighten extraversion, agreeableness and emotional stability (Neyer & Lehnart, 2007; Parker, Lüdtke, Trautwein & Roberts, 2012; Tackett, Kushner, Herzhoff, Smack & Reardon, 2014). To further support the propositions made by the social investment theory, research has also shown that people who participate in more antisocial activities, or people who are de-invested in their social roles, tend to show personality development that is in contradiction to normative findings. This includes for

example, a decrease in conscientiousness and emotional stability (Littlefield, Sher & Steinley, 2010; Roberts & Bogg, 2004; Roberts et al., 2006b).

Another perspective on personality and its development entails looking at the various goals individuals set out to achieve, and how their self-regulatory efforts at achieving their goals, which ultimately leads to habit formation, might induce trait change (Bleidorn et al., 2010; Hennecke, Bleidorn, Denissen & Wood, 2014; Roberts, O'Donnell & Robins, 2004; Shiner, Masten & Tellegen, 2002). Self-regulation may be conceptualised as a modification of thoughts, feelings and behaviour according to an individual's goals or standards (Baumeister & Heatherton, 1996). The need or want to change traits, from a self-regulatory perspective, may be intrinsically or externally imposed, either as means to achieve a goal, or as means to change a trait itself (Bleidorn et al., 2010; Hennecke et al., 2014; Roberts et al., 2004; Shiner et al., 2002). Once the decision to change has been made, the individual needs to self-regulate, which includes being able to identify goal-relevant situations, invest the necessary self-control to replace and change unwanted or unhelpful behaviours, monitor progress, and adjust the degree of effort invested into the process of change (Bleidorn et al, 2010; Hennecke et al., 2014; Roberts et al., 2004; Shiner et al, 2002). In order for this process to result in sustainable personality or trait change, the individual needs to consider alternative trait-related behaviours which will serve as instrumental in achieving the goal or are viewed as desirable behaviours in and of themselves. The individual further must consider performing these new/alternative trait-related behaviours, and the individual needs to enact, or practice, the new trait-related behaviours frequently in order to transform the self-regulated changes into fixed patterns or habits (Bleidorn et al., 2010; Hennecke et al., 2014; Roberts et al., 2004; Shiner et al., 2002). According to the goal perspective, it could therefore be argued that personality changes, such as reported increases in agreeableness, social dominance, conscientiousness and emotional stability, may be as consequence of individual goal pursuit (Bleidorn et al, 2010; Hennecke et al., 2014; Roberts et al., 2004; Roberts et al., 2006; Shiner et al., 2002).

Although not many studies have focused specifically on gender-related changes, gender-based social experiences as well as biological differences could have an impact on personality development (Bleidorn et al., 2014; Kanacri et al., 2013; Srivastava et al., 2003). The results of the meta-analysis done by Roberts and colleagues (2006), showed no significant difference between genders, although Yet, Ludtke, Roberts, Trautwein, and Nagy (2011), having used a sample of university students, found that women tend to show higher increase in agreeableness, and a lesser decrease in neuroticism in comparison to men. Blonigen and colleagues (2008), found that negative emotionality decreased more significantly for males than for females. The study done by Vecchione, Alessandri, Barbaranelli, and Caprara (2012) focused on gender-specific differences in personality development using a sample ranging between the ages of 16-20 years. They examined the form of trajectory and mean-level change of the big five personality factors separately for gender. Results indicated a linear increase for openness and conscientiousness with no significant difference between males and females (Vecchione et al., 2012). Trajectories of extraversion showed a marked stability for both genders. As with previous research, a difference was found for agreeableness and emotional stability. Regarding agreeableness, an increasing trajectory was only found in the male group. A quadratic trend was found among women, as mean-level change initially showed an increase and then a decline over time (Vecchione et al., 2012). Emotional stability showed to slightly increase in men, but remain stable in women (Vecchione et al., 2012). These differences could therefore also be viewed as the effect of conforming to gender-based social expectations, as proposed by the maturity principle (Arnett, 2000; Blonigen et al., 2008; Caspi et al., 2005; Hogan & Roberts, 2004; Hutteman et al., 2014; Kanacri et al., 2013; Reitz et al., 2014; Roberts & DelVecchio, 2000; Roberts & Jackson, 2008; Roberts & Mroczek, 2008; Roberts et al., 2005; Swann, 1987).

Personality disorder and the DSM-5

As with understanding personality and its development, it is imperative to understand the manner in which personality can become disordered. This is important for both adequate assessment

and intervention (Krueger et al., 2011; Krueger, Hopwood, Wright & Markon, 2014). Personality disorders may be described as enduring, pervasive, inflexible and stable patterns of thinking, feeling and behaving in ways different to that of the norm, which causes distress and impacts negatively on, or impairs two or more domains of functioning, usually occupational and interpersonal, sometimes to a debilitating degree (APA, 2013; Clarkin, Meehan & Lenzenweger, 2015; Stewart, Lips, Lakaski & Upshall, 2002). Research has also indicated that personality disorders may be understood as extreme or maladaptive variants of the big five personality traits (Samuel & Widiger, 2008; Widiger & Trull, 2007).

Studies focusing on the prevalence of personality disorders have indicated that approximately one-tenth of the general population and one-third of the clinical population have personality disorders (Clarkin et al., 2015; Schoeneleber & Berenbaum, 2011; Stewart et al., 2002; Trull, Jahng, Tomko, Wood & Sher, 2010). It has also been indicated that majority of hospitalised patients are between the ages of 15-44 years (Stewart et al., 2002), in line with age of onset. Although age of onset for personality disorders are generally between adolescence and early adulthood, some personality disorders only manifests at a later age. For example, narcissistic personality disorder has been found to manifest during mid-adulthood, associated with career or personal losses or limitations, affecting their status (Clarkin et al., 2015). Commonly found with personality disorders, is comorbid alcohol and drug use, anxiety disorders, mood disorders, eating disorders and suicidal behaviours. It has also been indicated that almost half of the prison population presents with antisocial personality disorder, as substance use and violence predisposes individuals to commit crimes (Stewart et al., 2002). Additionally, gender seems to impact on the prevalence of personality disorders, as for example, antisocial personality disorder is found more commonly among men, whereas borderline personality presents more commonly among women (Clarkin et al., 2015; Stewart et al., 2002).

One of the problems when considering assessment of personality disorders, is that merely partial models exist to identify these disorders, which currently needs greater theoretical

understanding and empirical evidence. Conceptualising personality disorders need to include analysis of biological and behavioural traits, emergent processes, such as mental representations, and the individual's interpersonal environment. Furthermore, models need to include and articulate the dynamic interdependent interactions between the analyses of these different dimensions (Clarkin et al., 2015; Gabbard, 2005; Leichsenring, Leibing, Kruse, New & Leweke, 2011; Skodol et al., 2002; Stewart et al., 2002; Torgersen et al., 2008; Wagner, Baskaya, Dahmen, Lieb & Tadić, 2010).

Over the past decade, research has yielded support for the significant role that biological processes have on the development of not only personality, but also personality pathology (Bechara, Damasio & Damasio, 2000; Casey, Getz & Galvan, 2008; Clarkin et al., 2015; Dahl, 2004; Eshel, Nelson, Blair, Pine & Ernst, 2007; Kuhn, 2006; McCrae et al., 2002; Miller & Cohen, 2001; Pharo, Sim, Graham, Gross & Hayne, 2011; Romer, 2010; Stewart et al., 2002; Zuckerman & Kuhlman, 2000). Indeed biology and genetic factors influence brain development and functioning, but it also creates the blueprint for an individual's personality structure. This personality structure serves as basis for how an individual will accept and respond to their environmental and social experiences, which in turn forms set patterns of thinking, feeling and behaving (Stewart et al., 2002). Research has indicated that certain impairments or malfunctions in brain circuits and structures may increase an individual's liability to develop pathological or unhealthy patterns of thinking, feeling and behaving underlying personality disorders (Clarkin et al., 2015; Stewart et al., 2002). Of great significance, is the limbic system and prefrontal cortex which is paramount to emotional and executive functioning, responsible for decision making, emotion regulation, risk assessment and exerting inhibition in contexts of stress or excitement (Bechara et al., 2000; Cardinal, Parkinson, Hall & Everitt, 2002; Casey et al., 2008; Delgado, 2007; Kuhn, 2006; LeDoux, 2000; McCrae et al., 2002; Miller & Cohen, 2001; Ochsner & Gross, 2005; Romer, 2010; Schultz, Dayan & Montague, 1997), which if impaired, will likely lead to dysfunction in these domains.

Pharo and colleagues (2011), examined the relationship between neuropsychological tests for executive functioning, personality traits and risk-taking behaviour in a sample of adolescents and young adults, ranging from ages 13-22 years. Risk taking behaviour may be seen as a pathological personality trait as well as a predisposition to developing certain personality disorders. Cross-sectional research (Lenzenweger & Willet, 2007; Wright, Pincus & Lenzenweger, 2010), supports the concept that personality traits are associated with personality disorder trajectories. Other research, for example done by Warner and colleagues (2005), suggests that personality traits, for example said risk taking behaviour, could also be seen as predictive of future personality disorder symptoms. In line with previous studies, Pharo and colleagues' (2011), research indicated that traits of sociability, aggression, impulsivity and sensation-seeking correlated with heightened levels of risky behaviour (Arnett, 1992; Eysenck, 1990; Harden & Tucker-Drop, 2011; Stanford, Greve, Boudreaux, Mathias & Brumbelow, 1996; Zuckerman & Kuhlman, 2000; Zuckerman, Kuhlman, Joireman, Teta & Kraft, 1993). Their study furthermore indicated that participants with lower scores on the neuropsychological tests were more involved in risky behaviours, supporting literature on the link between neurological development and risk-taking behaviour (Casey et al., 2008; Dahl, 2004; Eshel et al., 2007; Giedd et al., 1999; Harden & Tucker-Drop, 2011; Pharo et al., 2011; Romer, 2010; Somerville et al., 2010; Sowell, Thompson, Holmes, Jernigan & Toga, 1999; Steinberg, 2008, 2010).

One approach to understanding these results, is the dual systems model (Casey et al., 2008; Harden & Tucker-Drop, 2011; Steinberg, 2008, 2010; Somerville et al., 2010). This model proposes that an imbalance between or impairment of an adolescent's neurological systems (emotional and cognitive systems), for example an underdeveloped prefrontal cortex or an impaired or immature neural system of integration, may be the cause for risky behaviour. These neurological systems are responsible for a person's responsiveness to emotion, reward and novelty (Cardinal et al., 2002; Delgado, 2007; LeDoux, 2000; Schultz et al., 1997), as well as the regulation of impulses, emotions and making decisions (Bechara et al., 2000; Casey et al., 2008; Kuhn, 2006; Miller & Cohen, 2001;

Ochsner & Gross, 2005; Romer, 2010). The dual systems model posits that these neurobiological systems vary in the amount of time it takes to develop, resulting in maturity reached at different ages (Harden & Tucker-Drop, 2011; Somerville et al., 2010). The emotional system becomes more sensitive during adolescence, in accordance with changes in puberty (Galvan et al., 2006; Hare et al., 2008), whereas the cognitive system seems to mature during early adulthood (Casey et al., 2005; Giedd et al., 1999). This indicates a heightened response to rewards and emotions while still exhibiting immature inhibition and impulse control, which then gradually stabilises during early adulthood (Harden & Tucker-Drop, 2011; Steinberg et al., 2008). A study done by Harden and Tucker-Drob (2011), examined data focusing on impulsivity and sensation seeking, gathered from the National Longitudinal Study of Youth, Children and Young Adults (CNLSY). This study included over 7000 participants within the age range of 12 to 24 years. In accordance with previous studies done, impulsivity was found to decline linearly from the age of 12 to 24 years, while sensation seeking showed an initial increase from the age of 12 to 16 years (Galvan, Hare, Voss, Glover & Casey, 2007; Harden & Tucker-Drop, 2011; Leshem & Glicksohn, 2007; Steinberg et al., 2008). Sensation seeking was further found to gradually decline towards early adulthood (Harden & Tucker-Drop, 2011). These results corresponded with research indicating the maturation of neurobiological systems at different ages (Casey et al., 2005; Galvan et al., 2006; Giedd et al., 1999; Hare et al., 2008; Somerville et al., 2010).

Although biological processes are significant for the understanding of personality disorders and how they develop, the influence of psychological and social factors cannot be discarded as it increases an individual's vulnerability to develop personality pathology (Christensen & Kessing, 2006; Clarkin et al., 2015; Gabbard, 2005; Hopwood, Wright, Ansell & Pincus, 2013; Kotov, Gamez, Schmidt & Watson, 2010; Lahey, 2009; Leichsenring et al., 2011; Skodol et al., 2002; Stewart et al., 2002; Torgersen et al., 2008; Wagner et al., 2010).

One key concept is emotion regulation (APA, 2013; Gratz, Rosenthal, Tull, Lejeuz & Gunderson, 2006; Schoeneleber & Berenbaum, 2011). Emotion regulation may be described as

conscious or unconscious attempts exerted by an individual to try and control the effect and duration of emotions when they arise. This further includes an attempt to influence the behavioural expression or physiological impact these emotions might have (Schoeneleber & Berenbaum, 2011). Schoeneleber and Berenbaum (2011), proposed that maladaptive shame-regulation might be central to personality pathology. Therefore, the assumption is that an inability, or diminished ability, to effectively regulate emotions in order to avoid or alleviate shame – a subjective experience in which an individual considers him/herself as defected, elicited in situations highlighting the individual's flaws, i.e. negative self-beliefs – is a key factor in both the development and maintenance of some personality disorders (De Hooge, Breugelmans & Zeelenberg, 2008; Schoeneleber & Bernebaum, 2011; Tangney, Miller, Flicker & Barlow, 1996; Whelton & Greenberg, 2005). Literature on shame supports the assumption that shame is detrimental to an individual's functioning. Studies have repeatedly indicated that shame is associated with various psychological problems, not only personality pathology, and that shame does not serve any adaptive function (De Hooge et al., 2008; Thompson & Berenbaum, 2006; Whelton & Greenberg, 2005).

Tying in with shame and negative-self beliefs is the assumptions made by the cognitive-affective processing systems model (Eaton, South & Krueger, 2009; Mischel & Shoda, 2008). This model proposes that personality is comprised of distinct internalised cognitive-affective components existent in a structured network which mediates between an individual's environmental situation and behavioural response. These cognitive-affective components are thought to capture individuals' encoding and interpretations of their situations, their beliefs and perceptions about the world, their affective tendencies, values, morals and goals, and their self-regulatory competencies (Clarkin et al., 2015; Eaton et al., 2009; Mischel & Shoda, 2008). When these cognitive-affective components are rigid and limited in breadth, individuals are more likely to dysregulate emotions and feel unmoored by new experiences, to which they will therefore most probably respond to in a negative manner. The cognitive-affective processing systems model does not regard personality pathology as comprised of extreme dispositional traits, but emphasises the stability or rigidity of the individual's

behavioural style within which traits are observed (Clarkin et al., 2015; Eaton et al., 2009; Mischel & Shoda, 2008).

In line with research and a growing consensus that self-and-other functioning is also a core concept of personality functioning and disorders (Clarkin et al., 2015; Gunderson & Lyons-Ruth, 2008; Hengartner, Müller, Rodgers, Rössler & Ajdacic-Gross, 2014; Hopwood et al., 2013; Krueger, 2013; Pincus, 2005), Hopwood and colleagues (2013), proposed that personality dysfunction operates within a complex relational matrix and that basic aspects of personality pathology could therefore be viewed in terms of the extremity of problematic behaviours exhibited in interpersonal relations, such as rigidity of interpersonal behaviours and styles, which impairs the ability of the individual to adapt and respond to different relational needs and demands (Clarkin et al., 2015; Hopwood et al., 2013). These include a distrust in others; social detachment and avoidance; interpersonal difficulties, such as instability in relationships and a decreased capacity to form and maintain close relationships; excessive attention seeking; submissiveness and clinging behaviour; an obsession with interpersonal control, conflict or aggression; and a dysfunction in moral reasoning, such as a lack of empathy and dishonesty (APA, 2013; Clarkin et al., 2015). This model however, does not merely conceptualise personality pathology as interpersonal problems of extreme and rigid types. Rather, personality pathology is seen as significantly interacting with interpersonal dispositions within a pathoplastic relationship, therefore taking into account neural systems proposing that personality and interpersonal dysfunction mutually influence each other and shape each other's manifest expression (Clarkin et al., 2015; Farmer, 2000; Widiger, 2011; Hopwood et al., 2013). Support for a pathoplastic relationship, and presentation of personality disorders, have been indicated in various longitudinal studies where it has been shown that personality disorder symptoms are unstable and plastic (Johnson et al., 2000; Lenzenweger, Johnson & Willett, 2004; Shea et al., 2002; Zanarini, Frankenburg, Hennen & Silk, 2003).

As mentioned before, literature on personality pathology indicates that biological, psychological and social factors influence the development of personality pathology, and that

premorbid personality traits, especially neuroticism, can predispose individuals to be more vulnerable to stress (Christensen & Kessing, 2006; Hopwood et al., 2013; Kotov et al., 2010; Lahey, 2009; Leichsenring et al., 2011; Stewart et al, 2002; Torgersen et al., 2008; Wagner et al., 2010). For example, individuals high in neuroticism are more likely to respond to stressful situations with significant levels of distress and anxiety. In turn, the individual's response to stress might lead to poor decision-making or elicit negative reactions from others which therefore might increase and reinforce the original distress experienced, creating a cycle of poor and rigid emotional dysregulation.

Research focused on personality development during early adulthood (18-21 years), has also shown how personality traits influence development of pathology. Maturity is described as being comprised of low neuroticism, high conscientiousness and high agreeableness, whereas the inverted profile, i.e. high neuroticism, low conscientiousness and low agreeableness, has been related to personality pathology (Clarkin, Lenzenweger, Yeomans, Levy & Kernberg, 2007; Wright, Pincus & Lenzenweger, 2011). As personality may influence psychopathology, psychopathology may also influence personality. For example, an individual who suffered a severe psychological disorder, such as major depression or psychoses, could experience a change in feeling, thinking and relating to others, which in turn could then cause new personality traits or characteristics to develop (Widiger, 2011). Wright and colleagues (2011) used data from the Longitudinal Study of Personality Disorders, to examine the role that personality disorder plays in basic personality trait development. They found that as personality disorder symptoms declined over time, personality showed more growth toward maturation, and in contrast, that personality growth stagnated or regressed as personality disorder symptoms developed (Wright et al., 2011), once again supporting the plastic nature of pathology (Johnson et al., 2000; Lenzenweger et al., 2004; Shea et al., 2002; Zanarini et al., 2003).

The Diagnostic and Statistical Manual 5th edition (DSM-5) is the first edition to include a more dimensional and empirically-based model entailing maladaptive personality traits (APA,

2013). Dating back to previous versions of the Diagnostic and Statistical Manual of Mental Disorders (DSM), already starting with the DSM-III, experts and clinicians started exploring and discussing alternative approaches to the categorical model of personality disorders in order to deal with aforementioned difficulties in diagnosing personality disorders, such as poor validity of assessments, a lack of clinical utility and high comorbidity between the personality disorders (Clarkin et al., 2015; Eaton, Krueger, South, Simms & Clark, 2011; Few et al., 2013; First & Westen, 2007; Hyman, 2010; Kim & Tyrer, 2010; Krueger et al., 2014; Lenzenweger, Lane, Loranger & Kessler, 2007; Livesley, 1998; Morey et al., 2011; Paris, 2007; Ryder, Bagby & Schuller, 2002; Shedler & Westen, 2004; Trull & Durrett, 2005; Verheul, 2005; Walters & Ruscio, 2013; Westen & ArkowitzWesten, 1998; Widiger & Samuel, 2005; Widiger & Trull, 2007; Widiger, Simonsen, Krueger, Livesley & Verheul, 2005). Probably the most significant problem with the DSM-IV categorical model for personality disorder diagnosis (APA, 2000), is that personality pathology was organised in the form of ten disorders, conceptualised as separate dichotomous categories that are discontinuous with normal or general personality variation (Bernstein, Iscan & Maser, 2007; Krueger & Markon, 2014; Livesley, 2012), in contrast to research indicating the opposite. Existing data on personality disorders and related psychopathology, seems to fit better with models suggesting continuous variation (Conway, Hammen & Brennan, 2012; Hallquist & Wright, 2014; Stepp et al., 2012; Suzuki, Samuel, Pahlen & Krueger, 2015). Studies have furthermore consistently indicated validity for the Five-Factor Model's (FFM) general personality traits and its relationship to DSM-IV personality disorders, and has therefore increasingly been considered in the formulation of alternative models with the view that personality disorders could be considered maladaptive variants of these general personality traits (APA, 2013; Bach, Markon, Simonsen & Krueger, 2015; Clarkin et al., 2015; Few et al., 2013; Gore & Widiger, 2013; Markon, Krueger & Watson, 2005; Samuel & Widiger, 2008; Sellbom, Smid, De Saeger, Smit & Kamphuis, 2014; Thomas et al., 2013; Widiger & Costa, 1994; Widiger & Simonsen, 2005; Widiger et al., 2005; Wright et al., 2012; Zimmermann et al., 2015). Another problem entails that

these disorders were polythetic in nature, deeming a diagnosis possible on any variation of criteria (symptoms). For example, if a disorder is conceptualised in terms of eight different criteria, only four of those are necessary to make a diagnosis (Krueger et al., 2014). The problem is that persons meeting diagnostic criteria for specific personality disorders are heterogeneous, even though specific criteria may not be shared (example of any 4 criteria met) (Krueger et al., 2014). It is important to note individual differences that may exist between two people diagnosed with the same personality disorder.

In response to these limitations, the DSM-5 Personality and Personality Disorder work group was formally tasked to develop an alternative, more valid and clinically applicable approach for diagnosing and conceptualising personality disorders and proposed a model differing radically from previous models. The process for development of DSM-5 began in December 2004, with a sense of openness to new ideas pertaining classification, and the DSM leadership worked towards developing dimensional assessment tools for the DSM-5 (Krueger et al., 2014). Subsequently, in 2007, the formal appointment of the DSM-5 Personality and Personality Disorder work group occurred (Krueger & Markon, 2014), and they delivered first draft revisions for the hybrid model in February 2010, which they made open for professional and public comment (Bornstein, 2011). Initially, they proposed retaining five personality disorders, namely antisocial, borderline, schizotypal, avoidant and obsessive-compulsive, however modified. Patients would then be assessed on six broad trait domains, which include negative emotionality, antagonism, introversion, schizotypy, disinhibition and compulsivity, with 4-point ratings pertaining to a trait's degree of presence. Patients who may be diagnosed with a personality disorder would then also be assessed on a 5-point raring scale reflecting self and interpersonal functioning, i.e. impairment (Bornstein, 2011).

Furthering their research, the work group described 37 maladaptive traits, which appeared to represent all DSM-IV diagnostic personality disorder symptoms, which were sorted into six broader domains. The work group members formulated items for each trait that resulted in 381 items in

total, which were tested in a series of field trials of community and clinical samples (Krueger et al., 2011). This resulted in a reduced set of 25 trait scales delineated in five higher-order domains (Krueger & Eaton, 2010; Krueger et al., 2011; Widiger & Simonsen, 2005; Wright et al., 2012). The domains are organised hierarchically: negative affectivity; detachment; antagonism; disinhibition and psychoticism (Krueger et al., 2011; Wright et al., 2012). In line with research having indicated convergence between the FFM and pathological personality traits, the structure of maladaptive traits as proposed by the hybrid model clearly resembles the structure of normal personality and therefore that personality functioning and traits are represented in various degrees, and not, as the categorical model suggests, either present or absent (APA, 2013; Bach et al., 2015; Morey et al., 2011). Specifically, the DSM-5 trait of negative affectivity seems to be akin to the FFM trait of neuroticism; DSM-5 trait of detachment to low FFM extraversion; antagonism akin to low FFM agreeableness; disinhibition to low conscientiousness; and the DSM-5 trait of psychoticism to the FFM trait openness (Anderson et al., 2013; Few et al., 2013; Gore & Widiger, 2013; Hopwood, Thomas, Markon, Wright & Krueger, 2012; Krueger et al., 2011; Strickland, Drislane, Lucy, Krueger & Patrick, 2013; Thomas et al., 2013; Widiger, 2011; Wright & Simms, 2014; Wright et al., 2012).

The final version of the hybrid model was finalised between 2011 and 2012 and retained six personality disorder types, namely avoidant, schizotypal, borderline, antisocial, narcissistic and obsessive-compulsive, with diagnostic criteria for level of impairment/personality functioning as criteria A and characteristic personality trait patterns as Criteria B (Bender, Morey & Skodol, 2011; Krueger, Derringer, Markon, Watson & Skodol, 2012; Zimmerman et al., 2015).

The rationale behind Criterion A, was that the personality disorder system in the DSM-IV confounded the severity and style of personality disorders. This led to multiple personality disorder diagnoses capturing the core features of general severity surrounding personality dysfunction. This in turn caused diagnostic comorbidity and limited clinical utility of an individual personality disorder diagnosis (Clarkin et al., 2015; Eaton et al., 2011; Few et al., 2013; Hyman, 2010; Kim &

Tyrer, 2010; Krueger et al., 2014; Morey et al., 2011; Walters & Ruscio, 2013). Hence the DSM-5 Section III model of personality dysfunction includes two broad domains, (i) Self: comprised of identity and self-direction, and (ii) Interpersonal: comprised of empathy and intimacy. These domains were operationalised using the LPFS (Levels of Personality Functioning Scale), used to assess personality impairment pertaining to these domains (APA, 2013; Bach et al., 2015; Bender et al., 2011; Few et al., 2013; Morey et al., 2011).

The rationale behind Criterion B rested primarily on existing research that supports the advantages of using dimensional models for personality in both the conceptualisation and assessment of personality disorders (Clarkin et al., 2015; Gore & Widiger, 2013; Krueger & Eaton, 2010; Lowe & Widiger, 2009; Stepp et al., 2012; Suzuki et al., 2015; Trull & Durrett, 2005; Widiger & Trull, 2007; Widiger et al., 2005; Yalch & Hopwood, 2016). Criterion B sets out to capture personality disorder-associated, maladaptive personality traits, and is in essence hierarchically organised and comprised of five broad trait domains including 25 subordinate trait facets operationalised by the Personality Inventory for DSM-5 (PID-5) (Krueger 2013; Krueger et al., 2012; Morey et al., 2011; Suzuki et al., 2015).

Research using the LPFS and PID-5 in both clinical and non-clinical samples have indicated reliability and validity (Bender et al., 2011; Few et al., 2013; Gore & Widiger, 2013; Hopwood et al., 2012; Krueger et al., 2012; Morey & Skodol, 2013; Quilty, Ayearst, Chmielewski, Pollock & Bagby, 2013; Watson, Stasik, Ro & Clark, 2013; Wright et al., 2012; Yalch & Hopwood, 2016) and convergence with the higher order structure of the PID-5 and 5 factor models of personality, such as the NEO Personality Inventory (APA, 2013; Ashton, Lee, De Vries, Hendrickse & Born, 2012; De Fruyt et al., 2013; Few et al., 2013; Gore & Widiger, 2013; Thomas et al., 2013; Yalch & Hopwood, 2016).

Potential benefits for the hybrid model include a likelihood that comorbidity among personality disorders would decrease as personality disorder categories have been reduced and a more trait-specified personality diagnosis can be made. The inclusion of self and interpersonal

functioning ratings, based on elevations in maladaptive traits, could also indicate underlying dynamic processes of personality pathology, as well as an indication of impairment in functioning (Bornstein, 2011; Yalch & Hopwood, 2016). Yam and Simms (2014), for example, set out to evaluate the strength of Section III personality disorder traits in predicting traditional personality disorder criterion; whether non-specified personality disorder traits predict traditional personality disorder criterion; and Section III diagnosis rates within a psychiatric sample. In line with other studies (Few et al., 2013; Hopwood et al., 2012; Morey & Skodol, 2013; Samuel, Hopwood, Krueger, Thomas & Ruggero, 2013), their results indicated that both specified and non-specified personality disorder traits predicted traditional personality disorder criteria, although some specified traits predicted multiple traditional personality disorders.

However, when the DSM-5 was finalised, the Board of Trustees of the American Psychiatric Association decided to mention the alternative model in Section III of the DSM-5, and rather keep to the existing DSM-IVTR categorical model for personality disorders in Section II in order to "preserve continuity with current clinical practice" (p. 761, APA, 2013; Bagby, Sellbom, Costa & Widiger, 2008; Krueger & Markon, 2014; Krueger et al., 2014; Krueger, Skodol, Livesley, Shrout & Huang, 2007), although a comprehensive survey done by Morey and colleagues (2014), suggested that mental health clinicians indeed do find the hybrid model more useful than the categorical and Axis models, in line with research favouring a dimensional approach to personality pathology (Bernstein et al., 2007; Clarkin et al., 2015; Gore & Widiger, 2013; Lowe & Widiger, 2009; Trull & Durrett, 2005; Verheul, 2005; Widiger & Samuel, 2005; Widiger & Trull, 2007; Widiger et al., 2005; Yalch & Hopwood, 2016). Personality disorder, in Section II of the DSM-5, is then defined as an enduring pattern of both inner experiences (thinking and feeling) and behaviour that deviates significantly from individual cultural expectations. This pattern is seen in the way the individual thinks about him/herself and others; his/her emotional responses; his/her way of relating to others; and the individual's way of controlling his/her own behaviour (APA, 2013). Furthermore, a personality disorder is inflexible and pervasive; has a peak onset in adolescence or early

adulthood; it is generally stable over time; and leads to impairment and distress (APA, 2013). The hybrid model defines personality disorders mainly in the same way, but places more focus on the impairment of personality functioning as well as pathological personality traits (APA, 2013). Thus, included in this new model, are two central components – assessment of self and interpersonal functioning (Criterion A); and the use of pathological personality traits to describe personality disorders (Criterion B), (Miller, Few, Lynam & MacKillop, 2015; Suzuki et al., 2015).

Personality Inventory for DSM-5

In the operationalisation of the DSM-5 hybrid model for personality disorders, Krueger and colleagues (2012), developed an instrument (Personality Inventory for DSM-5/PID-5) to make publically available for clinicians, for the measurement of Criterion B, i.e. maladaptive personality traits. They began by identifying a hypothesised set of domains known to cover maladaptive personality variations in existing models and instruments. Members of the Personality and Personality Disorders work group, as well as consultants, generated a preliminary list of 37 facets covering specific personality traits, after which Krueger and colleagues (2012), wrote brief definitions for the individual facets aimed at informing the writing of item content for the facets. The initial construction process of the instrument involved two rounds of data collection. This was aimed at measuring the reliability of each facet, and examining if these facets could be collapsed, or if items should be reassigned among the facets. Data was collected through an on-line panel of respondents who were specifically chosen to optimise generalisability to the United States population (The Knowledge Networks Panel; Dennis, 2010; Krueger et al., 2012). Respondents were selected from the Knowledge Networks Panel if they responded “yes” to the question: “have you ever seen a therapist for psychological or psychiatric counselling or therapy”. Their factor analysis led to a reduction in constructs, narrowing it down to a list of 25 traits delineated under five higher-order domains, which were measured to be reliable (Cronbach’s alpha ranged .72-.96, median = .86), (Krueger et al., 2011). The 25 traits scales were made up of four to 14 items, rendering the PID-5 consisting of a total of 220 items (Fossati, Krueger, Markon, Borroni & Maffei,

2013; Griffin & Samuel, 2014; Krueger et al., 2012; Morey, Krueger & Skodol, 2013; Wright et al., 2012).

Literature surrounding the DSM-5 trait model and PID-5 has grown substantially since its development and numerous studies have indicated its reliability and validity as well as its internal consistency (Al-Dajani, Gralnick & Bagby, 2016; Anderson et al., 2013; Ashton et al., 2012; Bagby, 2013; Furnham, Milner, Akhtar & De Fruyt, 2014; Hopwood & Sellbom, 2013; Hopwood et al., 2013; Krueger et al., 2012; Morey, Benson, Busch & Skodol, 2015; Quilty et al., 2013; Watson et al., 2013; Wright et al., 2012). For example, Few and colleagues (2013), tested the reliability and validity of self-reported pathological traits using the PID-5 as assessment tool, and found good internal consistency for both domains and facets. Their findings indicated a median coefficient alpha of .87, which is similar to previous findings (e.g. Hopwood et al., 2011, Mdn α =.86; Krueger et al., 2012, Mdn α =.86). Wright and colleagues (2015), examined the PID-5's test-retest reliability in a clinical sample across an average of 1.44 years and indicated high mean-level and rank-order stability of the personality disorder traits. Having used Cohen's *d* (Cohen, 1988), their results yielded a median *d* of -.12, indicative of little to no change. Small changes were found in submissiveness (-.30); withdrawal (-.21); restricted affectivity (-.25); irresponsibility (-.22); risk taking (-.22) and rigid perfectionism (-.20). The study also indicated rank order stability (r .68; Wright et al., 2015) which is comparable to stability estimates of other psychopathology self-report measures (e.g. Samuel et al., 2011). Furthermore, results indicated that these traits also significantly predicted psychosocial dysfunction as well as life satisfaction, indicating the DSM-5 traits serving an important prognostic function. This further supports the construct validity of the DSM-5 personality disorder trait model as previously shown to demonstrate great association with patterns of interpersonal dysfunction (Wright et al., 2012).

Research indicates support for the DSM-5 hybrid model in comparison to other evidence-based systems pertaining to personality and pathology, and that it aligns in a theoretically acceptable manner (Austin & Deary, 2000; De Clercq, De Fruyt, Van Leeuwen & Mervielde, 2006;

De Fruyt et al., 2013; Gore & Widiger, 2013; Kendler et al. , 2011; Markon, 2010; Nestadt et al., 2008; Piedmont, Sherman, Sherman, Dy-Liacco & Williams, 2009; Thomas et al., 2013; Watson, Clark & Chmielewski, 2008; Widiger, Livesley & Clark, 2009). Miller and colleagues (2015), using a clinical sample, tested the validity of the personality disorder trait count portion as articulated in the DSM-5 Section III through examining the correlation thereof with DSM-IV personality disorders and whether it yielded personality and psychopathology profiles consistent with those that are created by the DSM-IV personality disorder categories. Their research demonstrated substantial convergence between DSM-5 personality disorder trait counts and DSM-IV personality disorder categories (Miller et al., 2015). Their findings also corroborated with Samuel, Hopwood and colleagues' (2013) findings, who used self-reported data from an undergraduate sample.

Given the overall status of the FFM (Costa & McCrae, 1992), as a widely supported and accepted model describing universal personality, it served as theoretical underpinning of the PID-5's maladaptive personality traits (Al-Dajani et al., 2016). Within this framework, the general hypothesis is that negative affect would correlate with neuroticism; detachment would correlate negatively with extraversion; antagonism would correlate negatively with agreeableness; and disinhibition would correlate negatively with conscientiousness. Seeing as research has yielded inconsistencies for the correlation between psychoticism and openness, it is not a correlation hypothesised, but one still being explored (Al-Dajani et al., 2016; De Fruyt et al., 2013; Gore & Widiger, 2013; Griffin & Samuel, 2014; Thomas et al., 2013; Wright & Simms, 2014).

Crego and colleagues (2015), set out to examine the discriminant validity of the PID-5. This was done through cross-domain correlations having used three independent samples; correlations between the 25 trait scales; as well as the specificity of the relationships between the 25 trait scales and general personality. Their study involved the use of the NEO-PI-R (Costa & McCrae, 1992); the International Personality Item Pool-NEO (IPIP-NEO; Goldberg et al. , 2006), the Inventory of Personal Characteristics (IPC; Almagor, Tellegen & Waller, 1995), the HEXACO Personality Inventory-Revised (HEXACO-PI-R; Lee & Ashton, 2004) and the 5-Dimensional Personality Test

(5DPT; Van Kampen, 2012). Sample one comprised 445 undergraduate university students who completed the NEO-PI-R, IPC and the 5DPT. Sample two consisted of 330 MTurk participants who completed the HEXACO PI-R, and sample three included 296 MTurk participants who completed the IPIP-NEO. Sample three participants furthermore had a history of having had utilised mental health treatment (Crego, Gore, Rojas & Widiger, 2015). The results indicated high correlations between most of the 25 PID-5 trait scales and their respective general personality domains (Crego et al., 2015).

In line with existent research (e.g. Quilty et al., 2013; Watson et al., 2013), weak correlations were found between the three PID-5 psychoticism subscales and the openness scale of the NEO-PI-R and IPIP-NEO. However, their results indicated convergence between the psychoticism scale with the IPC scale conventionality and the 5DPT scale absorption. Furthermore, relatively low convergent validity was obtained for restricted affectivity with the NEO-PI-R and IPIP-NEO, 5DPT neuroticism and IPC negative emotionality, which instead correlated with the NEO-PI-R and 5DPT scales extraversion and IPC positive emotionality (Crego et al., 2015). The PID-5 scale suspiciousness also showed a relatively weak relation to the NEO-PI-R, IPIP-NEO and 5DPT extraversion, and showed a correlation with NEO-PI-R and IPIP-NEO antagonism, as well as 5DPT insensitivity. These results may suggest for alternative placements for the DSM-5 traits restricted affectivity and suspiciousness (Watson et al., 2013). In addition, a weak correlation between PID-5 risk taking and rigid perfectionism with the NEO-PI-R, IPIP-NEO and HEXACO PI-R conscientiousness, and IPC dependability were found, which were inconsistent with their expectations (Crego et al., 2015). Crego and colleagues' (2015), results further indicated cross-domain correlations, for which psychoticism yielded the strongest correlation, although negative affectivity showed a substantial correlation with detachment across all samples (.62 – .65). Average cross-domain correlations yielded were .22 for the NEO-PI-R; .28 for the IPIP-NEO; .34 for IPC; .21 for HEXACO PI-R; and .20 for the 5DPT, in comparison to the PID-5 averages .57 for sample one; .42 for sample two; and .47 for sample three (Crego et al., 2015). Discriminant validity was

found to be generally good for some, although not all, of the PID-5 trait scales in their relationship to their respective general personality domains. Strong validity was especially found for emotional liability, submissiveness, separation insecurity, and anxiousness (negative affectivity); manipulativeness and grandiosity (antagonism); withdrawal (detachment); and impulsivity, distractibility and irresponsibility (disinhibition). However, problematic discriminant validity was found for restricted affectivity, hostility, perseveration (neuroticism); suspiciousness, intimate avoidance and depressivity (detachment); deceitfulness (antagonism); risk-taking and rigid perfectionism (disinhibition); and perceptual dysregulation, eccentricity and unusual beliefs/experiences (psychoticism) (Crego et al., 2015).

Griffin and Samuel (2014), administered a joint exploratory factor analysis of the 30 NEO-PI-R trait scales and the 25 PID-5 trait scales having used a sample of 388 undergraduate psychology students. Their results indicated a five-factor structure similar to the FFM, as supported by previous research having indicated the same (Anderson et al., 2013; De Fruyt et al., 2013; Griffin & Samuel, 2014; Krueger et al., 2012; Thomas et al., 2013; Wright et al., 2012). Their results furthermore indicated that the five joint factors obtained represent the same five factors materialised by normal-range personality measures. Their findings also extended to the domain of openness. In line with previous research (De Fruyt et al., 2013; Gore & Widiger, 2013; Thomas et al., 2013), they found NEO-PI-R openness facets (ideas, fantasy and aesthetics) loaded primarily onto the PID-5 psychoticism factor (unusual beliefs/experiences, perceptual dysregulation and eccentricity) (Griffin & Samuel, 2014).

Research has also demonstrated that the self-report PID-5 structure is replicable across both samples and countries (De Fruyt et al., 2013; Fossati et al., 2013; Wright et al., 2012), and that the structure generalises to clinician ratings of their patients (Morey et al., 2013) and is as such more useful to clinicians (Morey et al., 2014). Replicability is important, as it demonstrates preservation of the psychometric properties, even when items and instructions are translated to a language other than that in which it was developed. In 2013, De Fruyt and colleagues examined the replicability of

the DSM-5 personality trait model. They used a Dutch version of the PID-5 (checked via independent back translation) and furthermore explored the common structure of the PID-5 and the NEO-PI-3 (De Fruyt et al., 2013). The findings presented support for the validity of hierarchical conceptualisation of personality traits, with both general and maladaptive traits being organised under an umbrella of higher-order domains (Anderson et al., 2013; Thomas et al., 2013). More specifically, it would seem as though Negative affect (DSM-5) relates to Neuroticism (FFM); Detachment (DSM-5) is akin to low Extraversion (FFM); Antagonism (DSM-5) to low Agreeableness (FFM); and Disinhibition (DSM-5) to low Conscientiousness (FFM). A link between DSM-5 Psychoticism and FFM Openness could however not be clearly established. This study did however provide support for construct validity of the DSM-5 trait model and underscored the psychometric properties of the PID-5. Lastly, it suggested that the NEO measures can be used to supplement the PID-5 when both general and maladaptive traits want to be assessed (De Fruyt et al., 2013).

Personality Inventory for DSM-5 Brief Form

In addition to the original PID-5, a brief form was developed focused only on the five trait domains (APA, 2013b). Similar to the PID-5, the brief form is rated using a 4-point scale (APA, 2013b). The PID-5-BF assesses the five maladaptive trait domains (negative affectivity, detachment, antagonism, disinhibition and psychoticism), with each domain scale comprised of five items which furthermore generates a score for the overall measure. This brief version is not proposed as a fine-grained measure set out to assess the DSM-5 personality traits, but rather intends to screen for possible personality disorder. The easy accessibility of the PID-5-BF and routine utility thereof, could potentially allow for earlier detection of personality pathology, possibly preceding the development of more severe psychopathology, such as externalising problems (e.g. substance abuse, self-harming behaviour or aggressive behaviour), and internalising disorders (e.g. depression or anxiety) (Fossati, Somma, Borroni, Markon & Krueger, 2017). It should however, be noted that the PID-5-BF is not designed to measure impairment in Criterion A core functions, but

rather aims to recognise elevation of the maladaptive trait dimensions. Personality dysfunction as operationalised in Criterion A yields information regarding severity of the disorder, and not personality 'style' reflected through traits (Fossati et al., 2017). Although some research exists indicating that pathological traits may influence or capture dysfunction (e.g. Few et al., 2013), the total score obtained from the PID-5-BF should not be considered as evidence for Criterion A, but should rather be seen as a possible indication for thorough clinical assessment of Criterion A functioning and the severity of impairment (self and interpersonal) (Fossati et al., 2017).

Fossati and colleagues (2017), examined the reliability and construct validity of the PID-5-BF (APA, 2013c), in an Italian adolescent sample having used the Measure of Disordered Personality Functioning (MDPF; Parker et al., 2004). They also examined gender roles on the PID-5-BF scores. Their results suggested that, at least in the Italian-translated version, the PID-5-BF could be proficient in capturing personality psychopathology. They detected adequate internal consistency for all of the 5 PID-5-BF scales as measured by the mean interim correlation (MIC; Clark & Watson, 1995). Their results showed that gender has a significant effect on the PID-5-BF scores, suggesting that the adolescent version of the PID-5-BF might require differentiated norms while retaining the same internal consistency (Fossati et al., 2017). Specifically, significant gender differences with regards to scores on the negative affectivity, antagonism, detachment and psychoticism, may be of particular importance for early detection, and thus prevention, of personality disorders in adolescents. The study also involved a longitudinal evaluation, where a subsample of the original sample of adolescents re-administered the PID-5-BF two months later. The results indicated intra-class *r* coefficients suggestive of adequate consistency for both domain and total scores. Furthermore, they found moderate factor inter-correlations (median r = .24) indicative of the PID-5-BF measuring distinguishable constructs (Fossati et al., 2017). As expected, regression analysis indicated that an overall elevation of PID-5-BF total score positively and significantly predicted MDPF scale scores (non-coping scale and non-cooperative scale).

However, having used an adolescent sample, generalisability to adult populations are questionable. Bach and colleagues (2016), also evaluated the PID-5-BF's psychometric properties, as well as the PID-5 and PID-5-SF (PID-5 short form, 100 items) in a large Danish sample made up of both psychiatric and community respondents. Their results, in line with Fossati and colleagues' (2017) findings, also indicated acceptable reliability, internal consistency and evidence for the PID-5-BF's factor structure. Their results furthermore indicated that the PID-5-BF is able to differentiate between psychiatric and community participants and showed evidence for the measure's utility in assessing the categorical (Section II) personality disorders (Bach, Maples-Keller, Bo & Simonsen, 2016). In conclusion, their findings indicated similar results across all three versions of the measure. Although these studies indicated support for the clinical use of the PID-5 measures, these studies did not use the official English version of the measure.

Hence, in 2018, Anderson and colleagues set out to evaluate the psychometric properties of the PId-5-BF using the original English version. They specifically focused on the internal consistency reliability and the internal structure of the PID-5-BF, with the goal of confirming the five-factor structure which havs been included in this measure. In addition, they examined the associations between the PID-5-BF domains and the categorical personality disorders, the PSY-5 (Personality Psychopathology- Five) model of personality disorders or personality psychopathology, as well as broadband measures of both externalising and internalising psychopathology. Lastly, they set out to evaluate the consistency of the associations found in the PID-5-BF with associations found in the PID-5 and PID-5-SF (Anderson, Sellbom & Salekin, 2018).

They used three samples, which included 347 undergraduate university students; archival data from 285 undergraduate university students; and an archival community sample focused on participants who reported potentially psychopathological traits. In order to assess the associations between external criteria measures and the PID-5-BF domains, a variety of measures presumed to be associated with personality disorders were used, which included the PSY-5 (Harkness &

McNulty, 1994) – included in the MMPI-2-RF; Ben-Porath & Tellegen, 2008 – the Inventory for Depression and Anxiety Symptoms-2 (IDAS-2; Watson et al., 2007), and the Externalising Spectrum Inventory (ESI; Krueger et al., 2007).

As expected, their results indicated support for the utility of the PID-5-BF as a brief screening measure for maladaptive personality traits, as well as a brief measure of dimensional personality psychopathology. Although specific hypotheses on categorical diagnoses cannot be made using the PID-5-BF, clinicians could manage to broadly describe areas of dysfunction or potential preliminary diagnoses, which will inform the need for additional assessments. In line with previous research (Bach et al., 2016; Fossati et al., 2017; Krueger et al., 2012; Wright et al., 2012), their findings indicated acceptable internal consistency for the scales within each sample and showed support for model fit (via CFA) with the FFM used to inform the 25 PID-5-BF items. Furthermore, their results stipulated support for the associations between measures of Section II personality disorders and the PID-5-BF, PSY-5 scales, PID-5 and PID-5-SF, and measures of broad externalising and internalising psychopathology, consistent with previous findings (Anderson et al., 2013, 2015; Finn, Arbisi, Erbes, Polusny & Thuras, 2014; Sellbom et al., 2014). In addition, their results showed that externalising PID-5-BF domains predicted ESI scores and internalising PId-5-BF domains predicted IDAS scores. Finally, analyses indicated PID-5-BF associations with external measures to be consistent with correlation patterns found when using the PID-5 and PID-5-SF, as also found by Bach and colleagues (2016).

Methodology

The following section is focused on the methodology specifically used in this research study as well as justified rationales for its use.

Research design

The approach of this study was quantitative, which can be described as a process that is both systematic and objective as it uses data, collected and presented as numerical, from a selected

population, to be summarised, analysed and interpreted through statistical procedures, in order to generalise findings to the population being studied (Goodwin & Goodwin, 2014; Gravetter & Forzano, 2016; Maree & Pietersen, 2010b). Quantitative research can furthermore be described as an approach used to test objective theories through examining the relationship existent between variables. These variables are measured through the use of instruments or tests so as to be analysed. These theories are tested deductively, as it is done to generalise and replicate findings (Creswell, 2014).

A cross-sectional research design was used, which can be described as the gathering of data at one point in time, creating a snapshot of a social circumstance. Cross-sectional research can furthermore be exploratory, explanatory or descriptive. This research design is used to examine information of multiple cases at one point in time (Lawrence Neuman, 2014). Cross-sectional research studies are primarily used when determining prevalence. Prevalence is equal to the amount of cases in a population at a certain point in time, thus all measurements done on each person, are done so at one point in time (Mann, 2003). Prevalence is important to clinicians as it influences the likelihood of diagnosis, as well as the predictive value pertaining any investigation. As only one group of participants are used, data are collected once and variables can be compared or multiple outcomes examined, this method of study is relatively inexpensive (Institute for Work & Health, 2015; Mann, 2003). Many cross-sectional studies use questionnaires as method of data collection, as was used in the current study (Mann, 2003).

In order to determine validity of the PID-5-BF, or any other measure, constructs (variables) need to be statistically compared, justifying the use of a cross-sectional research design.

The classic perspective, dating back to the 1950's, of Cronbach and Meehl (1955), is that psychological constructs are unobservable. Traits, such as neuroticism and depression cannot be directly observed. The existence of such traits is merely inferred as it contributes to the understanding and explaining of human behaviour, and hence given operational definitions in order to empirically investigate them and develop measures/tests for them (Goodwin & Goodwin, 2014;

Smith, 2005). A construct can be described as a hypothetical factor which is developed within a theory in order to help explain a phenomenon, or which is created to use as a shorthand term for describing a certain cluster of behaviours (Goodwin & Goodwin, 2014). Therefore, a core focus of social science research is the observation of human behaviour through using different measurement instruments, thereby quantifying it (Drost, 2011). This is done through establishing reliability and validity for the measurement.

Reliability refers to the repeatability of a test, as in similar results should be expected when a test is conducted by different people, under different conditions, on different occasions in comparison to other measurements of the same constructs (Drost, 2011). For a measurement to show internal consistency reliability, estimates of reliability focus on average inter-correlations between all singe items of the test, most commonly measured by the coefficient alpha; more popularly referred to as Cronbach's alpha (Cronbach, 1951; Drost, 2011), for which the general accepted standard is .70 and above (Krizman, 2011; MacKenzie, Podsakoff & Podsakoff, 2011; Nunnally & Bernstein, 1994; Tavakol & Dennick, 2011). If Cronbach's alpha is indicated as low, the measurement might be too short or items might not correspond with each other.

Validating these constructs are very important and needed for standardisation, especially pertaining studies in which measures are used for variables that cannot be directly observed. Before a test or instrument can be classified as being standardised, construct validity needs to be examined and shown to be present. If such a test or psychological instrument lacks construct validity, results yielded would be difficult and quite useless to interpret (Pietersen & Maree, 2010; Westen & Rosenthal, 2003; White & McBurney, 2013).

When considering construct validity, this question can be asked: "what construct is the instrument actually measuring?' (Brink, Van Der Walt & Van Rensburg, 2012: p168). In order to validate measures for these hypothetical constructs, it must be established if indicators of the focal construct accurately represents the underlying construct; if indicators show an adequate capture of the dimensional nature of the construct; whether the indicators of one construct are distinguishable

from others; and if the indicators and constructs are related to other measures of the same indicators and constructs, as well as with the theoretical framework as its foundation (Campbell & Fiske, 1959; Cronbach & Meehl, 1995; Drost, 2011; MacKenzie et al., 2011; Tavakol & Dennick, 2011), i.e. the extent to which a situation or concept is accurately represented by research findings. Construct validity entails the effectivity and sufficiency of the translation and transformation of the concept, e.g. behaviour, into an operating and functioning measure (Drost, 2011). Thus, for hypothetical constructs, construct validity can be established through a quantitative, statistical procedure examining and analysing whether the scores on the measure conforms to a certain theory (the construct is a part of), and is connected to the operational definition (Coolican, 2014; Cronbach & Meehl, 1995; Brink et al., 2012; Goodwin & Goodwin, 2014; Pietersen & Maree, 2010; Roodt, 2009; Smith, 2005; Westen & Rosenthal, 2003; White & McBurney, 2013). It refers to the degree in which the intended construct is measured, as opposed to irrelevant constructs (Welman, Kruger & Mitchell, 2005). A behavioural test will therefore be valid when it measures what the researcher claims it to measure (Goodwin & Goodwin, 2014; Welman et al., 2005; Westen & Rosenthal, 2003).

In order to establish construct validity, a combination of theory and hypothesis testing is used to demonstrate that the measure is valid. Pertaining to construct validity, theory is used to generate hypotheses, which is used to predict relationships expected to be found between measures and a series of other variables (Coolican, 2014; Goodwin & Goodwin, 2014; Ruane, 2005). During the process of examining these different measures and theories, evidence and supportive research consistently found for the same hypothesis, will gradually and in an inductive manner, increase confidence in the hypothesis, even though it will never be fully proven, but rather established as ‘very likely’ (Coolican, 2014; Goodwin & Goodwin, 2014; Smith, 2005). The emphasis however, should not be on merely recording successful correlations, but on making inferences about the meaning of these correlations (Cronbach & Meehl, 1955).

Construct validity is furthermore established through assessing content validity and convergent and discriminant validity. Content validity discerns the extent to which indicators or items tap the meaning and content of a concept or construct as it has been defined by the researcher (Drost, 2011). Straub and colleagues (2004, p. 424), further states that content validity concerns "the degree to which items in an instrument reflect the content universe to which the instrument will be generalized." Two related judgments must therefore be made in the assessment of content validity: when considering the content of the construct, are the individual items representative of the content domain?; and do the items collectively represent the whole of the construct's content domain? (MacKenzie et al., 2011).

Construct validity is supported by high correlations with other tests or measures pertaining to the same construct, with other variables it is supposed to (theoretically) correlate with (convergent validity), as well as a weak relationship or low correlation with measures of different constructs or variables with which it should differ (discriminant validity), (Campbell & Fiske, 1951; Drost, 2011; Goodwin & Goodwin, 2014; Krizman, 2011; MacKenzie et al., 2011; Nunnally & Bernstein, 1994; Roodt, 2009; Tavakol & Dennick, 2011; Welman et al., 2005; Westen & Rosenthal, 2003). Thus research showing a strong relationship between two theoretically-linked measures would strengthen the construct validity because convergent validity would have been demonstrated. On the other hand, research showing that two measurements are not related or only weakly related, would establish discriminant validity, again strengthening construct validity (Goodwin & Goodwin, 2014).

Population sample

The sample population chosen for this study will include 300 undergraduate university students, specifically from the North-West University Potchefstroom campus. The age range will thus be between 18 and 22 years, and all participants must have an adequate understanding of the English language (hence it may be their second language). Furthermore, the sample group will be made up of both female and male participants, and there will be no restriction or preference

according to race or culture. The sample population is chosen in this way as to represent a homogeneous group.

According to the Students Statistics of the NWU (2018), the current number of enrolled students totals at 68 260, of which 43 394 are contact (on-campus) students, and 54 725 are undergraduates. The undergraduate population is made up of 66.6% female students and 33.4% male students. The undergraduate population further consists of 67.2% African students, 27.2% White students, 4.7% Coloured students and a combined 0.8% of Indian and Asian students. The information provided however, does not specify whether these statistics are relevant to all NWU campuses, or just Potchefstroom campus.

Arguments have been made that the use of university students is appropriate in research studies where emphasis is placed on psychological processes or the theory tested is related to human behaviour, thus being independent of sample characteristics (Druckman & Kam, 2009; Kardes, 1996; Lucas, 2003; Peterson, 2001). According to Sherman and colleagues (as cited in Peterson, 2001), in 1999 the percentage of subject-based articles with student participants found in the *Personality and Social Psychology Bulletin*, were 86%, and 63% in the *Journal of Personality and Social Psychology*.

When assessing a study, regardless of what the nature of the participants may be, it is important to do so in light of the goal it is set out to reach; the larger research agenda to which the specific study wishes to contribute to (Druckman & Kam, 2009). When considering external validity, it does not refer to a study or research project generating the same results when performed again on a different sample. Rather, it refers in a more general sense, to relationships that are deemed conceptually equivalent found across people, times, places and operationalisations (Druckman & Kam, 2009). Particularly regarding studies focused on theory, the goal is not to parallel observed behaviours outside of the study, but to generalise findings to the specific parameters put forth, both within the theory and the current study (Banerjee & Chaudhury, 2010; Druckman & Kam, 2009; Peterson, 2001). As mentioned previously, the aim of this study is not to

generalise findings to the wider South African population, but to get an indication of whether the PID-5-BF yields similar results in terms of validity, than that obtained in other countries and settings. In most of these studies, the nature of the participants is not of great relevance, especially when efforts are put in place to ensure that the preference or motivation for using a particular population sample is in line with what is set out in theory (Druckman & Kam, 2009). Consequently, a student sample may qualify as research participants for fundamental research as well as theory testing (Bello, Leung, Radebaugh, Tung & Van Witteloostuijn, 2009; Pernice, Van der Veer, Ommundsen & Larsen, 2008).

Furthermore, university students may be seen as appropriate research samples in certain situations, especially if they are representative of a certain population of interest (Peterson & Merunka, 2014). Since the DSM-5 (APA, 2013) states that the onset age of personality disorders is generally in late adolescence to early adulthood, which is also when personality is still quite unstable (Arnett, 2000; Blonigen et al., 2008; Caspi et al., 2005; Roberts & DelVecchio, 2000; Roberts & Mroczek, 2008; Roberts, Caspi & Moffit, 2001; Roberts et al., 2006; Robins et al., 2001), university students in this study can be seen as adequate research participants, especially since the preference or motivation for using this population sample is in line with what is set out in theory (APA, 2013; Arnett, 2000; Blonigen et al., 2008; Caspi et al., 2005; Druckman & Kam, 2009; Roberts & DelVecchio, 2000; Roberts & Mroczek, 2008; Roberts et al., 2001; Roberts et al., 2006; Robins et al., 2001). In addition, student populations, or participants in early adulthood, are frequently used in validation studies, like the CAPE (e.g. Mossaheb et al., 2012); MMPI-2 (e.g. Svanum, McGrew & Ehrmann, 1994); NEO-PI (e.g. McCrae, Zonderman, Costa Jr., Bond & Paunonen, 1996); PID-5 (e.g. De Fruyt et al., 2013) to name but a few.

However, when considering using university students, especially through convenience sampling, some forms of vulnerability must be considered. Participants may be seen as vulnerable when they are not respected or valued as autonomous agents and their voluntariness to participate is in some way compromised (Mrdjenovich, 2016). A relevant form of vulnerability to this study, is

institutional vulnerability, which refers to participants subjected to authority with the risk of consent being coerced (Institutional Review Board for Social and Behavioural Sciences, 2012; Mrdjenovich, 2016). For example, a student-lecturer relationship could be considered as carrying institutional vulnerability. University students are frequently used as population samples in research studies pertaining to social and behavioural sciences. What causes concern, is the relationship between the student and researcher, as it frequently involves a lecturer known to the students. This might lead students to feel pressure or coercion to participate in the research study, furthermore inhibiting their voluntariness to participate (Institutional Review Board for Social and Behavioural Sciences, 2012; University of Utah Institutional Review Board, 2012). Another issue raised with regards to this relationship, is the possible incentive of receiving extra course credits when participating in the research study. This is also viewed as a method of coercion (UCI Office of Research, 2015; University of Utah Institutional Review Board, 2012; Mrdjenovich, 2016). This research study does not provide students with the opportunity to better their grades through participation, and the student-lecturer relationship is furthermore controlled through excluding students that receives any classes from the involved researchers, lowering both the risk of coercion and institutional vulnerability.

What is expected of researchers, is to treat vulnerable populations with respect, equitability and allowing free will, therefore excluding any inducements, coercion or prejudice (Shivayogi, 2013). In order to do so, it is important to clearly define population representatives as well as any special procedures related to the population representatives (Shivayogi, 2013). Furthermore, controlling means of data collection and obtainment of consent, could lessen this vulnerability. Making use of a third party in these instances, as well as collecting data anonymously, serves to eliminate any conflicts of interest (Institutional Review Board for Social and Behavioural Sciences, 2012; Mrdjenovich, 2016; University of Utah Institutional Review Board, 2012). Another way to lessen vulnerability, is to collect data in a general sense, thus making use of all students and not those enrolled in specific courses or courses taught by any involved researchers. This can be

achieved through making use of advertisements posted around the university, providing maximum exposure to all students (University of Utah Institutional Review Board, 2012).

Sample size is important for several reasons. Firstly, power is dependent on the sample size. Hence, a larger sample size will increase the probability of finding an effect (given that it really exists), and decrease the chance of making a Type II error (Cohen, 1962; Schweizer & Furley, 2016). Many researchers are also not aware that smaller sample sizes show a higher likelihood of producing false positives that is to yield a significant test even though the effect does not exist. Low power will negatively affect the likelihood of nominally, statistically significant findings actually reflecting true effects (Button et al., 2013).

Small sample studies have the likelihood of being affected by biasing influences, such as the researcher's degree of freedom, also known as publication bias. Since smaller samples have more variation, more variation exists that may be exploited by the researcher's degree of freedom in choosing what 'worked', and hence what to publish (Button et al., 2013; Simmons, Nelson & Simonsohn, 2011). Furthermore, small sample sizes have a greater likelihood of yielding an effect size larger than the true effect. Thus effect sizes will be biased upwards, as smaller samples will more likely be affected by chance variation. Data vary randomly, and thus effects fluctuate (Button et al., 2013; Schweizer & Furley, 2016). Within a small sample, the influence of only a few strong variations will be higher. Simultaneously, only large effects will pass the statistical significance filter (Button et al., 2013; Schweizer & Furley, 2016). Previous studies done surrounding validity and reliability of the PID-5 and PID-5-BF, had samples ranging in size from 109 to 877 (e.g. Miller et al., 2015; Fossati et al., 2017).

A sample size too small will not be adequately generalised. Statistical power analysis indicated that the sample must be made up of at least 300 students. This is a fairly large sample, and is expected prove adequate for statistical implementations.

Sampling method

The sampling method used was convenience sampling. With any research project, it would be formidable to use the entire population, but as the population, in most cases, is almost infinite, this is not always possible. This is the rationale for using sampling techniques, such as convenience sampling, for most researchers (Etikan, Musa & Alkassim, 2016). Convenience sampling can be classified as a type of non-random or non-probability sampling method. Participants selected for the study will be done so because they meet certain practical criteria, e.g. accessibility, availability, geographical proximity, or the willingness to participate (Dörnyei, 2007; Maree & Pietersen, 2010a). A student sample from within the researcher's institution, is one of the most common examples of a convenience sample (Dörnyei, 2007). Convenience sampling is a method that is affordable and easy to administer as subjects or participants are readily available. Furthermore, in most cases, the choice of sampling method usually rests in the researcher's feasibility, especially regarding time and resources (Banerjee & Chaudhury, 2010). The main assumption regarding convenience sampling, is that the population is homogeneous. That is, whether using a random sample, a cooperative sample, a nearby sample or any other sample from the target population, there should be no difference regarding the research results (Banerjee & Chaudhury, 2010; Etikan et al., 2016).

The biggest disadvantage of convenience sampling, is selection bias (Mackey & Gass, 2005). Therefore, convenience sampling should not be seen as representative of the whole population, as generalisability is limited. However, when generalisation is not intended as the objective of the study, as it is in this case, it should not be seen as a limiting factor (Banerjee & Chaudhury, 2010). The results would still be deemed valid for the specified sample, and may furthermore serve as pointer for future research. (Banerjee & Chaudhury, 2010). The necessary steps must be taken to ensure that uncertainty and bias are controlled. This can be done through assessing the sample's representativeness, to add some diversity and to use more data (Skowronek & Duerr, 2009).

In order to reduce selection bias and increase the study's usefulness, the representativeness of the sample must be controlled and assessed. The sample obtained must attempt to be a miniature version of the target population (O'Connell, 2000; Skowronek & Duerr, 2009). Diversity is also an additive of strength to convenience sampling. For example, when using a university sample, diversity might be achieved through distributing questionnaires at different places on campus or focusing on students from different departments. An attempt should also be made to be objective, as in not to make judgements regarding including participants based on demographic factors (Skowronek & Duerr, 2009). Hence the current research study attempted to select a sample representative of the specified target population, that is, undergraduate students at the North-West University Potchefstroom campus, chosen for their representativeness of young adults. In order to ensure diversity, students from various faculties (excluding those enrolled in Psych courses taught by research supervisors), were selected. Furthermore, students of both male and female gender, as well as different races were selected.

A third way to increase control over bias and uncertainty, is to collect more data, hence to use larger samples (Skowronek & Duerr, 2009). With an increase in sample size, the statistical power of a convenience sample also increases. Using a big enough sample, enhances the success of the study as it gives leeway to be able to exclude participants who might damage the homogeneity of the sample and so the validity of the findings (Farrokhi & Mahmoudi-Hamidabad, 2012). That is why deciding on ranges and criteria for the sample is important, as it serves as a guide through the selection process. It represents the rigour the researcher wishes to exert, and stipulates which participants to include or exclude from the study (Etikan et al., 2016; Farrokhi & Mahmoudi-Hamidabad, 2012). This is done to ensure transparency and factual accuracy. The sample size selected for this study was done on the basis of statistical power analysis, which indicated that the sample must be made up of at least 300 students. This sample size was expected to prove adequate for statistical implementations, especially since the aim of the study was focused on the psychometric properties of the PID-5-BF and not on generalisation of results.

Data Collection

Data was collected through the administration of self-report questionnaires. This included the PID-5-BF, comprised of 25 questions, NEO-PI-R, comprised of 240 questions, and MINI (Version 6.0) (subscale K), comprised of 15 questions.

Internal consistency and construct validity for the PID-5-BF has been established. The study done by Fossati and colleagues' (2017) findings indicated coefficients ranging from 0.59-0.83. This is in line with other studies having indicated reliability and validity for the PID-5-BF.

Psychometric properties for the NEO-PI-R has shown to be valid and reliable. The NEO-PI-R's internal consistency (Cronbach alpha) for the five factors has been indicated to be approximately 0.9, and ranges between 0.5 – 0.7 for the facets, with construct validity supported by the facets' high factor loadings on the relevant predicted and theoretical factors (Costa & McCrae, 1992; Källmén, Wennberg & Bergman, 2011; Soto & John, 2009; Terracciano et al., 2005). High correlations between the NEO-PI-R facets and other personality scales, indicates sufficient convergent and discriminate validity (Gaughan, Miller & Lynam, 2012; Källmén et al., 2011; Maples, Guan, Carter & Miller, 2014). Furthermore, the NEO-PI-R has been translated into numerous languages and administered among various cultures, age ranges and gender, with consistent psychometric results, indicating good generalisability (e.g. Allik & McCrae, 2004; Bleidorn et al., 2009; Costa, McCrae & Dye, 1991; Costa et al., 1995; Goldberg, 1990; Ispas, Iliesco, Ilie & Johnson, 2014; Källmén et al., 2011; McCrae, Kurtz, Yamagata & Terracciano, 2011; McCrae & Terracciano, 2005; Terracciano et al., 2010; Yang et al., 1999).

The Mini International Neuropsychiatric Interview (MINI) can be used to diagnose a variety of disorders, including Criterion A psychotic symptoms of Schizophrenia. The MINI was validated through a cross-sectional study using a sample of more than 600 participants (Sheehan et al., 1998). Excellent test-retest and interrater reliability, as well as good convergent validity using the CIDI and the SCID, have been established for the English and French versions of the MINI (Lecrubier et

al., 1997; Sheehan et al., 1997). Psychotic disorders obtained the following kappa values: diagnosis of current disorder (0.69), current psychotic syndrome (0.68), current psychotic symptoms (0.76), and diagnosis of lifetime disorder (0.70), lifetime psychotic syndrome (0.75), and lifetime psychotic symptoms (0.82). Furthermore, reliability (inter-rater) for the MINI was very high (0.88-1.0) and the test-retest reliability for psychotic disorder specifically was 0.90 (Lecrubier et al., 1997). Amorim and colleagues (1998) also used The CIDI to explore the concordance between the MINI and CIDI and found satisfactory Kappa values ranging from 0.65 to 0.82 (Amorim, Lecrubier, Weiller, Hergueta & Sheehan, 1998). The MINI has been translated into 43 different languages, and validity and reliability has been established for the Italian (Rossi et al., 2004), Japanese (Otsubo et al., 2005), Moroccan (Kadri et al., 2005) and Norwegian (Mordal, Gunderson & Bramness, 2010) versions.

Data Analysis

The statistical analyses were implemented in Mplus 8.1 (Muthén & Muthén, 2015). Mplus allows for the implementation of latent variable modelling in a structural equation modelling (SEM) framework. Specifically, confirmatory factor analysis (CFA) was used to establish a measurement model, i.e. to create the factor structures based on the items (Brown, 2015). SEM may be described as a combination of confirmatory factor analysis and multiple regression (Schreiber, Stage, King, Nora, & Barlow, 2006). CFA, as a form of SEM, enables the investigation of relationships between variables. The terms exogenous and endogenous are furthermore associated with SEM, and refers to independent (exogenous) and dependent (endogenous) variables (Schreiber et al., 2006). The CFA represents the pattern of the observed variables. The CFA may be used to test reliability of the observed variables, as well as examine the covariations between constructs. Furthermore, SEM allows for testing relationships between constructs and the directionality thereof (Schreiber et al., 2006). The results generated by the Mplus program are interpreted in the light of any relationships between the specific constructs measured on the different assessment tools. Strong positive relationships will therefore indicate good correlation, contributing to the validity of the PID-5-BF.

To consider the fit of the factor structure to the data, the following indices was considered: Comparative fix index (CFI), Tucker-Lewis index (TLI) and root mean square error of approximation (RMSEA). Fit is considered to be adequate when CFI and TLI values are >.90; values of >.95 are considered better. The TLI aims at correcting complexity, but is sensitive to a sample that is small in size. It might also become >1.0, which is interpreted as over-fitting, in other words more complex than is needed. The RMSEA examines the closeness of fit with a cut-off value of <.08 (Van de Schoot, Lugtig, & Hox, 2012). A value of <.5 is better. Furthermore, the RMSEA is insensitive to the size of the sample, but is sensitive to the complexity of the model.

The CFA also generates a Pearson correlation matrix to consider the relationships between the variables, specifically aspects of convergent and discriminant validity will be considered by means of correlations. Effect sizes for the correlational relationship was considered as medium for values of $r = 0.30$ up to $r = 0.49$, and large for values of $r = 0.50$ to $r = 0.84$ (Cohen, 1992). Correlations of 0.85 and above were used as the cut-off points to consider discriminant validity issues, i.e. the measurement of the same construct which confounds the measurement model (Brown, 2015). Furthermore, a test for discriminant validity is established by constraining the correlation between [the two variables of interest] to unity (1.00) and then comparing it to a model where the correlation remains unconstrained by means of a chi-square difference test. A non-significant chi-square comparison ($p \geq 0.05$) would indicate that the constrained model was a better model compared to the unconstrained model – and that discriminant validity did not exist between the two variables.

REFERENCES

Al-Dajani, N., Gralnick, T. M., & Bagby, M. (2016). A psychometric review of the Personality Inventory for DSM-5 (PID-5): Current status and future directions. *Journal of Personality Assessment, 98*, 62-81.

Allik, J., & McCrae, R. R. (2004). Toward a geography of personality traits: Patterns of profiles across 36 cultures. *Journal of Cross-Cultural Psychology, 35*, 13-28. doi:10.1177/0022022103260382.

Almagor, M., Tellegen, A., & Waller, N. G. (1995). The Big Seven model: A cross-cultural replication and further exploration of the basic dimensions of natural language trait descriptors. *Journal of Personality and Social Psychology, 69*(2), 300-307.

American Psychiatric Association (APA). (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

American Psychiatric Association (2013b). The Personality Inventory for DSM-5—Brief Form (PID-5-BF)—Adult. Retrieved from https://www.psychiatry.org/File Library/Psychiatrists/Practice/DSM/APA_DSM5_The-PersonalityInventory-For-DSM-5-Brief-Form-Adult.pdf

American Psychiatric Association. (2013c). Online assessment measures: The Personality Inventory for DSM-5–Brief Form (PID-5-BF)—Child Age 11–17. Retrieved from http://www.psychiatry.org/practice/dsm/dsm5/online-assessment-measures

American Psychiatric Association (APA). (2016). *What are personality disorders?* Retrieved from: https://www.psychiatry.org/patients-families/personality-disorders/what-are-personality-disorders

Amorim, P., Lecrubier, Y., Weiller, E., Hergueta, T., & Sheehan, D. (1998). DSM-III-R Psychotic Disorders: Procedural validity of the Mini International Neuropsychiatric Interview (MINI). Concordance and causes for discordance with the CIDI. *European Psychiatry, 13,* 26-34.

Anderson, J. L., Sellbom, M., & Salekin, R. T. (2018). Utility of the Personality Inventory for DSM-5–Brief Form (PID-5-BF) in the measurement of maladaptive personality and psychopathology. *Assessment, 25*(5), 596-607. doi:1073191116676889

Anderson, J. L., Sellbom, M., Ayearst, L., Quilty, L. C., Chmielewski, M., & Bagby, R. M. (2015). Associations between DSM-5 section III personality traits and the Minnesota Multiphasic Personality Inventory 2-Restructured Form (MMPI-2-RF) scales in a psychiatric patient sample. *Psychological Assessment, 27*(3), 801-815. doi:10.1037/pas0000096

Anderson, J. L., Sellbom, M., Bagby, R. M., Quilty, L. C., Veltri, C. O., Markon, K. E., & Krueger, R. F. (2013). On the convergence between PSY-5 domains and PID-5 domains and facets: Implications for assessment of DSM-5 personality traits. *Assessment, 20*(3), 286-294. doi:10.1177/1073191112471141

Arnett, J. (1992). Reckless behaviour in adolescence: A developmental perspective. *Developmental Review, 12*(4), 339-373.

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469-480. doi:10.1037//0003-066X.55.5.469

Ashton, M. C., Lee, K., de Vries, R. E., Hendrickse, J., & Born, M. P. (2012). The maladaptive personality traits of the Personality Inventory for DSM-5 (PID-5) in relation to the HEXACO personality factors and schizotypy/dissociation. *Journal of Personality Disorders, 26*(5), 641-659.

Austin, E. J., & Deary, I. J. (2000). The 'four As': A common framework for normal and abnormal personality? *Personality and Individual Differences, 28*, 977-995.

Bach, B., Maples-Keller, J. L., Bo, S., & Simonsen, E. (2016). The alternative DSM–5 personality disorder traits criterion: A comparative examination of three self-report forms in a Danish population. *Personality Disorders: Theory, Research, and Treatment, 7*(2), 124-135. doi:10.1037/per0000162

Bach, B., Markon, K., Simonsen, E., & Krueger, R. F. (2015). Clinical utility of the DSM-5 alternative model of personality disorders: Six cases from practice. *Journal of Psychiatric Practice, 21*, 3-25. doi:10.1097/01.pra.0000460618.02805.ef

Bagby, R. M. (2013). Introduction to special issue on the Personality Inventory for DSM-5 (PID-5). *Assessment, 20*(3), 267-268. doi:10.1177/1073191113491643

Bagby, R. M., Sellbom, M., Costa Jr, P. T., & Widiger, T. A. (2008). Predicting Diagnostic and Statistical Manual of Mental Disorders-IV personality disorders with the five-factor model of personality and the personality psychopathology five. *Personality and Mental Health, 2*(2), 55-69. doi:10.1002/pmh

Banerjee, A., & Chaudhury, S. (2010). Statistics without tears: Populations and samples. *Industrial Psychiatry Journal, 19*, 60-65. doi:10.4103/0972-6748.77642

Baumeister, R. F., & Heatherton, T. F. (1996). Self-regulation failure: An overview. *Psychological Inquiry, 7*, 1-15.

Bechara, A., Damasio, H., & Damasio, AR (2000). Emotion, decision making and the orbitofrontal cortex. *Cerebral cortex, 10* (3), 295-307.

Bello, D., Leung, K., Radebaugh, L., Tung, R. L., & Van Witteloostuijn, A. (2009). From the editors: Student samples in international business research. *Journal of International Business Studies, 40*, 361-364.

Bender, D. S., Morey, L. C., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in DSM–5, part I: A review of theory and methods. *Journal of Personality Assessment, 93*(4), 332-346. doi:10.1080/00223891.2011.583808

Ben-Porath, Y. S., & Tellegen, A. (2008). *Minnesota Multiphasic Personality Inventory-2 Restructured Form: Manual for administration, scoring, and interpretation*. Minneapolis, MN: University of Minnesota Press.

Bernstein, D. P., Iscan, C., Maser, F. (2007). Opinions of personality disorder experts regarding the DSM-IV personality disorders classification system. *Journal of Personality Disorders, 21*(5), 536-551.

Bornstein, R. F. (2011). Toward a multidimensional model of personality disorder diagnosis: Implications for DSM–5. *Journal of Personality Assessment, 93*(4), 362-369. doi:10.1080/00223891.2011.577474

Bleidorn, W. (2012). Hitting the road to adulthood: Short-term personality development during a major life transition. *Personality and Social Psychology Bulletin, 38*(12), 1594-1608. doi:10.1177/0146167212456707

Bleidorn, W., Kandler, C., & Caspi, A. (2014). The behavioural genetics of personality development in adulthood – Classic, contemporary, and future trends. *European Journal of Personality, 28*(3), 244-255. doi:10.1002/per.1957

Bleidorn, W., Kandler, C., Riemann, R., Angleitner, A., & Spinath, F. M. (2009). Patterns and sources of adult personality development: Growth curve analyses of the NEO-PI-R scales in a longitudinal twin study. *Journal of Personality and Social Psychology, 97*, 142-155. doi:10.1037/a0015434

Bleidorn, W., Kandler, C., Hülsheger, U. R., Riemann, R., Angleitner, A., & Spinath, F. M. (2010). Nature and nurture of the interplay between personality traits and major life goals. *Journal of Personality and Social Psychology, 99*(2), 366-379. doi:10.1037/a0019982

Bleidorn, W., Klimstra, T. A., Denissen, J. J., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2013). Personality maturation around the world: A cross-cultural examination of social-investment theory. *Psychological Science*, *24*(12), 2530-2540. doi:10.1177/0956797613498396

Blonigen, D. M., Carlson, M. D., Hicks, B. M., Krueger, R. F., & Iacono, W. G. (2008). Stability and change in personality traits from late adolescence to early adulthood: A longitudinal twin study. *Journal of Personality*, *76*(2), 229-266. doi:10.1111/j.1467-6494.2007.00485.x

Briley, D. A., & Tucker-Drob, E. M. (2014). Genetic and environmental continuity in personality development: A meta-analysis. *Psychological Bulletin*, *140*(5), 1303. doi:10.1037/a0037091

Brink, H., Van Der Walt, C., & Van Rensburg, G. (2012). *Fundamentals of research methodology for healthcare professions* (3rd ed.). Cape Town: Juta.

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). New York: Guilford Press.

Button, K. S., Ioannidis, J. P. A., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S. J., & Monafó, M. R. (2013). Power failure: why small sample sizes undermine the reliability of neuroscience. *Nature Reviews Neuroscience, 14*, 365-376. doi:10.1038/nrn3475

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, *56*(2), 81-105.

Cardinal, R. N., Parkinson, J. A., Hall, J., & Everitt, B. J. (2002). Emotion and motivation: the role of the amygdala, ventral striatum, and prefrontal cortex. *Neuroscience & Biobehavioural Reviews*, *26*(3), 321-352.

Casey, B. J., Getz, S., & Galvan, A. (2008). The adolescent brain. *Developmental Review, 28*, 62-77. doi:10.1016/j.dr.2007.08.003

Casey, B. J., Galvan, A., & Hare, T. A. (2005). Changes in cerebral functional organization during cognitive development. *Current Opinion in Neurobiology*, *15*(2), 239-244. doi:10.1016/j.conb.2005.03.012

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: stability and change. *Annual Review of Psychology, 56,* 453-484. doi:10.1146/annurev.psych.55.090902.141913

Christensen, M. V., & Kessing, L. V. (2006). Do personality traits predict first onset in depressive and bipolar disorder? *Nordic Journal of Psychiatry, 60*(2), 79-88. doi:10.1080/08039480600600300

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*(3), 309-319.

Clark, L. A., Kochanska, G., & Ready, R. (2000). Mothers' personality and its interaction with child temperament as predictors of parenting behaviour. *Journal of Personality and Social Psychology, 79*(2), 274-285. doi:10.1037//0022-3514.79.2.274

Clarkin, J. F., Meehan, K. B., & Lenzenweger, M. F. (2015). Emerging approaches to the conceptualization and treatment of personality disorder. *Canadian Psychology, 56*(2), 155-167.

Clarkin, J. F., Lenzenweger, M. F., Yeomans, F., Levy, K. N., & Kernberg, O. F. (2007). An object relations model of borderline pathology. *Journal of Personality Disorders, 21*(5), 474-499. doi:10.1521/pedi.2007.21.5.474

Cohen, J. (1962). The statistical power of abnormal-social psychological research: a review. *The Journal of Abnormal and Social Psychology, 65*(3), 145-153.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Collins, W.A., Maccoby, E.E., Steinberg, L., Hetherington, E.M., & Bornstein, M.H. (2000). Contemporary research on parenting: The case for nature and nurture. *American Psychologist, 55*(2): 218-232. doi:10.1037//0003-066X.55.2.218

Conway, C., Hammen, C., & Brennan, P. (2012). A comparison of latent class, latent trait, and factor mixture models of DSM-IV borderline personality criteria in a community setting:

Implications for DSM-5. *Journal of Personality Disorders, 26,* 793-803. doi:10.1521/pedi.2012.26.5.793

Coolican, H. (2014). *Research methods and statistics in psychology* (6th ed.). London: Psychology Press.

Corker, K. S., Oswald, F. L., & Donnellan, M. B. (2012). Conscientiousness in the classroom: A process explanation. *Journal of Personality, 80*, 995-1028. doi:10.1111/j.1467-6494.2011.00750.x

Costa, P.T., & McCrae, R.R. (2006). Age changes in personality and their origins: Comment on Roberts, Walton, and Viechtbauer (2006). *Psychological Bulletin, 132*:26-28. doi: 10.1037/0033-2909.132.1.26

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual.* Odessa, FL: Psychological Assessment Resources.

Costa Jr, P. T., McCrae, R. R., & Dye, D. A. (1991). Facet scales for agreeableness and conscientiousness: A revision of the NEO Personality Inventory. *Personality and individual Differences*, *12*(9), 887-898. doi:10.1016/0191-8869(91)90177-D

Costa, P. T. Jr., McCrae, R. R., Kay, G.G. (1995). Persons, places and personality: Career assessment using the Revised NEO Personality Inventory. *Journal of Career Assessment, 3*(2), 123-139. doi:10.1177/106907279500300202

Crego, C., Gore, W. L., Rojas, S. L., & Widiger, T. A. (2015). The discriminant (and convergent) validity of the Personality Inventory for DSM–5. *Personality Disorders: Theory, Research, and Treatment*, *6*(4), 321-335.

Creswell, J. C. (2014). *Research design. Qualitative, quantitative & mixed method approaches* (4th ed.). United Kingdom: SAGE Publications.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297-334.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin, 52,* 281-302.

Dahl, R. E. (2004). Adolescent brain development: a period of vulnerabilities and opportunities. Keynote address. *Annals of the New York Academy of Sciences, 1021*, 1-22. doi:10.1196/annals.1308.001

De Clercq, B., De Fruyt, F., Van Leeuwen, K., & Mervielde, I. (2006). The structure of maladaptive personality traits in childhood: a step toward an integrative developmental perspective for DSM-V. *Journal of Abnormal Psychology*, *115*(4), 639-657. doi:10.1037/0021-843X.115.4.639

De Fruyt, F., Bartels, M., Van Leeuwen, K. G., De Clercq, B., Decuyper, M., & Mervielde, I. (2006). Five types of personality continuity in childhood and adolescence. *Journal of Personality and Social Psychology*, *91*(3), 538-552. doi:10.1037/0022-3514.91.3.538

De Fruyt, F., De Clercq, B., De Bolle, M., Wille, B., Markon, K., & Krueger, R. F. (2013). General and maladaptive traits in a five-factor framework for DSM-5 in a university student sample. *Assessment*, *20*(3), 295-307. doi:10.1177/1073191113475808

De Hooge, I. E., Breugelmans, S. M., & Zeelenberg, M. (2008). Not so ugly after all: when shame acts as a commitment device. *Journal of personality and social psychology*, *95*(4), 933-943. doi:10.1037/a0011991

Delgado, M. R. (2007). Reward-related responses in the human striatum. *Annals of the New York Academy of Sciences, 1104,* 70-88. doi:10.1196/annals.1390.002

Dennis, JM. (2010). Summary of Knowledge Panel Design. Retrieved from: http://www.knowledgenetworks.com/knpanel/docs/KnowledgePanel%28R%29-Design-SummaryDescription.pdf

Denissen, J. J. A., Asendorpf, J. B., & van Aken, M. A. G. (2008). Childhood personality predicts long-term trajectories of shyness and aggressiveness in the context of demographic

transitions in emerging adulthood. *Journal of Personality, 76,* 67-100. doi:10.1111/j.1467-6494.3007.00480.x

Denissen, J. A., Van Aken, M. G., Penke, L., & Wood, D. (2014). Self-regulation underlies temperament and personality: An integrative developmental framework. *Child Development Perspectives, 7*(4), 255-260.

Department of Health. (2012). *Policy Guidelines on 72-hour Assessment of Involuntary Mental Health Care Users.* ISBN: 978-1-920031-73-2.

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology, 41,* 417-440.

Donnellan, M. B., & Lucas, R. E. (2008). Age differences in the Big Five across the life span: evidence from two national samples. *Psychology and Aging, 23*(3), 558-566. doi:10.1037/a0012897

Dörnyei, Z. (2007). *Research methods in applied linguistics.* New York: Oxford University Press.

Drost, E. A. (2011). Validity and reliability in social science research. *Education Research and Perspectives, 3,* 105-124.

Druckman, J. N., Kam, C. D. (2009). Students as experimental participants: A defence of the "narrow data base". *Institute for Policy Research,* WP-09-05.

Eaton, N. R., South, S. C., & Krueger, R. F. (2009). The Cognitive–Affective Processing System (CAPS) approach to personality and the concept of personality disorder: Integrating clinical and social-cognitive research. *Journal of Research in Personality, 43*(2), 208-217. doi:10.1016/j.jrp.2009.01.016

Eaton, N., Krueger, R. F., South, C., Simms, L. J., & Clark, L. A. (2011). Contrasting prototypes and dimensions in the classification of personality pathology: Evidence that dimensions, but not prototypes, are robust. *Psychological Medicine, 41,* 1151-1163. doi:10.1017/S0033291710001650

Eshel, N., Nelson, E. E., Blair, R. J., Pine, D. S., & Ernst, M. (2007). Neural substrates of choice selection in adults and adolescents: development of the ventrolateral prefrontal and anterior cingulate cortices. *Neuropsychologia, 45*(6), 1270-1279. doi:10.1016/j.neuropsychologia.2006.10.004

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*, 1-4. doi:10.11648/j.ajtas.20160501.11

Eysenck, H. J. (1990). Genetic and environmental contributions to individual differences: The three major dimensions of personality. *Journal of Personality*, *58*, 245-261.

Farmer, R. F. (2000). Issues in the assessment and conceptualization of personality disorders. *Clinical Psychology Review, 20*(7), 823-851.

Farrokhi, F., & Mahmoudi-Hamidabad, A. (2012). Rethinking convenience sampling: Defining quality criteria. *Theory and Practice in Language Studies, 2*(4), 784-792. doi:10.4304/tpls.2.4.647-656

Few, L. R., Miller, J. D., Rothbaum, A. O., Meller, S., Maples, J., Terry, D. P., ... & MacKillop, J. (2013). Examination of the Section III DSM-5 diagnostic system for personality disorders in an outpatient clinical sample. *Journal of abnormal psychology*, *122*(4), 1057-1069. doi:10.1037/a0034878

Finn, J. A., Arbisi, P. A., Erbes, C. R., Polusny, M. A., & Thuras, P. (2014). The MMPI–2 restructured form personality psychopathology five scales: Bridging DSM–5 section 2 personality disorders and DSM–5 section 3 personality trait dimensions. *Journal of Personality Assessment*, *96*(2), 173-184. doi:10.1080/00223891.2013.866569

First, M. B., & Westen, D. (2007). Classification for clinical practice: How to make ICD and DSM better able to serve clinicians. *International Review of Psychiatry*, *19*(5), 473-481. doi:10.1080/09540260701563429

Fossati, A., Krueger, R. F., Markon, K. E., Borroni, S., & Maffei, C. (2013). Reliability and validity of the Personality Inventory for DSM-5 (PID-5) predicting DSM-IV personality disorders and psychopathy in community-dwelling Italian adults. *Assessment, 20*(6), 689-708. doi:10.1177/1073191113504984

Fossati, A., Somma, A., Borroni, S., Markon, K. E., & Krueger, R. F. (2017). The Personality Inventory for DSM-5 Brief Form: evidence for reliability and construct validity in a sample of community-dwelling Italian adolescents. *Assessment, 24*(5), 615-631. doi:10.1177/1073191115621793

Foxcroft, C., & Roodt, G. (2009). An overview of assessment: definition and scope. In C. Foxcroft & G. Roodt (Eds.). *Introduction to Psychological Assessment in the South African Context* (pp. 3-8). Cape Town: Oxford University Press.

Foxcroft, C., Paterson, H., Le Roux, N., & Herbst, D. (2004). Psychological assessment in South Africa: A needs analysis: The test usage patterns and needs of psychological assessment practitioners: Final report. July.

Fraley, R. C., & Roberts, B. W. (2005). Patterns of continuity: A dynamic model for conceptualising the stability of individual differences in psychological constructs across the life course. *Psychological Review, 112*, 60-74. doi:10.1037/0033- 295X.112.1.60

Furnham, A., Milner, R., Akhtar, R., & De Fruyt, F. (2014). A review of the measures designed to assess DSM-5 personality disorders. *Psychology, 5*(14), 1646-1686.

Gabbard, G. O. (2005). Mind, brain, and personality disorders. *American Journal of Psychiatry, 162*(4), 648-655.

Galvan, A., Hare, T., Voss, H., Glover, G., & Casey, B. J. (2007). Risk-taking and the adolescent brain: who is at risk? *Developmental Science, 10*(2), 8-14. doi:10.1111/j.1467-7687.2006.00579.x

Galvan, A., Hare, T. A., Parra, C. E., Penn, J., Voss, H., Glover, G., & Casey, B. J. (2006). Earlier development of the accumbens relative to orbitofrontal cortex might underlie risk-taking

behavior in adolescents. *Journal of Neuroscience, 26*(25), 6885-6892. doi:10.1523/JNEUROSCI.1062-06.2006

Ganiban, J. M., Saudino, K. J., Ulbricht, J., Neiderhiser, J. M., & Reiss, D. (2008). Stability and change in temperament during adolescence. *Journal of Personality and Social Psychology, 95*, 222-236. doi:10.1037/0022-3514.95.1.222

Gaughan, E. T., Miller, J. D., & Lynam, D. R. (2012). Examining the utility of general models of personality in the study of psychopathy: A comparison of the HEXACO-PI-R and NEO-PI-R. *Journal of Personality Disorders, 26*, 513-523. doi:10.1521/pedi.2012.26.4.513

Giedd, J. N., Blumenthal, J., Jeffries, N. O., Castellanos, F. X., Liu, H., Zijdenbos, A., ... & Rapoport, J. L. (1999). Brain development during childhood and adolescence: a longitudinal MRI study. *Nature neuroscience, 2*(10), 861-863.

Goldberg, L. R. (1990). An alternative "description of personality": The big-five factor structure. *Journal of Personality and Social Psychology, 59*(6), 1216-1229.

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. G. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality*, *40*, 84-96. doi:10.1016/j.jrp.2005.08.007

Goodwin, C. J., & Goodwin, K. A. (2014). *Research in psychology. Methods and design* (7th ed.). Singapore: Wiley.

Gore, W. L., & Widiger, T. A. (2013). The DSM-5 dimensional trait model and five-factor models of general personality. *Journal of abnormal psychology*, *122*(3), 816-821. doi:10.1037/a0032822

Gratz, K. L., Rosenthal, M. Z., Tull, M. T., Lejuez, C. W., & Gunderson, J. G. (2006). An experimental investigation of emotion dysregulation in borderline personality disorder. *Journal of Abnormal Psychology*, *115*(4), 850-855. doi:10.1037/0021-843X.115.4.850

Gravetter, F. J., & Forzano, L. B. (2016). *Research methods for the behavioural sciences.* USA: Cengage Learning.

Griffin, S. A., & Samuel, D. B. (2014). A closer look at the lower-order structure of the Personality Inventory for DSM-5: Comparison with the Five-Factor Model. *Personality Disorders: Theory, Research, and Treatment, 5*(4), 406-413. doi:10.1037/per0000074

Gunderson, J. G., & Lyons-Ruth, K. (2008). BPD's interpersonal hypersensitivity phenotype: A gene-environment-developmental model. *Journal of Personality Disorders, 22,* 22-41. doi:10.1521/pedi.2008.22.1.22

Hallquist, M. N., & Wright, A. G. C. (2014). Mixture modelling methods for the assessment of normal and abnormal personality, Part I: Cross-sectional models. *Journal of Personality Assessment, 96,* 256-268. doi:10.1080/00223891.2013.845201

Harden, K. P., & Tucker-Drob, E. M. (2011). Individual differences in the development of sensation seeking and impulsivity during adolescence: Further evidence for a dual-systems model. *Developmental Psychology, 47*(3), 739-746. doi:10.1037/a0023279

Hare, T. A., Tottenham, N., Galvan, A., Voss, H. U., Glover, G. H., & Casey, B. J. (2008). Biological substrates of emotional reactivity and regulation in adolescence during an emotional go-nogo task. *Biological Psychiatry, 63*(10), 927-934. doi:10.1016/j.biopsych.2008.03.015015

Harkness, A. R., & McNulty, J. L. (1994). The personality psychopathology five (PSY-5): Issue from the pages of a diagnostic manual instead of a dictionary. In S. Strack & M. Lorr (Eds.), *Differentiating normal and abnormal personality* (pp. 291-315). New York, NY: Springer.

Helson, R., Kwan, V. S., John, O. P., & Jones, C. (2002). The growing evidence for personality change in adulthood: Findings from research with personality inventories. *Journal of Research in Personality, 36*(4), 287-306.

Hengartner, M. P., Müller, M., Rodgers, S., Rössler, W., & Ajdacic-Gross, V. (2014). Interpersonal functioning deficits in association with DSM-IV personality disorder dimensions. *Social Psychiatry and Psychiatric Epidemiology, 49*(2), 317-325. doi:10.1007/s00127-013-0707-x

Hennecke, M., Bleidorn, W., Denissen, J. A. J., & Wood, D. (2014). A three-part framework for self-regulated personality development across adulthood. *European Journal of Personality, 28*, 289-299. doi:10.1002/per.1945

Hill, P. L., & Roberts, B. W. (2010). Propositions for the study of moral personality development. *Current Directions in Psychological Science, 19*(6), 380-383. doi:10.1177/0963721410389168

Hogan, R., & Roberts, B. W. (2004). A socioanalytic model of maturity. *Journal of Career Assessment, 12*(2), 207-217. doi:10.1177/1069072703255882

Hopwood, C. J., & Sellbom, M. (2013). Implications of DSM-5 personality traits for forensic psychology. *Psychological Injury and Law*, *6*(4), 314-323. doi:10.1007/s12207-013-9176-5

Hopwood, C. J., Wright, A. G., Ansell, E. B., & Pincus, A. L. (2013). The interpersonal core of personality pathology. *Journal of Personality Disorders*, *27*(3), 270-295. doi:10.1521/pedi.2013.27.3.270

Hopwood, C. J., Thomas, K. M., Markon, K. E., Wright, A. G., & Krueger, R. F. (2012). DSM-5 personality traits and DSM–IV personality disorders. *Journal of Abnormal Psychology*, *121*(2), 424-432. doi:10.1037/a0026656

Hopwood, C. J., Donnellan, M. B., Blonigen, D. M., Krueger, R. F., McGue, M., Iacono, W. G., & Burt, S. A. (2011). Genetic and environmental influences on personality trait stability and growth during the transition to adulthood: A three-wave longitudinal study. *Journal of Personality and Social Psychology, 100*(3), 545-556. doi:10.1037/a0022409

HPCSA. (2016). HPCSA. A snapshot review. *The Bulletin,* 56-57.

Hutteman, R., Hennecke, M. Orth, U., Reitz, A. K., & Specht, J. (2014). Developmental tasks as a framework to study personality development in adulthood to old age. *European Journal of Personality, 28,* 267-278. doi:10.1002/per.1959

Hyman, S. E. (2010). The diagnosis of mental disorders: the problem of reification. *Annual Review of Clinical Psychology*, *6,* 155-179. doi:10.1146/annurev.clinpsy.3.022806.091532

Institute for Work & Health, Toronto (2015). *What researchers mean by cross-sectional vs longitudinal studies.* At Work, Issue 81. Retrieved from: https://www.iwh.on.ca/wrmb/cross-sectional-vs-longitudinal-studies

Institutional Review Board for Social and Behavioural Sciences. (2012). *Students as participants*. University of Virginia. Retrieved from http://www.virginia.edu/vpr/irb/sbs/resources_guide_participants_vuln_coerce_students.htm

Ispas, D., Iliesco, D., Ilie, A., & Johnson, R. E. (2014). Exploring the cross-cultural generalizability of the five-factor model of personality: The Romanian NEO-PI-R. *Journal of Cross-Cultural Psychology, 45*(7), 1074-1088. doi:10.1177/0022022114534769

Jackson, J. J., Hill, P. L., Payne, B. R., Roberts, B. W., & Stine-Morrow, E. A. (2012). Can an old dog learn (and want to experience) new tricks? Cognitive training increases openness to experience in older adults. *Psychology and Aging*, *27*(2), 286-292. doi:10.1037/a0025918

Jackson, J. J., Wood, D., Bogg, T., Walton, K. E., Harms, P. D., & Roberts, B. W. (2010). What do conscientious people do? Development and validation of the behavioural indicators of conscientiousness (BIC). *Journal of Research in Personality, 44*(4), 501-511. doi:10.1016/j.jrp.2010.06.005

Johnson, W., Hicks, B. M., McGue, M., & Iacono, W. G. (2007). Most of the girls are alright, but some aren't: Personality trajectory groups from ages 14 to 24 and some associations with outcomes. *Journal of Personality and Social Psychology, 93*(2), 266-284. doi:10.1037/0022-3514.93.2.266

Johnson, J. G., Cohen, P., Kasen, S., Skodol, A. E., Hamagami, F., & Brook, J. S. (2000). Age-related change in personality disorder trait levels between early adolescence and adulthood: a community-based longitudinal investigation. *Acta Psychiatrica Scandinavica*, *102*(4), 265-275.

Josefsson, K., Jokela, M., Cloninger, C. R., Hintsanen, M., Salo, J., Hintsa, T ... & Keltikangas-Järvinen, L. (2013). Maturity and change in personality: developmental trends of temperament and character in adulthood. *Development and Psychopathology*, *25*(3), 713-727. doi:10.1017/S0954579413000126

Kadri, N., Agoub, M., El Gnaoui, S., Alami, K. M., Hergueta, T., & Moussaoui, D. (2005). Moroccan colloquial Arabic version of the Mini-International Neuropsychiatric Interview (MINI): Qualitative and quantitative validation. *European Psychiatry, 20,* 193-195. doi:10.1016/j.eurpsy.2004.11.007

Källmén, H., Wennberg, P., & Bergman, H. (2011). Psychometric properties and norm data of the Swedish version of the NEO-PI-R. *Nordic Journal of Psychiatry, 65*(5), 311-314. doi:10.3109/08039488.2010.545433

Kanacri, B. P. L., Pastorelli, C., Eisenberg, N., Zuffianò, A., Castellani, V., & Caprara, G. V. (2014). Trajectories of prosocial behaviour from adolescence to early adulthood: associations with personality change. *Journal of Adolescence, 37*(5), 701-713.

Kandler, C. (2012). Nature and nurture in personality development: The case of neuroticism and extraversion. *Current Directions in Psychological Science*, *21*(5), 290-296. doi:10.1177/0963721412452557

Kandler, C., Bleidorn, W., Riemann, R., Spinath, F. M., Thiel, W., & Angleitner, A. (2010). Sources of cumulative continuity in personality: A longitudinal multiple-rater twin study. *Journal of Personality and Social Psychology, 98*(6), 995-1008. doi:10.1037/a0019558

Kandler, C., Zimmermann, J., & McAdams, D. P. (2014). Core and surface characteristics for the description and theory of personality differences and development. *European Journal of Personality, 28*(3), 231-243. doi:10.1002/per .1952

Kendler, K. S., Aggen, S. H., Knudsen, G. P., Røysamb, E., Neale, M. C., & Reichborn-Kjennerud, T. (2011). The structure of genetic and environmental risk factors for syndromal and subsyndromal common DSM-IV axis I and all axis II disorders. *American Journal of Psychiatry*, *168*, 29-39.

Kim, Y. R., & Tyrer, P. (2010). Controversies Surrounding Classification of Personality Disorder. *Psychiatry Investigation*, *7*, 1-8. doi:10.4306/pi.2010.7.1.1

Klimstra, T. A., Hale, W.W., III., Raaijmakers, Q. A. W., Branje, S. J. T., & Meeus, W. H. J. (2009). Maturation of personality in adolescence. *Journal of Personality and Social Psychology, 96*(4), 898-912. doi:10.1037/a0014746

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "Big" personality traits to anxiety, depressive and substance use disorders: A meta-analysis. *Psychological Bulletin, 136*(5), 768-821. doi:10.1037/a0020327

Krizman, A. (2011). Methodolgy in research: how to assure reliability and validity of constructions in logistics research. *Transport Problems*, *6*, 51-58.

Krueger, R. F. (2013). Personality disorders are the vanguard of the post-DSM-5.0 era. *Personality Disorders: Theory, Research, and Treatment*, *4*(4), 355-362. doi:10.1037/per0000045

Krueger, R. F., & Eaton, N. R. (2010). Personality traits and the classification of mental disorders: Toward a more complete integration in DSM–5 and an empirical model of psychopathology. *Personality Disorders: Theory, Research, and Treatment*, *1*(2), 97-118. doi:10.1037/a0018990

Krueger, R. F., & Markon, K. E. (2014). The role of the DSM-5 personality trait model in moving toward a quantitative and empirically based approach to classifying personality and

pathology. *The Annual Review of Clinical Psychology, 10,* 477-501. doi:10.1146/annurev-clinpsy-032813-153732

Krueger, R. F., Hopwood, C. J., Wright, A. G., & Markon, K. E. (2014). DSM-5 and the path toward empirically based and clinically useful conceptualization of personality and psychopathology. *Clinical Psychology: Science and Practice, 21*(3), 245-261. doi:10.1111/cpsp.12073

Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, *42*(9), 1879-1890. doi:10.1017/S0033291711002674

Krueger, R. F., Skodol, A. E., Livesley, W. J., Shrout, P. E., & Huang, Y. (2007). Synthesizing dimensional and categorical approaches to personality disorders: refining the research agenda for DSM-V Axis II. *International Journal of Methods in Psychiatric Research*, *16*(S1), S65-S73. doi:10.1002/mpr.212

Krueger, R. F., Eaton, N. R., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2011). Personality in DSM–5: Helping delineate personality disorder content and framing the metastructure. *Journal of Personality Assessment, 93*(4), 325-331. doi:10.1080/00223891.2011.577478

Kuhn, D. (2006). Do cognitive changes accompany developments in the adolescent brain? *Perspectives on Psychological Science, 1,* 59-67. doi:10.1111/j.1745-6924.2006.t01-2-.x

Kumar, S. (2007). Burnout in psychiatrists. *World Psychiatry, 6,* 186-189.

Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist, 64*(4), 241-256. doi:10.1037/a0015309

Lawrence Neuman, W. (2014). *Social research methods: Qualitative and quantitative approaches.* USA: Pearson.

Lecrubier, Y., Sheehan, D. V., Weiller, E., Amorim, P., Bonora, I., Harnett Sheehan, K. H., … Dunbar, G. C. (1997). The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry, 12*(5), 224-231.

LeDoux, J. E. (2000). Emotion circuits in the brain. *Annual review of neuroscience, 23*, 155-184.

Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO Personality Inventory. *Multivariate Behavioural Research, 39*, 329 –358.

Lehnart, J., Neyer, F. J., & Eccles, J. (2010). Long-term effects of social investment: The case of partnering in young adulthood. *Journal of Personality, 78*(2), 639-670. doi:10.1111/j.1467-6494.2010.00629.x

Leichsenring, F., Leibing, E., Kruse, J., New, A. S., & Leweke, F. (2011). Borderline personality disorder. *Lancet, 377*, 74-84.

Lenzenweger, M. F., & Willett, J. B. (2007). Predicting individual change in personality disorder features by simultaneous individual change in personality dimensions linked to neurobehavioral systems: The longitudinal study of personality disorders. *Journal of Abnormal Psychology, 116*(4), 684-700. doi:10.1037/0021-843X.116.4.684

Lenzenweger, M. F., Johnson, M. D., & Willett, J. B. (2004). Individual Growth Curve Analysis Illuminates Stability and Change in Personality Disorder Features: The Longitudinal Study of Personality Disorders. *Archives of General Psychiatry, 61*(10), 1015-1024.

Lenzenweger, M. F., Lane, M. C., Loranger, A. W., & Kessler, R. C. (2007). DSM–IV personality disorders in the National Comorbidity Study replication. *Biological Psychiatry, 62*, 553-564. doi:10.1016/j.biopsych.2006.09.019

Leshem, R., & Glicksohn, J. (2007). The construct of impulsivity revisited. *Personality and Individual Differences, 43*(4), 681-691. doi:10.1016/j.paid.2007.01.015

Littlefield, A. K., Sher, K. J., & Steinley, D. (2010). Developmental trajectories of impulsivity and their association with alcohol use and related outcomes during emerging and young

adulthood. *Alcoholism: Clinical and Experimental Research*, *34*(8), 1409-1416. doi:10.1111/j.1530-0277.2010.01224.x

Livesley, W. J. (1998). Suggestions for a framework for an empirically based classification of personality disorder. *The Canadian Journal of Psychiatry*, *43*(2), 137-147.

Livesley, W. J. (2012). Disorder in the proposed DSM-5 classification of personality disorders. *Clinical Psychology and Psychotherapy*, *19*(5), 364-368. doi:10.1002/cpp.1808

Lodi-Smith, J., & Roberts, B. W. (2007). Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review, 11*, 68-86. doi:10.1177/1088868306294590

Lowe, J. R., & Widiger, T. A. (2009). Clinicians' judgments of clinical utility: a comparison of the DSM-IV with dimensional models of general personality. *Journal of Personality Disorders, 23*(3), 211-229. doi:10.1037/0021- 843X.115.2.298

Lucas, J. W. (2003). Theory-testing, generalisation, and the problem of external validity. *Sociological Theory, 21,* 236-253.

Ludtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down University Avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology*, *101*(3), 620-637. doi:10.1037/a0023743

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly*, *35*(2), 293-334.

Mackey, A., & Gass, S. (2005). *Second language research: Methodology and design.* New Jersey: Lawrence Erlbaum Associates, Inc.

Mann, C. J. (2003). Observational research methods. Research design II: Cohort, cross-sectional, and case-control studies. *Emergency Medical Journal, 20,* 54-60.

Maples, J. L., Guan, L., Carter, N. T., & Miller, J. D. (2014). A test of the international personality item pool representation of the revised NEO Personality Inventory and development of a

120-item IPIP-based measure of the fife-factor model. *Psychological Assessment, 26*(4), 1070-1084.

Maree, K., & Pietersen, J. (2010a). Sampling. In K. Maree (Ed.), *First steps in research* (pp. 171-181). Pretoria: Van Schaik Publishers.

Maree, K., & Pietersen, J. (2010b). The quantitative research process. In K. Maree (Ed.), *First steps in research* (pp. 144-153). Pretoria: Van Schaik Publishers.

Markon, K. E. (2010). Modelling psychopathology structure: A symptom-level analysis of Axis I and II disorders. *Psychological Medicine*, *40*(2), 273-288. doi:10.1017/S0033291709990183

Markon, K. E., Krueger, R. F., & Watson, D. (2005). Delineating the structure of normal and abnormal personality: an integrative hierarchical approach. *Journal of Personality and Social Psychology, 88*, 139-157.

McCrae, R. R., & Terracciano, A. (2005). Universal features of personality traits from the observer's perspective: Data from 50 cultures. *Journal of Personality and Social Psychology, 88*(3), 547-582. doi:10.1037/0022-3514.88.3.547

McCrae, R. R., Kurtz, J. E., Yamagata, S., & Terracciano, A. (2011). Internal consistency, retest reliability, and their implications for personality scale validity. *Personality and Social Psychology Review, 15*, 28-50. doi:10.1177/1088868310366253

McCrae, R. R., Zonderman, A. B., Costa Jr, P. T., Bond, M. H., & Paunonen, S. V. (1996). Evaluating replicability of factors in the Revised NEO Personality Inventory: Confirmatory factor analysis versus Procrustes rotation. *Journal of Personality and Social Psychology, 70*(3), 552-566. doi:10.1037/0022- 3514.70.3.552

McCrae, R. R., Costa, P. T., Jr., Terracciano, A., Parker, W. D., Mills, C. J., De Fruyt, F., & Mervielde, I. (2002). Personality trait development from age 12 to age 18: Longitudinal, cross-sectional and cross-cultural analyses. *Journal of Personality and Social Psychology, 83*(6), 1456 -1468. doi:10.1037//0022-3514.83.6.1456

McCrae, R. R., Costa Jr, P. T., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M. D ... & Saunders, P. R. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology, 78*, 173-186. doi:10.1037//0022-3514.78.1.173

Miller, E. K., & Cohen, J. D. (2001). An integrative theory of prefrontal cortex function. *Annual Review of Neuroscience, 24*, 167-202.

Miller, J. D., Few, L. R., Lynam, D. R., & MacKillop, J. (2015). Pathological personality traits can capture DSM-IV personality disorder types. *Personality Disorders: Theory, Research and Treatment, 6*, 32-40. doi:10.1037/per0000064

Mischel, W., & Shoda, Y. (2008). Toward a unified theory of personality: Integrating dispositions and processing dynamics within the cognitive-affective processing system. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and Research* (3rd ed., pp. 208-241). New York: Guilford Press.

Mordal, J., Gundersen, Ø., & Bramness, J. G. (2010). Norwegian version of the Mini-International Neuropsychiatric Interview: feasibility, acceptability and test-retest reliability in an acute psychiatric ward. *European Psychiatry, 25*(3), 172-177. doi:10.1016/j.eurpsy.2009.02.004

Morey, L. C., & Skodol, A. E. (2013). Convergence between DSM-IV-TR and DSM-5 diagnostic models for personality disorder: Evaluation of strategies for establishing diagnostic thresholds. *Journal of Psychiatric Practice, 19*(3), 179-193. doi:10.1097/01.pra.0000430502.78833.06

Morey, L. C., Krueger, R. F., & Skodol, A. E. (2013). The hierarchical structure of clinician ratings of proposed DSM–5 pathological personality traits. *Journal of Abnormal Psychology, 122*(3), 836-841. doi:10.1037/a0034003

Morey, L. C., Skodol, A. E., & Oldham, J. M. (2014). Clinician judgments of clinical utility: A comparison of DSM-IV-TR personality disorders and the alternative model for DSM-5

personality disorders. *Journal of Abnormal Psychology*, *123*(2), 398-405. doi:10.1037/a0036481

Morey, L. C., Benson, K. T., Busch, A. J., & Skodol, A. E. (2015). Personality disorders in DSM-5: Emerging research on the alternative model. *Current Psychiatry Reports*, *17*(4), 24-33. doi:10.1007/s11920-015-0558-0

Morey, L. C., Berghuis, H., Bender, D. S., Verheul, R., Krueger, R. F., & Skodol, A. E. (2011). Toward a model for assessing level of personality functioning in DSM–5, Part II: Empirical articulation of a core dimension of personality pathology. *Journal of Personality Assessment*, *93*(4), 347-353. doi:10.1080/00223891.2011.577853

Mossaheb, N., Becker, J., Schaefer, M. R., Klier, C. M., Schloegelhofer, M., Papageorgiou, K., & Amminger, G. P. (2012). The Community Assessment of Psychic Experience (CAPE) questionnaire as a screening-instrument in the detection of individuals at ultra-high risk for psychosis. *Schizophrenia Research*, *141*(2), 210-214.

Mrdjenovich, A. (2016). *Protection of vulnerable populations in research*. Retrieved from http://research-compliance.umich.edu/sites/default/files/resource-download/protection_of_vulnerable_populations_in_research.pdf

Muthén, L. K., & Muthén, B. O. (2015). *Mplus User's Guide* (7th ed.). Los Angeles: Muthén & Muthén.

Nestadt, G., Costa Jr, P. T., Hsu, F. C., Samuels, J., Bienvenu, O. J., & Eaton, W. W. (2008). The relationship between the five-factor model and latent Diagnostic and Statistical Manual of Mental Disorders, personality disorder dimensions. *Comprehensive Psychiatry*, *49*, 98-105.

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-relationship transaction in young adulthood. *Journal of Personality and Social Psychology, 81*(6), 1190-1204. doi:10.1037/0022-3514.81.6.1190

Neyer, F. J., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across young adulthood. *Journal of Personality, 75*, 535-568.

Noftle, E. E., & Shaver, P. R. (2006). Attachment dimensions and the Big Five personality traits: Associations and comparative ability to predict relationship quality. *Journal of Research in Personality, 40,* 179-208. doi:10.1016/j.jrp.2004.11.003

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory (McGraw-Hill Series in Psychology)* (Vol. 3). New York: McGraw-Hill.

Ochsner, K. N., & Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences, 9*(5), 242-249. doi:10.1016/j.tics.2005.03.010

O'Connell, A. A. (2000). Sampling for evaluation. Issues and strategies for community-based HIV-prevention programmes. *Evaluation and the Health Professions, 23*(2), 212-234. doi:10.1177/016327870002300206

Otsubo, T., Tanaka, K., Koda, R., Shinoda, J., Sano, N., Tanaka, S., … Kamijima, K. (2005). Reliability and validity of Japanese version of the Mini International Psychiatric Interview. *Psychiatry and Clinical Neurosciences, 59,* 517-526.

Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology, 57,* 401-421. doi:10.1146/annurev.psych.57.102904.190127

Paris, J. (2007). Why psychiatrists are reluctant to diagnose: borderline personality disorder. *Psychiatry (Edgmont), 4,* 35-39.

Parker, P. D., Lüdtke, O., Trautwein, U., & Roberts, B. W. (2012). Personality and relationship quality during the transition from high school to early adulthood. *Journal of Personality, 80*(4), 1061-1089. doi:10.1111/j.1467-6494.2012.00766.x

Parker, G., Hadzi-Pavlovic, D., Both, L., Kumar, S., Wilhelm, K., & Olley, A. (2004). Measuring disordered personality functioning: To love and to work reprised. *Acta Psychiatrica Scandinavica, 110*(3), 230-239.

Pernice, R. E., Van der Veer, K., Ommundsen, R., & Larsen, K. (2008). On use of student samples for scale construction. *Psychological Reports, 102,* 459-464. doi:10.2466/PR0.102.2.459-464

Peterson, R. A. (2001). On the use of college students in Social Science research: Insights from a second-order meta-analysis. *Journal of Consumer Research, 28,* 450-461.

Peterson, R. A., & Merunka, D. R. (2008). Convenience samples of college students and research reproducibility. *Journal of Business Research, 67,* 1035-1041.

Pharo, H., Sim, C., Graham, M., Gross, J., & Hayne, H. (2011). Risky business: Executive function, personality, and reckless behaviour during adolescence and emerging adulthood. *Behavioural Neuroscience, 125*(6), 970-978. doi:10.1037/a0025768

Piedmont, R. L., Sherman, M. F., Sherman, N. C., Dy-Liacco, G. S., & Williams, J. E. (2009). Using the five-factor model to identify a new personality disorder domain: The case for experiential permeability. *Journal of Personality and Social Psychology, 96*(6), 1245-1258. doi:10.1037/a0015368

Pietersen, J., & Maree, K. (2010). Standardisation of a questionnaire. In K. Maree (Ed.), *First Steps in Research* (pp. 214-223). Pretoria: Van Schaik Publishers.

Pincus, A. L. (2005). A contemporary integrative interpersonal theory of personality disorders. In M. F. Lenzenweger & J. F. Clarkin (Eds.), Major theories of personality disorder (2nd ed., pp. 282-331). New York: Guilford Press.

Prinzie, P., Stams, G. J. J., Deković, M., Reijntjes, A. H., & Belsky, J. (2009). The relations between parents' Big Five personality factors and parenting: A meta-analytic review. *Journal of Personality and Social Psychology, 97*(2), 351-362. doi:10.1037/a0015823

Quilty, L. C., Ayearst, L., Chmielewski, M., Pollock, B. G., & Bagby, R. M. (2013). The psychometric properties of the Personality Inventory for DSM-5 in an APA DSM-5 field trial sample. *Assessment, 20*(3), 362-369. doi:10.1177/1073191113486183

Reitz, A. K., Zimmermann, J., Hutteman, R., Specht, J., & Neyer, F. J. (2014). How peers make a difference: The role of peer groups and peer relationships in personality development. *European Journal of Personality, 28,* 279-288. doi:10.1002/per.1965

Roberts, B. W., & Bogg, T. (2004). A longitudinal study of the relationships between conscientiousness and the social-environmental factors and substance-use behaviours that influence health. *Journal of Personality, 72*(2), 325-354.

Roberts, B. W., & Davis, J. P. (2016). Young adulthood is the crucible of personality development. *Emerging Adulthood, 4*(5), 318-326. doi:10.1177/2167696816653052

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin, 126*, 3-25. doi:10.1037//0033-2909.126.1.3

Roberts, B. W., & Jackson, J. J. (2008). Sociogenomic personality psychology. *Journal of Personality, 76*(6), 1523-1544. doi:10.1111/j.1467-6494.2008.00530.x

Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science, 17*, 31-35. doi:10.1111/j.1467-8721.2008.00543.x

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2001). The kids are alright: growth and stability in personality development from adolescence to adulthood. *Journal of Personality and Social Psychology, 81*(4), 670-683. doi:10.1037/0022-3514.84.3.582

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology, 84*(3), 582-593.

Roberts, B. W., O'Donnell, M., & Robins, R. W. (2004). Goal and personality trait development in emerging adulthood. *Journal of Personality and Social Psychology, 87*(4), 541-550. doi:10.1037/0022-3514.87.4.541

Roberts, B. W., Walton, K., & Viechtbauer, W. (2006). Patterns of mean-level change in personality change across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin, 132*, 1-25. doi:10.1037/0033-2909.132.1.1

Roberts, B. W., Wood, D., & Smith, J. L. (2005). Evaluating five factor theory and social investment perspectives on personality trait development. *Journal of Research in Personality, 39*, 166-184. doi:10.1016/j.jrp.2004.08.002

Roberts, B. W., Walton, K., Bogg, T., & Caspi, A. (2006b). De-investment in work and non-normative personality trait change in young adulthood. *European Journal of Personality, 20,* 461-474. doi:10.1002/per.607

Robins, R. W., Fraley, R. C., Roberts, B. W., & Trzesniewski, K. H. (2001). A longitudinal study of personality change in young adulthood. *Journal of Personality, 69,* 617-640.

Romer, D. (2010). Adolescent risk taking, impulsivity, and brain development: Implications for prevention. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology, 52*(3), 263-276. doi:10.1002/dev.20442

Roodt, G. (2009). Validity: Basic concepts and measures. In C. Foxcroft & G. Roodt (Eds.), *Introduction to Psychological Assessment in the South African Context* (3rd ed., pp. 55-64). South Africa: Oxford University Press.

Rossi, A., Alberio, R., Porta, A., Sandri, M., Tansella, M., & Amaddeo, F. (2004). The reliability of the Mini International Neuropsychiatric Interview – Italian version. *Journal of Clinical Psychopharmacology, 24,* 561-563. doi:10.1097/01.jcp.0000139758.03834.ad

Ruane, J.M. (2005). *Essentials of research methods. A guide to social science research*. United States of America: Blackwell Publishing.

Ryder, A. G., Bagby, R. M., & Schuller, D. R. (2002). The overlap of depressive personality disorder and dysthymia: a categorical problem with a dimensional solution. *Harvard Review of Psychiatry, 10*(6), 337-352.

Samuel, D. B., & Widiger, T. A. (2008). A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: A facet level analysis. *Clinical Psychology Review, 28*(8), 1326-1342. doi:10.1016/j.cpr.2008.07.002

Samuel, D. B., Hopwood, C. J., Krueger, R. F., Thomas, K. M., & Ruggero, C. J. (2013). Comparing methods for scoring personality disorder types using maladaptive traits in DSM-5. *Assessment, 20*(3), 353-361. doi:10.1177/1073191113486182

Samuel, D. B., Hopwood, C. J., Ansell, E. B., Morey, L. C., Sanislow, C. A., Markowitz, J. C., ... & Grilo, C. M. (2011). Comparing the temporal stability of self-report and interview assessed personality disorder. *Journal of Abnormal Psychology, 120*(3), 670-680. doi:10.1037/a0022647

Schofield, T. J., Conger, R. D., Donnellan, M. B., Jochem, R., Widaman, K. F., & Conger, K. J. (2012). Parent personality and positive parenting as predictors of positive adolescent personality development over time. *Merrill-Palmer quarterly (Wayne State University. Press), 58*(2), 255-283. doi:10.1353/mpq.2012.0008

Schoeneleber, M. & Berenbaum, H. (2011). Shame regulation in personality pathology. *Journal of Abnormal Psychology, 121*(2), 433-447. doi:10.1037/a0025281

Schreiber, J. B., Stage, F. K., King, J., Nora, A., & Barlow, E. A. (2006). Reporting structural equation modelling and confirmatory analysis results: A review. *The Journal of Educational Research, 99*(6), 323-337.

Schultz, W., Dayan, P., & Montague, P. R. (1997). A neural substrate of prediction and reward. *Science, 275*, 1593-1599.

Schweizer, G., & Furley, P. (2016). Reproducible research in sport and exercise psychology: The role of sample sizes. *Psychology of Sport and Exercise, 23*, 114-122.

Scollon, C. N., & Diener, E. (2006). Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology, 91*(6), 1152-1165. doi:10.1037/0022-3514.91.6.1152

Sellbom, M., Sansone, R. A., Songer, D. A., & Anderson, J. L. (2014). Convergence between DSM-5 Section II and Section III diagnostic criteria for borderline personality disorder. *Australian & New Zealand Journal of Psychiatry, 48*(4), 325-332. doi:10.1177/0004867413511997

Shea, M. T., Stout, R., Gunderson, J., Morey, L. C., Grilo, C. M., McGlashan, T., ... & Keller, M. B. (2002). Short-term diagnostic stability of schizotypal, borderline, avoidant, and

obsessive-compulsive personality disorders. *American Journal of Psychiatry, 159*(12), 2036-2041.

Shedler, J., & Westen, D. (2004). Dimensions of personality pathology: an alternative to the five-factor model. *American Journal of Psychiatry, 161*(10), 1743-1754.

Sheehan, D. V., Lecrubier, Y., Sheehan K. H., Amorim, P., Janavs, J., Weiller, E., … Dunbar, G. C. (1988). The Mini-International Neuropsychiatric Interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry, 59*(20), 22-33.

Shiner, R., & Caspi, A. (2003). Personality differences in childhood and adolescence: Measurement, development, and consequences. *Journal of Child Psychology and Psychiatry, 44*, 2-32. doi:10.1111/1469- 7610.00101

Shiner, R. L., Masten, A. S., & Tellegen, A. (2002). A developmental perspective on personality in emerging adulthood: Childhood antecedents and concurrent adaptation. *Journal of Personality and Social Psychology, 83*(5), 1165-1177. doi:10.1037//0022-3514.83.5.1165

Shivayogi, P. (2013). Vulnerable population and methods for their safeguard. *Perspectives in Clinical Research, 4*, 53-57. doi:10.4103/2229-3485.106389

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science, 22*(11), 1359-1366. doi:10.1177/0956797611417632

Skodol, A. E., Siever, L. J., Livesley, W. J., Gunderson, J. G., Pfohl, B., & Widiger, T. A. (2002). The borderline diagnosis II: biology, genetics, and clinical course. *Biological Psychiatry, 51*(12), 951-963.

Skowronek, D., & Duerr, L. (2009). The convenience of non-probability. Survey strategies for small academic libraries. *College and Research Libraries News, 70*(7), 412-415.

Smith, G. T. (2005). On construct validity: Issues of method and measurement. *Psychological Assessment, 17*(4), 396-408. doi:10.1037/1040-3590.17.4.396

Somerville, L. H., Jones, R. M., & Casey, B. J. (2010). A time of change: behavioral and neural correlates of adolescent sensitivity to appetitive and aversive environmental cues. *Brain and Cognition, 72,* 124-133. doi:10.1016/j.bandc.2009.07.003

Soto, C. J., & John, O. P. (2009). Ten facet scales for the Big-Five Inventory: Convergence with NEO-PI-R facets, self-peer agreement, and discriminant validity. *Journal of Research in Psychology, 43,* 84-90. doi:10.1016/j.jrp.2008.10.002

Soto, C. J., & John, O. P. (2014). Traits in transition: The structure of parent-reported personality traits from early childhood to early adulthood. *Journal of Personality, 82*(3), 182-199. doi:10.1111/jopy.12044

Soto, C. J., & Tackett, J. L. (2015). Personality traits in childhood and adolescence: Structure, development and outcomes. *Current Directions in Psychological Science, 24*(5), 358-362. doi:10.1177/0963721415589345

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2008). The developmental psychometrics of Big Five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology, 94*(4), 718-737. doi:10.1037/0022-3514.94.4.718

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology, 100*(2), 330-348. doi:10.1037/a0021717

Sowell, E. R., Thompson, P. M., Holmes, C. J., Jernigan, T. L., & Toga, A. W. (1999). In vivo evidence for post-adolescent brain maturation in frontal and striatal regions. *Nature Neuroscience, 2*(10), 859-861. doi:10.1038/13154

Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the big five. *Journal of Personality and Social Psychology, 101,* 862-882.

Srivastava, S., John, O. P., Gosling, S. D., & Potter, J. (2003). Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology, 84*(5), 1041-1053. doi:10.1037/0022-3514.84.5.1041

Stanford, M. S., Greve, K. W., Boudreaux, J. K., Mathias, C. W., & Brumbelow, J. L. (1996). Impulsiveness and risk-taking behavior: Comparison of high-school and college students using the Barratt Impulsiveness Scale. *Personality and Individual Differences*, *21*(6), 1073-1075.

Statistics South Africa. (2015). *Mid-year population estimates.* Statistical release, P0302. Retrieved from: https://www.statssa.gov.za/publications/P0302/P03022015.pdf

Statistics South Africa. (2016). *Economic Growth.* Retrieved from: http://www.statssa.gov.za/?page_id=735&id=1

Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review, 28,* 78-106. doi:10.1016/j.dr.2007.08.002

Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology*, *52*(3), 216-224. doi:10.1002/dev.20445

Steinberg, L., Albert, D., Cauffman, E., Banich, M., Graham, S., & Woolard, J. (2008). Age differences in sensation seeking and impulsivity as indexed by behavior and self-report: evidence for a dual systems model. *Developmental Psychology*, *44*(6), 1764-1778. doi:10.1037/a0012955

Stepp, S. D., Yu, L., Miller, J. D., Hallquist, M. N., Trull, T. J., & Pilkonis, P. A. (2012). Integrating competing dimensional models of personality: Linking the SNAP, TCI, and NEO using item response theory. *Personality Disorders: Theory, Research, and Treatment, 3,* 107-126. doi:10.1037/a0025905

Stewart, P., Lips, T., Lakaski, C., & Upshall, P. (2002). A report on mental illnesses in Canada. *Centre for Chronic Disease Prevention and Control. Ottawa, Ontario*. ISBN H39-643/2002E.

Strickland, C. M., Drislane, L. E., Lucy, M., Krueger, R. F., & Patrick, C. J. (2013). Characterizing psychopathy using DSM-5 personality traits. *Assessment, 20*(3), 327-338. doi:10.1177/1073191113486691

Suzuki, T., Samuel, D. B., Pahlen, S., & Krueger, R. F. (2015). DSM-5 alternative personality disorder model traits as maladaptive extreme variants of the Five Factor Model: An item-response theory analysis. *Journal of Abnormal Psychology, 124*(2), 343-354.

Sutin, A. R., Costa, P. T., Miech, R., & Eaton, W. W. (2009). Personality and career success: Concurrent and longitudinal relations. *European Journal of Personality*, *23*(2), 71-84. doi:10.1002/per.704

Svanum, S., McGrew, J., & Ehrmann, L. (1994). Validity of the substance abuse scales of the MMPI-2 in a college student sample. *Journal of Personality Assessment, 62*(3), 427-439.

Swann, W. B. (1987). Identity negotiation: Where two roads meet. *Journal of Personality and Social Psychology, 53*(6), 1038-1051.

Tackett, J. L., Krueger, R. F., Iacono, W. G., & McGue, M. (2008). Personality in middle childhood: A hierarchical structure and longitudinal connections with personality in late adolescence. *Journal of Research in Personality, 42*(6), 1456-1462. doi:10.1016/j.jrp.2008.06.005

Tackett, J. L., Kushner, S. C., Herzhoff, K., Smack, A. J., & Reardon, K. W. (2014). Viewing relational aggression through multiple lenses: Temperament, personality, and personality pathology. *Development and Psychopathology*, *26*(3), 863-877. doi:10.1017/S0954579414000443

Tackett, J. L., Slobodskaya, H. R., Mar, R. A., Deal, J., Halverson, C. F., Baker, S. R., . . . Besevegis, E. (2012). The hierarchical structure of childhood personality in five countries: Continuity from early childhood to early adolescence. *Journal of Personality, 80*(4), 847-879. doi:10.1017/S0954579414000443

Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt, and embarrassment distinct emotions? *Journal of Personality and Social Psychology, 70*(6), 1256-1269.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53-55. doi:10.5116/ijme.4dfb.8dfd

Terracciano, A., Costa, P. T., & McCrae, R. R. (2006). Personality plasticity after age 30. *Personality and Social Psychology Bulletin, 32*(8), 999-1009. doi:10.1177/0146167206288599

Terracciano, A., McCrae, R. R., Brant, L. J., & Costa, P. T. (2005). Hierarchical linear modelling analyses of NEO-PI-R scales in the Baltimore Longitudinal Study of Aging. *Psychology and Aging, 20*(3), 493-506. doi:10.1037/0882-7974.20.3.493

Terracciano, A., Sanna, S., Uda, M., Deiana, B., Usala, G., Busonero, F., … & Distel, M. A. (2010). Genome-wide association scan for five major dimensions of personality. *Molecular Psychiatry, 15*(6), 647-656. doi:10.1038/mp.2008.113

The NWU student statistics. (2018). *Student headcount enrolments & graduates*. Retrieved from http://143.160.39.37/PowerHEDA/Dashboard.aspx

Thomas, K. M., Yalch, M. M., Krueger, R. F., Wright, A. G., Markon, K. E., & Hopwood, C. J. (2013). The convergent structure of DSM-5 personality trait facets and five-factor model trait domains. *Assessment, 20*(3), 308-311. doi:10.1177/1073191112457589

Thompson, R. J., & Berenbaum, H. (2006). Shame reactions to everyday dilemmas are associated with depressive disorder. *Cognitive Therapy and Research, 30*(4), 415-425.doiI10.1007/s10608-006-9056-3

Torgersen, S., Czajkowski, N., Jacobson, K., Reichborn-Kjennerud, T., Røysamb, E., Neale, M. C., & Kendler, K. S. (2008). Dimensional representations of DSM-IV cluster B personality disorders in a population-based sample of Norwegian twins: a multivariate study. *Psychological Medicine, 38*(11), 1617-1625. doi:10.1017/S0033291708002924

Trull, T. J., & Durrett, C. A. (2005). Categorical and dimensional models of personality disorder. *Annual Review of Clinical Psychology*, *1*, 355-380. doi:10.1146/annurev.clinpsy.1.102803.144009

Trull, T. J., Jahng, S., Tomko, R. L., Wood, P. K., & Sher, K. J. (2010). Revised NESARC personality disorder diagnoses: gender, prevalence, and comorbidity with substance dependence disorders. *Journal of Personality Disorders*, *24*(4), 412-426. doi:10.1521/pedi.2010.24.4.412

UCI Office of Research. (2015). *Vulnerable Subject populations*. University of California. Retrieved from http://www.research.uci.edu/compliance/human-research-protections/researchers/vulnerable-subject-populations.html#IRB

University of Utah Institutional Review Board. (2012). *Research conducted in post-secondary schools.* Investigator Guidance Series. Version 102912. Retrieved from https://irb.utah.edu/_pdf/IGS-research-conducted-post-secondary-schools.pdf

Van den Akker, A. L., Deković, M., Asscher, J., & Prinzie, P. (2014). Mean-level personality development across childhood and adolescence: A temporary defiance of the maturity principle and bidirectional associations with parenting. *Journal of Personality and Social Psychology, 107*(4), 736-751.

Van Kampen, D. (2012). The 5-Dimensional Personality Test (5DPT): Relationships with two lexically based instruments and the validation of the Absorption scale. *Journal of Personality Assessment, 94,* 92-101. doi:10.1080/00223891.2011.627966

Vecchione, M., Alessandri, G., Barbaranelli, C., & Caprara, G. (2012). Gender differences in the big-five personality development: A longitudinal investigation from late adolescence to emerging adulthood. *Personality and Individual Differences, 53,* 740-746.

Verheul, R. (2005). Clinical utility of dimensional models for personality pathology. *Journal of Personality Disorders, 19*(3), 283-302. doi:10.1521/pedi.2005.19.3.283

Wagner, S., Baskaya, Ö., Dahmen, N., Lieb, K., & Tadić, A. (2010). Modulatory role of the brain-derived neurotrophic factor Val66Met polymorphism on the effects of serious life events on impulsive aggression in borderline personality disorder. *Genes, Brain and Behaviour*, *9*, 97-102.

Walters, G. D., & Ruscio, J. (2013). Trajectories of youthful antisocial behaviour: Categories or continua? *Journal of Abnormal Child Psychology, 41,* 653-666. doi:10.1007/s10802-012-9700-1

Warner, M. B., Morey, L. C., Finch, J. F., Gunderson, J. G., Skodol, A. E., Sanislow, C. A., ... & Grilo, C. M. (2005). The longitudinal relationship of personality traits and disorders. *Focus, 113*(3), 217-477. doi:10.1037/0021-843X.113.2.217

Watson, D., Clark, L. A., & Chmielewski, M. (2008). Structures of personality and their relevance to psychopathology: II. Further articulation of a comprehensive unified trait structure. *Journal of Personality*, *76*(6), 1545-1586. doi:10.1111/j.1467-6494.2008.00531.x

Watson, D., Stasik, S. M., Ro, E., & Clark, L. A. (2013). Integrating normal and pathological personality: Relating the DSM-5 trait-dimensional model to general traits of personality. *Assessment*, *20*(3), 312-326. doi:10.1177/1073191113485810

Watson, D., O'hara, M. W., Simms, L. J., Kotov, R., Chmielewski, M., McDade-Montez, E. A., ... & Stuart, S. (2007). Development and validation of the Inventory of Depression and Anxiety Symptoms (IDAS). *Psychological Assessment*, *19*(3), 253-268. doi:10.1037/1040-3590.19.3.253

Welman, C., Kruger, F., & Mitchell, B. (2005). *Research methodology* (3rd ed.). Cape Town: Oxford University Press.

Westen, D., & Arkowitz-Westen, L. (1998). Limitations of Axis II in diagnosing personality pathology in clinical practice. *American Journal of Psychiatry*, *155*(12), 1767-1771.

Westen, D., & Rosenthal, R. (2003). Quantifying construct validity: Two simple measures. *Journal of Personality and Social Psychology*, *84*(3), 608-618. doi:10.1037/0022-3514.84.3.608

Whelton, W. J., & Greenberg, L. S. (2005). Emotion in self-criticism. *Personality and Individual Differences*, *38*(7), 1583-1595. doi:10.1016/j.paid.2004.09.024

White, T. L., & McBurney, D. H. (2013). *Research methods* (9th ed.). USA: Wadsworth.

Widiger, T. A. (2011). Personality and psychopathology. *World Psychiatry, 10*(2), 103-106.

Widiger, T. A., & Costa Jr, P. T. (1994). Personality and personality disorders. *Journal of Abnormal Psychology*, *103*, 78-91.

Widiger, T. A., & Samuel, D. B. (2005). Evidence-based assessment of personality disorders. *Psychological Assessment*, *17*(3), 278-287. doi:10.1037/1040-3590.17.3.278

Widiger, T. A., & Simonsen, E. (2005). Alternative dimensional models of personality disorder: Finding a common ground. *Journal of Personality Disorders, 19*(2), 110-130.

Widiger, T. A., & Trull, T. J. (2007). Plate tectonics in the classification of personality disorder: shifting to a dimensional model. *American Psychologist*, *62*(2), 71-83. doi:10.1037/0003-066X.62.2.71

Widiger, T. A., Livesley, W. J., & Clark, L. A. (2009). An integrative dimensional classification of personality disorder. *Psychological Assessment*, *21*(3), 243-255. doi:10.1037/a0016606

Widiger, T. A., Simonsen, E., Krueger, R., Livesley, W. J., & Verheul, R. (2005). Personality disorder research agenda for the DSM–V. *Journal of Personality Disorders*, *19*(3), 315-338.

Wille, B., & De Fruyt, F. (2014). Vocations as a source of identity: Reciprocal relations between Big Five personality traits and RIASEC characteristics over 15 years. *Journal of Applied Psychology, 99*(2), 262-281. doi:10.1037/a0034917

Wright, A. G., & Simms, L. J. (2014). On the structure of personality disorder traits: Conjoint analyses of the CAT-PD, PID-5, and NEO-PI-3 trait models. *Personality Disorders: Theory, Research, and Treatment*, *5*, 43-54. doi:10.1037/per0000037

Wright, A. G., Pincus, A. L., & Lenzenweger, M. F. (2010). Modeling stability and change in borderline personality disorder symptoms using the Revised Interpersonal Adjective Scales–

Big Five (IASR–B5). *Journal of Personality Assessment*, *92*(6), 501-513. doi:10.1080/00223891.2010.513288

Wright, A. G. C., Pincus, A. L., & Lezenweger, M. F. (2011). Development of personality and the remission and onset of personality pathology. *Journal of Personality and Social Psychology, 101*(6), 1351-1358. doi:10.1037/a0025557

Wright, A. G., Thomas, K. M., Hopwood, C. J., Markon, K. E., Pincus, A. L., & Krueger, R. F. (2012). The hierarchical structure of DSM-5 pathological personality traits. *Journal of Abnormal Psychology, 121*(4), 951-957. doi:10.1037/a0027669

Wright, A. G., Calabrese, W. R., Rudick, M. M., Yam, W. H., Zelazny, K., Williams, T. F., ... & Simms, L. J. (2015). Stability of the DSM-5 Section III pathological personality traits and their longitudinal associations with psychosocial functioning in personality disordered individuals. *Journal of Abnormal Psychology*, *124*, 199-207. doi:10.1037/abn0000018

Yalch, M. M., & Hopwood, C. J. (2016). Convergent, discriminant, and criterion validity of DSM–5 traits. *Personality Disorders: Theory, Research, and Treatment, 7*(4), 394-415.

Yam, W. H., & Simms, L. J. (2014). Comparing criterion-and trait-based personality disorder diagnoses in DSM-5. *Journal of Abnormal Psychology*, *123*(4), 802-808.

Yang, J., McCrae, R. R., Costa, P. T., Jr, Dai, X., Yao, S., Cai, T., & Gao, B. (1999). Cross-cultural personality assessment in psychiatric populations: The NEO-PI-R in the People's Republic of China. *Psychological Assessment, 11*(3), 359-368.

Zanarini, M. C., Frankenburg, F. R., Hennen, J., & Silk, K. R. (2003). The longitudinal course of borderline psychopathology: 6-year prospective follow-up of the phenomenology of borderline personality disorder. *American Journal of Psychiatry*, *160*(2), 274-283.

Zimmermann, J., Böhnke, J. R., Eschstruth, R., Mathews, A., Wenzel, K., & Leising, D. (2015). The latent structure of personality functioning: Investigating criterion A from the alternative model for personality disorders in DSM–5. *Journal of Abnormal Psychology*, *124*(3), 532-548.

Zuckerman, M., & Kuhlman, D. M. (2000). Personality and risk-taking: common bisocial factors. *Journal of Personality*, *68*(6), 999-1029.

Zuckerman, M., Kuhlman, D. M., Joireman, J., Teta, P., & Kraft, M. (1993). A comparison of three structural models for personality: The Big Three, the Big Five, and the Alternative Five. *Journal of Personality and Social Psychology*, *65*(4), 757-768. doi:10.1037/0022-3514.65.4.757

CHAPTER 2

ARTICLE

Psychometric properties of the Personality Inventory for DSM-5 Brief Form in an undergraduate sample of South African university students

Abstract

Assessments are regularly used amongst clinicians within Psychology, yet many are deemed too time-consuming and expensive. The Personality Inventory for DSM-5 Brief Form (PID-5-BF) was developed to measure maladaptive personality traits (*Negative Affect, Detachment, Antagonism, Disinhibition, and Psychoticism*), based on the "hybrid model" for personality disorders included in the DSM 5 Section III. Literature indicates that reliability and validity for the PID-5-BF has been established in other countries. We explored these psychometric properties within a South African population using the NEO Personality Inventory Revised and MINI Subscale K: Psychotic disorders and mood disorder with psychotic features, as measures for comparison. Our results indicated support for the PID-5-BF with sufficient reliability, convergent and discriminant validity. More research is needed on the PID-5-BF, especially in South Africa, but our findings indicate it to be a promising assessment tool that could greatly benefit clinicians in the mental health sector.

Key words

Personality disorder; PID-5-BF; NEO-PI-R; Construct validity; Convergent validity; Discriminant validity

Introduction

Psychometric assessments are important tools within the psychology field to aid in the formulation of diagnoses enabling the application of effective treatment. These assessments need to be of high quality and standardised within a South African context in order to yield valid and reliable results (Foxcroft, Paterson, Le Roux & Herbst, 2004; Foxcroft & Roodt, 2009).

A survey regarding psychometric tests in South Africa expressed urgency for tests to specifically diagnose personality disorders and pathology. This survey also indicated concern that tests are too time-consuming and expensive (Foxcroft et al., 2004). Considering the rushed manner of modern-day life, and the decline of South Africa's economic growth (Statistics South Africa, 2016), psychopathology is a problem not currently dissipating (Fearon et al., 2017; Kliewer et al., 2017; Shulman & Scharf, 2018), and it can surely be assumed that the findings of Foxcroft and colleagues (2004) are still valid. Therefore, the Personality Inventory for DSM-5 Brief Form (PID-5-BF) could greatly benefit South Africa's mental health sector in providing a measure that is not only cost-free, but quick to administer and in line with contemporary views of personality pathology as described by the DSM-5.

Personality, within the field of Psychology, is a central and indispensable concept, as it contributes to the clinical presentations and general functioning of clients or patients (McWilliams, 2011; Montag & Panksepp, 2017; Roberts & Davis, 2016). Personality may be described as relatively stable, enduring patterns of thinking, feeling and acting that differentiates one individual from another (Briley & Tucker-Drob, 2014; Kandler 2012). Characteristics or traits, influenced by the individual's life experiences, his or her environment and genetics (Bleidorn, Kandler & Caspi, 2014; Briley & Tucker-Drob, 2014), are internalised to guide his or her behaviour in consistent ways (Roberts & Davis, 2016). Research has indicated that most personality traits may be understood from the Five-Factor Model (FFM) of personality, comprised of five basic dimensions, namely extraversion, neuroticism, openness, conscientiousness, and agreeableness (e.g., Kandler, Zimmermann & McAdams, 2014).

It is furthermore imperative to understand the manner in which personality may become pathological. This is important for both adequate assessment and intervention (Krueger et al., 2011; Krueger, Hopwood, Wright & Markon, 2014). Research indicates that personality disorders are influenced by both biological factors, that is, impairments and malfunctions of the brain (Clarkin, Meehan & Lenzenweger, 2015; Pharo, Sim, Graham, Gross & Hayne, 2011; Romer, 2010); trauma and psychosocial factors, including emotion-dysregulation, negative self-beliefs, and rigidity of interpersonal behaviours and styles (Clarkin et al., 2015; Hopwood, Wright, Ansell & Pincus, 2013; Krueger, 2013).

In response to various limitations presented by the Diagnostic and Statistical Manual of Mental Disorders (DSM) categorical model of personality disorders (i.e., poor validity of assessments; lack of clinical utility, and high comorbidity between personality disorders), a more dimensional and empirically-based approach, the "hybrid model", was developed and included in the DSM-5 Section III (APA, 2013; Clarkin et al., 2015; Krueger et al., 2014). Personality disorders, in Section II of the DSM-5, are defined as enduring patterns of inner experiences and behaviour deviating significantly from individual cultural expectations, seen through how individuals think about themselves and others; their emotional responses; way of relating to others; and how they control their own behaviour (APA, 2013). Furthermore, personality disorders are inflexible, pervasive, and generally stable; peaking during adolescence/early adulthood, and causing impairment and distress (APA, 2013). The hybrid model (Section III) defines personality disorders similarly but places more focus on the impairment of personality functioning (Criterion A), as well as pathological personality traits (Criterion B), (APA, 2013; Miller, Few, Lynam & MacKillop, 2015; Suzuki, Samuel, Pahlen & Krueger, 2015).

In the operationalisation of the hybrid model, Krueger and colleagues (2012), developed an instrument (Personality Inventory for DSM-5/PID-5) for the measurement of Criterion B, that is, maladaptive personality traits. In addition, a brief form was developed focusing on five trait domains, namely negative affectivity, detachment, antagonism, disinhibition, and psychoticism

(APA, 2013b). The easy accessibility of the PID-5-BF and routine utility thereof could potentially allow for earlier detection of personality pathology. It should, however, be noted that the PID-5-BF is not designed to diagnose personality disorders or measure impairment in Criterion A core functions, but rather aims to recognise elevation of the maladaptive trait dimensions to indicate whether there is a need for further assessment (Fossati, Somma, Borroni, Markon & Krueger, 2017).

Literature surrounding the DSM-5 hybrid model and PID-5/PID-5-BF has expanded substantially since its development and have indicated reliability and validity, as well as internal consistency (Al-Dajani, Gralnick & Bagby, 2016; Anderson, Sellbom & Salekin, 2018; Bach, Maples-Keller, Bo & Simonsen, 2016; Fossati et al., 2017). Research furthermore indicates support for the DSM-5 hybrid model in comparison to other evidence-based systems of personality and pathology, and that it aligns in a theoretically acceptable manner (Gore & Widiger, 2013; Thomas et al, 2013). However, research on the PID-5-BF has not yet been done in South Africa.

Methodology

The approach of this study was quantitative, and a cross-sectional research design was used. The aim of the study was to explore the psychometric properties of the PID-5-BF within a South African context. The objectives were to examine the construct validity, as well as convergent and discriminant validity of the measuring instrument as compared to similar constructs of the NEO Personality Inventory Revised (NEO-PI-R) and the Mini International Neuropsychiatric Interview's (MINI) Subscale K: Psychotic disorders and mood disorder with psychotic features.

We hypothesised that construct validity and reliability for the PID-5-BF will be present in a South African sample when compared with conceptually similar measures and coefficients found in other studies. We further hypothesised that, based on research, *Negative Affect* would correlate positively with *Neuroticism*; *Detachment* negatively with *Extraversion*; *Antagonism* negatively with *Agreeableness*; and *Disinhibition* negatively with *Conscientiousness* (Gore & Widiger, 2013;

Krueger et al., 2011; Thomas et al., 2013). Although a significant positive relationship between *Psychoticism* and *Openness* has not yet been empirically proven, it was still hypothesised that there would be some correlation found between the scales. To better investigate construct validity for *Psychoticism*, it was measured against the MINI Subscale K.

Participants

The sample included 283 undergraduate university students from the North-West University Potchefstroom campus. The age range fell between 18 and 22 years, and all participants had an adequate understanding of English. Furthermore, the sample group was made up of both female (77.7%) and male (21.6%) participants, and no restriction or preference according to race or culture was made.

Table 1: Sample distribution (*n* = 283)

Age	**18**	**19**	**20**	**21**	**22**	
	9.5%	17.3%	21.1%	30.7%	20.8%	
Gender	**Male**	**Female**				
	21.6%	77.7%				
Race	**African**	**Caucasian**	**Coloured**	**Indian/Asian**		
	17.0%	78.1%	3,9%	0,7%		
Marital status	**Single**	**Steady relationship**	**Married**	**Cohabiting**	**Divorced/ Separated**	**Widowed**
	61.1%	34.3%	2.1%	1.1%	0.4%	0.0%
Academic year	**1st year**	**2nd year**	**3rd year**			
	33.2%	29.0%	37.1%			
Field of study	**Human/Social sciences**	**Natural sciences**	**Economic/ Management sciences**	**Engineering**	**Law**	**Technology**
	47.7%	7.8%	21.2%	9.5%	6.4%	6.0%

Procedure

Sampling method

Convenience sampling was used to recruit students through advertisements, that is, posters on notice boards and pamphlets handed out in classrooms.

Data Collection

Data was collected through the administration of self-report questionnaires. This included the PID-5-BF, comprised of 25 questions, MINI (Version 6.0) Subscale K, comprised of 15 questions, and the NEO-PI-R comprising 240 questions.

PID-5 BF

The Personality Inventory for DSM-5 Brief Form (PID-5 BF) is measured on a 4-point Likert scale, with the following responses: Very false/Often false, Sometimes/Somewhat false, Sometimes/Somewhat true/Very true/Often true. Internal consistency and construct validity for the PID-5-BF has been established, Fossati and colleagues (2017) found coefficients ranging from 0.59-0.83, in line with other studies indicating reliability and validity for the PID-5-BF.

NEO-PI-R

The NEO Personality Inventory Revised (NEO-PI-R) focuses on the measurement of personality constructs as theorised by the big-five personality structure, or FFM. Questions are rated on a 5-point Likert scale: Strongly disagree, Disagree, Neutral, Agree, Strongly disagree. Internal consistency for the five factors has been indicated to be approximately 0.90, and ranges between 0.50-0.70 for the facets (Costa & McCrae, 1992; Soto & John, 2009). High correlations between the NEO-PI-R facets and other personality scales, indicates sufficient convergent and discriminant validity (Gaughan, Miller & Lynam, 2012; Maples, Guan, Carter & Miller, 2014).

MINI Subscale K

The Mini International Neuropsychiatric Interview (MINI) can be used to diagnose a variety of disorders, including Criterion A psychotic symptoms of Schizophrenia. Subscale K: Psychotic disorders and mood disorder with psychotic features, specifically focuses on symptoms of a psychotic nature. The MINI has been proved valid and reliable, with excellent test-retest and interrater reliability values (0.88-1.0), and good convergent validity values (0.69-0.82) (Lecrubier et al., 1997; Sheehan et al., 1988).

Ethical considerations

As a student sample was used, the risk level was medium. The risk of possible coercion was lessened by excluding students from the Psychology or Industrial Psychology classes lectured by the co-authors, as well as excluding incentives such as course credits for participation. Informed consent was obtained by an independent party, and questionnaire protocols were numbered beforehand as to maintain anonymity of participants and avoid any stigmatisation or confidentiality breeches.

Participants were exposed to reflections regarding their personalities with the risk of inducing psychological distress. Debriefing services were made available to any participant who required it after survey completion. No participants made use of this opportunity.

Data Analysis

The statistical analyses were conducted using Mplus 8.1 (Muthén & Muthén, 2018), which allowed for the implementation of latent variable modelling in a structural equation modelling (SEM) framework. Specifically, confirmatory factor analysis (CFA) was used to establish measurement models, that is, to create the latent factor structures based on the items in the case of the PID-5 BF; and the personality factors were based on the total score for their sub-dimensions as the items. Latent variables are more desirable to normal total or mean scores as it considers measurement error (Brown, 2015). In terms of parameter estimation, the mean- and variance-adjusted weighted least squares (WLSMV) implementation was used and this implementation has been found to work well in samples that exceed 200 participants (Li, 2016), outperforming maximum likelihood estimation.

With regards to the fit of the factor structure to the data, the following indices were considered: Comparative fix index (CFI), Tucker-Lewis index (TLI) and root mean square error of approximation (RMSEA). For the CFI and TLI the rule of thumb of 0.90 would be used and for the RMSEA 0.80 and below (Van de Schoot, Lugtig, & Hox, 2012). The CFA analysis also generated a

correlation matrix that examined the relationships between the variables, specifically aspects of convergent and discriminant validity. Effect sizes for correlational relationships were considered medium for values of r = 0.30-0.49 and large for correlations from r = 0.50-0.84. Correlations of 0.85 and above was used as the cut-off point to consider discriminant validity issues (Brown, 2015). Furthermore, a test for discriminant validity was implemented by constraining the correlation between two variables of interest to unity (1.00), and then having compared it to a model where the correlation remained unconstrained by means of a chi-square difference test.

Results

Please see sections below for fit of the models and corresponding correlation matrices. For each NEO-PI-R factor, for example, *Neuroticism*, it was estimated as a single factor with the PID-5-BF represented by its individual components. Investigation also included the subcomponents of the NEO-PI-R facets in the correlation matrixes. Therefore, a series of models were tested.

PID-5-BF factor structure: 5-factors versus higher-order 6-factor model

In the consideration of model fit to the data of the PID-5-BF instrument, two models were considered. The first model was a 5-factor model consisting of the individual components of the PID-5-BF, and the second was a 6-factor (2nd order/higher-order) model that contained an additional factor for the score as a higher-order latent variable consisting of the five components of the first model. For the initial 5-factor model all items were assigned to their respective factors (χ^2 = 556.89; df = 242; CFI = 0.94; TLI = 0.94; RMSEA = 0.07). However, in this initial 5-factor model item Q13 (“I steer clear of romantic relationships”), had a low loading (0.27) in context of the other items and was removed to re-test the 5-factor model. As can be seen, the revised first (5-factor) model indicated best fit to the data as it had the lowest chi-square and RMSEA values and higher CFI and TLI values. Further data analyses were therefore based upon the 5-factor model.

Table 2: PID-5-BF Model-Fit Statistics

Description	χ^2	*df*	CFI	TLI	RMSEA
5-factor model	556.89	242	0.94	0.94	0.07
6-factor model	724.31	390	0.90	0.89	0.06

Notes: χ^2 = Chi-square; df = Degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; $p < .001$

Table 3: Correlations between PID-5-BF Constructs

				NEG AFF	DETACH	ANTAG	DISIN	PSYCH
	α	*M*	*SD*					
NEG AFF	0.73	9.18	4.51	1.00				
DETACH	0.69	7.21	4.37	0.71	1.00			
ANTAG	0.84	5.34	4.40	0.35	0.38	1.00		
DISIN	0.81	6.10	4.77	0.58	0.56	0.55	1.00	
PSYCH	0.82	7.94	5..23	0.68	0.72	0.54	0.69	1.00

Furthermore, comparison between the scales also yielded good correlations for most relationships. The highest correlations found were between *Detachment* and *Negative affect* (r = 0.71; large effect) and *Detachment* and *Psychoticism* (r = 0.72; large effect). All other relationships between scales (e.g., *Disinhibition* and *Psychoticism*), had values of between 0.54 and 0.69 (large effects). However, *Antagonism* had the weakest correlation coefficient values in correlation to the other scales. It correlated most significantly with *Disinhibition* (r = 0.55; large effect) and *Psychoticism* (r = 0.54; large effect). Furthermore, correlational values for its relationship to *Detachment* showed a medium effect (r = 0.38), as well as for the correlation to *Negative Affect* (r = 0.35).

In general, as can be seen, the PID-5-BF showed adequate convergent validity, as all coefficients represented medium to large effects, and none were above 0.85, indicative of discriminant validity (an additional discriminant validity for the Psychoticism scales are performed below). Internal consistency was also established with sufficient Cronbach's alpha coefficients (α = 0.69-0.84). Although the traditional cut-off for Cronbach's alpha is 0.70, the difference of 0.01 for *Detachment* was considered insignificant, and did not warrant its exclusion.

Table 4: Factor loadings (5-factor model)

Factor and item	Loadings	S.E.	p-value
Negative affect			
Q8	0.49	0.07	0.001
Q9	0.54	0.07	0.001
Q10	0.46	0.07	0.001
Q11	0.54	0.06	0.001
Q15	0.65	0.06	0.001
Detachment			
Q4	0.69	0.06	0.001
Q14	0.48	0.07	0.001
Q16	0.52	0.06	0.001
Q18	0.46	0.07	0.001
Antagonism			
Q17	0.67	0.07	0.001
Q19	0.55	0.07	0.001
Q20	0.48	0.07	0.001
Q22	0.82	0.05	0.001
Q25	0.78	0.05	0.001
Disinhibition			
Q1	0.68	0.06	0.001
Q2	0.60	0.06	0.001
Q3	0.70	0.05	0.001
Q5	0.81	0.05	0.001
Q6	0.59	0.06	0.001
Psychoticism			
Q7	0.65	0.06	0.001
Q12	0.68	0.06	0.001
Q21	0.56	0.06	0.001
Q23	0.71	0.05	0.001
Q24	0.69	0.05	0.001

As can be seen the best-fitting 5-factor model's items loaded onto their constructs in a significant manner (cut-off value = >0.50). It should be noted that Q8 (0.49) and Q10 (0.46) just did not meet the cut-off loading on to *Negative Affect*. The same was found for Q14 (0.48) and Q18 (0.46) for *Detachment*, and Q20 (0.48) for *Antagonism*. However, given the proximity to 0.50 in terms of rounding it was decided to keep these items for further analysis.

Scale correlations

Relationship between NEO-PI-R *Neuroticism* PID-5-BF

The Cronbach's alpha coefficient was found to be adequate ($\alpha = 0.79$) for *Neuroticism*. The model containing the PID-5-BF components and NEO-PI-R *Neuroticism* scale indicated adequate data fit ($\chi^2 = 724.31$; df = 390; CFI = 0.90; TLI = 0.89; RMSEA = 0.06).

Table 5: Correlations between Neuroticism and PID-5-BF

	NA	DET	ANT	DIS	PSY	**NEU**	ANX	HOS	DEP	SC	IMP	VUL
NEGATIVE AFFECT	1.00											
DETACHMENT	0.72	1.00										
ANTAGONISM	0.34	0.36	1.00									
DISINHIBITION	0.57	0.54	0.55	1.00								
PSYCHOTICISM	0.66	0.71	0.51	0.72	1.00							
NEUROTICISM	***0.78***	0.58	0.14	0.30	0.51	1.00						
Anxiety	***0.47***	0.35	0.09	0.18	0.31	0.61	1.00					
Hostility	***0.41***	0.31	0.07	0.16	0.27	0.53	0.32	1.00				
Depression	***0.24***	0.18	0.04	0.09	0.16	0.31	0.19	0.16	1.00			
Self-Consciousness	***0.39***	0.29	0.07	0.15	0.26	0.50	0.31	0.27	0.16	1.00		
Impulsiveness	***0.37***	0.28	0.07	0.14	0.25	0.48	0.29	0.25	0.15	0.24	1.00	
Vulnerability	***0.46***	0.34	0.08	0.18	0.30	0.59	0.36	0.31	0.18	0.30	0.28	1.00

Negative Affect and *Neuroticism* (relationship primarily investigated), showed a significant positive relationship ($r = 0.78$; large effect). Furthermore, all subscales of *Neuroticism* showed medium effect correlations, apart from *depression* which showed a small effect size ($r = 0.24$). *Neuroticism* also showed correlations of large effect with *Detachment* ($r = 0.58$) and *Psychoticism* ($r = 0.51$).

Relationship between NEO-PI-R *Extraversion* and PID-5-BF

Extraversion showed an adequate Cronbach's alpha of 0.78. The model for the PID-5-BF components with the NEO-PI-R *Extraversion* fit the data adequately ($\chi^2 = 975.12$; df = 388; CFI = 0.91; TLI = 0.90; RMSEA = 0.07). Table 6 below presents the correlations based on the model.

Table 6: Correlations between *Extraversion* and PID-5-BF

	NA	**DET**	ANT	DIS	PSY	**EXT**	WAR	GRE	ASS	ACT	EXC
NEGATIVE AFFECT	1.00										

DETACHMENT	0.74	1.00									
ANTAGONISM	0.39	0.38	1.00								
DISINHIBITION	0.61	0.56	0.55	1.00							
PSYCHOTICISM	0.74	0.74	0.55	0.71	1.00						
EXTRAVERSION	-0.07	***-0.51***	-0.05	0.06	-0.08	1.00					
Warmth	-0.05	***-0.40***	-0.04	0.05	-0.06	0.78	1.00				
Gregariousness	-0.04	***-0.33***	-0.03	0.04	-0.05	0.64	0.50	1.00			
Assertiveness	-0.03	***-0.24***	-0.02	0.03	-0.04	0.47	0.37	0.30	1.00		
Activity	-0.03	***-0.26***	-0.02	0.03	-0.04	0.51	0.40	0.33	0.24	1.00	
Excitement – seeking	-0.03	***-0.25***	-0.02	0.03	-0.04	0.50	0.39	0.32	0.23	0.26	1.00
Positive emotions	-0.05	***-0.39***	-0.04	0.05	-0.06	0.76	0.60	0.49	0.36	0.39	0.38

The PID-5-BF scale of *Detachment* correlated negatively with the NEO-PI-R *Extraversion* scale (r = -0.51; large effect). Half of the subscales showed medium effect sizes, although *assertiveness*, *activity* and *excitement-seeking* indicated coefficients of small effects (i.e., <0.29), in a negative direction.

Relationship between NEO-PI-R *Openness* and PID-5-BF

The Cronbach's alpha for *Openness* was 0.66. In general, for reliability to be adequate, Cronbach's alpha should be $\alpha \geq 0.70$, although for the *Openness* factor other studies have also found the coefficient to be below 0.70 (e.g., $\alpha = 0.68$; Sherry, Hewitt, Flett, Lee-Baggley & Hall, 2007), indicating lower internal consistency for this factor. Once again due to rounding, it was decided to keep this factor for further analysis. The model indicated adequate fit to data (χ^2 = 927.36; df = 390; CFI = 0.91; TLI = 0.90; RMSEA = 0.07).

Table 7: Correlations between *Openness* and PID-5-BF

	NA	DET	ANT	DIS	**PSY**	**OPE**	FAN	GRE	FEE	ACT	IDE
NEGATIVE AFFECT	1.00										
DETACHMENT	0.71	1.00									
ANTAGONISM	0.35	0.38	1.00								

DISINHIBITION	0.58	0.56	0.55	1.00							
PSYCHOTICISM	0.68	0.72	0.53	0.69	1.00						
OPENESS	0.20	-0.01	-0.10	0.13	***0.31***	1.00					
Fantasy	0.13	-0.01	-0.06	0.08	***0.20***	0.65	1.00				
Aesthetics	0.12	-0.01	-0.06	0.08	***0.19***	0.61	0.39	1.00			
Feelings	0.08	0.00	-0.04	0.05	***0.13***	0.41	0.27	0.25	1.00		
Actions	0.02	0.00	-0.01	0.01	***0.03***	0.09	0.06	0.06	0.04	1.00	
Ideas	0.11	-0.01	-0.06	0.07	***0.18***	0.57	0.37	0.35	0.24	0.05	1.00
Values	0.11	-0.01	-0.06	0.07	***0.18***	0.58	0.37	0.35	0.24	0.05	0.33

In terms of correlational relationships, no large correlation between *Psychoticism* and *Openness* was found ($r = 0.31$; medium effect). All subscales of *Openness* correlated with the PID-5-BF Psychoticism scale to a small effect, and actions were found to have a statistically nonsignificant correlation ($r = 0.03$; $p > 0.05$).

Relationship between NEO-PI-R *Agreeableness* and PID-5-BF

Agreeableness yielded an adequate Cronbach's alpha coefficient of $\alpha = 0.70$. Again, as with previous models, data fit the model adequately ($\chi^2 = 1013.72$; df = 387; CFI = 0.91; TLI = 0.90; RMSEA = 0.08).

Table 8: Correlations between *Agreeableness* and PID-5-BF

	NA	DET	**ANT**	DIS	PSY	**AGR**	TRU	STR	ALT	COM	MOD
NEGATIVE AFFECT	1.00										
DETACHMENT	0.74	1.00									
ANTAGONISM	0.38	0.38	1.00								
DISINHIBITION	0.61	0.56	0.55	1.00							
PSYCHOTICISM	0.71	0.72	0.54	0.69	1.00						
AGREEABLENESS	-0.21	-0.36	***-0.76***	-0.32	-0.31	1.00					
Trust	-0.09	-0.14	***-0.30***	-0.13	-0.12	0.40	1.00				
Straightforwardness	-0.16	-0.28	***-0.59***	-0.25	-0.24	0.77	0.31	1.00			
Altruism	-0.07	-0.11	***-0.24***	-0.10	-0.10	0.31	0.12	0.24	1.00		

Compliance	-0.11	-0.19	***-0.40***	-0.17	-0.16	0.53	0.21	0.41	0.16	1.00	
Modesty	-0.10	-0.18	***-0.37***	-0.16	-0.15	0.48	0.19	0.37	0.38	0.26	1.00
Tendermindedness	-0.15	-0.25	***-0.52***	-0.22	-0.21	0.68	0.27	0.53	0.52	0.36	0.33

Antagonism was strongly negatively correlated with *Agreeableness* in the negative (r = -0.76; large effect), and *Antagonism* strongly correlated with two *Agreeableness* subscales, namely *straightforwardness* (r = -0.59) and *tendermindedness* (r = -0.52).

Relationship between NEO-PI-R *Conscientiousness* and PID-5-BF

The Cronbach's alpha coefficient indicated good internal consistency for *Conscientiousness* ($\alpha = 0.88$). Furthermore, the model containing the PID-5-BF and NEO-PI-R *Conscientiousness* components indicated good fit to data ($\chi^2 = 849.52$; df = 390; CFI = 0.94; TLI = 0.94; RMSEA = 0.07).

Table 9: Correlations between *Conscientiousness* and PID-5-BF

	NA	DET	ANT	**DIS**	PSY	**CON**	COM	ORD	DUT	ACH	SD
NEGATIVE AFFECT	1.00										
DETACHMENT	0.71	1.00									
ANTAGONISM	0.36	0.37	1.00								
DISINHIBITION	0.58	0.56	0.55	1.00							
PSYCHOTICISM	0.68	0.72	0.54	0.69	1.00						
CONSCIENTIOUS-NESS	-0.31	-0.32	-0.39	***-0.70***	-0.42	1.00					
Competence	-0.21	-0.22	-0.26	***-0.48***	-0.28	0.68	1.00				
Order	-0.22	-0.23	-0.28	***-0.52***	-0.31	0.74	0.50	1.00			
Dutifulness	-0.24	-0.25	-0.30	***-0.55***	-0.33	0.78	0.53	0.57	1.00		
Achievement – striving	-0.23	-0.23	-0.29	***-0.52***	-0.31	0.74	0.50	0.54	0.58	1.00	
Self-discipline	-0.27	-0.28	-0.33	***-0.61***	-0.36	0.87	0.59	0.64	0.68	0.64	1.00
Deliberation	-0.24	-0.25	-0.30	***-0.55***	-0.33	0.79	0.53	0.58	0.61	0.58	0.68

Disinhibition and *Conscientiousness* showed a significant negative correlation (r = -0.70; large effect). PID-5-BF *Disinhibition* additionally correlated negatively with all *Conscientiousness* subscales. All correlated in a significantly negative manner with large effect size, that is, *order* = -0.52; *dutifulness* = -0.55; *achievement-striving* = -0.52; *self-discipline* = -0.61; and *deliberation* = -0.55; except for *competence* which showed a medium effect size (r = -0.48).

MINI Subscale K and PID-5-BF

As mentioned previously, all correlations were below the 0.85 guideline set by Brown (2015) for discriminant validity issues in CFA analysis. However, an additional discriminant validity test was conducted. For this test, the MINI Subscale K and PID-5-BF Psychoticism scale were both best operationalised comprising factors based on items of each construct, as indicators of the respective latent factors (χ^2 = 1015.89; df = 684; CFI = 0.92; TLI = 0.91; RMSEA = 0.04).

Table 10: Correlations between MINI Subscale K and PID-5-BF

	NA	DET	ANT	DIS	**PSY**	**SC K**
NEGATIVE AFFECT	1.00					
DETACHMENT	0.71	1.00				
ANTAGONISM	0.36	0.38	1.00			
DISINHIBITION	0.58	0.56	0.55	1.00		
PSYCHOTICISM	0.68	0.72	0.53	0.69	1.00	
MINI SUBSCALE K	0.35	0.41	0.32	0.41	***0.66***	1,00

The test for discriminant validity was conducted with the DIFFTEST option in Mplus, comparing two correlated models: i) where the correlation between the MINI Subscale K and PID-5-BF Psychoticism scale remained unconstrained, and ii) where the correlation between the two variables was constrained to unity (1.00). The result of the chi-square difference test was significant ($p < 0.001$), indicating that the model in which the MINI Subscale K and PID-5-BF was constrained to unity was not a better model. However, it should still be noted that a large positive correlation

existed between the constructs (r = 0.66; large effect), still indicating a significant overlap between the two concepts (R^2 = 43.56%; large effect).

Discussion

Literature has consistently indicated validity for the FFM's general personality traits and its relationship to DSM-IV personality disorders and has therefore increasingly been considered in the formulation of alternative models with the view that personality disorders could be considered maladaptive variants of these general personality traits (Bach, Markon, Simonsen & Krueger, 2015; Clarkin et al., 2015; Gore & Widiger, 2013; Thomas et al., 2013). In line with research having indicated convergence between the FFM and pathological personality traits, the structure of maladaptive traits as proposed by the hybrid model clearly resembles the structure of normal personality and therefore that personality functioning and traits are represented in various degrees, and not, as the categorical model suggests, either present or absent (APA, 2013; Bach et al., 2015). Specifically, the DSM-5 trait of *Negative Affect* seems to be akin to the FFM trait of *Neuroticism*; DSM-5 trait of *Detachment* to low FFM *Extraversion*; *Antagonism* akin to low FFM *Agreeableness*; *Disinhibition* to low *Conscientiousness*; and the DSM-5 trait of *Psychoticism* to the FFM trait *Openness* (Gore & Widiger, 2013; Krueger et al., 2011; Thomas et al., 2013).

The results yielded from the current study proved to be in line with these findings. Reliability for the PID-5-BF was found to be adequate with Cronbach's alphas ranging between 0.69-0.84. Although the cut-off for Cronbach's alpha is 0.70, we found the difference of 0.01 for *Detachment* (α = 0.69) statistically insignificant, and thus viewed it as an adequate representation of reliability.

As hypothesised, the predicted correlational relationships between the constructs of the PID-5-BF (hybrid model) and NEO-PI-R (FFM) were found, as well as between the PID-5-BF and MINI Subscale K. In general, adequate convergent validity coefficients were found (r = 0.35; medium effect, to 0.72; large effect), and as no correlations were above 0.85, discriminant validity

was also indicated. Factorial validity was found for most questions as they loaded strongly onto the expected factor. Some were however below the expected cut-off level of >0.5 (0.46-0.49), which included two questions under *Negative affect* ("I worry about almost everything" and "I fear being alone in life more than anything else"); two questions under *Detachment* ("I'm not interested in making friends" and "I rarely get enthusiastic about anything"), as well as Q20 ("I often have to deal with people who are less important than me") under *Antagonism*. The reason for this might be a presence of "faking good" responses. The questions are asked in a very unipolar fashion which possibly urged participants to respond in an overly positive way so as to downplay negative or extreme characteristics that would in general be perceived as falling outside of the norm.

Question 13 ("I steer clear of romantic relationships"), had a significantly low loading (0.27) onto *Detachment* in context to other items. Perhaps, an avoidance of romantic relationships would better load on to *Negative Affect* as it includes aspects of anxiousness, separation insecurity and emotional lability, with the suggestion then that avoiding romantic relationships are more based on social anxiousness than emotional withdrawal/detachment. These are mere speculations and warrants further investigation.

Pursuant to literature (Gore & Widiger, 2013; Krueger et al., 2011; Thomas et al., 2013), our results indicated a strong positive relationship between PID-5-BF *Negative Affect* and NEO-PI-R *Neuroticism* ($r = 0.78$). This finding is not only significant in that it shows good construct validity for the *Negative Affect* component, but also that it supports existing theory. Literature on personality pathology have indicated that premorbid personality traits, especially *Neuroticism* (anxiety, angry hostility, depression, self-consciousness, impulsiveness, vulnerability; Costa & McCrae, 1992), akin to *Negative Affect* (emotional lability, anxiousness, separation anxiety; APA, 2013c), can predispose individuals to be more vulnerable to stress (Hopwood et al., 2013; Kotov, Gamez, Schmidt & Watson, 2010; Leichsenring, Leibing, Kruse, New & Leweke, 2011). For example, individuals high in neuroticism are more likely to respond to stressful situations with significant levels of distress and anxiety. In turn, the individual's response to stress might lead to poor

decision-making or elicit negative reactions from others which therefore might increase and reinforce the original distress experienced, creating a cycle of poor and rigid emotional dysregulation. This is not only relevant to the trait *Negative Affect*. As indicated by our results, *Neuroticism* correlated with *Detachment* (r = 0.58), as well as with *Psychoticism* (r = 0.51), showing support for the influence neuroticism/negative affect may have on one's functioning and personality related to other domains.

The PID-5-BF scale of *Detachment* correlated negatively with the NEO-PI-R *Extraversion* scale (r = 0.51), indicating convergent and discriminant validity. This inverse relationship has been established by various research studies (Gore & Widiger, 2013; Krueger et al., 2011; Thomas et al., 2013). *Detachment*, which includes characteristics such as withdrawal, anhedonia and intimacy avoidance, interpersonal inhibition (APA, 2013c; Pettersen et al., 2014), may therefore be seen as the opposite of extraversion. *Extraversion* is characterised by Costa & McCrae (1992), as including traits of warmth, gregariousness, assertiveness, excitement-seeking, activity and positive emotions. In line with this description, others have indicated that being outgoing, talkative, having the need for external and social stimulation further describes the construct *Extraversion* (Acton, 2003). McCabe and Fleeson (2012) investigated the purpose of extraversion and stipulated as being a facilitator for having fun and entertaining people, and connecting to others, which indicates a stark contrast to the construct detachment, as shown through the inverse correlational relationship found between the two constructs.

The correlation found between *Psychoticism* and *Openness* was positive, yet medium in effect (r = 0.31). Seeing as research has yielded inconsistencies for the correlation between *Psychoticism* (unusual beliefs and experiences, eccentricity, perceptual dysregulation; APA, 2013c) and *Openness* (fantasy, aesthetics, feelings, actions, ideas, values; Costa & McCrae, 1992), it is not a correlation hypothesised, but one still being explored (Al-Dajani et al., 2016; Gore & Widiger, 2013; Griffin & Samuel, 2014; Thomas et al., 2013). In response, we utilised the MINI Subscale K as alternative measure of psychoticism to be correlated with the PID-5-BF *Psychoticism* scale. As

of yet, there has not been a study that specifically compared the PID-5-BF *Psychoticism* scale with the MINI Subscale K, which specifically measures psychotic components. Since validity and reliability for the MINI (Lecrubier et al., 1997; Sheehan et al., 1998), has been established, it is safe to assume its relevance as sufficient for comparison purposes. The correlation found between *Psychoticism* and MINI Subscale K proved to be sufficient (r = 0.66; R = 43.56%). In that regard, the PID-5-BF *Psychoticism* scale may be seen as adequately assessing the probability of psychotic symptoms. It should be noted though that whereas the MINI Subscale K focuses on more severe psychosis (e.g., hallucinations/delusions present with schizophrenia), the PID-5-BF scale of *Psychoticism* focuses on psychotic symptoms related to personality pathology, such as dissociation. We recommend that the *Psychoticism* scale therefore be compared to other, more similar in construct, scales in future research.

The construct *Agreeableness* comprises empathy, compassion, trust, compliance and cooperation, altruism, modesty and tendermindedness (Costa & McCrae, 1992; John & Srivastava, 1999; Laursen, Pulkkinen & Adams, 2002). It has been mentioned that *Agreeableness* plays a key role in psychological well-being, as positive affect and healthy, friendly interpersonal relationships help to anchor resilience, in turn facilitating efficacy and success (Laursen et al., 2002). On the other hand, *Antagonism*, which may be described as manipulativeness, deceitfulness, grandiosity (APA, 2013c), being exploitative, violent and volatile (Pettersen et al., 2014), uncontrolled, hostile and impulsive (Laursen et al., 2002), predisposes one to maladaptive or antisocial behaviour. This, together with existing literature, therefore suggests that *Agreeableness* and *Antagonism* are each other's inverses. Our study indicated that *Antagonism* was strongly correlated with *Agreeableness* in the negative (r = -0.76), supporting theory, indicating very good construct validity, and also convergent and divergent validity. Furthermore, *Antagonism* negatively correlated with two *Agreeableness* subscales, namely *straightforwardness* (r = -0.59; large effect) and *tendermindedness* (r = -0.52; large effect).

Conscientiousness may be described as the propensity to stay within social norms, as in controlling one's impulses, delaying gratification and to be goal-directed (John & Srivastava, 1999). Costa and McCrae (1992) emphasises *Conscientiousness* as entailing traits of dutifulness, self-discipline, deliberation, achievement-striving, order and competence. In contrast, disinhibition refers to irresponsibility, impulsivity and distractibility (APA, 2013c). *Disinhibition* and *Conscientiousness* showed a significant negative correlation (r = -0.70). PID-5-BF *Disinhibition* additionally correlated negatively with all *Conscientiousness* subscales. Our results, in line with research, indicates an overlap between *Disinhibition* and a lack of *Conscientiousness*, which may be reflective of the trait domain's temperamental core (Bogg & Roberts, 2004). This trait may have significant implications for, not only psychological well-being, but physical health as well. Individuals who are more disinhibited and therefore less conscientious, are more likely to engage in reckless and risky behaviour, such as alcohol or drug use (Acton, 2003; Bogg & Roberts, 2004; Vaidya, Latzman, Markon & Watson, 2010).

The results of our study indicate adequate construct validity for the PID-5-BF, as all constructs indicated to sufficiently measure the trait domain it was set out to measure, in a convergent and discriminant way in relation to similar assessments. The results also support existing literature on the PID-5-BF and FFM, further indicating support for the hybrid model of personality disorders as well. The use thereof in clinical settings may therefore be suggested. The PID-5-BF is not proposed as a fine-grained measure set out to assess the DSM-5 personality traits, but rather intends to screen for possible personality pathology, as specific hypotheses on categorical diagnoses cannot be made using only the PID-5-BF. However, the PID-5-BF can broadly describe areas of dysfunction to inform the need for additional assessments. It may also potentially allow for earlier detection of personality pathology, possibly preceding the development of more severe psychopathology, such as externalising problems (e.g., substance abuse, self-harming behaviour or aggressive behaviour), and internalising disorders (e.g., depression or anxiety) (Fossati et al., 2017), as these are commonly found to be comorbid with personality disorders.

Some limitations regarding the current study are noted. Although reliability was established for the PID-5-BF, it was done through establishing internal consistency reliability with Cronbach's alpha values. This is a common method of investigating reliability, but test-retest analysis might establish more credible coefficients. Another limitation was possible common method variance as only one manner of data gathering was used. In future, it could be beneficial to use surveys, as was done in this study, in conjunction with other methods, for example, interviews, to increase objectivity and lessen method bias.

This study entailed a sample of 283 participants, and although power analysis indicated it as sufficient, a bigger sample could yield more statistically significant results. The sample was furthermore made up of a very specific demographic group (i.e., NWU students, 18-22 years), and future research could focus on extending the sample size and demography. Valuable information could also be obtained by assessing the psychometric properties within the South African mental health sector, as this is where the PID-5-BF would predominantly be used.

Conclusion

In conclusion, our study found the psychometric properties of the PID-5-BF to be in line with what has been indicated in literature. The PID-5-BF showed adequate reliability and validity when measured within a South African sample and correlated as expected in comparison to measurements of similar constructs. Our findings suggest that, although more research needs to be done, the PID-5-BF could be a promising tool to use in South African mental health facilities where time and economy are limited.

REFERENCES

Acton, G. S. (2003). Measurement of impulsivity in a hierarchical model of personality traits: Implications for substance use. *Substance Use and Misuse, 38,* 67-83. doi:10.1081/JA-120016566

Al-Dajani, N., Gralnick, T. M., & Bagby, M. (2016). A psychometric review of the Personality Inventory for DSM-5 (PID05): Current status and future directions. *Journal of Personality Assessment, 98,* 62-81.

American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

American Psychiatric Association (2013b). The Personality Inventory for DSM-5—Brief Form (PID-5-BF)—Adult. Retrieved from https://www.psychiatry.org/File.Library/Psychiatrists/Practice/DSM/APA_DSM5_The-PersonalityInventory-For-DSM-5-Brief-Form-Adu,t.pdf.

American Psychiatric Association. (2013c). Online assessment measures: The Personality Inventory for DSM-5–Brief Form (PID-5-BF)—Child Age 11–17. Retrieved from http://www.psychiatry.org/practice/dsm/dsm5/online-assessment-measures

Anderson, J. L., Sellbom, M., & Salekin, R. T. (2018). Utility of the Personality Inventory for DSM-5–Brief Form (PID-5-BF) in the measurement of maladaptive personality and psychopat(ology. *Assessment*, *25*(5), 596-607. doi:1073191116676889

Bach, B., Maples-Keller, J. L., Bo, S., & Simonsen, E. (2016). The alternative DSM–5 personality disorder traits criterion: A comparative examination of three self-report forms in a Danish population. *Personality Disorders: Theory, Research, and Treatment*, *7*(2), 124-135. doi:10.1037/per0000162

Bach, B., Markon, K., Simonsen, E., & Krueger, R. F. (2015). Clinical utility of the DSM-5 alternative model of personality disorders: Six cases from practice. *Journal of Psychiatric Practice, 21*, 3-25. doi:10.1097/01.pra.0000460618.02805.ef

Bleidorn, W., Kandler, C., & Caspi, A. (2014). The behavioural genetics of personality development in adulthood – Classic, contemporary, and future trends. *European Journal of Personality, 28*(3), 244-255. doi:10.1002/per.1957

Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviours: A meta-analysis of the leading behavioural contributors to morality. *Psychological Bulletin, 130*(6), 887-919. doi:10.1037/0033-2909.130.6.887

Briley, D. A., & Tucker-Drob, E. M. (2014). Genetic and environmental continuity in personality development: A meta-analysis. *Psychological Bulletin, 140*(5), 1303 -1331. doi:10.1037/a0037091

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). New York: Guilford Press.

Clarkin, J. F., Meehan, K. B., & Lenzenweger, M. F. (2015). Emerging approaches to the conceptualization and treatment of personality disorder. *Canadian Psychology, 56*(2), 155-167.

Costa, P. T., & McCrae, R. R. (1992). Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual. Odessa, FL: Psychological Assessment Resources.

Fearon, R. P., Tomlinson, M., Kumsta, R., Skeen, S., Murray, L., Cooper, P. J., & Morgan, B. (2017). Poverty, early care, and stress reactivity in adolescence: Findings from a prospective, longitudinal study in South Africa. *Development and psychopathology*, *29*(2), 449-464. doi:10.1017/S0954579417000104

Fossati, A., Somma, A., Borroni, S., Markon, K. E., & Krueger, R. F. (2017). The Personality Inventory for DSM-5 Brief Form: evidence for reliability and construct validity in a sample of community-dwelling Italian adolescents. *Assessment, 24*(5), 615-631. doi:10.1177/1073191115621793

Foxcroft, C., & Roodt, G. (2009). An overview of assessment: definition and scope. In C. Foxcroft & G. Roodt (Eds.) *Introduction to Psychological Assessment in the South African Context* (pp. 3-8). Cape Town: Oxford University Press.

Foxcroft, C., Paterson, H., Le Roux, N., & Herbst, D. (2004). Psychological assessment in South Africa: A needs analysis. *The test usage patterns and needs of psychological assessment practitioners.*

Gaughan, E. T., Miller, J. D., & Lynam, D. R. (2012). Examining the utility of general models of personality in the study of psychopathy: A comparison of the HEXACO-PI-R and NEO-PI-R. *Journal of Personality Disorders, 26*, 513-523. doi:10.1521/pedi.2012.26.4.513

Gore, W. L., & Widiger, T. A. (2013). The DSM-5 dimensional trait model and five-factor models of general personality. *Journal of abnormal psychology, 122*(3), 816-821. doi:10.1037/a0032822

Griffin, S. A., & Samuel, D. B. (2014). A closer look at the lower-order structure of the Personality Inventory for DSM-5: Comparison with the Five-Factor Model. *Personality Disorders: Theory, Research, and Treatment, 5*(4), 406-413. doi:10.1037/per0000074

Hopwood, C. J., Wright, A. G., Ansell, E. B., & Pincus, A. L. (2013). The interpersonal core of personality pathology. *Journal of Personality Disorders*, *27*(3), 270-295. doi:10.1521/pedi.2013.27.3.270

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. *Handbook of personality: Theory and research, 2*(1999), 102-138.

Kandler, C. (2012). Nature and nurture in personality development: The case of neuroticism and extraversion. *Current Directions in Psychological Science, 21*(5), 290-296. doi:10.1177/0963721412452557

Kandler, C., Zimmermann, J., & McAdams, D. P. (2014). Core and surface characteristics for the description and theory of personality differences and development. *European Journal of Personality, 28*(3), 231-243. doi:10.1002/per .1952

Kliewer, W., Pillay, B. J., Swain, K., Rawatlal, N., Borre, A., Naidu, T., ... & Drazdowski, T. K. (2017). Cumulative risk, emotion dysregulation, and adjustment in South African youth. *Journal of Child and Family Studies, 26*(7), 1768-1779. doi:10.1007/s10826-017-0708-6

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "Big" personality traits to anxiety, depressive and substance use disorders: A meta-analysis. *Psychological Bulletin, 136*(5), 768-821. doi:10.1037/a0020327

Krueger, R. F. (2013). Personality disorders are the vanguard of the post-DSM-5.0 era. *Personality Disorders: Theory, Research, and Treatment, 4*(4), 355-362. doi:10.1037/per0000045

Krueger, R. F., Hopwood, C. J., Wright, A. G., & Markon, K. E. (2014). DSM-5 and the path toward empirically based and clinically useful conceptualization of personality and psychopathology. *Clinical Psychology: Science and Practice, 21*(3), 245-261. doi:10.1111/cpsp.12073

Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological medicine, 42*(9), 1879-1890. doi:10.1017/S0033291711002674

Krueger, R. F., Eaton, N. R., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2011). Personality in DSM–5: Helping delineate personality disorder content and framing the metastructure. *Journal of personality assessment, 93*(4), 325-331.

doi:10.1080/00223891.2011.577478

Laursen, B., Pulkkinen, L., & Adams, R. (2002). The antecedents and correlates of agreeableness in adulthood. *Developmental Psychology, 38*(4), 591-603. doi:10.1037//0012-1649.38.4.591

Lecrubier, Y., Sheehan, D. V., Weiller, E., Amorim, P., Bonora, I., Harnett Sheehan, K. H., … Dunbar, G. C. (1997). The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry, 12*(5), 224-231.

Leichsenring, F., Leibing, E., Kruse, J., New, A. S., & Leweke, F. (2011). Borderline personality disorder. *Lancet, 377*, 74-84.

Li, C. H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods*, *48*(3), 936-949.

Maples, J. L., Guan, L., Carter, N. T., & Miller, J. D. (2014). A test of the international personality item pool representation of the revised NEO Personality Inventory and development of a 120-item IPIP-based measure of the fife-factor model. *Psychological Assessment, 26*(4), 1070-1084.

McCabe, K. O., & Fleeson, W. (2012). What is extraversion for? Integrating trait and motivational perspectives and identifying the purpose of extraversion. *Psychological Science, 23*(12), 1498-1505. doi:10.1177/0956797612444904

McWilliams, N. (2011). *Psychoanalytic diagnosis: Understanding personality structure in the clinical process*. Guilford Press.

Miller, J. D., Few, L. R., Lynam, D. R., & MacKillop, J. (2015). Pathological personality traits can capture DSM-IV personality disorder types. *Personality Disorders: Theory, Research and Treatment, 6*, 32-40. doi:10.1037/per0000064

Montag, C., & Panksepp, J. (2017). Primary emotional systems and personality: an evolutionary perspective. *Frontiers in Psychology, 8*. doi:10.3389/fpsyg.2017.00464

Muthén, L. K., & Muthén, B. O. (2018). *Mplus user's guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.

Pettersson, E., Mendle, J., Turkheimer, E., Horn, E. E., Ford, D. C., Simms, L. J., & Clark, L. A. (2014). Do maladaptive behaviors exist at one or both ends of personality traits? *Psychological assessment, 26*(2), 433-446. doi:10.1037/a0035587

Pharo, H., Sim, C., Graham, M., Gross, J., & Hayne, H. (2011). Risky business: Executive function, personality, and reckless behaviour during adolescence and emerging adulthood. *Behavioural Neuroscience, 125*(6), 970-978. doi:10.1037/a0025768

Roberts, B. W., & Davis, J. P. (2016). Young adulthood is the crucible of personality development. *Emerging Adulthood, 4*(5), 318-326. doi:10.1177/2167696816653052

Romer, D. (2010). Adolescent risk taking, impulsivity, and brain development: Implications for prevention. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology, 52*(3), 263-276. doi:10.1002/dev.20442

Sheehan, D. V., Lecrubier, Y., Sheehan K. H., Amorim, P., Janavs, J., Weiller, E., … Dunbar, G. C. (1988). The Mini-International Neuropsychiatric Interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry, 59*(20), 22–33.

Sherry, S. B., Hewitt, P. L., Flett, G. L., Lee-Baggley, D. L., & Hall, P. A. (2007). Trait perfectionism and perfectionistic self-presentation in personality pathology. *Personality and Individual Differences, 42*(3), 477-490.

Shulman, S., & Scharf, M. (2018). Adolescent psychopathology in Times of Change: The need for integrating a developmental psychopathology perspective. *Journal of adolescence, 65*, 95-100.

Soto, C. J., & John, O. P. (2009). Ten facet scales for the Big-Five Inventory: Convergence with NEO-PI-R facets, self-peer agreement, and discriminant validity. *Journal of Research in Psychology, 43,* 84-90. doi:10.1016/j.jrp.2008.10.002

Statistics South Africa. (2016). *Economic Growth.* Retrieved from: http://www.statssa.gov.za/?page_id=735&id=1

Suzuki, T., Samuel, D. B., Pahlen, S., & Krueger, R. F. (2015). DSM-5 alternative personality disorder model traits as maladaptive extreme variants of the Five Factor Model: An item-response theory analysis. *Journal of Abnormal Psychology, 124*(2), 343-354.

Thomas, K. M., Yalch, M. M., Krueger, R. F., Wright, A. G., Markon, K. E., & Hopwood, C. J. (2013). The convergent structure of DSM-5 personality trait facets and five-factor model trait domains. *Assessment, 20*(3), 308-311. doi:10.1177/1073191112457589

Vaidya, J. G., Latzman, R. D., Markon, K. E., & Watson, D. (2010). Age differences on measures of disinhibition during young adulthood. *Personality and Individual Differences*, *48*(7), 815-820. doi:10.1016/j.paid.2010.02.002

Van de Schoot, R., Lugtig, P., & Hox, J. (2012). A checklist of testing measurement invariance. *European Journal of Developmental Psychology, 9,* 486-492. doi:10.1080/17405629.2012.686740

CHAPTER 3

CRITICAL REFLECTION

This chapter focuses on my personal reflection regarding the research process. It is centred around my experiences over the last few years – some positive, some negative, but all valuable to my learning. This process took me somewhat longer than initially planned.

For 8 years I had to push myself and keep myself motivated in pursuing my passion. After the third try, I was finally accepted for the Master's program in Clinical Psychology and could not contain my excitement. This however changed quite drastically as soon as classes started. I had a completely different idea of what "research" meant, and only then learned about the various processes, and possible stumbling blocks I will be faced with. To be honest, I was taken aback and experienced an amount of anxiety like never before! Was I even capable of doing this? Or should I just quit while I'm a head? Spoiler alert: I didn't quit!

Getting started

The original topics I wanted to work with, i.e. psychopathology amongst criminals, was quickly deemed as idealistic and unrealistic. I did not understand this, as at that stage I did not understand the major role ethics played in research. Hence, my supervisor suggested we look at new developments, such as the "hybrid model" for personality disorders in the DSM-5 Section III. As soon as he said "personality disorders" I immediately said yes. However, once we got started and contemplated the layout of the study (focused on the PID-5-BF), anxiety once again reared its unwelcome head. I realised that most of the study would focus on statistical analysis – something, I'll admit, I had little to no experience with. But as my passion involves personality disorders, and working in state hospitals, I felt that this study might have an actual impact on clinical practice and policy, and somehow got the courage to face the challenge. That is how we decided on "The

psychometric properties of the PID-5-BF in an undergraduate sample of South African university students".

Ethics

The process of receiving ethical clearance and going through three panels of ethical approval, proved to be a bigger struggle than expected. The process of getting approval from the first two panels was relatively straight forward and was easy enough to comply with. But my experience with HREC proved to be somewhat more of a challenge. Some of the problems I experienced with HREC will be mentioned here, some under subsequent headings.

Firstly, I made the mistake of attending my research's HREC feedback meeting. I would not recommend that to any student – it was unnerving listening to other people criticising my work, without me having the opportunity to defend the reasoning behind certain things. I left the room with an intense mixture of emotions – ranging from fury, to sadness, to happiness. I also found the fact that only two of the people in the room was psychologists – and could not fathom how someone from a completely different field of study has the authority to comment on my research. At that stage I felt it to be a big problem as scope of practice indicates that a psychologist needs to assess and guide psychological research. What I came to learn and understood is that a multi-disciplinary team is needed for an evaluation like this, especially since the main focus lies on following correct ethical procedures.

That said, even though this was a horrible experience I will never forget, there were some positive aspects I could take with me – this was the eventual feeling of happiness. Firstly, I got clearance, with some changes, which was amazing as now I could continue. I sent in my rebuttal and was granted final clearance. I also learnt about the ethical process and the influence it has on research. I became more aware of certain considerations I did not perceive as being unethical and learnt to be patient with the process and trust those more knowledgeable in the field.

This was however not the last contact I had with HREC. I submitted a request for amendment – I needed to change one of the tests I was going to use to another version of the same test. I waited seven weeks for feedback and approval, which severely slowed the progress of my study, as without approval I could not gather data. I feel this waiting period was exceptionally and unnecessarily long. It was brought to their attention and they did apologise as this was also not acceptable to the HREC panel. Probably, some form of miscommunication took place, and seeing as the members of HREC are overwhelmed with work and pressure, I completely understand this.

The (actual) research process

My biggest frustration throughout the entire experience, was that of gathering data. My method of data gathering was limited through HREC's ethical approval, and as result I was only allowed to advertise through posters on campus boards and pamphlets handed out in classes. Having been a student on campus for several years, I know how people react to these types of recruitment – usually, though not in all cases, with a level of ignorance. I felt that this process of recruiting was sure to inevitably inhibit my process. And it did. It took months to gather data which ultimately almost slowed my progress to a stop. I really struggled to accept this and felt that sometimes ethical considerations are taken to an extreme. I understand that ethical principles are not necessarily imposed by the HREC committee but do feel like certain requirements or "taboos" are a bit unnecessary. If I may suggest, research on students' perceptions of coercion and the use of incentives is needed to better understand their needs for participating in someone else's research study. It does take a lot of time and perhaps giving a "thank you" (i.e. a sweet) should not be viewed as unethical.

But data was finally gathered, and analyses could commence. Obviously, as mentioned before, my lack of knowledge on statistics made this a very daunting experience. Luckily my data could be read into a statistics analysis program. I have to give great thanks to my co-supervisor for all his help regarding this. He also taught me a lot about statistics, and although I am not on expert level, my knowledge on statistics grew, as well as my confidence to write up results.

I was left with the final task of writing up the rest of my article for submission. I had to spend hours looking at others' research, but I found it extremely interesting and satisfying linking my results to existing literature, in a way that assimilated! I never before regarded myself as a researcher, but have to admit that it was a great experience through which I grew and gained confidence in a field I was not particularly familiar with.

Theory and practice

After all these hurdles and hick-ups I experienced, I managed to finish my dissertation. And even if I have to say so myself, I feel very proud of the end result. I believe that my research, albeit a very small foot in the door, could potentially benefit the South African mental health sector.

Our findings proved to be in line with existing literature on both the DSM-5 hybrid model and the PID-5-BF. Understand however, that the PID-5-BF still needs a lot of investigation in South Africa. We live in such a beautifully diverse country, and research on this test administered in different provinces, different cultures and demographics, would be both interesting and meaningful, especially if this can help the PID-5-BF be a registered test on the HPCSA's list.

Final words

I experienced a difficult few years, albeit not without "ups", but am extremely proud, and relieved, that it is now over. I grew as a researcher, in that I know finally understand statistics and am able to interpret findings, I understand the process of research, especially in South Africa a lot better and I have a better understanding of ethics. I do feel a need for South African research committees to revise policy, as proper, meaningful research is sometimes retrained when the amount of considerations seen as unethical weighs more than those deemed ethical.

I also grew as an individual. I learnt to be patient and accept certain processes as they are. I learnt that in some cases I am not in control, and I am allowed to not take it personally, but understand the impact of external forces. I gained a level of perseverance I did not have before, and

learnt how to encourage and motivate myself in situations where it was extremely difficult to do so. I learnt that I am not too bad of a researcher, and actually quite enjoy it.

I leave you with words from my favourite psychologist:

> "The privilege of a lifetime is to become who you truly are"
>
> - Carl Gustav Jung

APPENDIX A

DECLARATION OF LANGUAGE EDITING

DECLARATION BY LANGUAGE EDITOR

Heleen Venema
37 Nature's Own
Dakota Avenue
Helderkruin

I hereby declare that I have language-edited the mini-dissertation by Heleen Venema (student number (21629137):

Psychometric properties of the PID-5 BF in an undergraduate sample of South African university students

submitted in the fulfilment of the requirements for the Master's degree in Clinical Psychology, North West University, Department of Humanities

to the satisfaction of the student.

Date: 7 February 2019

Dr A. D. Kotze

Althéa Kotze • Language practitioner • APEd (South African Translators' Institute) • PhD Afrikaans and Dutch • MA Afrikaans and Dutch • MA Applied Linguistics • BA Hons • BA • PGCE •
4 Ixia Close • Yzerfontein • South Africa
+27 (0) 823518509 (m)
althea.erasmus@gmail.com

APPENDIX B

SOLEMN DECLARATION

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SOLEMN DECLARATION AND PERMISSION TO SUBMIT

1. Solemn declaration by student

I, **Heleen Venema**

declare herewith that the thesis/dissertation/mini-dissertation/article entitled (**exactly as registered/approved title**),

Psychometric properties of the PID-5-BF in an undergraduate sample of South African university students

which I herewith submit to the North-West University is in compliance/partial compliance with the requirements set for the degree:

M.A. Clinical Psychology

is my own work, has been text-edited in accordance with the requirements and has not already been submitted to any other university.

LATE SUBMISSION: If a thesis/dissertation/mini-dissertation/article of a student is submitted after the deadline for submission, the period available for examination is limited. No guarantee can therefore be given that (should the examiner reports be positive) the degree will be conferred at the next applicable graduation ceremony. It may also imply that the student would have to re-register for the following academic year.

Signature of Student Heleen Venema Digitally signed by Heleen Venema Date: 2019.02.11 09:28:14 +02'00'

University Number 21629137

Signed on this 11 day of February of 20 19

2. Permission to submit and solemn declaration by supervisor/promoter

The undersigned declares that the thesis/dissertation/mini-dissertation complies with the specifications set out by the NWU and that:

- the student is hereby granted permission to submit his/her mini-dissertation/ dissertation/thesis:
  (•) Yes ( ) No
- that the student's work has been checked by me for plagiarism (by making use of TurnItIn software for example) and a satisfactory report has been obtained:
  (•) Yes ( ) No

Signature of Supervisor/Promoter

Ruan Spies Digitally signed by Ruan Spies Date: 2019.02.11 08:48:04 +02'00'

Date 11/02/2019

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APPENDIX C

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Psychometric properties of the PID-5-BF in an undergraduate sample of South African university students

Abstract

Assessments are regularly used amongst clinicians within Psychology, yet many are deemed too time-consuming and expensive. The Personality Inventory for DSM-5 Brief Form (PID-5-BF) was developed to measure maladaptive personality traits (*Negative Affect, Detachment, Antagonism, Disinhibition, and Psychoticism*), based on the "hybrid model" for personality disorders included in the DSM-5 Section III. Literature indicates that reliability and validity for the PID-5-BF has been established in other countries. We explored these psychometric properties within a South African population using the NEO Personality Inventory Revised and MINI Subscale K: Psychotic disorders and mood disorder with psychotic features, as measures for comparison. Our results indicated support for the PID-5-BF with sufficient reliability, convergent and discriminant validity. More research is needed on the PID-5-BF, especially in South Africa, but our findings indicate it to be a promising assessment tool that could greatly benefit clinicians in the mental health sector.

Key words

Personality disorder; PID-5-BF; NEO-PI-R; Construct validity; Convergent validity; Discriminant validity

Introduction

Psychometric assessments are important tools within the psychology field to aid in the formulation of diagnoses enabling the application of effective treatment. These assessments need to be of high quality and standardised within a South African context in order to yield valid and reliable results (Foxcroft, Paterson, Le Roux & Herbst, 2004; Foxcroft & Roodt, 2009).

A survey regarding psychometric tests in South Africa expressed urgency for tests to specifically diagnose personality disorders and pathology. This survey also indicated concern that tests are too time-consuming and expensive (Foxcroft et al., 2004). Taking into account the rushed manner of modern-day life, and the decline of South Africa's economic growth (Statistics South Africa, 2016), psychopathology is a problem not currently dissipating (Pearce et al., 2017; Kliewer et al., 2017; Shuhran & Scharf, 2018), and it can surely be assumed that the findings of Foxcroft and colleagues (2004) are still valid. This is why the