Predictors of Academic Performance: General Factor of Personality and Emotional Intelligence

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TABLE OF CONTENTS

List of Tables and Figures

Tables

Figures

Abstract

The existence of higher-order factors of personality has attracted significant attention in recent years. Specifically, the General Factor of Personality (GFP) and meta-traits; Stability and Plasticity, as a result of several studies reporting moderate-to-strong correlations between the Big Five personality dimensions, which were originally conceptualised as orthogonal. However, the existence and influence of higher-order factors still remains unclear, with opposing explanations that argue the covariances are a statistical artifact derived from correlated measurement errors. Extending the existing literature, the present study (N = 688) analyzed pre-existing data from a questionnaire administered between 2010 to 2013 to third-year undergraduates. This study supported the presence of a GFP, but not for the meta-traits. In order to attain a comprehensive understanding of the nature of the GFP, the relationship between the single higher-order factor and an established construct, namely emotional intelligence (EI), was investigated, which revealed a large overlap between the GFP and EI (r = .94). Furthermore, it was reported that the GFP was a small but significant predictor of academic performance (AP), while EI was not. Severe multicollinearity prevented the examination of the incremental validity the GFP may have had on EI. Therefore, as a substitute Tertiary Entrance Rank (TER) was investigated instead of EI, it was reported that the GFP did not have incremental validity above TER. This study yielded mixed findings and, thus, highlights the need for future research of higher-order factors on personality and the extent to which they offer anything above the existing established personality structures.

Declaration

This thesis contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

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Contribution Statement

In writing this thesis, my supervisor and I collaborated to generate research questions of interest. All research design, recruitment and ethical applications were completed by my supervisor as an existing data set was provided. Additionally, an R script was developed by my supervisor and me as statistical analyses required were beyond the scope of that usually from an Honours student. I conducted the literature research and wrote-up all aspects of the thesis.

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CHAPTER 1: INTRODUCTION

1.1 Preamble

This thesis will examine the General Factor of Personality (GFP) and Emotional intelligence (EI) as predictors of academic performance (AP). Individual differences are psychological characteristics that convey a sense of consistency and personal uniqueness in individual behaviour (Ashton, 2013). The study of individual differences is particularly important, as it allows us to understand the ways in which individuals differ from one another, which influences behaviour (Ashton, 2013). Among the most important forms of individual differences are personality and intelligence (Williamson, 2017). According to McCrae and Costa (2008), individual differences in personality can be understood in the form of five factors of personality, known as the 'Big Five'. The Big Five encompasses five core personality traits, represented using the acronym OCEAN (Openness to Experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism) (Alegre et al., 2019). The Big Five dimensions were originally perceived as orthogonal construct but accumulating research consistently reports covariances between the dimensions (van der Linden et al., 2010). The reported correlations have prompted the underlying notion of a higher order factor that exists beyond the Big Five factors, termed the GFP (van der Linden et al., 2010). The GFP reflects a social effectiveness component; high-GFP scorers have a combination of low neuroticism and high levels of the other four dimensions (van der Linden et al., 2010). Additionally, there has been recent research between the GFP and EI as related constructs (Alegre et al., 2019; van der Linden et al., 2017). EI is defined as the ability to apply, manage and understand one's emotions as well as those of others, which guides thinking and behaviour (Mayer & Salovey, 1991). Hence, it would be expected that there is a relationship between GFP and EI, provided that both represent how one effectively responds to social

demands(van der Linden et al., 2017). Furthermore, those who are socially competent are able to produce advantageous life outcomes, such as high-AP (Dunkel & van der Linden, 2014; Petrides, 2013; Wijekoon et al., 2017).

1.2 Introduction

AP is a multidimensional phenomenon and is highly regarded given its role in the economic and cultural advancement of a country (MacCann et al., 2020; Poropat, 2009; Rooy & Viswesvaran, 2004). Through AP, students can realise their educational capacity in line with educational objectives. Several studies have linked individual differences in AP to intelligence and personality (O'Connor & Paunonen, 2007; Rooy & Viswesvaran, 2004; Wijekoon et al., 2017). Moreover, certain personality traits or facets are associated with performance in various settings, including organisational, health, and educational (Chang et al., 2012; van der Linden et al., 2017) (Chang et al., 2012; Linden et al., 2017). Over the past decades researchers have reported important findings using hierarchical models, including the 'Big Five' to investigate individual differences in personality (Poropat, 2009; van der Linden et al., 2010). The Big Five is a well-known and rigorously studied model, which reflects core components of human personality that have strong influences on behaviour (Alegre et al., 2019). Various studies have revealed consistent findings on the Big Five model's ability to predict academic success (O'Connor & Paunonen, 2007). Conscientiousness, especially seems to have significant positive influences on examination performance, grade point average (GPA), and academic success (Komarraju et al., 2009; Komarraju & Karau, 2005). The Big Five Model was conceptualised to comprise orthogonal dimensions but several studies have revealed correlations between the dimensions (Bäckström et al., 2009). This initiated two prevailing interpretations that may clarify the existence of the shared variance between the proposed independent constructs. One interpretation

argues for the presence of higher-order factors beyond the Big Five, whilst the other argues that the covariances between the Big Five factors are attributable to statistical artifacts (e.g,. socially-desirable response bias) (van der Linden et al., 2010).

DeYoung et al. (2002) made a significant contribution to this field of study by identifying two meta-factors beyond the Big Five via exploratory factor analysis; these were described as "alpha" and "beta". They described alpha as a socialisation factor which relates to the positive or negative expressions of socially desirable traits, whereas beta is interpreted as personal growth verses restriction (Chang et al., 2012). In addition to the two superordinate factors above the Big Five, recent findings have suggested a GFP, defined as a higher-order single factor that occupies the apex of a multifactorial hierarchy of personality (van der Linden et al., 2010). The GFP differentiates the desirable and undesirable poles of the Big Five, reflecting the general tendency for individuals to behave in a manner that garners or deters social acceptance (Veselka et al., 2012).

EI, on the other hand, encompasses core aspects of interpersonal and intrapersonal relationships, adaptability, stress and mood regulation (van der Linden et al., 2017). van der Linden et al. (2017) proposed that the GFP reflects a social effectiveness component, and hence it can be anticipated to have some overlap with measures of EI, provided that EI reflects how one effectively responds to social demands. Furthermore, there is ample evidence that suggests moderate positive correlations between EI and AP. MacCann et al. (2020) conducted a meta-analysis on a total of 158 studies, which yielded small-to-moderate correlations between EI and AP, where high-EI students tended to achieve higher grades and test scores. There are two aspects to EI largely determined by the approaches to its measurement: ability-EI and trait-EI. Ability-EI is characterised by the ability to regulate, perceive and express one's and other's

emotions, and is operationalised by maximum performance tests. Trait-EI is a constellation of emotional self-perceptions measured by self-report (Petrides, 2013; van der Linden et al., 2017). It was reported by (MacCann et al., 2020) that ability-EI was a stronger predictor of AP than trait EI (see section 1.2.4, below). Furthermore, it would be worth investigating whether the GFP has incremental validity beyond the already established relationship between EI and AP. This field of study is relevant to both educators and researchers who are concerned with identifying predictors of real-life outcomes. Furthermore, identifying determinants of academic success will allow better development of curricula aimed at improving levels of AP (O'Connor & Paunonen, 2007) .The current study aims to contribute to this developing research field, by address existing gaps in the literature of individual differences in intelligence and personality. Through investigating the existence of a single higher-order factor (GFP), its overlap with EI, and how the GFP may increase predictive validity beyond the established EI and AP association. Core concepts of interest will now be discussed in more detail.

1.2.1 Big Five Model

Few psychological theories have as much support as the Big Five model. Well-known for its scientifically valid psychometric properties that allow understanding of individual personalities defined by variations across the five domains (Alegre et al., 2019). These five dimensions govern the individual differences in the way responsibilities are managed (Conscientiousness), relations with others (Agreeableness), negative emotions (Neuroticism vs Emotional Stability), experiential/influential stimulation (Openness to Experience), and how they seek affiliation (Extraversion) (Chang et al., 2012). It should be noted that Neuroticism and Emotional Stability are opposite poles of the same dimension. Neuroticism is characterised by the tendency to perceive typical situations as difficult to control and threatening. In contrast, Emotional Stability

is defined by the ability to handle adversity and withstand difficult situations, while remaining emotionally in control (Rodríguez-Ramos et al., 2019).

Historically, the Big Five has represented the highest-level in the hierarchical structure of personality, and were originally perceived as independent constructs with little or no shared variance amongst the five domains (Chang et al., 2012). However, accumulating research evidence suggests otherwise, reporting moderate-to-strong correlations between the Big Five domains (Chang et al., 2012). Evidence of intercorrelations among the Big Five was further supported through a meta-analysis (Mount et al. (2005), which included four frequently used personality inventories assessing the Big Five domains. They found four out of the ten intercorrelations were moderately large, Emotional Stability- Conscientiousness (r =.52), Conscientiousness – Agreeableness (r =.39), Emotional Stability – Agreeableness (r = .42) and Extraversion – Openness (r =.45). Furthermore, Musek (2007) computed correlations on three different instruments which measured the Big Five: the Big Five Inventory (BFI) (John & Srivastava, 1999; Rammstedt & John, 2017), the International Personality Item Pool (IPIP-300) (Goldberg et al., 2006) and the Big Five Observer (BFO) (Caprara et al., 1993). Some correlations were fairly sizable with correlation coefficients of r = .40 and even r =.50. Neuroticism correlated negatively with all dimensions, except Openness to Experience in the IPIP-300 and BFO and correlations were positive except Conscientiousness and Openness to Experience in IPIP-300 (Musek, 2007). The pattern of intercorrelations can be summarised as Neuroticism correlating negatively with all other dimensions, as Neuroticism comprises negative personality facets, where individuals with low-neuroticism tend to be more emotionally stable and less volatile to stress. The other four dimensions comprise of more positive personality facets and hence are more likely to positively correlate with one another (Deneve & Cooper,

1998). They discussed that correlations between the Big Five domains have been proposed to arise because the Big Five dimensions are not at the basic level of personality explanation and that broader factors exist beyond them at higher levels (DeYoung, 2006; Digman, 1997; Musek, 2007).

The first systematic analysis of correlations among the Big Five domains was reported by Digman (1997), who concluded that two orthogonal meta-traits exist, alpha and beta, which arise because of the observed correlations among the Big Five. Alpha is characterised as social development and beta is referred to as personal growth (Anuaj et al., 2009). Hence, these findings confirm that the Big Five are non-orthogonal. This has prompted two prominent explanations for this covariance. The first interpretation suggests that the correlated constructs are due to factors at the lower levels, being associated with one another through their relationships with higher order-factors (Bäckström et al., 2009). The second interpretation argues that the Big Five traits are orthogonal and the associations between traits are caused by measurement error (Chang et al., 2012). These two interpretations are further elaborated in the Nature of GFP section (1.2.3), below.

1.2.2 Plasticity and Stability

Digman (1997) made important contributions to the debate about individual difference in personality by proposing two meta-traits alpha and beta, as higher-order factors derived from the Big Five model (Bäckström et al., 2009). This finding was based on Digman's model that facets of the five domains reveal a loading structure that can be attributed to two higher-order factors; Digman (1997) later relabeled them as Stability (Alpha) and Plasticity (Beta) after replication of the two-factor solution (Bäckström et al., 2009). Therefore, this forms a three-level hierarchical structure of personality, where the levels of trait adjectives are arranged subordinate to the Big

Five, Stability and Plasticity are higher-order factors beyond the Five domains, with the GFP situated at the apex of the hierarchical structure of the personality (although some personality inventories arrange trait adjectives into facets subsumed by the Big Five, e.g., the NEO-PI, these are not considered here). Stability is defined by the variance shared between Conscientiousness, Agreeableness and Emotional Stability (the inverse of Neuroticism)(Digman, 1997). It reflects an individual's ability to socially adapt through avoiding distractions that may threaten personal or social objectives (Conscientiousness), establishing harmonious social relationships (Agreeableness), and coping effectively to stress and negative emotions (Emotional Stability) (Chang et al., 2012). Plasticity refers to the extent to which an individual proactively explores and seeks experiences both intellectually and socially, which is where Extraversion and Openness to Experience load (Digman, 1997). Rushton & Irwing (2008) conducted a meta-analysis on Digman (1997) and Mount et al. (2005) and reported that both studies did indeed show support for the two-higher order factors derived from several personality instruments. Study 1 included 14 studies of inter-scale correlations gathered by Digman (1997), where Stability was defined by Conscientiousness, Emotional Stability and Agreeableness with loadings between 0.61 to 0.70, while Plasticity reported loadings of 0.55 and 0.77 for Openness to Experience and Extraversion. In Study 2 the GFP was defined by alpha and beta, which presented further supportive evidence with factor loadings of 0.67 (Rushton & Irwing, 2008).

1.2.3 Nature of the General Factor of Personality

Consistent findings of covariances between the Big Five traits has prompted the concept of a single higher-order solution (i.e., the GFP). Digman (1997) calculated inter-scale correlations from 14 sets of the Big Five and found the average correlation was r ~.26 (Rushton & Irwing, 2009). Ensuing research has found significant moderate-to-strong correlations of GFPs extracted

from different personality measures, with average correlations among GFPs of $r \sim .60$ (van der Linden et al., 2017). There are statistical differences between the methods used for extracting the GFP. For example, by using: a simple average of the lower-order traits; the first unrotated factor in a set of personality measures; or by using confirmatory factor analysis (CFA), and structural equation modelling (van der Linden et al., 2017). Despite the variation in statistical methods, there is accumulating literature that shows highly similar outcomes in regards to the GFP (Hull & Beaujean, 2011; van der Linden et al., 2017; Woods & Hardy, 2011). For example, methods such as CFA or principle axis factoring yield almost identical GFP loadings (van der Linden et al., 2017). It was previously stated that the GFP reflects a general social effectiveness component, where high-GFP individuals are agreeable, extraverted, emotionally stable, conscientious, and intellectually open, core characteristics that likely lead to successful and satisfying lives (Chang et al., 2012). In support of this social effectiveness perspective of the GFP, there is evidence that suggest its association with several relevant objective criteria, for example, classmate likability and popularity, job performance, academic achievement, and interviewer impressions (van der Linden et al., 2016).

However, a different perspective suggests that the Big Five constructs are essentially orthogonal and the covariances are due to a methodological artifact derived from correlated measurement errors (e.g., response bias). Hence, some researchers have investigated the extent to which GFP scores are correlated with the tendency to endorse positively framed personality items in the direction of the cultural norm (socially desirable). Dunkel and van der Linden (2014) tested these two different interpretations and reported that despite controlling for socially-desirable responding, GFPs and measures of social-effectiveness were significantly correlated with over 50% of shared variance. It was noted that the majority of analyses controlling for social-

desirability weakened the strength of the GFP and social-effectiveness relationship (Dunkel & van der Linden, 2014).

Bäckström et al. (2009) reported evidence that contradicted the presence of the GFP, reporting that when items were reformulated in a way that avoids the social desirable direction (e.g., "Gets upset easily" reformulated to "Sometimes reacts strongly to things that happen"), the shared variance of personality traits (i.e., the GFP) is reduced. Nevertheless, Bäckström et al. (2009) found that a substantial proportion of shared variance between social desirability and the GFP still remained. An issue identified with reformulating the items is that it is unclear the degree to which social desirability can be controlled without altering the actual content of the items. Additionally, Rushton and Irwing (2008) proposed an interesting albeit controversial evolutionary interpretation for this single higher-order factor solution derived from Differential K theory. Differential K theory states animals and humans utilise various adaptive strategies, where high-GFP individuals have inherited fitness-to-survive via natural selection; in contrast, low-GFP individuals produce more offspring to enhance their genetic survival (Chang et al., 2012). Despite current mixed findings of the GFP, there is a growing interest in the research and application of the GFP across various psychology domains, which will allow for more precise theoretical understanding of its essence.

1.2.4 Ability and Trait Emotional Intelligence

An important distinction within the EI literature is between trait and ability EI. These two EI constructs can be differentiated based on the methods used to operationalise them. The general concept of EI refers to the ability to perceive emotions in the self and others in addition to understanding and regulating information in advantageous ways (Brannick et al., 2009). *Trait EI* can be defined as a constellation of emotional self-perceptions and social effectiveness

operationalised by self-report (i.e., questionnaires and rating scales). Whilst *ability EI* is often defined as a set of emotional-related cognitive abilities measured via maximum performance tests (Schutte et al., 1998) . It refers to having knowledge about the influences of emotions on behaviour and utilising this to identify and regulate one's own and other's emotional states (Petrides, 2013).

The present study utilises the Assessing Emotions Scale (AES) as the form of operationalizing EI, which attempts to assess *ability EI* (Schutte et al., 2009) but by self-report. It was developed by Schutte et al. (1998) based on the Salovey and Mayer (1990) three-branch EI model comprising of appraisal and expression of emotion, emotion regulation and application of emotion to solve problems (Kun et al., 2010). Early findings suggested AES scores related to optimism, impulse control, mood repair and attention to feelings (Schutte et al., 2009). Schutte et al. (1998) yielded evidence of predictive validity of first year university grades as indicated by their grade point averages, $r(63) = .32$, $p < .01$ (Schutte et al., 2009). Using a meta-analytic procedure Rooy and Viswesvaran (2004) summarised outcome analysis of several variables expected to be related to EI, within 14 diverse samples of participants, which found that scores on the AES correlated on average at $r = .23$ with outcomes in various domains. An interesting finding by Burns et al. (2007) found that many self-report EI scales are more related to personality measures than ability measures, including the AES. This may be due to EI items not measuring actual performance, as answers do not demonstrate how one would actually emotionally behave, despite testing for application, knowledge and management of emotions (Burns et al., 2007).

1.2.5 Emotional Intelligence and General Factor of Personality

Existing literature on EI definitions implies that high-EI individuals, on average, display higher aptitudes of effectiveness in social interactions, comparative to their low-EI peers (van der Linden et al., 2017). Generally EI refers to the extent and manner in which individuals express, manage, and utilise information about themselves and others to guide thinking and behaviour to achieve personal and social objectives (van der Linden et al., 2016). For example, an individual may be very angry, but instead of acting out their anger, they calmly express their dissatisfaction with the situation. Such behaviours are advantageous as they enhance the probability of reaching social goals, which may reflect a fundamental aspect of an individual's personality to exhibit socially appropriate behaviours (Dunkel & van der Linden, 2014). Therefore, if high-EI individuals are socially effective, then it is not difficult to imagine an overlap of EI and GFP in a socially desirable direction provided that high-GFP individuals seem to also consistently display higher levels of socially effective behaviour (van der Linden et al., 2017). Rooy and Viswesvaran (2004) reported that EI is significantly associated with the socially desirable poles of each of the Big Five dimensions, with correlations ranging from .23 to .34. Therefore, given that EI shows correlations with the Big Five dimensions in a socially desirable direction and the existence of the GFP in the Big Five, the GFP and EI would likely have a strong overlap. Rooy and Viswesvaran (2004) in their meta-analysis on 142 data sources reported two prominent findings: a large overlap between GFP and trait EI ($r \sim .85$), and more moderate positive correlations with ability EI ($r \sim .28$). Hence, this provides evidence to suggest the notion of a GFP-EI overlap and that the GFP is a social effectiveness factor. Additionally, van der Linden et al. (2017) found average correlations of $r \sim .70$ between the GFP and EI, which further supports this overlap.

1.2.6 Emotional Intelligence General Factor of Personality Link and Academic Performance

Literature on the GFP and EI has established the notion of both constructs reflecting a social effectiveness component, which encompasses socially desirable factors that likely lead to positive outcomes (Dunkel & van der Linden, 2014). EI is a well-established construct with various researchers examining and applying EI within academic, medical, and organisational settings (Fallahzadeh, 2011). Individuals with higher EI are perceived to have better interpersonal relationships, which may affect general intellectual development positively and behavioural patterns of self-regulation and self-motivation that ultimately lead to higher AP (Wijekoon et al., 2017). Wijekoon et al. (2017) reported strong correlations with two components of EI and academic success: adaptability and stress management. A cross-sectional study on 163 medical students found that high-EI individuals performed better in both continuous assessments and final examinations (Wijekoon et al., 2017). Rooy and Viswesvaran (2004) utilised meta-analytic methods to examine the relationship between EI and performance outcomes. It was reported that there was a correlation of only r =.10 between EI and AP. Moreover, it was identified that three of the Big Five dimensions yielded a correlation of r =.31 with EI; with the lowest correlation being r =.23 for Agreeableness and Openness to Experience. EI showed incremental validity over the Big Five suggesting that EI may be considered a better predictor of performance outcomes than the Big Five, from which the GFP is extracted (Rooy & Viswesvaran, 2004). The Big Five personality dimensions have been found to be strong predictors of AP, where O'Connor and Paunonen (2007) found Conscientiousness was consistently an indicator of academic success, with Extraversion found to be negatively related. Furthermore, GFP was reported to be stable across measurements, and is predictive of various critical real-life outcomes, including AP, job performance, and health (Alegre et al., 2019).

Given that EI and personality (particularly Conscientiousness and Openness to Experience) are well-established predictors of AP, it is important to examine the incremental validity of the more recently identified GFP alongside the contributions of these traditional predictors (MacCann et al., 2020). Additionally, the current research into the incremental validity of GFP beyond EI in AP will contribute to the still limited number of studies on the recently identified high-order construct.

1.3 The Current Study

The current study will investigate the GFP as a predictor of AP. While, the existing literature focused on the underlying basis for the existence of the GFP, this study will offer a more conceptual understanding. To further validate the GFP, the present study will provide additional understanding into the extent the GFP adds predictive value to the already well-established relationship between EI and AP.

This study poses three main research questions:

1) Does a single higher-order factor (GFP) exist beyond the Big Five and what is its nature?
2) To what extent are the GFP and EI associated?
3) To what extent do the GFP and EI predict AP?

CHAPTER 2: METHOD

2.1 Ethical statement

This study was conducted by the University of Adelaide School of Psychology. Ethics approval was obtained by the *University of Adelaide Human Research Ethics Subcommittee* prior to the study's commencement in 2010. The ethical procedures sought approval to access psychology course grades and permission for future use of the data for research purposes.

2.2 Participants

The study recruited 3rd year psychology students at the University of Adelaide, between 2010 and 2013 who completed the course PSYCHOL 3022 'Individual Differences, Personality & Assessment', as part of the course's practical '*Emotional intelligence: More than personality and cognitive ability?*'. A total sample of 688 students were involved, which included 530 females (77%) and 158 males (23%) ranging from 18 – 67 years old (M = 23.9, SD = 6.66 yrs).

2.3 Materials

The questionnaire was hosted by MyUni on the BlackBoard system, with a survey battery consis ting of five standardised psychometric measures assembled for data collection. Data analyses we re conducted using R (R Core Team, 2019); the psych for R package (Revelle, 2020) and the lav aan package (Yves Rosseel, 2012) were used to access specific functions to complete statistical a nalyses.

2.4 Procedures

Provided that data collection was completed between 2010 and 2013 all necessary Ethics approvals were obtained by the *University of Adelaide Human Research Ethics Subcommittee* at the time. Questionnaire participation was a part of a course requirement but the use of data for research purposes was voluntary. Therefore, participants were assured confidentially, anonymity and student consent for the use of the use of the data collected for future research purposes were obtained. Participation was part of a 3rd year course practical, with a set time completion period of one week and was self-paced. Following data collection, once data was matched a de-identification procedure was completed to ensure there was no way of reidentifying participants.

2.4.1 Measures

Despite the survey consisting of five psychometric measures, only The Assessing Emotions Scales (AES), Openness Conscientiousness Extraversion Agreeableness Neuroticism Index Condensed (OCEANIC) and average of psychology subjects will be used due to their relevance to the current study. Additionally, age, gender, and Tertiary Entrance Rank (TER) were self-reported.

2.4.2 Emotional Intelligence

The (AES) is a 33-item self-report inventory of EI, where respondents are to indicate on a 5-point Likert scale their degree of agreement with each statement, in relation to what best describes them (e.g., “I know when to speak about my personal problems to others”) (Schutte et al., 1998). A total score was calculated by summing all items, where an individual higher total

score will indicate higher EI. Schutte, et al., (1998) reported the 33-item scale showed good internal consistency indicated by a Cronbach's alpha of 0.87, and scores are fairly stable over time with a 2-week test-retest reliability of 0.78.

2.4.3 Personality

OCEANIC is a standardised measure that will assess participant's personality according to the Five Factor Model personality construct (Schulze & Roberts, 2006). It consist of 45-items, where participants are to rate the frequency of their engagement in each of the behaviours on a 6-point Likert scale (i.e. (a) indicates participant has never engage in the specified behaviour, and (f) indicates participant always engage in the specified behaviour (Schulze & Roberts, 2006). Cronbach's alpha for the five dimensions range from 0.77-0.91, and hence indicates good reliability for the OCEANIC measure (Schulze & Roberts, 2006).

2.4.4 Academic Performance

AP was represented by the average final grade of third-year psychology subjects in that year. TER was also a measure of AP, which participants received at least three years prior to the study. TER are used in several Australian states as a ranking scheme to determine admission to tertiary education, where all students completing secondary schooling will receive a TER (*Australian Tertiary Admission Rank*, u.d).

CHAPTER 3: RESULTS

This section presents the findings reported from conducting a series of statistical analyses. Preliminary statistical analysis include data screening and descriptive statistics are firstly outlined, followed by analyses addressing the three research questions.

3.1 Data Screening

Preliminary data analyses involved data screening for incorrect data input. There were 139 missing values for TER, with 549 participants having reported their TER out of the total sample of 688. An incorrect response was identified for age entered as 2.4, this value was modified to 24yrs. All psychometric measures had good reported reliability as described in the Methods section.

3.2 Descriptive Statistics

Descriptive statistics for all variables are presented in Table 1. There was a total sample of N = 688, this included 530 females (77%) and 158 males (23%) ranging from 18 - 67 years old (M = 23.9, SD = 6.66yrs). Table 2 presents intercorrelations between all variables using Pearson's correlation coefficient. Covariances between the Big Five dimensions are evidently shown in Table 2, ranging from r = .38 to .05. The largest correlation was between Conscientiousness and Agreeableness, whilst, the smallest was between Emotional Stability and Openness to Experience. Thus, this is consistent with the existing literature of intercorrelations between the Big Five traits, which provides a basis for the existence of higher-order factor. Additionally, Emotional Stability is the inverse of Neuroticism and therefore was derived by reverse scoring Neuroticism. It should be noted that average grade and TER are subject to the issue of restriction

of range, where correlations tend to be smaller than if the full range was available. Hence, average grade and TER means are considerably high, this may be due to the selection of students into the undergraduate degree were on the basis of academic merit, in addition to, students who do not drop out or fail any courses. TER and average grade had a relativity small correlation of *r* =.34, which is unexpected given that they are both measurements of AP, albeit separated by at least three years and, as noted, both subject to range restriction.

AES showed moderate correlations with the Big Five traits ranging from *r* =.30 to .47, with the highest being with Agreeableness at *r* =.47. Previous research has reported that when compared to ability EI, self-report EI measures are more closely correlated to personality. Hence, despite the AES being derived from ability EI models, Bastian et al. (2005) reported evidence that the AES is significantly more correlated with personality measures than to cognitive measures (Burns et al., 2007). Additionally, Conscientiousness was the largest correlated Big Five dimension out the five dimensions with average grade (*r* = .24), although it is a small-to-moderate correlation. This finding is consistent with the current literature that several studies having reported Conscientiousness to have positive correlations with AP (Hasbi et al., 2018; Komarraju et al., 2009). Conscientiousness reflects an individual's tendency to be goal-directed, organised and adhere to norms and rules, hence it would be expected to have a strong correlation with AP (Roberts et al., 2014). Again, however the size of this correlation will be affected by range restriction.

Table 1. Descriptive Statistics of Predictors of Academic Performance in the Current Sample (N= 688)

Variable	Mean	SD	Min	Max
Age (yrs)	23.9	6.66	18.3	67.00
Tertiary Entrance Rank	86.3	9.90	46.2	99.95
Openness to Experience	32.7	7.12	14.0	53.00
Conscientiousness	38.1	7.13	14.0	54.00
Extraversion	33.3	7.37	12.0	52.00
Agreeableness	43.3	5.59	23.0	52.00
Emotional stability	23.4	7.19	1.0	42.00
Assessing Emotions Scale	122.3	11.3	80.0	161.00
Average Grade %	70.3	10.3	41.0	93.0

Note: N= Sample size, SD= Standard deviation, Min = Minimum, Max= Maximum

Table 2. Correlation Matrix of Psychometric Variables

	Age	TER	O	C	E	A	ES	AES	AveGrade
Age	1.00	-.05	.21	.14	-.07	.04	.15	.15	.03
TER	-.05	1.00	.06	.11	.10	-.01	-.03	.05	.34
O	.21	.06	1.00	.26	.13	.24	.05	.41	.01
C	.14	.11	.26	1.00	.20	.38	.11	.40	.24
E	-.07	.10	.13	.20	1.00	.30	.34	.41	-.02
A	.04	-.01	.24	.38	.30	1.00	.15	.47	.02
ES	.15	-.03	.05	.11	.34	.15	1.00	.30	.03
AES	.15	.05	.41	.40	.41	.47	.30	1.00	.03
AveGrade	.03	.34	.01	.24	-.02	.02	.03	.03	1.00

Note: TER is Tertiary entrance rank, Openness to Experience (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), Emotional Stability (ES), AES is Assessing Emotions Scale and AveGrade is Average Grade.

3.3 Research Question 1: Does a single higher-order factor (GFP) exist beyond the Big Five and what is its nature?

Research question 1 investigates whether a GFP exists beyond the Big Five as measured by the OCEANIC (Schulze & Roberts, 2006). An exploratory factor analysis of the Big Five was conducted to determine the number of factors by using the fa.parallel R function from package psych (Revelle, 2020). Factors with high eigen values should be retained, which can be determined by adopting Kaiser's approach in retaining factors with an eigenvalue ≥ 1 and eliminate eigenvalue < 1 (Zaiontz, n.d). Additionally, Cattel's scree test plots the size of the eigen values from largest-to-smallest and works by retaining the number of factors above the inflection point in the plot, where the curve begins to level off and to eliminate any factor below the inflection point (Zaiontz, n.d). Figure 1 shows the application of function fa.parallel of eigenvalues from factor analysis and principal components of the five variables (O,C,E,A,ES) represented by the unbroken lines and from random data indicated by broken lines. According to the scree plot generated, there are two eigen values greater than one and the scree-test and parallel analysis both indicate a two-factor solution. This is consistent with current literature reporting the existence of two higher-order factors known as Stability and Plasticity.

A two-factor exploratory factor analysis (EFA) was conducted on the Big Five using the psych R package (Revelle, 2020) applying the fa.parallel function and was estimated via maximum likelihood factor analysis with oblique rotation. Table 3 presents the loading matrix of the two-factor EFA for the Big Five dimensions. Together both factors explain 36% of variance in the Big Five and are correlated at $r = .45$. It can be seen in Table 3 that the factor loadings of the Big Five on these two factors are not consistent with the theoretical two-factor model, as the Big Five

dimensions do not load according to the current literature on alpha and beta. According to the literature, alpha is defined by dimensions Conscientiousness, Emotional Stability and Agreeableness, while beta is defined by Openness to Experience and Extraversion. However, it is evident in the two-factor EFA That Openness to Experience instead loaded onto alpha and Emotional Stability loaded onto beta. Therefore, it can be concluded that two-higher order factors consistent with previous theory are not present in the data. Following this, the Lavaan package in R (Yves Rosseel, 2012) allowed the application of confirmatory factor analyses (CFA) to test whether the data fits a hypothesised measurement model. A series of CFA were fitted, each of which represent a different model of personality. Figure 2 posits a single higher-order factor of personality (GFP), fit statistics for this model were modest $\chi^2(5) = 57.5$, $p < .001$), CFI = .84 but the RMSEA = .024, 90% CI (.097,.154) showed good approximate fit. Figure 3 displays a three-level hierarchical model, with the Big Five dimensions loading according to the theoretical alpha and beta model, the fit statistics for Figure 3 indicated that the model was not a good fit $\chi^2(4) = 57.2$, $p < .001$), CFI= .88 and RMSEA= .136, 90%CI (.105, .169). Moreover, this solution is inadmissible because the estimated residual variance for beta is negative. Lastly, Figure 4 displays a hierarchical model with the Big Five dimensions loading onto two factors according to the findings of the two-factor EFA, this model was a better fit than the other models $\chi^2(4) = 5.56$, $p = .235$),CFI= .99 and RMSEA= .024, 90% CI (.000, .067), as would be expected. Consequently, the data at hand rejects the idea that there is a plasticity and stability structure underlying the GFP, given that the data does not conform to the proposed alpha and beta model. Therefore, subsequent analyses with be completed by modelling the GFP as a single factor that sits above the Big Five because we have no theoretical basis for accepting the solution found via EFA.

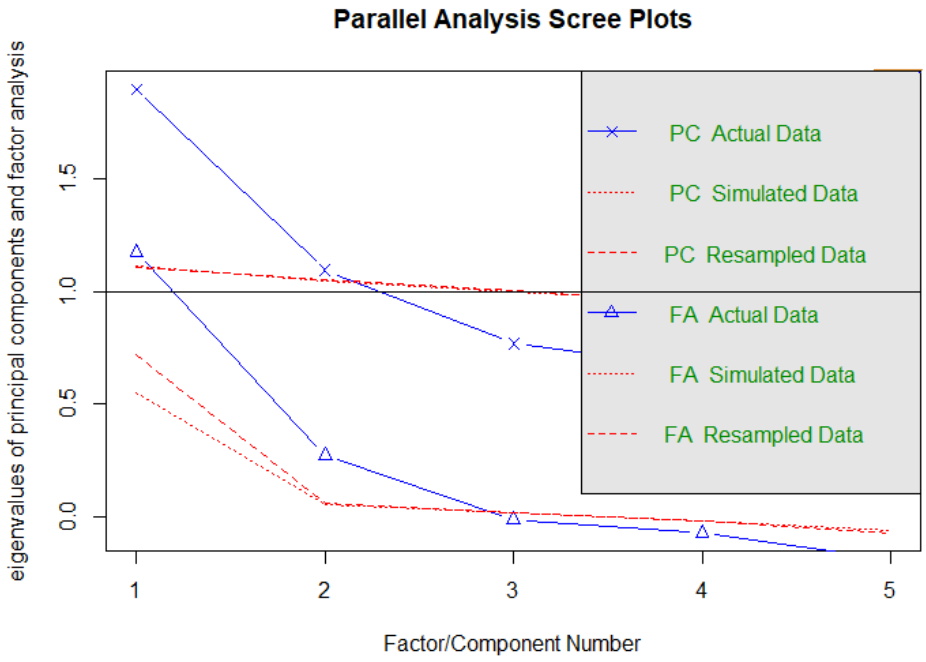

Figure 1. Scree plot of eigen values from factor analysis and principal components of Big Five factors

Note: Plot of eigen values from principal and factor analysis for four variables (unbroken lines) and from random data (broken lines). Plot indicates two eigen values greater than one and the screen test and parallel analysis both indicate a two-factor solution.

Table 3. Factor loadings of a two-factor EFA for the Big Five dimensions

Big Five dimensions	**Factor 1**	**Factor 2**
	Loading	Loading
O	0.43	-0.04
C	0.65	-0.04
E	-0.01	0.83
A	0.55	0.13
ES	0.00	0.42

Note: Openness to Experience (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), Emotional Stability (ES).

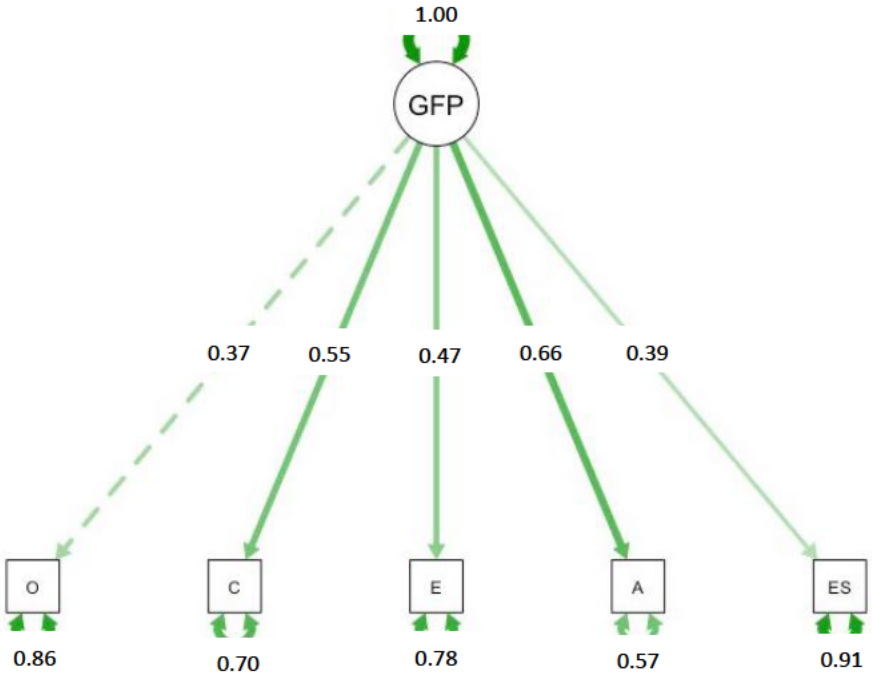

Figure 2. Single higher-order factor

Note: GFP is General Factor of Personality, Openness to Experience (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), Emotional Stability (ES). Significant factor loadings (unbroken lines), insignificant factor loadings (broken line), variances and residual variances (Curved arrows)

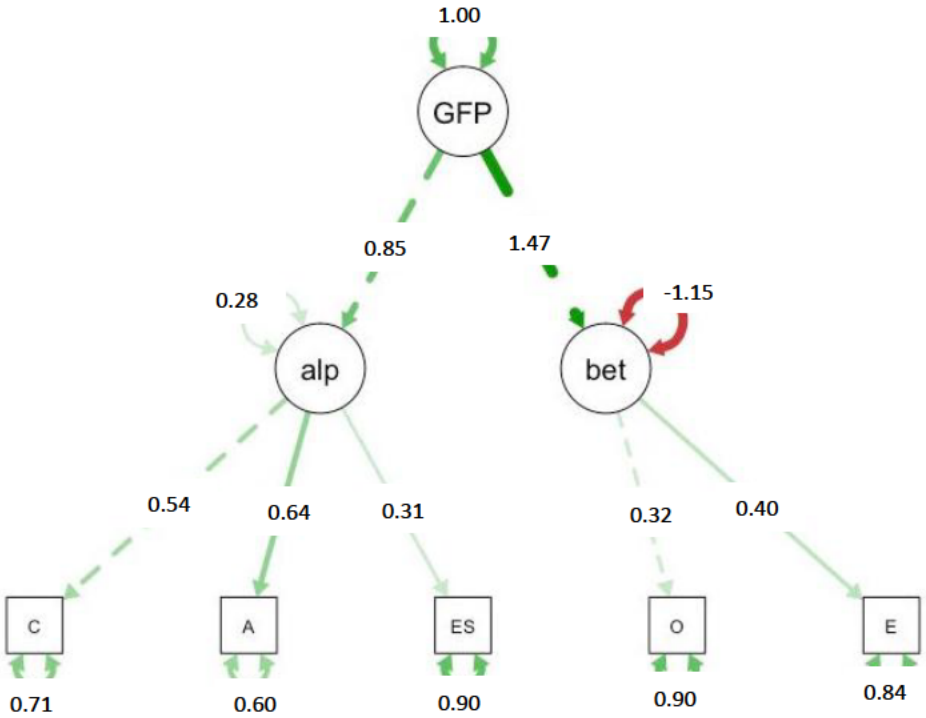

Figure 3. Two higher-order factors according to the theoretical alpha and beta model

Note: GFP is General Factor of Personality, Openness to Experience (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), Emotional Stability (ES). Significant factor loadings (unbroken lines), insignificant factor loadings (broken line), variances and residual variances (Curved arrows).

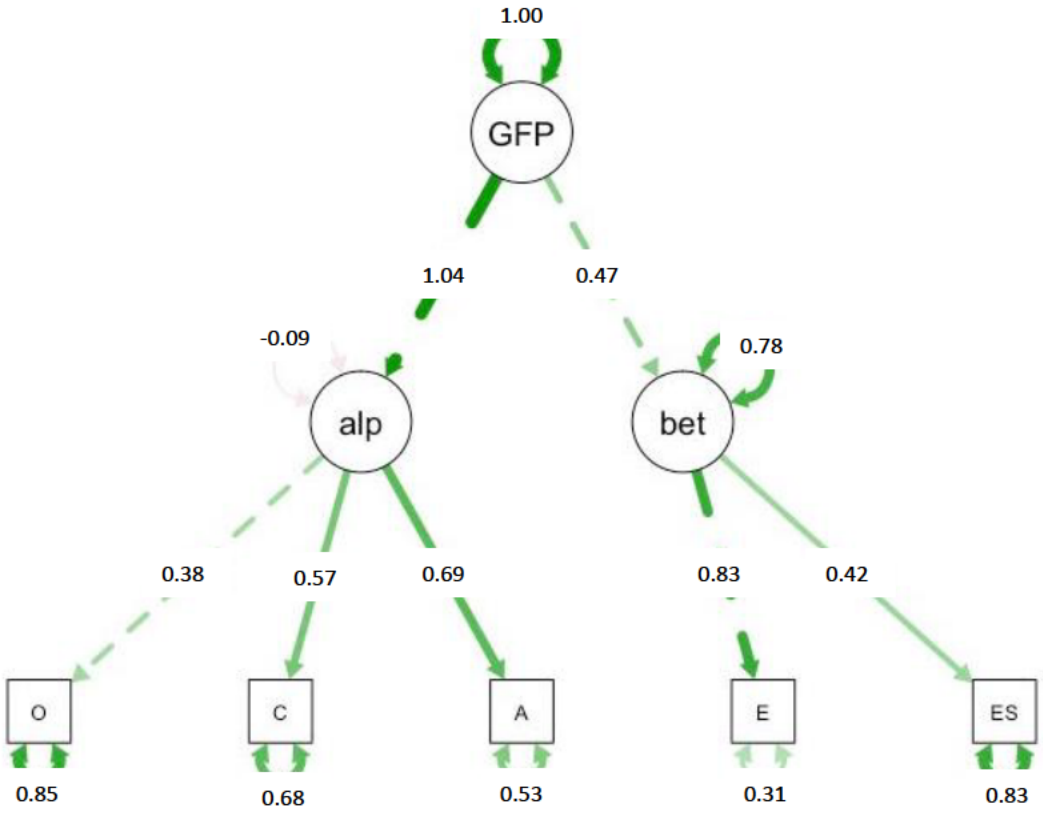

Figure 4. Two higher-order factors according to two-factor EFA findings

Note: GFP is General Factor of Personality, Openness to Experience (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), Emotional Stability (ES). Significant factor loadings (unbroken lines), insignificant factor loadings (broken line), variances and residual variances (Curved arrows).

3.4 Research Question 2: To what extent are the GFP and EI associated?

Research Question 2 was to examine whether the GFP and EI are related. A measurement model was utilised to estimate the relationship between the GFP and EI. EI was specified as a single indicator latent variable by fixing the observed indicator's factor loading to 1 and substituting its error term value on the basis of the indicator's variance (127.83) and reliability (test-retest reliability= .78). Hence, the calculated residual variance is 28.11, this indicates the unexplained variance when the total variance of the EI has been accounted for. A correlation between GFP and EI revealed a substantially positive relationship (r= .94, p < .001). This finding supports literature which suggests that the GFP and EI are constructs that reflect a social effective component and both are significantly associated with the socially desirable poles of the Big Five, therefore, are expected to have a strong overlap.

3.5 Research Question 3: To what extent do the GFP and EI predict academic performance?

Research Question 3 was to investigate the degree to which GFP and EI predict AP. Statistical analyses for this research question were completed using the psych (Revelle, 2020) and Lavaan package (Yves Rosseel, 2012), a total of four models were estimated using the sem() function. Firstly, the extent to which GFP and EI predict AP were observed in separate models. It was revealed that the standardised coefficient for the GFP was small but a positive statistically significant predictor of AP (*Beta*=.14, p=.01). In contrast, it was found that EI was not a significant predictor of AP (*Beta*= .04, p=.38). Although EI and GFP are highly correlated as presented in research question 2, there appears to be an underlying difference between the two constructs that may explain why EI is not able to predict AP. Note, however, both standardised

coefficients are small and the lack of significance for EI may be due to its being less well defined than the GFP in this data set. Of the Big Five dimensions, Conscientiousness is the only trait to have consistently been associated with AP, where individuals with higher levels of Conscientiousness achieve better academic results in both secondary and tertiary education (Conrad & Patry, 2012). Therefore, there is the possibility that EI does not capture Conscientiousness.

A multiple regression with both GFP and EI predicting average grade exhibited severe multicollinearity as indicated by a high statistically significant regression coefficient of .95. Multicollinearity refers to the occurrence of high correlations among predictor variables in a multiple regression model, this possess an issue as multicollinearity undermines the statistical significance of regression coefficients and can lead to misleading results in regards to the extent to which each independent variable (GFP and EI) is able to effectively predict the dependent variable (AP) in a statistical model (Allison, 2012). Therefore, due to the issue of multicollinearity, the GFP and EI cannot be in the same model. Furthermore, a second multiple regression included TER as a predictor instead of EI, which reported that the GFP (*Beta*= .08, *p* >.05) did not have incremental validity above TER (*Beta*= .34, *p* <.001).

CHAPTER 4: DISCUSSION

4.1 Overview

The primary objective of the current study was to investigate the GFP and EI as predictors of AP. The first objective was to identify the existence of higher-order factors in data, which informed subsequent analyses. The OCEANIC instrument measured the Big Five personality traits to which higher-order factors were derived from on the basis of a number of studies reporting covariances between the dimensions (Chang et al., 2012; van der Linden et al., 2018; van der Linden et al., 2017). In a further attempt to understand the nature of a single higher-order factor, a secondary objective was to examine the relationship of the GFP with an established psychological construct, specifically EI. The AES was a measure of ability-EI, although there is some ambiguity in its classification of EI given it is self-reported but was formulated on the basis of ability EI models (Salovey & Mayer, 1990). Finally, assessing the extent to which the GFP and EI predict AP would provide insight into the effectiveness of both constructs to predict real-life outcomes, in this case AP in third-year psychology students.

4.2 Key Findings

4.2.1 Research Question 1

There has been a long-standing debate regarding whether the intercorrelations among the Big Five dimensions are due to the presence of higher-order factors or methodological artifacts. This has major implications for considering which traits are broadest and most fundamental (Chang et al., 2012). Specifically, if the Big Five covariances are caused by a method bias, that is socially-

desirable responding, where individuals tend to give favorable answers to portray a positive self-image. In contrast, if the Big Five are correlated with higher-order factors, this may reflect more fundamental aspects of personality that warrant further research into the nature of high-order factors (Chang et al., 2012).

Factor analyses were conducted to investigate the existence of higher-order factors beyond the Big Five in the current study. Results from a factor analysis of the Big Five revealed a two-factor solution, which is consistent with the proposed meta-traits; Stability and Plasticity. Following this, a two-factor EFA of the Big Five reported factor loadings of the Big Five traits were not consistent with the theoretical two-factor model, where dimensions Conscientiousness, Emotional Stability and Agreeableness should have loaded onto Stability, whilst, Openness to Experience and Extraversion should have loaded onto Plasticity. Evidently, in the two-factor EFA, this was not the case, and instead Openness to Experience loaded onto Stability, and Emotional Stability loaded onto Plasticity. Therefore, the notion of two higher-order factors were not present in this study. A possible explanation for the inconsistent findings reported in the present study can be seen in Mutch (2005) who re-analyzed Digman's (1997) data with the same 14 matrices. Upon re-examination it was revealed to have quite a few issues that would have adversely affected the validity of his findings of the two higher-order factors (Mutch, 2005). In particular, the principal factors method of estimation adopted in Digman's exploratory factor model did not allow for the evaluation of overall model fit and estimation of standard errors for factor loadings. As a result, prohibits statistical inference (Mutch, 2005). Furthermore, it was found that the degrees of freedom (*df*) for the chi-square (X^2) goodness -of-fit test statistics were incorrectly calculated. Consequently, a domino effect of incorrect analyses and statistical values were reported, which perhaps explains why subsequent replication of Digman's higher-order

factors have yielded mixed findings (Mutch, 2005). Similar to the inconsistent findings of the current study, Costa and McCrae (1992) extracted two-factor solutions from three separate correlation matrices of different personality scales designed to measure the Big Five. However, they were not able to replicate factor loadings according to Digman's alpha and beta model (Costa & McCrae, 1992).

Furthermore, a sequence of CFAs was completed to assess whether the current data would fit three proposed hypothesised measurement models. Fit statistics provided further evidence that the present study rejected the idea of two higher-order factors underlying the GFP. Thus, ensuing statistical analyses modelled the GFP as a single higher-order factor above the Big Five dimensions. Therefore, results supported the presence of a single higher-order factor (GFP), but not for the two higher-order factors (Alpha and Beta). Despite the mixed findings in regard to alpha and beta, they still may be correct. Thus, further empirical evidence is necessary to support Digman's theoretical meta-traits.

An explicit investigation of whether the presence of higher-order factors was a result of correlated measurement errors from social desirability bias were not included in the current study. However, Bäckström et al. (2009) were among the first to argue the GFP reflected social desirability bias. They demonstrated that when items were reformulated to control for socially desirable responding, the covariances between the personality traits was reduced, nevertheless, a substantial proportion of shared variance still remained (van der Linden et al., 2016). Additionally, when shared variances between the Big Five traits were based on a combination of self and other ratings, the GFP diminished significantly (Chang et al., 2012). It is useful to acknowledge the opposing perspectives of the GFP, in order to holistically understanding the essence of higher-order factors.

4.2.2 Research Question 2

The second research question examined the relationship between the GFP and EI. It was reported that the GFP and EI were highly positively associated (r =.94, p <.001), where high-GFP individuals tend to have high levels of EI and vice versa. This finding was anticipated and is coherent with the existing literature of an GFP-EI overlap. Though, the reported strong correlation between the two constructs were a lot higher than what was typically reported by other studies, with average associations of r ~ .70 (van der Linden et al., 2017). This finding high may be attributable to the fact that at the core both constructs involve knowing how to behave in order to optimise the chances of achieving social and personal goals, reflecting a social effective component (van der Linden et al., 2018).

EI has been distinctively characterised between trait-EI and ability-EI, especially in the personality domain, which has predominately focused on trait-EI (Alegre et al., 2019). The large interest in trait-EI may be due to the fact that it has been theorised to be a personality trait, provided that trait-EI is defined as the constellation of emotional-related dispositions and self-perception (Alegre et al., 2019). Pérez-González and Sanchez-Ruiz (2014) found that the GFP correlated more strongly with trait-EI than with any of the Big Five dimensions, they determined not only was there a strong GFP-EI relationship but that trait-EI was a broad personality trait integrated into multi-level personality hierarchies. Hence, it was suggested that trait-EI may be synonymous with the GFP. Moreover, van der Linden et al. (2017) reported correlations of no less than r =.86 reflected in their deattenuated correlation between trait-EI and the GFP. To place this value and that of the current study's high EI-GFP correlation, the Big Five dimensions assessed with different instruments on average correlate between r = .40 and .80, despite being

directly designed and assumed to measure the same construct, such as Conscientiousness measured with the Revised NEO Personality Inventory (NEO-R) and Conscientiousness measured with Big Five Inventory (BFI) (van der Linden et al., 2017). The study included both trait and ability EI scales, where trait-EI was found to have higher correlations with the GFP than with ability-EI. A possible explanation for this difference, perhaps is that ability-EI measures are based on a restricted range of behaviours reflected by mainly understanding and regulating emotions, opposed to trait-EI measures that provides a more comprehensive coverage of affective aspects of personality and behaviours (Petrides, 2013).

The classification between trait and ability EI proposed by Petrides and Furnham (2000) was on the basis of their method of measurement, whether the measure was a self-report questionnaire (trait-EI) or maximal performance (ability-EI). Therefore, according to this method of categorization, ability-EI measures test an individual's theoretical understanding of emotions and emotional function; whereas trait-EI measures behaviours in relation to emotion-relevant situations (O'Connor et al., 2019). However, the AES used in this study does not conform to this classification technique, as the scale is self-report, though it was designed to evaluate ability-EI. Thus, leads to ambiguity in what the AES is actually assessing. Burns et al. (2007) discovered that the AES was more related to personality measures than to ability measures, including ability-EI, therefore, this offers another possible basis for the highly associated constructs found here. There have been some concerns regarding the extent to which self-reported EI measures correlate with established personality traits. Generally, self-report EI instruments and personality measures have been suggested to converge because they both appear to assess personality traits (Petrides et al., 2007). Thus, the AES intended to assess ability-EI, perhaps may be assessing personality. Furthermore, future research should continue to understand the nature of EI,

specifically ability-EI, due to the limited research and inadequate representation of ability-EI in the personality realm.

4.2.3 Research Question 3

Research question 3 investigated the extent to which the GFP and EI were predictors of AP. Two separate fit models were completed to observe the effects of the GFP and EI independently on AP. Results showed that the GFP was a small but significant indicator of AP, while EI was not. Beta coefficients were small for both the GFP (*Beta* =.14, *p*=.01) and EI (*Beta* = .04, *p*=.38) when predicting AP, and although, the GFP was found to be statistically significant and not EI, this may have arisen because the GFP was better defined in our data in comparison to EI. This was an unexpected outcome, given that the GFP and EI were so highly correlated as presented in research question 2. Therefore, there may also potentially be a distinctive underlying factor between the GFP and EI that may provide an explanation as why the GFP is able to predict AP and EI is not. Of the Big Five dimensions, Conscientiousness is the only trait to have consistently been associated with AP, where high-Conscientious individuals are highly self-disciplined, diligent and goal-oriented, to which are valuable attributes that enables them to on average achieve better outcomes academically in both secondary and tertiary education (Conrad & Patry, 2012; Tomšik, 2018). In support of Conscientiousness being the distinctive factor between the two constructs, Alghamdi et al. (2017) revealed only three personality traits Extraversion, Agreeableness and Openness to Experience as predictors of EI, with Conscientiousness and Neuroticism having found to have no impact on EI among university teacher/student advisors. Furthermore, Bastian et al. (2005) examined the relationship of EI with a number of life skills,

including academic achievement in first-year university students; correlations between EI and AP were reported to not be statistically significant.

Additionally, a multiple regression with both the GFP and EI as predictors of average grade displayed severe multicollinearity. This, therefore, prevented both constructs from being entered into the same model, as multicollinearity leads to misleading findings in regards to the extent to which each independent variable (GFP and EI) is able to effectively predict the dependent variable (AP) in a statistical model (Allison, 2012). Furthermore, it is highly likely that the presence of multicollinearity was caused by the poorly defined EI measure in this study. As it was previously discussed (see section 4.2.2, above), that the AES is more closely related to personality than to ability measures. As a substitute, a second multiple regression with the inclusion of TER as a replacement predictor of EI was conducted, which revealed that the GFP did not increase the predictive ability beyond that provided by TER. This was rather expected as TER and average grade are both indicators of AP.

Based on the present study's mixed findings, this study can neither confirm or deny the possibility of a relationship between EI and AP, provided that the AES measure of EI is a poorly defined one. Although several other studies have used the AES, the current study would have attained clearer findings to answer research question 3 with proper measures of ability-EI and trait-EI, such as Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) (Mayer et al., 2004) and The Trait Emotional Intelligence Questionnaire (TEIQue) (Petrides & Furnham, 2000).

4.3 Strengths

Despite the limitations identified, this study offers a valuable contribution to the existing individual differences and personality literature. Most research in this field was conducted within the trait-EI domain and, hence, a strength of this study is its inclusion of an ability-EI based measure. Although, the AES used in this study was based on EI as an ability, it was via self-report and not maximum performance based, still it is intended to measure ability-EI. To comprehend the complete nature of EI, it is essential that both trait and ability EI are equally represented in research literature, as both forms reflect two distinct aspects of EI. Within the personality domain, trait-EI has been embedded exclusively and hence, separates ability-EI rather sharply. It is certainly reasonable to research the perceptions of emotional function as an aspect of personality but the label trait-EI may be misleading given its connotations of ability (Zeidner et al., 2008). Despite the extensive research in the field of EI, there is still controversy in regards to defining the construct. Hence, the inclusion of the unrepresented ability-EI was to contribute to the better conceptualisation of EI.

The majority of studies have demonstrated the existence of a GFP in personality measures, though, it does not necessarily reveal much information about the construct's theoretical or practical relevance (van der Linden et al., 2010). Hence, making this study one of few to investigate the degree to which the GFP is able to predict real-life outcomes, such as AP.

4.4 Limitations

It is important to acknowledge limitations within the study as this places the research findings into context when interpreting their credibility and validity when drawing conclusions. Additionally, it provides support for future investigation. So, the study is not without limitations. Firstly, although it is a common practice, the current study only recruited Level 3 Psychology students, because it was a part of course requirements. Hence, this limited access to a more varied data set that would have otherwise been more representative of the population. This poses the issue of restriction of range provided that students were accepted into the undergraduate degree based on academic merit, that is TER, and that students did not withdraw or fail any courses. This presents the issue of a series of participant biases that may have resulted in the under-or overestimation of finding than otherwise presented if the full range was available. There was potential for correcting correlations for reliability and range restriction issues; but doing so, would be a little problematic and in any case ultimately would not make a difference to the main outcomes of the study.

Secondly, the present study did not include a measure of trait-EI and, hence, the only form of EI measured was ability-EI. As it was previously mentioned the EI instrument in this study is an ability-EI measure but via self-report, still it is intended to offer indications of an individual's ability to understand emotions and how they work, however, they tend to not predict typical behaviours as well as trait based measures (O'Connor et al., 2019). Ability-EI measures are valid albeit weak predictors of a range of performance outcomes compared to trait-EI measures, therefore, the inclusion of both trait and ability EI measures would have offered better conceptualisation of EI (O'Connor et al., 2019). Thirdly, the issue with employing self-report

psychometrics rely on truthful answering, hence, a threat would be socially desirable responding. Individuals may have the tendency to tailor their responses to portray a particular self-image and to seek social approval by fabricating their answers (van der Linden et al., 2018). Therefore, it would have been useful if multiple informants were used (e.g., self and other-ratings), this would allow insight into whether the higher-order factors extracted were the result of a methodological artifact in the data (Hull & Beaujean, 2011). Furthermore, the inclusion of social desirability measures would allow the control of the effects on the GFP-EI relationship.

4.5 Implications

The interpretation of the GFP has been suggested to reflect patterns of desirable and advantageous traits, where high-GFP individuals have a combination of low neuroticism and high levels of the other four dimensions (McIntyre, 2009). This, therefore, may be problematic as it categorises and encourages certain personality traits to be perceived as ‘good’ and ‘bad’. Moreover, the Big Five is among the most prevalent personality frameworks in personality classification. Provided that the GFP is extracted from the Big Five it begs the question as to whether further investigation of higher-order factors like the GFP and the meta-traits, offers anything beyond what can already be obtained with the Big Five dimensions alone. If the personality facets below the Big Five dimensions lie closest to behaviour than they are better predictors than higher-order traits (Rushton & Irwing, 2008). As A Result, this highlights whether future research in the presence of higher-order factors will be valuable to the existing personality domain.

4.6 Future Research

Given the underrepresentation of ability-EI in the personality domain, future research should include more measures of ability-EI in order to attain better insight into the conceptualisation of EI and its association with other important constructs. As the current study only used self-reported measures, it would be interesting to explore multi-informants of personality and EI by comparing self and other-ratings. This assessment approach involves receiving reports from individuals who share close relationships with the participant to provide adequate information (e.g., self, peers, parents) (Reyes et al., 2015). Additionally, this would allow for improved understanding and determination of whether higher-order factors extracted from personality instruments are due to methodological artifacts in the data. A few contemporary studies have investigated self-other correlations within the Big Five and within EI, however, these have not been simultaneously considered in the same study (van der Linden et al., 2017).

4.7 Conclusion

The findings presented are anticipated to provide further clarification into the field of higher-order factors, though, the collection of mixed results have only highlighted the large gap in the existing literature. It is clear that there is a proportion of shared variances among the Big Five dimensions, which the present study supports as being attributable to the GFP. Our findings also demonstrated that there is a substantial GFP-EI overlap, so much so, that results displayed severe multicollinearity between the GPF and EI, however, this inhibited the complete examination of the extent to which the GFP and EI predict AP. Still, further research to provide more concrete empirical evidence is required in terms of its statistical properties and associations with external criteria, that would allow for a more precise theoretical understanding of its nature.

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