



# The relationship between personality facets and burnout



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**Orientation:** Many studies have investigated the relationship between the five-factor model of personality and burnout. However, relationships between the facets of these five factors and burnout remain relatively unexplored.

**Research purpose:** This study set out to investigate the relationship between the five-factor facets and burnout using more appropriate variance decomposition than simply using zero-order correlation coefficients.

**Motivation for the study:** Investigating the relationship between personality facets and burnout can provide a complete understanding of the role of personality in possible development of burnout. Most studies that have investigated these relationships have relied on zero-order correlation coefficients.

**Research approach/design and method:** A cross-sectional survey research design was used. The Basic Traits Inventory and Maslach Burnout Inventory – General Survey were administered to a sample of 127 working adults. Zero-order correlation coefficients, semi-partial correlation coefficients and bifactor modelling were used to investigate the relationship.

**Main findings:** Several of the personality facets showed statistically significant correlations with burnout over and above their respective factors. In some instances, these correlation coefficients were in opposite directions to their factor.

**Practical/managerial implications:** Our results provide a more complete investigation of the relationship between personality and burnout. They suggest that there might be value to consider both the five-factor personality factors and their respective facets in burnout interventions and preventative measures, as well as for a better understanding of the relationship between personality and burnout.

**Contribution/value-add:** The results add some support to the argument that personality facets should be interpreted in addition to their respective factor scores. There might also be value to add personality facets as possible antecedents in models on the development of burnout.

**Keywords:** personality; facets; five-factor; burnout; bifactor.

## Introduction

### Orientation

The job demands-resources (JD-R) model posits that employees are at risk of developing burnout when they experience many demands and few resources at work (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Hu, Schaufeli, & Taris, 2017). Demands and resources exist at both the organisational and individual levels (Schaufeli & Taris, 2014). In this article, we focus on individual antecedents of burnout. Behaviour does not occur in a vacuum because employees bring with them unique individual difference variables (e.g. demographic variables and personality) that might interact with the environment in the development of burnout (Maslach, Schaufeli, & Leiter 2001; Taris & Schaufeli, 2016). Individual characteristics have been added to the JD-R model (Schaufeli & Taris, 2014) in the form of personal resources (Xanthopolou, Bakker Demerouti, & Schaufeli, 2007), defined as ‘aspects of the self that are generally linked to resiliency’ (Hobfoll, Johnson, Ennis, & Jackson, 2003, p. 632; Xanthopolou et al., 2007).

Schaufeli and Taris (2014) identified a number of possible personal resources that can be included in the JD-R model. These include, for example, optimism, organisation-based self-esteem, self-efficacy, emotional stability (i.e. low neuroticism) and extraversion – the latter two are pertinent to this study. Neuroticism and extraversion are two of the five personality traits included in the

five-factor model of personality (the other three being conscientiousness, openness to experience and agreeableness) (McCrae & Costa, 2010). Personality traits influence how people behave in and perceive their work environment (Hogan, 2013; McCrae & Costa, 2003; Ones & Viswesvaran, 1996; Spector, Zapf, Chen, & Frese, 2000). They also appear to influence how people react to and/or cope with stressful work conditions (Alarcon, Eschleman, & Bowling, 2009; Bakker, Van der Zee, Lewig, & Dollard, 2006; Watson & Hubbard, 1996). It might therefore be useful to incorporate personality traits, whether in the form of a resource or vulnerability factor, into the JD-R model when considering possible antecedents of burnout (Bakker et al., 2010; Schaufeli, 2017; Taris, Leisink, & Schaufeli, 2017).

Many studies have shown that the five aforementioned personality factors, specifically neuroticism, are related to burnout (e.g. Alarcon et al., 2009; Morgan & De Bruin, 2010; Schaufeli & Buunk, 2003). However, little is known about the relationship between the five-factor facets, which are often conceptualised as more narrow reflections of these five personality traits (Ones & Viswesvaran, 1996; Salgado et al., 2015), and burnout. Investigating these relationships is important for at least two reasons: firstly, it can provide a greater conceptual understanding of how personality (i.e. broad vs. narrow traits) might be related to the development of burnout, potentially allowing for refinement of the role of personality in the JD-R model, and secondly, it might allow for better-targeted interventions for employees at risk of developing burnout or for burnout interventions in general.

Several studies have investigated the relationship between personality facets and burnout (e.g. Hurt, Grist, Malesky, & McCord, 2013; Periard & Burns, 2014; Piedmont, 1993; Țânculescu, 2019), showing that there are specific facets within each factor that correlate with burnout. Whilst these studies have helped us to better understand these relationships, the statistical techniques that were employed have not always allowed for unambiguous interpretation of the results (we will return to this issue later in the article). Facet variance can be divided into common variance shared with other facets within each factor, reliable variance specific to each facet and error variance (Ones, Wiernik, Wilmot, & Kostal, 2016; Vorster, 2016). A better (and less ambiguous) understanding of the relationship between personality facets and burnout needs to tease apart the effects of common and reliable specific variance (Chen, Hayes, Carver, Laurenceau, & Zhang, 2012; Wiernik, Wilmot, & Kostal, 2015). Proper variance decomposition can help determine unique facet relationships with criterion variables that are independent of higher-order personality variables (Bornoalova, Choate, Fatimah, Petersen, & Wiernik, 2020; Ones et al., 2016).

## Research purpose and objectives

The purpose of this article was to investigate: (1) the relationship between the five personality factors and burnout (defined here as the sum of Exhaustion and Cynicism) and

(2) the relationship between the facets within each personality factor and burnout with consideration for the different sources of variance in each facet.

## Literature

### Burnout, the job-demands resources model and personal resources

Burnout, which is a psychological response to a work environment, consists of three dimensions: (1) Exhaustion, (2) Depersonalisation or Cynicism and (3) Reduced Personal Accomplishment or Efficacy (Maslach & Jackson, 1981; Maslach, Schaufeli, & Leiter, 2001). Exhaustion and Depersonalisation/Cynicism are considered the core dimensions of burnout (Schaufeli & Bakker, 2004; Schaufeli & Taris, 2005). However, as discussed later in the article, we use the sum of Exhaustion and Cynicism items to represent burnout in this study. Exhaustion (also referred to as emotional exhaustion) is the stress element of burnout and refers to loss of energy and fatigue, whereas Depersonalisation or Cynicism reflects a negative and/or detached attitude towards clients or work (Maslach et al., 2001, 2008).

Demands and resources and their relationship with burnout are captured in the JD-R model (Demerouti et al., 2001). Briefly, the JD-R model proposes that demands lead to strain and burnout through depletion of energy (Schaufeli, 2017). This is the health impairment process (Taris et al., 2017). Resources, on the other hand, promote well-being and engagement and assist employees in achieving their work goals (Bakker & Demerouti, 2007; Demerouti et al., 2001). This is the motivational process (Taris et al., 2017). Resources and demands also interact with each other (Bakker & Demerouti, 2007), and resources may therefore offset the harmful effects of demands (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003). Personal resources, which we previously introduced, are similar to job-level or organisational resources because they are both important for achieving work goals (Taris & Schaufeli, 2016). Personality traits, which represent fundamental individual dispositions (McCrae & Costa, 2003), are one potential personal resource in the JD-R model (Schaufeli & Taris, 2014). Although personality traits can be placed at different locations in the JD-R model, they are probably best thought of as antecedents or moderators of burnout (Taris & Schaufeli, 2016).

### The five-factor personality traits, their facets and their relationship with burnout

In this study, we used the Basic Traits Inventory (BTI) to measure personality (Taylor & De Bruin, 2006). Definitions of the factors and facets of the BTI are presented in Table 1. In the sections that follow, we define the five factors as described by McCrae and Costa (2010) (because other studies we cite have used these definitions) and provide findings on the relationship between these personality traits and their facets and burnout. These studies did not use the BTI and, therefore, the facets reported in these studies do not correspond perfectly with the BTI.

**TABLE 1:** Definitions of the Basic Traits Inventory five factor facets.

Neuroticism	Definition
Anxiety	Nervousness and apprehension
Depression	Low mood, helplessness and guilt
Self-consciousness	Sensitivity to criticism and a tendency towards experiencing embarrassment
Affective instability	Emotional volatility and a tendency towards experiencing anger and irritability
<b>Extraversion</b>	
Gregariousness	The need for social contact and interaction
Positive affectivity	The tendency to experience positive emotions such as optimism and love
Ascendance	A penchant for being assertive and leading groups
Excitement-seeking	The preference for stimulating activities.
Liveliness	A person's energy and activity level
<b>Openness to experience</b>	
Aesthetics	An appreciation for beauty in objects
Action	Willingness to engage in novel activities
Values	The tendency to adhere to traditional values (e.g. authority) or be more open to critically engaging with them
Ideas	The tendency to engage in intellectual challenges and be intellectually curious
Imagination	Having a rich inner imagination and being creative
<b>Agreeableness</b>	
Straightforwardness	The extent to which a person is honest, genuine and candid
Compliance	The tendency to be submissive and restrain aggression
Modesty	Humility and diverting attention from oneself
Tender-mindedness	Sympathy/empathy for others
Prosocial tendencies	Kindness and helpfulness
<b>Conscientiousness</b>	
Order	Neatness and organisation
Self-discipline	Ability to start and complete tasks and remain motivated when faced with unpleasant tasks
Dutifulness	The extent to which a person is reliable and dependable
Effort	The extent to which a person is ambitious and diligent and works hard to achieve outcomes
Prudence	The tendency to be careful

Source: Definitions obtained from Taylor, N. (2004). *The construction of a South African five factor personality questionnaire*. Unpublished masters dissertation, Rand Afrikaans University, Johannesburg, South Africa.

## Neuroticism

Neuroticism is a predisposition towards experiencing negative emotions, ineffective coping with these emotions and difficulty controlling impulses (McCrae & Costa, 2010; Pervin & John, 2001). This trait has four facets in the BTI: (1) Anxiety, (2) Depression, (3) Self-Consciousness and (4) Affective Instability (see Table 1). Research has consistently found that neuroticism is positively related with Exhaustion and Cynicism (Bakker et al., 2006; Bühler & Land, 2003; Hills, Francis, & Rutledge, 2004; Kokkinos, 2007). At the facet level, most of the facets appear to be related to these two burnout dimensions (Hurt et al., 2013; Piedmont, 1993; Țănculescu, 2019). These results, and those for the other facets to come, must, however, be interpreted with caution because of the way in which the facets are operationalised in these studies (we will return to this issue later in the article).

## Extraversion

Extraversion is defined as the tendency to be gregarious, optimistic, energetic, ambitious and caring, as well as a preference for stimulation and excitement (McCrae & Costa,

2010). This trait has five facets in the BTI: (1) Gregariousness, (2) Positive Affectivity, (3) Ascendance, (4) Excitement-seeking and (5) Liveliness (see Table 1). Research has shown that extraversion is usually negatively related with Exhaustion and Cynicism (Van den Broeck, Vansteenkiste, de Witte, & Lens, 2008). At the facet level, Hurt et al. (2013) found that Friendliness was negatively related with Exhaustion and that Friendliness, Gregariousness, Assertiveness, Activity Level and Cheerfulness were negatively related with Cynicism. Țănculescu (2019) similarly found that Warmth and Gregariousness were negatively related with Cynicism. Piedmont (1993), in turn, showed that Excitement-seeking was positively related with Exhaustion.

## Openness to experience

Openness to Experience describes individuals who are curious about their world, creative, have an active imagination and have a preference for variety (McCrae & Costa, 2010; McCrae & John, 1992). This trait has five facets in the BTI: (1) Aesthetics, (2) Actions, (3) Values, (4) Ideas and (5) Imagination (see Table 1). Openness to Experience sometimes shows a positive relationship with burnout (Deary et al., 1996; Roccas, Sagiv, Schwartz, & Knafo, 2002; Zellars, Perrewe, & Hochwater, 2000). At the facet level, Hurt et al. (2013) found that none of the facets had a statistically significant relationship with Exhaustion or Cynicism. Piedmont (1993), in contrast, found that Values was positively related with Depersonalisation. More recently, Țănculescu (2019) found that Values was negatively related with Exhaustion and Cynicism and that Aesthetics, Actions and Ideas were negatively related with Cynicism.

## Agreeableness

Agreeableness is an interpersonal component of personality and is described by traits such as likeability, friendliness, compliance, straightforwardness and good-naturedness (Digman, 1990; Graziano & Eisenberg, 1997; McCrae & Costa, 2010). This trait has five facets in the BTI: (1) Straightforwardness, (2) Compliance, (3) Modesty, (4) Tender-mindedness and (5) Prosocial tendencies (Table 1). Agreeableness has been shown to sometimes have a negative relationship with burnout (Morgan & De Bruin, 2010; Zellars et al., 2000). At the facet level, Hurt et al. (2013) found that Modesty was positively related with both Exhaustion and Cynicism. Țănculescu (2019), in turn, found that Modesty was negatively related with Cynicism. Periard and Burns (2014) found that Trust, Straightforwardness and Compliance were negatively correlated with Exhaustion. Țănculescu (2019) also found that Trust and Straightforwardness were negatively related with both Exhaustion and Cynicism.

## Conscientiousness

Conscientiousness reflects impulse control and is evidenced as high motivation, determination, reliability, self-discipline and goal-driven behaviours (McCrae & Costa, 2010; Periard & Burns, 2014). This trait has five facets in the BTI: (1) Order,

(2) Self-Discipline, (3) Dutifulness, (4) Effort and (5) Prudence. Conscientiousness tends to show a negative relationship with Exhaustion and Cynicism (Kim, Shin, & Swanger, 2009). At the facet level, Hurt et al. (2013) found that Dutifulness had a statistically significant negative relationship with Cynicism. Periard and Burns (2014) found that Competence, Dutifulness and Self-Discipline had a negative relationship with Exhaustion. Țânculescu (2019) found that Competence, Self-Discipline and Deliberation were negatively related with Exhaustion and Dutifulness and Self-Discipline were negatively related with Cynicism.

### Some considerations when using personality facets in research

There are various ways for measuring the relationship between personality facets and some external criterion. An overview of some of these techniques can be obtained from Anglim and Grant (2014), Chen et al. (2012) and Wiernik et al. (2015). The simplest way of measuring these relationships is to correlate the facet scale scores (i.e. the summated scale scores) with a criterion or to use facets as predictors in a regression model (Chen et al., 2012). However, as Bornovalova et al. (2020), Chen et al. (2012) and Wiernik et al. (2015) point out, these two approaches might be flawed because common variance and specific variance (i.e. reliable variance specific to each facet) are not separated and because standard errors in regression models can be biased when there is multicollinearity. These can potentially lead to ambiguity in results. For example, if a statistically significant correlation is found, it is not clear whether the relationship is driven by variance common to all other facets in the factor, variance unique to that facet or a combination of both sources of variance (Wiernik et al., 2015).

An alternative approach is to use semi-partial correlations (Anglim & Grant, 2014), residualised factor scores (Salgado et al., 2013) or disturbances in a second-order confirmatory model (Chen et al., 2012) as predictors. An arguably superior way however is to model common variance and specific variance directly using a bifactor model (Ones et al., 2016; Wiernik et al., 2015). In brief, a bifactor model allows one to model common variance (as a general factor) and specific variance (as a residualised factor), and then use these variance decompositions directly in a structural model (Jennrich & Bentler, 2011). In this way, an attempt is made to reduce the ambiguity caused by different sources of variance. A non-technical discussion of these issues can be obtained from Wiernik et al. (2015). However, as we discuss in the recommendations section of the article, bifactor models can lead to interpretational difficulties.

### Summary

In summary, we have argued that investigating the relationship between personality facets and burnout might help researchers and practitioners better understand how personality and burnout are related. There is some evidence that several facets are related to burnout, but these studies have not always separated common and specific variance, which might lead to ambiguity in the interpretation of relationships. This study sets out to address this limitation by investigating the relationship

between personality facets and burnout using several different statistical approaches that control for these different sources of variance. In the next section, we present the research method.

## Method

### Research approach

We used a quantitative cross-sectional survey research design in this study.

### Research participants

The sample consisted of 127 respondents obtained through a non-probability convenience sampling. The mean age of participants was 33.21 years (median = 29, standard deviation [SD] = 12.17 years) and there were more women ( $n = 82$ , 64%) than men ( $n = 45$ , 35%). Most of the participants were white people ( $n = 80$ , 62%), followed by black Africans ( $n = 29$ , 22%), Indians or Asians ( $n = 16$ , 12%), mixed race ( $n = 1$ , 0.78%) and other ( $n = 1$ , 0.78%). The participants' mean years of working was 11.77 years (median = 7.5, SD = 11.77). Although not captured by the biographical questionnaire, we endeavoured to obtain participants working (or who had worked) in different industries.

### Measuring instruments

We used the BTI and the Maslach Burnout Inventory-General Survey (MBI-GS) in this study. The BTI is a South African measure of the five-factor model of personality (Taylor & De Bruin, 2006). It consists of 193 items with a five-point Likert-type response format. Cronbach's alpha coefficients > 0.80 have been found for the five factors and > 0.60 for the facets (Grobler & De Beer, 2015; Taylor & De Bruin, 2006). Structural validity of the BTI is supported by Taylor and De Bruin (2006) and Vorster (2016). The Exhaustion and Cynicism scales of the MBI-GS (Schaufeli, Leiter, Maslach, & Jackson, 1996) consist of five items, each with a seven-point rating category response format. Cronbach's alpha coefficients > 0.70 have been found for these two scales in the South African context (Coetzee & Rothmann, 2004; Marais, Mostert, & Rothmann, 2009). Storm and Rothmann (2003) have also found support for the structural validity of the MBI-GS. In this study, we used the sum of Exhaustion and Cynicism items as a measure of burnout because bifactor analysis in this sample showed that almost all of the variance in the Cynicism items was general factor variance.<sup>1</sup>

### Research procedure and ethical consideration

Participants were invited to complete several questionnaires (including the BTI and MBI-GS) as part of a larger project. The questionnaires were completed during work hours. Instructions were provided to all participants on how to complete the questionnaires. Ethical clearance for the study was obtained from the Department of Industrial Psychology at the University of Johannesburg (clearance no. IPPM2017-105). Participants were provided with participant information

<sup>1</sup>That is, the Cynicism scale had almost no unique reliable variance left after modelling the general factor. The results of the bifactor model can be obtained from the second author.

sheets and were required to provide written informed consent prior to participation. Permission and consent were obtained from relevant parties at the organisations where the questionnaires were administered. The BTI was used with permission from the test distributor and a licence was purchased from Mind Garden to administer the MBI-GS.

## Analysis

Missing responses at the item level in the BTI was imputed using the chained equation approach for ordinal data as implemented in the *mi* package version 1.0 (Su, Gelman, Hill, & Yajima, 2011) in R version 3.4.3 (R Core Team, 2019). Approximately 11.02% of the sample had missing data, with the number of missing item responses ranging from 1 (.56%) to 8 (4.44%) out of the 180 BTI items (validity items not included). There were no missing data for the MBI items. Imputation was conducted on a factor-by-factor basis using the default *mi* settings and the first imputed data set was used in further analyses (i.e. uncertainty because of imputation was not modelled) because there were very few missing responses.

We investigated the relationship between the five personality factors and their facets with burnout in four ways. We used three alternatives to the bifactor model that have been suggested in the literature because of the small sample size and large number of parameters to be estimated and because not all facets formed group factors in the bifactor model. Firstly, we obtained the zero-order correlations between the factors or facets and burnout. A slightly modified procedure described by Anglim and Grant (2014) was then followed where we obtained residualised scores (i.e. semi-partial correlations) for each facet partialling out: (1) other facets in its factor, (2) the focal factor (e.g. neuroticism) and (3) all of the factors (i.e. all five factors).<sup>2</sup> Although many comparisons were conducted inflating the family-wise error rate, we did not perform corrections to the *p*-values because the sample size was small, affecting the statistical power. This must be kept in mind when interpreting the results (i.e. the possibility of Type-I errors). The *miscor* package version 0.1-1 (Yanagida, 2017) was used to calculate these correlations.

We then applied a confirmatory bifactor model to model common (general factor) and specific (group factor) variance and used these in a measurement model with the burnout dimension. It must be noted that the correlation analysis previously discussed and bifactor analysis we present here are not directly comparable because of the different ways in which the facets are defined (Anglim & Grant, 2014). However, they should lead to similar substantive conclusions (Chen et al., 2012). The bifactor analysis was run in the *lavaan* package version 0.6-5 (Rosseel, 2012) with robust maximum likelihood (MLM) estimation. We note that the small sample likely impacted the stability of the parameter estimates, that is, large standard errors (Wiernik et al., 2015), and these results therefore need to be interpreted with caution because they have limited generalisability.

<sup>2</sup>These correlation coefficients could also be obtained as the part (semipartial) correlation coefficients from a regression model in SPSS. The *miscor* package calculates the residualised scores and then calculates the usual Pearson correlation coefficient and *t* statistic for these scores.

To determine the suitability of the group factors in the structural model, we used McDonald's (1999) coefficient omega hierarchical ( $\omega_h$ ) and omega specific<sup>3</sup> ( $\omega_s$ ) (Revelle & Zinbarg, 2008; Rodriguez, Reise, & Haviland, 2016). These two coefficients allowed us to determine if each facet had enough reliable variance left to warrant its inclusion as a group factor. We also investigated the statistical significance of the unstandardised group factor loadings. Group factors that had no (or almost no) statistically significant factor loadings were collapsed so that these items only reflected the general factor. We used Dueber's (2017) bifactor indices calculator to calculate these coefficients. Model fit of the different structural models was investigated using the unbiased correlation root mean squared residual (CRMRR), the root mean square error of approximation (RMSEA) and comparative fit index (CFI) (Maydeu-Olivares, 2017). For some models one or two items were removed to help with model convergence, and we have not indicated which items in this article as doing so would potentially reveal the scoring key of the BTI.

## Results

### Descriptive statistics and reliability coefficients

Descriptive statistics and reliability coefficients for the BTI facets and five-factor scores, as well as burnout scores are presented in Table 2. Alpha coefficients for the five-factor scores ranged from 0.87 to 0.95. For the facets, the alpha coefficients ranged from 0.67 to 0.87. As expected, the omega specific coefficients for the facets were smaller than these alpha coefficients (because general factor variance was removed). Fit statistics for the structural models were mostly satisfactory from the perspective of the unbiased CRMRR and RMSEA. These ranged from 0.045 to 0.062 for the CRMRR and 0.078 to 0.084 for the RMSEA. The CFI fit statistics ranged from 0.633 to 0.784, showing an unsatisfactory fit. However, the null model RMSEAs for the different structural models were quite low, ranging from 0.138 to 0.172. The CFI fit statistics were therefore not over-interpreted (Kenny, 2015).

### Relationship between the five personality traits and burnout

Zero-order correlations for Neuroticism ( $r = 0.452, p < 0.001$ ) and Conscientiousness ( $r = -0.202, p = 0.023$ ) with burnout were statistically significant. The semi-partial correlation (partialling out the other factors) for Neuroticism was also statistically significant ( $r = 0.388, p < 0.001$ ). The bifactor model general factor was statistically significant for Neuroticism ( $r = 0.502, p < 0.001$ ), Openness to Experience ( $r = 0.261, p = 0.009$ ) and Agreeableness ( $r = -0.209, p = 0.014$ ). The results are shown in Table 3.

### Relationship between neuroticism facets and burnout

Table 4 presents the correlation coefficients at the facet level. The zero-order correlations showed that all of the Neuroticism facets had a statistically significant relationship with burnout. These statistically significant relationships mostly

<sup>3</sup>This is also referred to as omega hierarchical subscale (Rodriguez et al., 2016).

**TABLE 2:** Descriptive statistics and reliability coefficients of the Maslach Burnout Inventory-General Survey and the Basic Traits Inventory scale scores.

Variable	Mean	SD	Median	Skewness	Kurtosis	SE	$\alpha$		$\omega_t$	$\omega_h/\omega_s$
							Coefficient $\alpha$	95% CI		
Burnout	2.27	1.37	1.90	0.62	-0.54	0.12	0.90	0.88, 0.93	0.94	0.76
<b>Neuroticism</b>	2.68	0.69	2.65	0.04	-0.47	0.06	0.95	0.94, 0.96	0.96	0.89
Anxiety	2.75	0.80	2.75	-0.05	-0.55	0.07	0.87	0.83, 0.90	-	0.24
Self-consciousness	2.89	0.81	2.89	0.11	-0.60	0.07	0.86	0.82, 0.89	-	0.25
Depression	2.48	0.80	2.44	0.23	-0.24	0.07	0.88	0.84, 0.91	-	-
Affective instability	2.58	0.80	2.50	0.35	-0.20	0.07	0.87	0.83, 0.91	-	0.41
<b>Extraversion</b>	3.39	0.53	3.42	-0.37	0.22	0.05	0.91	0.88, 0.93	0.93	0.74
Gregariousness	3.56	0.86	3.71	-0.59	0.27	0.08	0.87	0.82, 0.91	-	0.38
Excitement-seeking	2.74	0.90	2.62	0.09	-0.68	0.08	0.87	0.83, 0.90	-	0.81
Positive affectivity	3.78	0.62	3.83	-0.58	0.69	0.05	0.80	0.73, 0.86	-	0.33
Ascendance	3.33	0.73	3.43	-0.23	-0.30	0.06	0.81	0.75, 0.85	-	0.53
Liveliness	3.64	0.62	3.62	0.12	-0.67	0.05	0.71	0.64, 0.77	-	-
<b>Openness to experience</b>	3.85	0.47	3.84	-0.12	-0.20	0.04	0.89	0.86, 0.92	0.92	0.78
Imagination	3.99	0.63	4.00	-0.17	-0.78	0.06	0.82	0.77, 0.86	-	0.33
Ideas	3.69	0.67	3.67	0.03	-0.23	0.06	0.73	0.64, 0.81	-	0.41
Action	3.73	0.70	3.86	-0.41	-0.07	0.06	0.79	0.71, 0.85	-	0.41
Values	4.07	0.57	4.17	-0.33	-0.32	0.05	0.67	0.58, 0.75	-	-
Aesthetics	3.81	0.71	3.86	-0.15	-0.90	0.06	0.81	0.75, 0.84	-	0.51
<b>Agreeableness</b>	3.61	0.40	3.57	0.40	0.48	0.04	0.87	0.84, 0.90	0.89	0.78
Straightforwardness	3.50	0.58	3.57	-0.07	0.04	0.05	0.63	0.53, 0.73	-	-
Modesty	3.60	0.53	3.57	0.22	0.33	0.05	0.66	0.53, 0.75	-	0.31
Tender-mindedness	3.99	0.53	4.00	0.07	-0.51	0.05	0.80	0.74, 0.84	-	0.36
Compliance	3.51	0.59	3.50	0.44	-0.16	0.05	0.75	0.67, 0.80	-	-
Prosocial tendencies	3.49	0.64	3.50	-0.39	0.68	0.06	0.76	0.67, 0.83	-	0.60
<b>Conscientiousness</b>	3.81	0.51	3.83	-0.74	1.82	0.05	0.94	0.92, 0.95	0.95	0.88
Self-discipline	3.59	0.68	3.62	-0.46	0.76	0.06	0.83	0.78, 0.89	-	0.23
Effort	3.92	0.63	3.88	-0.22	-0.29	0.06	0.83	0.76, 0.88	-	0.45
Dutifulness	3.97	0.54	4.00	-0.67	1.88	0.05	0.83	0.78, 0.89	-	-
Order	3.69	0.72	3.80	-0.36	-0.58	0.06	0.86	0.83, 0.89	-	0.38
Prudence	3.89	0.63	4.00	-0.99	2.64	0.06	0.79	0.69, 0.87	-	-

SD, standard deviation; SE, standard error of the mean;  $\omega_t$ , coefficient omega total;  $\omega_h$ , coefficient omega hierarchical;  $\omega_s$ , coefficient omega specific.

Note: Confidence intervals for  $\alpha$  obtained using bias-corrected and accelerated confidence intervals with 5000 resamples.

**TABLE 3:** Correlation coefficients for the five factors and burnout.

Trait	$r$	95% CI	$p$	$r_{sp}$	95% CI	$p$	$rbg$	95% CI	$p$
Neuroticism	0.452†	0.301, 0.580	< 0.001	0.388†	0.229, 0.526	< 0.001	0.502†	0.367, 0.638	< 0.001
Extraversion	0.025	-0.150, 0.199	0.777	0.085	-0.090, 0.256	0.339	-0.085	-0.292, 0.122	0.421
Openness to experience	0.17	-0.005, 0.334	0.057	0.135	-0.040, 0.302	0.131	0.261†	0.060, 0.457	0.009
Agreeableness	-0.12	-0.288, 0.056	0.18	-0.098	-0.267, 0.078	0.274	-0.209†	-0.376, -0.042	0.014
Conscientiousness	-0.202†	-0.364, -0.029	0.023	-0.09	-0.260, 0.085	0.312	-0.116	-0.277, 0.044	0.156

$r$ , Pearson correlation coefficient;  $r_{sp}$ , semi-partial correlation;  $rbg$ , correlation with bifactor general factor.

Note: 95% confidence intervals for correlation coefficients based on normal theory.  $P$ -values for bifactor model based on standard error estimates for standardised estimates.

†, Statistically significant correlation coefficients.

disappeared after controlling for shared variance. Depression showed a marginally statistically significant relationship with burnout after partialling out the other Neuroticism facets ( $r = 0.178, p = 0.046$ ).

### Relationship between extraversion facets and burnout

None of the zero-order correlations for Extraversion except for Excitement Seeking showed a statistically significant relationship with burnout ( $r = 0.187, p = 0.035$ ). Excitement Seeking also showed a positive relationship with burnout when controlling for the other Extraversion facets ( $r = 0.183, p = 0.040$ ), the Extraversion factor ( $r = 0.223, p = 0.012$ ) and for the bifactor group factor ( $r = 0.242, p = 0.006$ ). Positive Affectivity was negatively related with

burnout when controlling for the Extraversion factor ( $r = -0.214, p = 0.016$ ).

### Relationship between openness to experience facets and burnout

Values showed a statistically significant zero-order correlation with burnout ( $r = 0.175, p = 0.050$ ). None of the other correlation coefficients were statistically significant.

### Relationship between agreeableness facets and burnout

Straightforwardness showed a statistically significant zero-order correlation ( $r = -0.222, p = 0.012$ ), as well as a statistically significant semi-partial correlation ( $r = -0.243, p = 0.006$ ) after partialling out the other facets and the Agreeableness factor

TABLE 4: Correlation coefficients for the facets and burnout.

Trait	<i>r</i>	95% CI	<i>p</i>	Facet <i>r<sub>sp</sub></i>	95% CI	<i>p</i>	Focal factor <i>r<sub>sp</sub></i>	95% CI	<i>p</i>	All factor <i>r<sub>sp</sub></i>	95% CI	<i>p</i>	<i>r<sub>bf</sub></i>	95% CI	<i>p</i>
Anxiety	0.400†	0.243, 0.537†	< 0.001†	0.080	-0.096, 0.250	0.373	0.001	-0.173, 0.175	0.987	0.066	-0.109, 0.238	0.461	0.058	-0.146, 0.261	0.579
Self-consciousness	0.369†	0.208, 0.510†	< 0.001†	0.022	-0.153, 0.195	0.807	-0.059	-0.231, 0.116	0.508	-0.051	-0.223, 0.124	0.569	-0.096	-0.325, 0.133	0.411
Depression	0.443†	0.291, 0.573†	< 0.001†	0.178†	0.003, 0.341†	0.046†	0.094	-0.082, 0.264	0.294	0.059	-0.116, 0.231	0.509	-	-	-
Affective instability	0.344†	0.181, 0.489†	< 0.001†	0.050	-0.125, 0.222	0.578	-0.03	-0.203, 0.145	0.736	-0.060	-0.232, 0.116	0.504	0.050	-0.157, 0.257	0.638
Ascend	-0.031	-0.204, 0.144	0.734	-0.016	-0.189, 0.159	0.862	-0.068	-0.240, 0.107	0.446	0.035	-0.140, 0.208	0.693	-0.017	-0.222, 0.187	0.868
Positive affectivity	-0.148	-0.314, 0.027	0.096	-0.169	-0.333, 0.006	0.058	-0.214	-0.374, -0.042	0.016	-0.031	-0.204, 0.144	0.733	-0.111	-0.292, 0.122	0.350
Excitement-seeking	0.187†	0.013, 0.350†	0.035†	0.183†	0.009, 0.346†	0.040†	0.223†	0.051, 0.383†	0.012	-0.016	-0.190, 0.159	0.857	0.242†	0.071, 0.413†	0.006†
Liveliness	0.043	-0.132, 0.216	0.632	0.125	-0.050, 0.293	0.161	0.037	-0.138, 0.210	0.680	0.070	-0.106, 0.241	0.434	-	-	-
Gregariousness	-0.061	-0.233, 0.115	0.497	-0.086	-0.257, 0.089	0.336	-0.128	-0.295, 0.047	0.152	-0.047	-0.219, 0.128	0.600	-0.014	-0.257, 0.230	0.913
Aesthetics	0.148	-0.027, 0.314	0.097	0.084	-0.091, 0.255	0.346	0.039	-0.136, 0.212	0.665	0.011	-0.163, 0.185	0.901	-0.002	-0.195, 0.191	0.985
Values	0.175†	0.000, 0.339†	0.050	0.144	-0.031, 0.310	0.107	0.089	-0.087, 0.259	0.322	0.016	-0.159, 0.189	0.861	-	-	-
Action	0.151	-0.023, 0.317	0.089	0.094	-0.081, 0.264	0.291	0.034	-0.141, 0.207	0.702	0.062	-0.113, 0.234	0.486	0.071	-0.148, 0.289	0.525
Ideas	0.049	-0.126, 0.222	0.582	-0.048	-0.220, 0.128	0.595	-0.098	-0.267, 0.078	0.274	-0.021	-0.194, 0.154	0.818	-0.165	-0.385, 0.054	0.139
Imagination	0.074	-0.102, 0.245	0.410	-0.051	-0.223, 0.124	0.568	-0.083	-0.254, 0.092	0.351	-0.089	-0.260, 0.086	0.318	-0.195	-0.411, 0.021	0.077
Straightforwardness	-0.222†	-0.382, -0.050†	0.012†	-0.243†	-0.401, -0.072†	0.006†	-0.191†	-0.354, -0.018†	0.031†	-0.086	-0.256, 0.090	0.336	-	-	-
Compliance	-0.108	-0.277, 0.067	0.226	-0.090	-0.260, 0.086	0.316	-0.024	-0.197, 0.151	0.791	-0.141	-0.308, 0.034	0.114	-	-	-
Prosocial tendencies	-0.099	-0.268, 0.077	0.269	-0.121	-0.290, 0.054	0.174	-0.026	-0.199, 0.149	0.771	0.033	-0.142, 0.206	0.711	-0.090	-0.287, 0.107	0.372
Modesty	-0.051	-0.223, 0.124	0.568	0.032	-0.143, 0.205	0.722	0.035	-0.140, 0.208	0.694	0.003	-0.171, 0.177	0.974	-0.087	-0.286, 0.112	0.389
Tendermindedness	0.083	-0.093, 0.253	0.357	0.242†	0.071, 0.400†	0.006†	0.256†	0.085, 0.412†	0.004†	0.212†	0.039, 0.372†	0.017†	0.397†	0.208, 0.585†	< 0.001†
Prudence	-0.018	-0.191, 0.157	0.844	0.163	-0.011, 0.328	0.067	0.224†	0.052, 0.383†	0.011†	0.122	-0.053, 0.290	0.172	-	-	-
Effort	-0.036	-0.208, 0.140	0.692	0.074	-0.102, 0.245	0.411	0.143	-0.032, 0.310	0.108	0.122	-0.053, 0.290	0.170	0.036	-0.165, 0.237	0.726
Order	-0.258†	-0.414, -0.088†	0.003†	-0.144	-0.310, 0.031	0.107	-0.161	-0.326, 0.014	0.071	-0.167	-0.331, 0.008	0.061	-0.243†	-0.448, -0.037†	0.021†
Self-discipline	-0.272†	-0.426, -0.103†	0.002†	-0.187†	-0.350, -0.014†	0.035†	-0.195†	-0.357, -0.021†	0.028†	-0.116	-0.285, 0.059	0.193	-0.351†	-0.576, -0.127†	0.002†
Duty	-0.134	-0.301, 0.041	0.134	-0.020	-0.193, 0.155	0.826	0.063	-0.112, 0.235	0.479	0.106	-0.069, 0.275	0.235	-	-	-

*r*, Pearson (zero-order) correlation coefficient; facet *r<sub>sp</sub>*, semi-partial correlation coefficient controlling for facets; focal factor *r<sub>sp</sub>*, semi-partial correlation coefficient controlling for factor; all factor *r<sub>sp</sub>*, semi-partial correlation coefficient controlling for all five factors; *r<sub>bf</sub>*, correlation coefficient from bifactor model.

Note: 95% confidence intervals for correlation coefficients based on normal theory. *P*-values for bifactor model based on standard error estimates for standardised estimates.

†, Statistically significant correlation coefficients.

( $r = -0.191, p = 0.031$ ). Tender-mindedness showed a non-significant zero-order correlation ( $r = 0.083, p = 0.357$ ). However, the semi-partial correlation controlling for other facets in the factor ( $r = 0.242, p = 0.006$ ), the Agreeableness factor ( $r = 0.256, p = 0.004$ ) and all five factors ( $r = 0.212, p = 0.017$ ), as well as the bifactor group factor correlation ( $r = 0.397, p < 0.001$ ), was statistically significant.

### Relationship between conscientiousness facets and burnout

The zero-order correlations for Order ( $r = -0.258, p = 0.003$ ) and Self-Discipline ( $r = -0.272, p = 0.002$ ) were statistically significant. For Order, the bifactor group factor correlation was also statistically significant ( $r = -0.243, p = 0.021$ ). Self-Discipline had a statistically significant semi-partial correlation coefficient when controlling for the other facets ( $r = -0.187, p = 0.035$ ) and the Conscientiousness factor ( $r = -0.195, p = 0.028$ ). The bifactor group factor was also statistically significant ( $r = -0.351, p = 0.002$ ).

## Discussion

This study set out to investigate, firstly, the relationship between the five personality factors and burnout and, secondly, the relationship between these factor facets and burnout with consideration for the different sources of variance in each facet. In the following sections, we discuss the findings for each of these aims.

### Relationship between the five personality factors and burnout

Our results showed that Neuroticism was positively related with burnout across the three different correlation coefficients and that Openness to Experience was positively related and Agreeableness was negatively related with burnout in the bifactor model. Although the zero-order correlation coefficient showed that Conscientiousness was negatively related with burnout, the bifactor model did not find a statistically significant relationship (we discuss possible reasons in the next section). None of the bifactor correlation coefficients showed meaningful differences from their respective zero-order correlation coefficients. This is to be expected because much of the variance in facets (which typically constitute the factor when summed) represents common factor variance (Ones et al., 2016). Neuroticism showed the largest overall effect size and was also the only semi-partial correlation coefficient (controlling for the other four factors) that was statistically significant. Our results generally reflect similar results to other studies that have investigated the relationship between the five personality factors and burnout (e.g. Bakker et al., 2006; Bühler & Land, 2003; Kim et al., 2009; Morgan & De Bruin, 2010; Zellars et al., 2000).

### Relationships between personality facets and burnout

The results showed that some of the five-factor facets showed statistically significant relationships with burnout over and above their respective factor. For example, Order and Self-

Discipline showed a negative relationship with burnout after controlling for the Conscientiousness factor. A closer inspection of the correlation coefficients for Conscientiousness shows that the zero-order correlation coefficient was larger than the bifactor correlation coefficient. One possible reason for this discrepancy is that the zero-order correlation coefficient was inflated by facet variance in Order and Self-Discipline because these sources of variance were in the same direction as the Conscientiousness factor (Wiernik et al., 2015). Periard and Burns (2014) also found that Self-Discipline showed the largest relationship with Exhaustion after controlling for the other Conscientiousness facets. It might therefore be the Order and Self-Discipline facets in particular that drive the relationship between Conscientiousness and burnout.

Excitement Seeking showed a statistically significant positive correlation with burnout even though the Extraversion factor correlation was close to zero. This is in contrast to Țănculescu (2019) who found that Excitement Seeking has no statistically significant zero-order correlation coefficients with Exhaustion and Cynicism. The zero-order correlation coefficients for Excitement Seeking were smaller than the bifactor group correlation coefficient although it did not lead to a substantively different conclusion. The zero-order correlation coefficient and the bifactor group factor correlation for Tender-mindedness, in contrast, would lead to different conclusions. After controlling for Agreeableness, which had a negative correlation with burnout, the group correlation coefficient for Tender-mindedness showed a large *positive* correlation with burnout. This opposite correlation coefficient might explain the differences in zero-order and bifactor correlations of Agreeableness with burnout. Wiernik et al. (2015) referred to this situation as suppressive conflation.

### Implications for theory and practice

Our study results add support to the arguments made by Ones et al. (2016) and Wiernik et al. (2015) that '[t]raits at each hierarchical level [e.g. factor and facet level] should be interpreted as psychological entities in their own rights' (Ones et al., 2016, p. 319). Specifically, we found evidence that some facets are related with burnout over and above their respective factors and that factor correlations with burnout were clarified when using bifactor modelling. We cannot address possible causal mechanisms for these facets with burnout in this study. However, as Ones et al. (2016) noted, the lack of causal explanations does not mean that these relationships should be ignored in practice. There might therefore be value to include facets as predictors of burnout in the JD-R model over and above the five factors. This can potentially lead to a better understanding of the role of personality in the development of burnout.

Our results suggest that practitioners should probably pay attention to Neuroticism, Agreeableness and Openness to Experience in burnout interventions. Furthermore, there might be merits in also interpreting facet scores, such as



Excitement Seeking, Tender-mindedness, Order and Self-Discipline. For example, rather than considering Tender-mindedness to be a protective factor (because it is a facet of Agreeableness), it is possible that it can increase the probability of experiencing burnout. It is not easy in practice to separate different sources of variance in observed scores. However, practitioners should probably consider facet scores and interpret them as part of, and independent of, their respective factor scores.

### Limitations and recommendations

The results and conclusions of this study should not be over-interpreted as there are several limitations of the study. The sample size is a definition limitation because it reduces statistical power (i.e. increased probability of Type-II errors), can lead to unstable parameter estimates (Wiernik et al., 2015) and can capitalise on unique sample characteristics that are not found in the population. Our sample, for example, was over-represented by white women when compared with the population statistics of South Africa. This might limit the generalisation of our results to other demographic groups. From a statistical point of view, the sample size was not optimal for a bifactor model. In addition to the aforementioned limitations, it also prevented us from using estimators more appropriate for the ordinal structure of the item data. This can lead to incorrect model rejection rates (Beauducel & Herzberg, 2006). However, what was promising is that the other techniques we used, which are arguably less sensitive to sample size, tended to produce the same substantive conclusions.

We also noted that not all group factors were included in the bifactor model because these group factors showed weak evidence for group factors. This should not be interpreted as a representation of the psychometric properties of the BTI and the utility of these facets in practice because it is probably because of the sample used in this study and would need to be replicated many times before any conclusions can be made (see Vorster, 2016, for a discussion). We strongly recommend that our results should be re-investigated and replicated before any definite conclusions can be made about the predictive power of the facets identified in this study with burnout. This would require a much larger sample size and sample demographics that are more representative of the population of interest. There might also be value to use different measures of personality to remove possible biasing effects of scale-specific variance (Ones et al., 2016). It must be kept in mind that this study set out to investigate whether personality facets are related to burnout after controlling for the general factor, not which facets are related to burnout (i.e. we did not theoretically argue for any particular directional relationships).

It is difficult to make a direct recommendation on which statistical technique is best suited to investigate the relationships between personality facets and external variables. The bifactor model is well suited when the aim is to statistically remove common and specific variance when there is a large general factor (Chen et al., 2012; Wiernik et al., 2015).

The advantage of bifactor modelling is that it is a latent variable model that accounts for measurement error (Chen et al., 2012). This can lead to more accurate parameter estimates. However, bifactor modelling has several limitations. For example, large sample sizes are generally required because of the large number of parameter estimates (depending on the number of items) (Chen et al., 2012). This can become especially problematic when items are modelled as ordinal responses using polychoric correlation coefficients (see Moshagen & Musch, 2013, for a discussion). A careful interpretation of bifactor models is also required. It is not appropriate to rely solely on model fit statistics as bifactor models tend in general to show better fit. The decision on whether or not a structure is consistent with a bifactor structure should be based on factor loadings, factor variances and relevant statistics such as omega hierarchical and omega specific (Bornovalova et al., 2020). Bornovalova et al. (2020) demonstrated the correct application of these procedures. Approaches based on total scores, such as semi-partial correlation coefficients, tend to produce similar substantive conclusions, but this is not always the case (Chen et al., 2012). One problem is that these scores contain measurement error, which can distort the results, especially when reliability coefficients for these scores are small (Chen et al., 2012). They are, however, easier to calculate and less sensitive to sample size requirements. What is clear, however, is that reliance on zero-order correlation coefficients in the presence of large general factors should be treated with appropriate caution and probably avoided (Wiernik et al., 2015). As a whole, it appears that bifactor modelling is an appealing and probably statically superior approach to investigate the relationship with facets and external variables.

### Conclusion

This study set out to investigate the relationship between the five-factor model personality traits and burnout and the relationship of their facets with burnout after controlling for shared facet and factor variance. The results showed relationships similar to those reported in other studies for the five factors and burnout. However, we also found that there are some facets that are related to burnout after correcting for different sources of variance. This lends some support to the argument that facets should be interpreted over and above factor scores (Ones et al., 2016).

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### Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

## Authors' contributions

This manuscript is based on the master's dissertation of the first author under the supervision of the second author. The first author was responsible for conceptualising and writing the manuscript. The second author conducted and interpreted the statistical analysis and assisted in writing the manuscript.

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## Data availability statement

Data used in this study can be obtained from the corresponding author upon request.

## Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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