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Values in action scale and the Big 5: An empirical indication of structure

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Abstract

Within this study we used self-report measures completed by 123 undergraduate students from an Australian university to investigate the validity of Peterson and Seligman's [Peterson, C., & Seligman, M. E. P (2004). *Character strengths and virtues*. New York: Oxford.] classification system of 24 character strengths and six virtues. We also looked at how the 24 character strengths relate to the Five Factor Model of personality and to a measure of social desirability. Using a second order factor analysis of the 24 character strengths, we found that these 24 character strengths did not produce a factor structure consistent with the six higher order virtues as proposed by Peterson and Seligman [Peterson, C., & Seligman, M. E. P (2004). *Character strengths and virtues*. New York: Oxford.]. Instead, the 24 character strengths were well represented by both a one and four factor solution. Patterns of significant relationships between each of the 24 character strengths, the one and four factor solutions and the Five Factor Model of personality were found. The results have implications for [Peterson, C., & Seligman, M. E. P (2004). *Character strengths and virtues*. New York: Oxford.] classification.
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Keywords: Values; VIA scale; Big 5; Five Factor Model

1. Introduction

The field of positive psychology has the goal of helping people achieve an above normal or optimal level of functioning, leading to a happier existence (Gable & Haidt, 2005; Wallis, 2005). Wallis (2005) suggests that this is because much of psychological practice and theory has focused on helping people to recover from a diminished level of functioning, and has largely neglected helping people achieve a higher level of functioning.

Two of the main proponents of positive psychology are Seligman and Csikszentmihalyi (2000), who see positive psychology encompassing subjective experience, individual traits, and societal interactions. With regard to the area of individual differences, Peterson and Seligman (2004) have developed a hierarchy of positive psychological character strengths. The hierarchy consists of 24 specific character strengths that are seen as

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Table 1
Peterson and Seligman's (2004) classification of character strengths and virtues

Virtue	Character strengths
Wisdom and Knowledge	Creativity
	Curiosity
	Open-mindedness
	Love of Learning
	Perspective
Courage	Bravery
	Persistence
	Integrity
	Vitality
Humanity	Love
	Kindness
	Social Intelligence
Justice	Citizenship
	Fairness
	Leadership
Temperance	Forgiveness and Mercy
	Humility/Modesty
	Prudence
	Self-control
Transcendence	Appreciation of Beauty
	Gratitude
	Hope
	Humour
	Spirituality

Adapted from Table 1.1 in Peterson and Seligman (2004), pp 29–30.

the psychological ingredients that make up six "virtues". These virtues are situated at a higher level of abstraction than character strengths, and are likened to constructs proposed by philosophers and religious figures over many centuries. These six virtues and their associated character strengths are displayed in Table 1.

Peterson and Seligman (2004) analysed different religious, cultural and legal texts from around the world in an attempt to achieve a universal classification for character strengths, and only included character strengths and virtues that were found to be ubiquitous (Dahlsgaard, Peterson, & Seligman, 2005).

To measure and assess the 24 character strengths, Peterson and Seligman (2004) also developed the Virtues In Action Scale (VIA). The VIA is a self-assessment measure of character strength requiring respondents to rate how likely they are to participate in certain behaviours that are representative of the different character strengths. It is important to note that the scale does not directly measure the six virtues they describe; these are only linked conceptually to the character strengths by Peterson and Seligman (2004).

In addition to developing their classification system, Peterson and Seligman (2004) have also suggested how their classification of character strengths and virtues is related to, but distinct from, already established theories of values. For example, Peterson and Seligman (2004) see their classification of character strengths and virtues as being related to Maslow's (1973) idea of self-actualised individuals, the Five Factor Model (FFM) of personality (McCrae & John, 1992; Costa & McCrae, 1994), Cawley's virtue factors (Cawley, Martin, & Johnson, 2000), Buss' evolutionary ideas about what is attractive in a mate [i.e. what character traits are essential for survival and propagation, (Botwin, Buss, & Shackelford, 1997; Shackelford, Schmitt, & Buss, 2005)], and Schwartz's (1992) Universal Values.

Some research into establishing the validity of these claims has begun. Haslam, Bain, and Neal (2004) found that both Schwartz's (1992) Universal Values and the Five Factor Model (FFM) of personality were conceptually linked to the 24 character strengths. However, as these constructs were defined and subsequently measured by only one or two terms that were ranked and grouped together by participants on the basis of conceptual likeness, more thorough research is needed before we can draw any firm conclusions.

Peterson and Seligman (2004) acknowledge that there are some clear correspondences between their classification and the FFM. For example, Neuroticism could be seen as the conceptual opposite of Hope,

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Table 2
Factors found in the virtues in action scale and their correlates

Character strengths contained within the factor	Name given to factor	Reflected virtue	Theoretical FFM correlate
Fairness, Humility, Mercy, Prudence	Strengths of restraint	Temperance	Conscientiousness
Creativity, Curiosity, Love of Learning, Appreciation of Beauty	Intellectual strengths	Wisdom and Knowledge	Openness
Kindness, Love, Leadership, Teamwork, Playfulness	Interpersonal strengths	Humanity and Justice	Agreeableness
Bravery, Hope, Self-control, Zest	Emotional strengths	Courage	Opposite of Neuroticism (Emotional Stability)
Gratitude, Spirituality	Theological strengths	Transcendence	No FFM correlate

Constructed from information found in Peterson and Seligman (2004), pp. 632–633.

and Extroversion could be a key to Leadership (Peterson & Seligman, 2004). They also show how their classification system as a whole corresponds to the FFM, by conceptually equating a factor analysis of their 24 character strengths to the five factors, although the FFM does not account for all of their classification (see Table 2).

It is important to note that Peterson and Seligman (2004) did not empirically correlate their value strength factors with the five factors of the FFM but only make these links conceptually. They also acknowledge that the five factors found in their factor analysis of the VIA do not exactly reflect their hypothesized hierarchical classification of the six virtues. Moreover, it is also interesting to note that only 19 of the 24 character strengths are reported, raising the question of where the other five would load. This ambiguity brings into doubt both the hierarchical link between the 24 character strengths and six virtues and the conceptual links between the FFM and the character strengths. The proposed relationships are further brought into doubt when one reviews other research into character strengths and the FFM. This research suggests that some of the character strengths are related to combinations of FFM traits and not individual traits. For instance, creative people have been shown to be high in Openness (O) and low in Agreeableness [A (King, Walker, & Broyles, 1996)]; honest and humble people have been found to be high in Agreeableness (Ashton & Lee, 2005) and also high in Conscientiousness [C (Paunonen, 2003)]; Brose, Rye, Lutz-Zois, and Ross (2005) found forgiveness to be both negatively correlated with Neuroticism (N) and positively correlated with Agreeableness and sometimes Extroversion (E). Also, a meta-analysis of a number of different studies by Suroglou (2000) found that religiosity was related to high A, C and (to some extent) E.

Although most of the theoretical correlates predicted by Peterson and Seligman (2004) are reflected in this research, there are often multiple predictors present as shown in the studies above. Our research pursues this idea by investigating which combinations of FFM traits, rather than a single trait, are best related to each of the 24 character strengths found within Peterson and Seligman's (2004) classification.

In consideration of the factor analysis carried out by Peterson and Seligman (2004) it is important to reiterate that their results did not support their theory of particular combinations of character strengths as being represented as the higher order virtues. Consequently, this issue is also examined, with the expectation that a factor analysis of the 24 character strengths will not produce the six virtues proposed by Peterson and Seligman (2004).

A further area of interest we considered was whether the VIA is effected by social desirability. Peterson and Seligman (2004) state that the 24 character strengths are socially desirable constructs themselves and as a result the VIA should not be affected by social desirability. We take this to mean that the VIA will not be affected by individual differences in socially desirable responding. Although this may be true, the opposing argument could also be made: as the 24 character strengths are socially desirable constructs, the VIA will be highly affected by social desirability.

To summarise, the aim of this study is to further the understanding of Peterson and Seligman's (2004) classification of 24 character strengths by examining the relationships between the character strengths themselves and their relationship to the Five Factor Model of personality. To achieve this, the 24 character strengths are

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first factor analysed with the expectation that the extracted factors will not neatly represent the six virtues proposed by Peterson and Seligman (2004). The 24 character strengths will then be compared to the FFM in order to investigate the relationships between them. It is hypothesized that there will not be a one-to-one relationship between for the majority of the character strengths and the FFM personality traits. Rather it is expected that most of the character strengths will show relationships to more than one of the FFM constructs. Following Peterson and Seligman's (2004) view, we expect that the VIA will not be influenced by socially desirable responding.

2. Method

2.1. Participants

The participants for this study were 123 first year psychology students enrolled in an Australian university. There were 28 males and 86 females, with 9 participants not indicating their gender. Ages ranged from 18 to 57 years, with a mean of 21.51 years and a standard deviation of 6.57 years. All participants volunteered to take part in the study and were given course credit for doing so.

2.2. Materials

The materials used were question booklets containing a battery of ten psychometric tests and answer booklets. Four versions of the question booklets were used with the questionnaires presented in different orders in each version to account for any possible order effects. The psychometric tests not relevant to the current research will be reported elsewhere.

To measure the 24 character strengths, Peterson and Seligman's (2004) Virtues In Action Scale (VIA) was used. This test uses a five-point Likert scale (A = very much like me, B = like me, C = neutral, D = unlike me, E = very much unlike me) to measure how frequently one perceives oneself as exhibiting certain behaviours. These behaviours are representative of the 24 individual character strengths. The actual VIA scale used was a 213-item edition obtained from the IPIP web site (International Personality Item Pool, 2001). Items were compiled in the test booklet pseudo-randomly to ensure that items representing individual character strengths and positively and negatively worded items were distributed evenly throughout the questionnaire. Using data obtained from over 150,000 adult respondents completing the VIA over the Internet, the measure was found to have acceptable internal reliability (all alphas $>.7$) and temporal reliability (test/retest $>.7$) (Peterson & Seligman, 2004).

The measure of the Five Factor Model of Personality was Goldberg's (1999) Big Five scale obtained from the IPIP web site (International Personality Item Pool, 2001). This measure has 20 self-report items per scale and participants respond using a four-point Likert scale (F = definitely false, f = false on the whole, t = true on the whole, T = definitely true). This instrument has been found to be both a reliable and valid measure of the FFM (see Goldberg, 1999; Goldberg et al., 2006).

The 20 item Marlowe-Crowne Social Desirability scale (Strahan & Gerbasi, 1972) was also included in the battery in order to examine and potentially account for social desirability effects. Strahan and Gerbasi reported internal reliabilities ranging from.73 to.83 for the 20 item short-form of the scale. The scale uses a true/false response option for each question. The scale is balance with half the items being reverse scored.

2.3. Procedure

Testing was done in multiple testing sessions. Upon entering the testing room the participants were randomly given one of the four differently ordered questionnaire booklets and its accompanying answer booklet. Participants sat where they chose and were instructed to complete all the tests presented the question booklet in the order they appeared. They were also told that all information recorded was confidential. All tests were answered in a separate answer booklet using either a pen or pencil. Both booklets were collected and participants were allowed to leave when they had finished. The time taken to complete the entire battery was between 90 and 120 min.

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3. Results

Each questionnaire was first assessed for missing data; 18 item non-responses from the VIA scale and 17 from the FFM scale were replaced with the middle response of their corresponding Likert scale. Two VIA respondents and one FFM scale respondent were removed for not responding correctly. Each measure was scored and descriptive statistics and histograms were generated. These were then inspected for normality and were all found to be within acceptable limits. *T*-tests were calculated between mean scores for each FFM scale and norms derived by the second author (MB) from data collected for teaching purposes from undergraduate psychology students ($n = 565$). No significant differences were found ($p > .05$). VIA norms have not been published therefore no comparison was possible. In addition, *t*-tests were calculated to assess differences in age and gender; and all tests conducted were non-significant. Order effects possibly resulting from the different presentation order of the tests were also found to be non-significant.

Internal reliabilities for all the measures were then assessed via the generation of Cronbach Alpha coefficients. These were compared to alpha coefficients reported in the literature for each of the individual measures (see Table 3).

The alpha coefficient for all 213 VIA scale items taken together (reverse scored where appropriate) was .96. This showed that the behaviours related to the character strengths were responded to in a highly consistent

Table 3
Alpha coefficients for the VIA scale, the IPIP FFM scale, and the social desirability scale compared to the expected alpha coefficients obtained from published findings

Character strength	Our sample	Previously reported	No. items
Appreciation of Beauty	.70	.77	8
Capacity for Love	.68	.70	9
Citizenship/Teamwork	.62	.78	9
Curiosity	.83	.78	10
Equity/Fairness	.80	.70	9
Forgiveness/Mercy	.85	.76	9
Gratitude	.76	.79	8
Hope/Optimism	.58	.73	8
Humor/Playfulness	.86	.84	9
Industry/Perseverance/Persistence	.83	.81	8
Integrity/Honesty/Authenticity	.56	.72	9
Judgment/Open-mindedness	.80	.80	9
Kindness/Generosity	.75	.72	10
Leadership	.43	.77	7
Love of Learning	.74	.77	10
Modesty/Humility	.68	.70	9
Originality/Creativity	.83	.85	8
Perspective/Wisdom	.76	.75	9
Prudence	.57	.73	9
Self-regulation/Self-control	.68	.75	11
Social/Personal/Emotional Intel	.75	.76	7
Spirituality/Religiousness	.89	.91	7
Valor/Bravery/Courage	.61	.75	10
Zest/Enthusiasm/Vitality	.80	.78	9
Total character strength	.96	n.a	213
IPIP Big 5			
Agreeableness	.88	.91	20
Conscientiousness	.90	.88	20
Extroversion	.92	.88	20
Neuroticism	.91	.91	20
Openness	.87	.90	20
Marlowe-Crowne Social Desirability	.74	.73 to .83	20

Notes: For published alpha reliabilities see: VIA, Peterson and Seligman (2004); IPIP Big 5, Goldberg et al. (2006); Marlowe-Crowne Social Desirability, Strahan and Gerbasi (1972).

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fashion regardless of the separate scales with which they are theoretically associated. This overall measure was included in subsequent analyses as a variable called Total Character Strength.

A second order factor analysis of the 24 character strengths derived from the VIA scale was then carried out using a Principle Components analysis with a Varimax rotation. An initial extraction revealed five components with an eigenvalue >1, however, the scree plot (shown in Fig. 1) indicated that three components might also yield a simple solution.

The loadings of the character strengths in the five factor solution were not easily interpretable and many high cross-loadings between the factors were evident. This was also observed when using an oblique (Direct Oblimin) rotation. A four factor solution was then generated (see Table 4) and found to be more interpretable. The four factors were tentatively labeled Positivity, Intellect, Conscientiousness and Niceness. The only notable reduction in communality between the five and four factor solutions was with the variable of Spirituality/Religiosity. This four factor structure also had the clearest pattern of correlations with the FFM constructs (see Table 4).

Social Desirability scores were correlated with each of the VIA character strength scores and the five factor scores (also shown in Table 4). The correlations indicated that the factors were differentially related to Social Desirability. Factors 2 and 3 (Intellect and Conscientiousness) were not significantly related to Social Desirability scores, however, Factor 1 (Positivity) was weakly and positively related to Social Desirability and Factor 3 (Niceness) moderately positively related. The correlations between Social Desirability and each of the 24 character strengths reflect this pattern, with the six character strengths that loaded on Factor 4 (Niceness) all correlating significantly with Social Desirability.

The two and three factor solutions were also run but were found to produce pronounced high cross-loadings and disjointed relationships to the FFM scales. Therefore these solutions were not considered further. A single component solution was produced on which all the character strengths except Modesty and Prudence loaded strongly (Table 5). However, eight variables showed very low communalities (<.3) and are therefore not well represented by this solution.

Given the significant correlations between Social Desirability and several of the VIA character strength scores, the data was reanalysed after 'centering' the 24 character strength scores for each participant. This was done by dividing each character strength score by the number of items that made up each score, calculating the mean score for each participant across all 24 character strengths and then subtracting this mean from each participant's score for each character strength. The effect of centering is to remove the influence of mean response set differences between participants (but not individual variability); in this case, individual differences in the tendency to agree more strongly with socially desirable items.

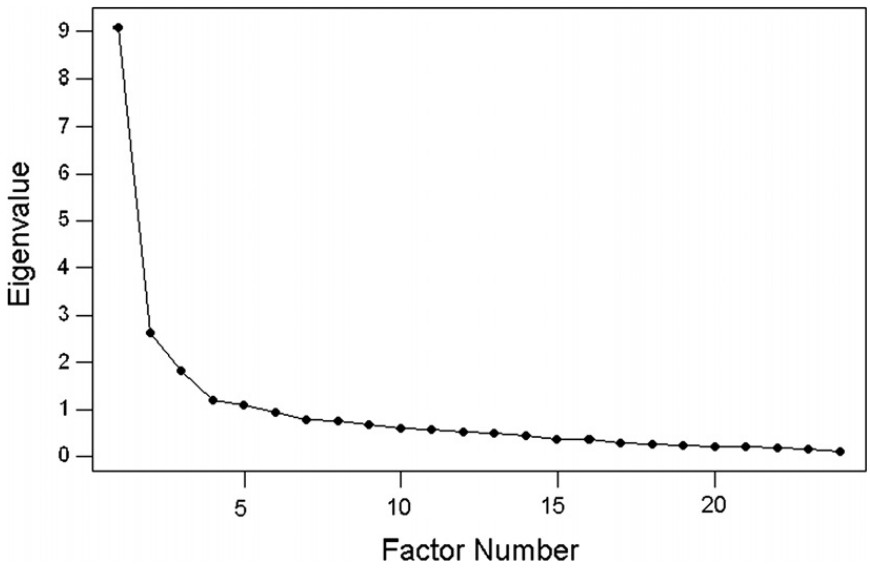

Fig. 1. Scree plot for the 24 character strength raw scores.

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Table 4
Varimax rotated four factor solution of 24 character strength scores and correlations with social desirability and Big 5 scores

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Communality	SocDes correlation
Positivity						
Citizenship/Teamwork	.78				.64	.13
Capacity for Love	.74				.58	.19*
Hope/Optimism	.73				.68	.26**
Humor/Playfulness	.63	−.43			.60	.18
Zest/Enthusiasm/Vitality	.62	−.40	−.48		.77	.28**
Leadership	.50	−.44		.38	.58	.15
Intellect						
Originality/Creativity		−.78			.69	.02
Appreciation of Beauty		−.72			.55	.15
Curiosity	.49	−.61			.69	.32**
Love of Learning		−.60	−.43		.61	.15
Social/Personal/Emotional Intel	.55	−.58			.67	.23*
Perspective/Wisdom	.35	−.53	−.47		.65	.12
Valor/Bravery/Courage	.42	−.44			.46	.22*
Conscientiousness						
Self-regulation/Self-control			−.75		.62	.12
Industry/Perseverance/Persist			−.73		.66	.17
Judgment/Open-mindedness			−.59	.34	.58	−.05
Integrity/Honesty/Authenticity			−.58	.39	.57	.33***
Prudence			−.53	.50	.60	.16
Niceness						
Modesty/Humility				.75	.72	.28**
Equity/Fairness	.36		−.31	.64	.68	.53***
Kindness/Generosity	.35			.64	.65	.45***
Forgiveness/Mercy	.35			.62	.53	.55***
Spirituality/Religiousness				.50	.34	.25**
Gratitude	.42	−.41		.45	.59	.29**
Proportion of Variance	.19	.16	.13	.13	.61	
Factor correlations						
Social Desirability	.24**	−.04	−.06	.46***		
Agreeableness	.20*	−.08	.14	.57***		.60***
Conscientiousness	.12	.14	.71***	.15		.18*
Extraversion	.71***	.26**	−.06	−.10		.20*
Neuroticism	−.50***	−.17	−.12	−.30		−.27**
Openness	.03	.68***	.11	.04		.16

Notes: Loadings <.3 not shown. SocDes = Social Desirability.
For correlations: $*p < .05$; $**p < .01$; $***p < .001$.

A second order Principle Components factor analysis of the centered scores of the 24 character strengths derived from the VIA scale was conducted. The initial extraction revealed nine factors with an eigenvalue >1 (see Fig. 2). Several solutions were examined, but none were clearly interpretable. Given the elbow in the Scree Plot at factor 6 a five factor solution is presented here as an example (see Table 6). We could arrive at no meaningful interpretation of this factor structure, particularly with regard to some of the negative loadings observed. The correlations observed between social desirability and each of the centred character strength scores appeared to be systematically reduced compared to the same correlations with character strength raw scores reported above. Thus, the technique of centering reduced but did not eliminate the influence of social desirability.

Stepwise regression analyses were conducted with the FFM traits and social desirability as predictor variables and the raw and the centralised character strength scores as criterion variables. After adjustment to account for family-wise error a working significance level of $p \leqslant .01$ was used. Only values for the constructs that had a p value $\leqslant 01$ are presented in the results of this analysis (see Table 7).

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Table 5
One factor solution of 24 character strength scores and correlations with social desirability and Big 5 scores

Character strength	Factor 1	Communality
Zest/Enthusiasm/Vitality	.81	.65
Curiosity	.79	.63
Perspective/Wisdom	.76	.57
Social/Personal/Emotional Intelligence	.75	.56
Gratitude	.74	.55
Hope/Optimism	.74	.54
Equity/Fairness	.72	.52
Kindness/Generosity	.70	.49
Humor/Playfulness	.68	.46
Leadership	.68	.46
Industry/Perseverance/Persistence	.63	.39
Integrity/Honesty/Authenticity	.63	.39
Valor/Bravery/Courage	.63	.39
Capacity for Love	.57	.32
Citizenship/Teamwork	.57	.33
Originality/Creativity	.56	.31
Love of Learning	.54	.29
Forgiveness/Mercy	.53	.28
Appreciation of Beauty	.52	.27
Self-regulation/Self-control	.49	.24
Judgment/Open-mindedness	.45	.20
Spirituality/Religiousness	.39	.16
Prudence	.24	.06
Modesty/Humility	.19	.04
Proportion of Variance	.38	.38
Factor correlations		
Social Desirability	$.37^{***}$	
Agreeableness	$.37^{***}$	
Conscientiousness	$.52^{***}$	
Extroversion	$.51^{***}$	
Neuroticism	$-.45^{***}$	
Openness	$.45^{***}$	

Notes: For correlations $*p < .05$; $**p < .01$; $***p < .001$.

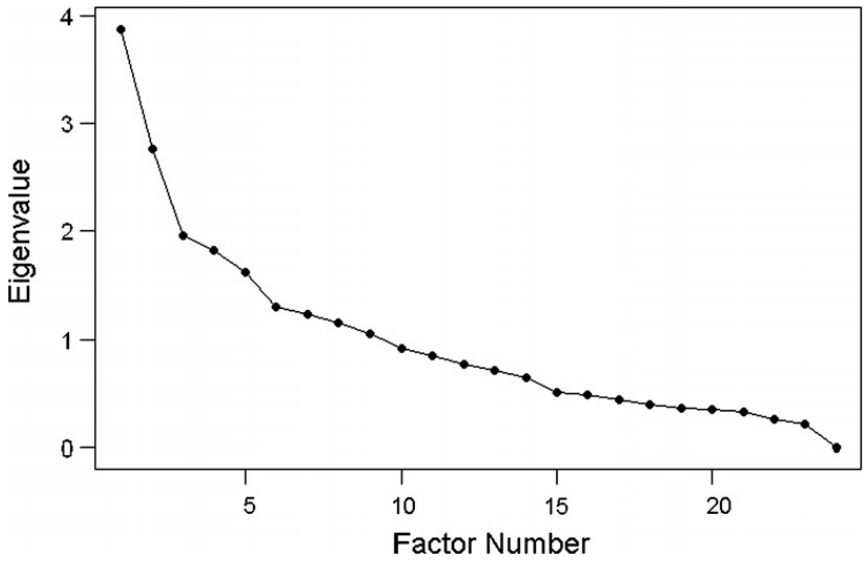

Fig. 2. Scree plot for the 24 character strengths centred scores.

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Table 6
Varimax rotated four component solution of centred scores and correlations with social desirability and Big 5 scores

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Communality	SocDes correlation
Curiosity	.75					.65	.12
Prudence	−.70		−.36			.64	.09
Zest/Enthusiasm/Vitality	.67	.31	−.32			.67	.08
Modesty/Humility	−.59	−.47	−.30			.66	.03
Judgment/Open-mindedness	−.59			.32		.54	−.32***
Hope/Optimism	.55			−.41		.50	.01
Forgiveness/Mercy		−.72				.54	.44***
Equity/Fairness		−.72				.54	.43***
Kindness/Generosity		−.55				.38	.27**
Perspective/Wisdom		.47				.30	−.20*
Social/Personal/Emotional Intel			.62			.47	−.04
Leadership			.58	−.31		.53	−.21*
Self-regulation/Self-control			−.57			.46	−.13
Industry/Perseverance/Persist		.43	−.56			.51	−.04
Humor/Playfulness			.51	−.30		.48	−.04
Originality/Creativity		.36	.44	.35	−.40	.67	−.21*
Citizenship/Teamwork				−.75		.59	−.17
Love of Learning				.66		.47	−.10
Capacity for Love				−.63		.43	−.06
Appreciation of Beauty			.30	.39		.34	−.06
Gratitude					.70	.55	.09
Spirituality/Religiousness					.69	.50	.12
Integrity/Honesty/Authenticity			−.34		−.42	.42	.05
Valor/Bravery/Courage					−.38	.21	−.07
Proportion Of Variance	.12	.11	.10	.10	.07	.50	
Factor Correlations							
Social Desirability	.25**	−.49***	−.09	.06	.14		
Agreeableness	.16	−.57***	−.20*	.04	.11		
Conscientiousness	.10	.18*	−.49***	.17	.06		
Extroversion	.49***	.14	.28**	−.33***	.07		
Neuroticism	−.49***	.04	.04	.13	.07		
Openness	.31***	.09	.24**	.48***	−.10		

Notes: Loadings <.3 not shown. SocDes = Social Desirability.
For correlations: $*p < .05$; $**p < .01$; $***p < .001$.

The results of this analysis found that no consistent pattern of predictors was evident. For example, in the raw score analysis, Neuroticism was only predictive of Hope/Optimism and Valour/Bravery/Courage while Spirituality/Religiosity was only weakly predicted by Agreeableness. Social Desirability was found to be a significant predictor of just 3 of the 24 character traits. Conducting the stepwise regression analysis on the character strength centred scores did produce somewhat different predictor patterns but no consistency in the pattern of predictors was apparent.

4. Discussion

As hypothesised, the results of a second order Principal Components factor analysis of the 24 character strengths were not consistent with Peterson and Seligman's (2004) theory of how they relate to the six virtues. For their theory to have been supported the 24 character strengths needed to have produced a clean six component solution, whereas only five components with eigenvalues greater than one were found. At first glance the five component solution appears to be similar to the five factor solution obtained by Peterson and Seligman (2004), but it is apparent on closer inspection that they are made up of different clusters of character

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Table 7
Stepwise regression analysis with FFM scales and social desirability as predictor variables of raw and centred character strength scores

Character strength	Proportion of raw score accounted for						Proportion of centred score accounted for					
	A	C	E	N	O	Soc Des	A	C	E	N	O	Soc Des
Appreciation of Beauty	—	—	—	—	27.6**	—	4.41*	—	—	—	10.1**	—
Capacity for Love	—	—	24.97**	—	—	—	—	8.01*	6.49**	—	4.79*	—
Citizenship/Teamwork	—	—	34.7**	—	—	—	—	7.53**	17.49**	—	13.59**	—
Curiosity	—	5.06*	19.06**	—	11.28**	—	—	—	—	—	5.62*	—
Equity/Fairness	30.46**	—	—	—	—	5.52*	20.02**	—	—	5.17*	—	3.79*
Forgiveness/Mercy	44.89**	—	—	—	—	2.66*	33.43**	3.4*	—	—	—	—
Gratitude	—	11.24**	6.55*	—	—	—	—	—	—	—	—	—
Hope/Optimism	—	—	3.21*	35.51**	—	—	—	—	—	18.18**	—	—
Humour/Playfulness	—	—	34.73**	—	4.22**	—	—	8.22**	20.43**	—	—	—
Industry/Perseverance/ Persistence	—	58.67**	—	—	—	—	—	37.66**	—	3.7*	—	—
Integrity/Honesty/ Authenticity	—	17.28**	—	—	—	6.44*	—	—	5.28*	—	—	—
Judgment/Open-mindedness	—	22.83**	2.8*	—	4.58*	—	—	6.82**	15.26**	—	—	7.11*
Kindness/Generosity	20.67**	—	3.79*	—	—	—	6.98**	—	—	7.34*	—	—
Leadership	—	—	19.75**	—	—	—	—	6.95*	—	—	—	—
Love of Learning	—	9.22**	—	—	25.67**	—	—	—	12.04**	—	8.01**	—
Modesty/Humility	22.85**	—	17.79**	—	—	—	11.39**	—	32.12**	—	6.35**	—
Originality/Creativity	34.2**	—	—	—	—	—	10.97**	—	—	—	17.8**	—
Perspective/Wisdom	—	21.82**	—	—	13.5**	—	7.13*	—	—	—	5.07*	—
Prudence	—	18.8**	11.21**	—	—	—	—	4.72*	29.41**	2.9*	6.66**	—
Self-control	—	29.02**	—	—	—	—	—	5.82*	—	—	—	—
Social/Personal/ Emotional Intel	—	—	32.9**	—	6.46**	—	—	—	15.46**	8.42**	—	—
Spirituality/ Religiousness	5.72*	—	—	—	—	—	—	—	—	—	—	—
Valour/Bravery/ Courage	—	—	—	16.59**	5.84*	—	6.96**	—	—	6.77*	—	—
Zest/Enthusiasm/ Vitality	—	25.99**	17.76**	—	—	—	—	5.37**	10.78**	—	—	—
Total Character Strength	—	29.56**	7.13**	—	12.08**	4.61*						

Note: $**p < .001$, $*p \leqslant .01$.

strengths (compare Table 2 with Table 4). Furthermore, none of the clusters of character strengths contained within the components were completely representative of the clusters needed to make up any of the six virtues, thus providing additional evidence against Peterson and Seligman's (2004) theoretical relationships.

Many of the VIA character strengths loaded strongly on multiple components making interpretability questionable. Similar problems of cross-loading may have been the reason that Peterson and Seligman (2004) originally left out five of the character strengths when reporting the results of their factor analysis. Even so, they must have found cross-loadings different to those contained in our component solution, because many of the character strengths remaining in Peterson and Seligman's (2004) solution showed cross-loadings in ours.

In an attempt to find a solution that was representative of independent higher order constructs, two, three and four component solutions of the 24 character strengths were produced. Each of these solutions also had multiple character strengths cross-loading on different factors. The two and three factor solutions were uninterpretable, whereas the four-factor solution made conceptual sense and is discussed below. An oblique rotation was also carried out to allow the factors to correlate more strongly with each other, but the results did not dramatically enhance the interpretability of the solution.

Lastly a single component solution was generated. Only two character strengths did not load strongly: Prudence and Modesty. Several others were also poorly represented, as indicated by the squared loadings. How-

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ever, the idea that the character strengths are best represented by one overarching factor was further supported by the very high Cronbach Alpha coefficient of .96 that was obtained for the Total Character Strength score. Although this variable is not the one suggested for the VIA scale by Peterson and Seligman (2004), it may provide a useful addition to a theory of character.

In order to further investigate the VIA structure we centered the data and again conducted factor analyses. None of the resulting factor solutions were supportive of the proposed relationship between the 24 character strengths and the six virtues. Therefore, regardless of which factor solution might be considered most appropriate from these results, none of them supports at the next level of abstraction the six virtues as proposed by Peterson and Seligman (2004). But that does not mean that these six virtues are meaningless. Like the 24 character strengths, they were originally found ubiquitously in cross-cultural and cross-generational literature. The interpretation of the virtues as higher order representations of a large number of character strengths was purely theoretical. The results of the factor analyses within this study, and even the results of Peterson and Seligman's (2004) own factor analyses, reveals that their theory does not hold up under empirical investigation. The question now open for consideration is what to do with the six virtues Peterson and Seligman (2004) found to be ubiquitous in various forms of literature. Potentially the six virtues could be better dealt with as a stand-alone classification with a separate instrument needing to be developed to measure them, or simply treated as additional character strengths themselves that could be added to Peterson and Seligman's classification of character strengths.

Another question raised by the factor analyses is how to interpret the overarching factor that was found in the raw data factor structure but not found (or minimized) in the centered scores factor structure. Centering the data appeared to removed the influence of the large first factor. This then raises the question of what this factor was representing. Centering is generally thought to remove the influence of socially desirable responding. However, one suggestion we make here is that social desirability in this instance is itself a character strength (rather than a response set) with anti-social tendencies being its antithesis. As such, it would seem inappropriate to remove a critical aspect of the construct the VIA sets out to measure.

The most simple interpretation might be that this factor is representing some sort of "goodness" as a whole, thus raising the question of whether a person possessing large amounts of one character strength is also likely to possess large amounts of multiple character strengths. Another interpretation may be that because these character strengths are measured via self-assessment they might be subject to self-enhancing halo effects. Therefore, self-perception of one's overall character might be what is being measured by this factor.

The correlations between the Marlow-Crowne Social Desirability scores and the character strengths and factor scores partly support these suggestions. However, Social Desirability was found to be significantly related to some character strengths but not all character strengths. This clearly does not support Peterson and Seligman's (2004) assertion that the VIA is free of social desirability effects because all the items of the VIA are socially desirable. Rather the differential relationships observed suggest that some character strengths are more socially desirable than others. Perhaps not surprisingly all the character traits that loaded on the factor of Niceness were all significantly related to social desirability scores.

A further complication is that centering the character strength scores reduced but did not remove the influence of social desirability. This finding, together with the differential relationships between social desirability scores and the character strengths and factor scores, and the presence of a possible single overriding factor, strongly suggest that research into the predictive validity of the VIA is required. Findings from such research might be able to indicate which scores are predictive of positive behaviour: raw character strength scores, centered scores or scores with social desirability partialed out.

Within considering various factor analyses of the VIA it is important not to lose sight of the individual character strengths. Given that the majority of the 24 constructs had alpha coefficients over .6 (as shown in Table 3) and that they are all highly recognized constructs within society, one should not ignore them as individual constructs. The only character strength with very low internal consistency was Leadership. The reason for this may have been the young age of the majority of participants and their lack of opportunities to exhibit leadership. Prudence, Integrity and Hope also had reliabilities of less than .60. One may argue, for example, that Prudence is not a concept that is familiar to the current generation of younger people. This leads to the suggestion that the cultural context of character needs to be considered.

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As hypothesised, some of the predictors of the character strengths consisted of more than one FFM construct, which brings into doubt Peterson and Seligman's (2004) idea that each character strength should be represented by one FFM construct. Furthermore, some FFM scales were only weakly related to the character strengths. In particular, Neuroticism was only predictive (negatively) of Hope/Optimism and Valour/Bravery/Courage. A similar trend was seen with the regressions conducted on the centralized data. Within this, some differences in predictors were seen between the two analyses although the stronger predictors remained constant between the two data sets. Moreover, changes between the data sets did not show any consistent pattern, with some FFM traits increasing in predictiveness when moving from the original to the centralized data sets, whereas others decreased. A better understanding of what latent construct is being removed when centering the data is needed before this can be discussed further. What is evident from both of these data sets is that as hypothesized, for a majority of the character strengths there was more than one FFM predictor.

None of the factor analyses were entirely 'clean' in terms of cross-loadings. The cross-loadings suggest that such character strengths might be positioned in factor space between two orthogonal factors or between two (or more) of the FFM traits as suggested in the AB5C personality model (Hofstee, de Raad, & Goldberg, 1992). Other strengths, such as spirituality, might be related to a sixth 'big trait' (e.g., see Piedmont, 1999).[1] Another way of relating the FFM to character strength is to look at how the FFM relates to the factors obtained in each solution attempted. When this was done with the four factor solution of the character strength scores (not centered) one could tentatively interpret the factors as representing higher traits such as Positivity, Intellect, Conscientiousness and Niceness. The first component was positively correlated with Extroversion and negatively with Neuroticism, with the character strengths reflecting the idea of being positive (or engaged) and active in life (and the workplace). The second component reflects character strengths mainly related to the activity of the mind (except Valour/Bravery/Courage) and was positively correlated with Openness. The third component was highly positively correlated with Conscientiousness and reflected self-regulation of one's attitudes and actions. The fourth component (Niceness) was highly positively correlated with Agreeableness and the individual character strengths are all related to interaction between individuals.

A limitation of our research was the small sample size. It would be interesting to see how the 213 individual items of the VIA scale factored together as opposed to the 24 character strengths analysed here. To do this, over 1000 participants would be needed to allow for at least five participants per item. From this analysis one could further investigate the influence of the overarching factor. Furthermore it is important that relationships between the VIA and other psychological constructs continue to be investigated in order to elaborate the construct validity of the character strengths themselves. Peer ratings of character strength could also be used in future research to provide some validation for the VIA. In our study, both a single factor and a four factor solution of the non-centered VIA character strength scores were most interpretable perhaps suggesting that the latter represents the influence of the Big 5 on character strengths whereas the former may represent some other global influence.

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[1] We are indebted to one of the reviewers for these two suggestions.

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