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Scarecrow, Tin Woodsman, and Cowardly Lion: The three-factor model of virtue

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ABSTRACT

Recent research has identified three virtues from the 24 strengths in the VIA Classification of Strengths and Virtues, labeled caring, inquisitiveness, and self-control. This article explored this model further. Study 1 demonstrated substantial congruence in three-factor loadings across 12 samples (total $N = 1,082,230$) despite substantial differences in methodology. Study 2 ($N = 1719$) provided support for the use of aggregate scores for the three virtues. Study 3 ($N = 498$) demonstrated substantial overlap between measures of personality and the virtues. We conclude these three are potentially essential components of a theory of virtue. They cannot be considered a sufficient model, which may be unattainable. We also note that treating virtue as an individual difference concept neglects key elements of our understanding of virtue as a social construct, and these more amorphous elements must be considered in developing an optimal model of virtue.

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Positive psychology was originally founded with the intention of improving our understanding of the nature of (1) positive subjective experience, (2) positive institutions, and (3) positive individual traits (Seligman & Csikszentmihalyi, 2000). The most important product of this last initiative has been the introduction of the VIA Classification of Strengths and Virtues (Peterson & Seligman, 2004). The VIA Classification is intended to provide a model of positive traits, focusing particularly on the development of a comprehensive set of character strengths.

The development of the VIA Classification began with the delineation of criteria that can characterize a character strength (Park, Peterson, & Seligman, 2004; Peterson & Seligman, 2004), the most important of which was that strengths are morally valued because they contribute to the benefit of others as well as to personal fulfillment. Several of the other criteria also suggest a societal value to the strengths, such as cross-cultural ubiquity and the existence of social institutions intended to cultivate the strengths. The criteria are polythetic, and moral value is not a necessary condition for inclusion in the list, but it nonetheless was considered a key determinant in the process of identifying character strengths.

This process consisted of an intensive three-year investigation involving 53 scientists who studied positive functioning, with the goal of evaluating various candidates for inclusion in a catalog of character strengths (Niemiec, 2013). The final list consisted of 24 character strengths that

Peterson and Seligman (2004) believed provided a comprehensive framework for conceptualizing individuals as positive social actors.

If character strengths are in large part defined by their moral desirability, it would seem reasonable to hypothesize that they should reflect abstract social values; in the words of Ralph Waldo Emerson (1884, para. 5), character is 'moral order seen through the medium of an individual nature'. In other words, one would expect valued individual traits and behaviors to reflect broader, more abstract principles of socially desirable functioning. To evaluate this possibility, Dahlsgaard, Peterson, and Seligman (2005) conducted an intensive review of foundational texts from eight classical moral and religious traditions: Athenian philosophy, Buddhism, Christianity, Confucianism, Hinduism, Islam, Judaism, and Taoism. Through this process, they identified six core principles of positive social functioning that were valued across these traditions, a set of principles they referred to as core virtues: wisdom and knowledge, courage, humanity, justice, temperance, and transcendence. Peterson and Seligman (2004) hypothesized that character strengths would represent the personal manifestations of these more general dimensions. Based on this hypothesis, they offered an initial attempt at a hierarchical model in which the 24 strengths were each considered reflective of one of the six virtues (see Table 1). It is noteworthy that these associations were developed on theoretical grounds, in an attempt to mirror the cultural understanding of how

Table 1. The VIA Classification.

Virtues	Character strengths
Wisdom & Knowledge	Creativity [originality, ingenuity]
	Curiosity [interest, novelty-seeking, openness to experience]
	Judgment & Open-Mindedness [critical thinking]
	Love of Learning
Courage	Perspective [wisdom]
	Bravery [valor]
	Perseverance [persistence, industriousness]
	Honesty [authenticity, integrity]
Humanity	Zest [vitality, enthusiasm, vigor, energy]
	Capacity to Love and Be Loved
	Kindness [generosity, nurturance, care, compassion, altruistic love, 'niceness']
	Social Intelligence [emotional intelligence, personal intelligence]
Justice	Teamwork [citizenship, social responsibility, loyalty]
	Fairness
	Leadership
Temperance	Forgiveness & Mercy
	Modesty & Humility
	Prudence
Transcendence	Self-Regulation [self-control]
	Appreciation of Beauty and Excellence [awe, wonder, elevation]
	Gratitude
	Hope [optimism, future-mindedness, future orientation]
	Humor [playfulness]
	Religiousness & Spirituality [faith, purpose]

Source: Adapted from Peterson and Seligman (2004, pp. 29–30). Copyright 2004 by Values in Action Institute (now the VIA Institute on Character).

abstract principles manifest in personal traits. This is the model now often referred to as the VIA Classification of Strengths and Virtues.

Once the model was finalized, Peterson and Seligman (2004) moved on to develop an instrument to measure the 24 strengths, the VIA Inventory of Strengths (VIA-IS). The VIA-IS is a self-report questionnaire comprised of 24 10-item scales representing each of the strengths, for a total of 240 items. Developed for adults 18 and over, respondents rate the degree to which statements reflecting character strengths describe them on a Likert-type five-point scale ranging from *very much like me* to *very much unlike me*. All items are positively keyed. The instrument has demonstrated satisfactory internal reliability (α values >0.70); test-retest reliability ($r_s \geq 0.70$); and validity, based on correlations with appropriate criteria (Park et al., 2004) as well as others' ratings of participants' character strengths (Ruch et al., 2010).

Several studies have since been conducted using exploratory factor analysis or principal components analysis (PCA) to investigate the latent structure of the 24 scales of the VIA-IS (e.g. Brdar & Kashdan, 2010; Littman-Ovadia & Lavy, 2012; Macdonald, Bore, & Munro, 2008; McGrath, 2014; Peterson, Park, Pole, D'Andrea, & Seligman, 2008; Ruch et al., 2010; Shryack, Steger, Krueger, & Kallie, 2010; Singh & Choubisa, 2010). These studies yielded models that varied in the number of latent variables retained, the content of those latent variables, and the labels applied

to them by the authors. These variations may be attributable to sampling and methodological differences across the studies. For example, the studies varied in the demographics and size of the samples used, the methods used to determine how many factors/components to retain, and the method of extraction and rotation. Differences in methodologies and results notwithstanding, the majority of these studies favored a model for the VIA-IS consisting of five latent variables. None replicated the six-virtue model incorporated into the VIA Classification.

McGrath (2015) focused on another aspect of these findings, which was a lack of correspondence between the latent variables that were identified and traditional cultural ideals of virtuous functioning. For example, McGrath (2014) identified five factors similar to factors described in previous factor analytic studies that he labeled interpersonal, emotional, restraint, theological, and intellectual strengths. The distinction between interpersonal and emotional strengths in particular did not map onto any traditional model of virtues. He suggested this finding might indicate that the hypothesized connection between character and moral/social principles is invalid, but it could also represent an idiosyncrasy in the latent structure of the VIA-IS.

In light of these concerns, McGrath (2015) conducted three studies, each using a different measure of the VIA Classification, with the goal of identifying a latent model for the VIA Classification that was consistent with intuitive and culturally meaningful constructs of socially valued qualities. Each study also involved the use of a strategy described by Goldberg (2006) for exploring latent structure. This strategy consists of conducting a series of PCAs with a data-set, in each case retaining one more component than in the previous solution. The results provide information about how latent structure emerges at increasing levels of specificity.

In all three studies, the same three-component model emerged. In addition, that model more closely mirrored intuitive and culturally meaningful conceptions of the basic elements of positive social functioning than the five-factor model described previously by McGrath (2014). These three latent variables were labeled caring, self-control, and inquisitiveness. He concluded that these variables supported the original hypothesis proposed by Peterson and Seligman (2004) that character strengths reflect broader, more general constructs that are consistent with cultural conceptions of desirable functioning. Furthermore, he proposed these three factors could be essential elements for personal, social, and cultural flourishing. Taken together, these conclusions suggest the three factors meet many of the common-sense criteria for a model of virtue.

A variety of sources have since been identified that suggest similar models. Indeed, findings consistent with the

three-virtue model emerge with surprising consistency across the psychological, educational, and philosophical literature, as well as in popular culture. For example, Aristotle identified two superordinate virtues, the moral – which included virtues of behavioral control such as courage, as well as interpersonal ones such as justice – and the intellectual. More recently, the philosopher Randall Curren (2013) suggested that implicit to Aristotelian thinking is the existence of three pathways through which personal excellence can lead to personal fulfillment. He called these pathways the social, intellectual, and productive. Elsewhere, he identified three similar cardinal virtues in academic administration: commitment to the good of the institution, good judgment, and conscientiousness (Curren, 2008).

The Christian psychologist Everett Worthington (e.g. Worthington & Hampson, 2011) also suggested a similar model of virtue. He proposed three classes of virtues: warmth-based virtues such as love and empathy; epistemic-based virtues such as prudence and knowledge; and conscientiousness-based virtues such as justice and self-control. Like the virtue model found in the VIA Classification, Worthington's model was developed conceptually. Its organization differs slightly from the three-virtue model under discussion here. For example, conscientiousness-based virtues encompass strengths that in the empirically derived model divide into caring and self-control (e.g. justice and courage). In a sense, conscientiousness-based virtues reflect an alternative conceptual rotation of the self-control factor that emerged in factor analyses.

Discussions of character development have also alluded to the same three factors. The site www.character.org frequently cites 'head, heart, and hand' (e.g. McDonnell, 2010), corresponding to the intellectual, interpersonal, and intrapersonal contributors to character. This same theme recurs as three of the Hs in 4-H (with health as the fourth H), and in the work of educational theorist Thomas Sergiovanni (1992). Thomas Lickona and Michael Josephson, prominent figures in the field of character education, have both been quoted as suggesting that good character is 'the moral awareness and strength to know the good, love the good, and do the good' (e.g. Josephson, n.d., para. 26 and 31; see also Ryan & Bohlin, 2003). We would note, however, that this quote implies 'doing' and 'knowing' are important primarily as means for achieving 'the good', whereas factor analysis has identified them as independent contributors to a model of right behavior.

Experts on the topic of character have variously referred to concepts such as moral character, performance character, and intellectual character (Baehr, 2013; Lickona & Davidson, 2005). The three factors were also echoed in a National Academy of the Sciences report on educating students for 'twenty-first century' skills (National Research

Council, 2012), and recent psychological research found factor analyses of key strengths related to school success in middle-school students generated interpersonal, intellectual, and intrapersonal latent dimensions (Park, Tsukayama, Goodwin, Patrick, & Duckworth, 2017). This thematic repetition is particularly striking given that many of the models summarized here developed essentially independently of each other.

Finally, this model is reflected in prominent popular literature. In Harry Potter (Rowling, 1997), the three good houses within Hogwarts School of Witchcraft and Wizardry are characterized by intrapersonal strengths (Gryffindor), intellectual strengths (Ravenclaw), and interpersonal strengths (Hufflepuff, though the strengths associated with this house are less consistent than for the others). Similarly, in *The Wonderful Wizard of Oz* (Baum, 1900/2006), the Scarecrow is in search of a brain, the Tin Woodsman a heart, and the Cowardly Lion is pursuing courage. In the end, of course, they learn that we achieve all three by looking within.

In this article, we summarize results from three studies intended to provide further support for the three-virtue model. The first expands on McGrath (2015), and was conducted to evaluate the reliability of the three-virtue model as a superordinate structure for the 24 character strengths. The second examined the convergent and discriminant validity of the three virtues in comparison with each other. The final study evaluated their convergent and discriminant validity in comparison with commonly studied domains of personality. Consideration of the implications of the results will be deferred to the Discussion.

Study 1

Method

The first study was conducted to demonstrate the generality of the three-factor solution across populations, measurement instruments, and methods of analysis. We obtained results from 12 adult samples in which a measure of the 24 strengths from the VIA Classification was factor-analyzed to produce a three-factor solution. In five samples, loadings were drawn from a previous article or were provided by the author. In each of these samples the analysis involved varimax rotation of PCA. The samples available to us were analyzed using either PCA or principal axis factor analysis with promax rotation. Table 2 summarizes the populations, demographics, instruments, and statistical methods reflected in these samples.

The first four samples are from the McGrath (2015) article described above. Although portions of these results were presented in a prior study, these samples are the largest ever collected to evaluate the structure of character,

Table 2. Summary of samples used in Study 1.

Sample	Source	Sample	N	Age ^a	Female (%)	College (%)	Ethnicity	Instrument	Extraction	Rotation
1	McGrath (2015)	U.S. residents who completed the VIA-IS online	634,933	35.3 (14.1)	67.5	88.9		VIA-IS	PCA	promax
2	McGrath (2015)	non-U.S. residents who completed the VIA-IS online	434,518	36.2 (12.0)	64.1	84.8		VIA-IS	PCA	promax
3	McGrath (2015)	Individuals who agreed to complete additional measures after the VIA-IS online	385	43.2 (12.2)	68.6	93.8		PSS	PCA	promax
4	McGrath (2015)	Oregon homeowners	713	50.0 (12.1) ^b	57.1	84.4	98.3% White	IPIP-VIA	PCA	promax
5	Duan et al. (2012)	Chinese college students	420	20.3 (1.9)	60.2	100.0	100.0% Chinese	CVQ	PCA	varimax
6	Shryack et al. (2010)	Minnesota twins	332	49.0				VIA-IS	PCA	varimax
7	Ruch et al. (2010)	Swiss residents	1674	42.2 (17.2)	53.4	47.0	100.0% Swiss	German VIA-IS	PCA	varimax
8	Ruch et al. (2010)	Swiss residents	777				100.0% Swiss	German VIA-IS Peer	PCA	varimax
9	Seibel et al. (2015)	Brazilian Portuguese speakers who completed the VIA-IS online	1975	35.0 (10.8)	63.3		100.0% Brazilians	Brazilian VIA-IS	PCA	varimax
10	Study 2	Individuals who agreed to complete additional measures after the VIA-IS online	1719	43.0 (14.4)	74.7	94.5		VIA-120	PAF	promax
11	Study 3	Mechanical Turk workers	498	34.3 (10.4)	44.9	86.3	80.5% White	VIA-120	PAF	promax
12	Unpublished	Individuals who agreed to complete additional measures after the VIA-IS online	4286	45.6 (13.1)	77.7	69.7		PSS	PAF	promax

Notes: Empty cells reflect demographics not reported by original authors. VIA-IS = VIA Inventory of Strengths; PSS = Personal Strengths Scale; IPIP-VIA = International Personality Item Pool VIA Inventory; CVQ = Chinese Virtues Questionnaire; VIA-120 = 120-item version of the VIA-IS; PCA = principal components analysis; PAF = principal axis factor analysis.

^aM (SD).

^bCollected in 1993, at the time the sample was formed.

and are included to provide a reference point for other samples. Samples 1 and 2 (McGrath, 2015, Study 1) consisted of individuals who completed the VIA-IS online between 2005 and 2012 either through the Authentic Happiness (<http://www.authentichappiness.sas.upenn.edu>) or VIA Institute on Character (<http://viacharacter.org>) website. Currently, the VIA-IS is available at the VIA website in over 40 languages, and data were included regardless of which translation the respondent selected. These participants accessed the website and completed the VIA-IS voluntarily in return for personal feedback on their results upon completion. Though procedures used to determine the number of factors supported a five-factor solution in both samples, which is typical for the VIA-IS (McGrath, 2014), McGrath (2015) provided results from models involving 1–5 factors.

Sample 1 included 634,933 U.S. residents. Sample 2 included 434,518 non-U.S. residents from 190 countries, the most common of which were Australia ($N = 113,753$, 26.18%), Canada ($N = 74,256$, 17.09%), and the United Kingdom ($N = 70,020$, 16.11%). Ethnicity data were not collected in either sample because American conceptions of ethnicity are not relevant to many of the countries from which individuals access the VIA and Authentic Happiness websites.

Sample 3 was also described in McGrath (2015, Study 2). It consisted of 385 English-speaking adults from various countries who also accessed the VIA Institute website to complete the VIA-IS. These individuals then agreed to complete a second questionnaire called the Personal Strengths Scale (PSS). This questionnaire involved reading a description of each of the 24 strengths, then completing 72 items that evaluated each strength in terms of three dimensions: (1) how essential that strength is to who they are, (2) how natural and effortless it is to express that strength, and (3) how uplifting and energizing it is to express that strength. Responses were collected using a seven-point scale. Procedures used in the previous study to determine the number of factors consistently suggested three. The sample came from 24 countries, but the majority were from the United States ($N = 209$, 54.96%), Australia ($N = 76$, 19.95%), Canada ($N = 30$, 7.87%), and the United Kingdom ($N = 28$, 7.35%).

Sample 4, also from McGrath (2015, Study 3), was drawn from the Eugene-Springfield Community Sample (Goldberg & Saucier, 2016), a sample of over 1000 homeowners from Oregon who agreed in 1993 to complete various questionnaires over the ensuing years in return for compensation. A subsample of 713 individuals completed a new set of items based on the VIA-IS items in 2004. These items were developed as part of a larger scale development project called the International Personality Item Pool (Goldberg et al., 2006; see also <http://ipip.ori.org>).

Most were rewritten versions of VIA-IS items, although some items were replaced with new items on the basis of item-total correlations. Again, analyses suggested retaining three factors.

Sample 5 came from Duan et al. (2012). It consisted of 420 Chinese undergraduate students randomly drawn from a larger sample of 839. The authors selected the best four items from each VIA-IS strength scale based on the results of item-level factor analyses for each scale, cognitive interviews, and evaluations of cultural appropriateness by the researchers. They called this short form the Chinese Virtues Questionnaire. The authors concluded a three-factor model offered the best fit for the shortened measure.¹

Sample 6 was from Shryack, Steger, Krueger, and Kallie (2010; see also Steger, Hicks, Kashdan, Krueger, & Bouchard, 2007). It consisted of 332 monozygotic or dizygotic twins from the Minnesota Twin Registry who completed the VIA-IS, for which they received \$7. Various strategies for determining the number of factors suggested the presence of 3–4 factors. The authors presented loadings from both models.

Samples 7 and 8 were from Ruch et al. (2010). Sample 7 consisted of 1674 Swiss residents recruited from various sources who completed a German translation of the VIA-IS. Sample 8 was created by asking 495 members of Sample 7 to recruit 1–2 friends or family members for participation. These informants received a version of the German VIA-IS modified so items referred to another person, and were asked to rate the individual who recruited them. Sample 8 consisted of 777 peer ratings; demographic statistics were not provided for this sample. Though the article presented results from a five-factor solution, which was considered optimal, Dr Ruch generously provided results from three-component solutions for each sample.

Sample 9 consisted of 1975 Brazilian adults who accessed the VIA Institute website and completed a Brazilian Portuguese translation of the VIA-IS between 2010 and 2013 (Seibel, DeSousa, & Koller, 2015). These individuals were recruited to the site for purposes of this study from a variety of sources, including groups interested in positive psychology in Latin America. The authors indicated procedures for setting the number of factors suggested retaining one, three, or four; all three solutions were presented.

Sample 10 is also used in Study 2 below. It consisted of 1719 adults recruited via the VIA website who agreed to complete a 120-item version of the VIA-IS (the VIA-120), consisting of the five items from each scale that demonstrated the largest corrected item-total correlations in Sample 1 described above. Participants were from 46 countries, with the majority coming from the United States (89.7%); no other country accounted for as much as 2% of

the sample. Evaluation of the number of factors underlying the data is discussed in Study 2.

Sample 11 is also used in Study 3 below, as well as by McGrath, Hall-Simmonds, and Goldberg (2016). It consisted of 498 U.S. English-speaking adults who were recruited through Mechanical Turk. They completed the VIA-120 as well as other measures described in Study 3, for which they received \$10. The initial sample included 508 participants, of whom 10 were eliminated because they correctly answered less than 11 of 12 items distributed across the survey to gauge attention to the task (e.g. 'Choose Neutral'). They were fairly equally distributed across the country, with the largest groups living in Southeastern (28.8%) and Western (22.1%) states. Results from analyses intended to identify the maximum number of factors to retain in this sample will be discussed in Study 3.

Sample 12 consisted of 4286 who accessed the VIA Institute website and agreed to complete additional questionnaires, including the PSS. For present purposes we focus on their PSS results, to enhance evaluation of the generalizability of the findings beyond the VIA-IS. The United States was the most common nation of residence (50.9%), though residents of Australia (10.9%), Canada (7.4%), and the United Kingdom (6.0%) were also common.

Results

The first step involved reviewing loadings from each sample to determine whether it was possible to identify a factor or component within each solution that could reasonably be identified as caring, self-control, and inquisitiveness. The next step involved the computation of Tucker congruence coefficients between loadings for each factor and for the three factors from the other 11 samples. This resulted in 594 unique coefficients, 198 between factors thought to be equivalent and 396 between non-equivalent factors. For factors generated using oblique rotation, loadings were drawn from the factor structure matrix, which tends to be more reliable than the factor pattern matrix. Congruence coefficients were generated using the psych package for R (Revelle, 2016). Note that inaccuracies in the identification of factors/components as exemplars of the three latent constructs would attenuate values for the congruence coefficients.

Commonly used benchmarks for Tucker congruence coefficients suggest values ≥ 0.95 indicate essentially equivalent factors, while values ≥ 0.90 indicate factors that are highly similar (Jensen, 1998); an alternative view considers any value above 0.85 to be fairly similar (Lorenzo-Seva & ten Berge, 2006). For caring factors, 27 of 66 (40.9%) coefficients were ≥ 0.95 , another 35 (53.0%) were ≥ 0.90 , and all were > 0.87 . For inquisitiveness, 42 of 66 (63.6%) coefficients were ≥ 0.95 , another 20 (30.3%) were ≥ 0.90 ,

and all were > 0.88 . For self-control, 31 coefficients (47.0%) were ≥ 0.95 , another 25 (37.9%) were ≥ 0.90 , and another 7 (11%) were ≥ 0.85 . There were three coefficients (4.5%) in this last set that did not meet this minimum standard, though all were > 0.82 . Overall, 100 of the 198 (50.5%) coefficients were ≥ 0.95 , another 80 (40.4%) were ≥ 0.90 , and another 15 (7.8%) were ≥ 0.85 . In contrast, none of the 396 congruence coefficients comparing loadings for different factors exceeded 0.95, only 12 (3.0%) were ≥ 0.90 , 41 (10.4%) were ≥ 0.85 , and the other 343 (86.6%) were < 0.85 .

Table 3 summarizes relationships between strengths and the three virtues. The left portion of the tables presents the number of times the loading between a strength and a factor was ≥ 0.40 out of 12 samples; the right half provides the mean of those loadings. Using a minimum of ten loadings ≥ 0.40 as evidence of a reliable association between a strength and factor allowed all but seven strengths to be uniquely related to one virtue. For caring, in order from largest to smallest mean loading these were kindness, gratitude, love, teamwork, forgiveness, and leadership. Six were associated primarily with inquisitiveness: curiosity, creativity, zest, bravery, learning, and hope. Finally, there were five uniquely related to self-control: prudence, perseverance, self-regulation, honesty, and modesty. Three of the remaining strengths were strongly associated with any factor in no more than nine samples: humor, social intelligence, and spirituality. The final four each tended to reflect two virtues: appreciation of beauty was related to both caring and inquisitiveness, fairness to caring and self-control, and judgment and perspective to both inquisitiveness and self-control.

Finally, at the bottom of Table 3 are the mean correlations between factors across the seven samples that were analyzed using oblique rotations. The sample correlations, which varied between 0.26 and 0.56, are not trivial, calling into question the common use of orthogonal rotation in these studies. Even though the three factors demonstrate a moderate level of overlap, which would be expected given that each has to do with socially desirable characteristics, the majority of variability comprising each of the three virtues in each sample is unique to that virtue.

Study 2

Method

The sample used for this study was described in Study 1 as Sample 10. In addition to the VIA-120, these individuals agreed to complete four additional questionnaires that served as criteria relevant to the three virtues. These included three measures of general positive social functioning, including measures of relationship quality, positive self-perception, and affect. The final questionnaire was

Table 3. Loadings across 12 samples.

Strengths	No. loadings ≥ 0.40			Mean loading		
	Caring	Inquisitiveness	Self-control	Caring	Inquisitiveness	Self-control
Beauty	10	10	1	0.47	0.49	0.15
Bravery	5	11	4	0.30	0.62	0.38
Creativity	0	12	0	0.20	0.73	0.17
Curiosity	4	12	1	0.39	0.75	0.26
Fairness	12	1	10	0.65	0.24	0.52
Forgiveness	11	0	6	0.58	0.16	0.36
Gratitude	12	6	5	0.73	0.40	0.33
Honesty	8	3	12	0.47	0.31	0.66
Hope	7	10	7	0.53	0.57	0.40
Humor	9	9	1	0.48	0.52	0.11
Judgment	0	11	12	0.16	0.51	0.65
Kindness	12	3	4	0.75	0.32	0.30
Leadership	10	7	8	0.57	0.42	0.47
Learning	0	11	1	0.20	0.60	0.25
Love	12	5	1	0.68	0.39	0.22
Modesty	8	0	11	0.44	-0.08	0.53
Perseverance	4	6	12	0.31	0.40	0.67
Perspective	4	12	11	0.32	0.65	0.53
Prudence	1	1	12	0.30	0.15	0.77
Self-regulation	0	2	11	0.25	0.29	0.67
Social Intelligence	8	9	2	0.50	0.57	0.33
Spirituality	9	2	0	0.48	0.27	0.26
Teamwork	12	0	7	0.68	0.19	0.45
Zest	7	11	3	0.52	0.64	0.33
Mean factor r						
Inquisitiveness	0.42					
Self-control	0.48	0.37				

developed for this study as a series of items specifically relevant to the three virtues.

As noted previously, the VIA-120 consists of 24 five-item scales. The reliability coefficient for the Teamwork scale was $\alpha = 0.53$, but the next smallest was 0.69 (Leadership), and the average was 0.78.

The Interpersonal Relationship Quality Scale (IRQS; Kang & Shaver, 2004) is a six-item measure of the quality of social relationships, with items answered on a five-point scale ranging from *does not describe me at all* to *describes me very well*. The measure demonstrated adequate internal consistency in the present sample ($\alpha = 0.79$) and demonstrated good test-retest reliability in the derivation study ($r = 0.78$). The developers demonstrated its validity through correlations with a measure of social awareness during interpersonal communications.

The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a widely used ten-item self-report measure of global self-esteem. Items are answered on a four-point scale from *Strongly Agree* to *Strongly Disagree*. The measure demonstrated good internal consistency in the present sample ($\alpha = 0.83$). Its validity has been demonstrated in a number of prior studies. For example, Rosenberg and Simmons (1971) found positive correlations between the RSE and other measures of self-esteem, and negative correlations with measures of depression and anxiety.

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a brief measure of

affective state. It consists of two ten-item lists reflecting positive and negative emotions. Depending on the instructions that accompany the items, the PANAS can be used to measure the experience of these affective states for any period of time, ranging from *in the moment* to *in general*; the latter was used in the present study. Coefficients alphas were 0.88 for the positive scale and 0.90 for the negative scale in our sample. A number of studies have demonstrated its validity through correlations with measures of constructs reflecting depression, anxiety, and other elements of psychopathology (e.g. Watson et al., 1988).

In addition, participants completed an 88-item questionnaire created for this study. The items were developed in a series of brainstorming sessions involving four graduate students and a doctoral-level psychologist, all of whom had a background in positive psychology research. Items were retained if it was agreed that they tapped into an important behavioral consequence or correlate of one or more virtues, or if it was thought that the results would provide some insight into the nature of the virtue. After data collection was completed, four items on the questionnaire were excluded from analyses because of errors or ambiguities in the item, and six were excluded because they were deemed essentially redundant with other items based on correlations. Brief summaries of the remaining 78 items may be found in Table 4.

Table 4. Semi-partial correlations for Study 2.

Criterion	Caring	Inquisitiveness	Self-Control
<i>Caring</i>			
IRQS	0.43*	0.08*	-0.02
Performs acts of kindness regularly	0.28*	0.13*	-0.07*
Values family	0.27*	-0.03	0.00
Tries not to judge others	0.26*	-0.06*	0.01
Often disappointed by people	-0.26*	-0.03	0.03
Calls family to say hello	0.24*	0.06*	-0.01
Tries not to criticize others	0.24*	-0.06*	0.07*
Enjoys romantic films	0.23*	-0.06*	-0.06*
Calls friends to say hello	0.21*	0.12*	-0.02
Values independence over close relationships	-0.21*	0.08*	0.07*
Views birthdays cynically	-0.20*	0.01	0.10*
Prioritizes career	-0.19*	0.08*	0.16*
Sends birthday greetings	0.19*	0.02	0.08*
Sends greetings to sick	0.19*	0.08*	0.03
Usually declines social invitations	-0.18*	-0.12*	0.01
Openly criticizes people	-0.18*	0.16*	-0.01
Donates to charity regularly	0.17*	0.08*	0.02
Annoyed by calls for no reason	-0.17*	-0.02	0.00
Sends holiday greetings	0.17*	0.02	0.07*
Enjoys movies	0.16*	0.00	-0.03
Enjoys comedies	0.15*	-0.05	0.01
Frequency of sexual activity with a partner	0.15*	0.01	-0.02
Views holidays cynically	-0.15*	-0.01	0.06*
Enjoys romance novels	0.15*	-0.06*	-0.02
NA	-0.15*	-0.14*	-0.14*
Visits sick	0.14*	0.09*	0.06*
Relaxed	0.11*	0.03	0.09*
Enjoys popular music	0.10*	0.00	0.01
Enjoys amusement parks	0.10*	0.01	0.01
Highly values physical attractiveness in a partner	-0.09*	0.04	0.08*
Enjoys dramas	0.09*	0.05*	-0.08*
Sleeps enough	0.07*	0.06*	0.04
Eats breakfast	0.05*	0.00	0.05
Believes private citizens should care for disadvantaged	0.05*	-0.04	0.00
<i>Inquisitiveness</i>			
PA	0.13*	0.38*	0.12*
RSE	0.14*	0.30*	0.13*
Enjoys reading non-fiction	-0.08*	0.27*	-0.03
Enjoys reading	-0.07*	0.26*	-0.06*
Excelled in art	-0.05*	0.21*	-0.02
Excelled in history	-0.10*	0.20*	0.07*
Excelled in writing	-0.09*	0.20*	0.02
Enjoys museums	0.00	0.20*	0.00
Enjoys documentaries	-0.02	0.19*	0.01
Enjoys looking at art	0.03	0.19*	-0.01
Hosts social events	0.11*	0.18*	-0.04
Volunteers regularly	0.15*	0.17*	0.01
Dislikes boredom	-0.08*	0.15*	0.07*
Enjoys classical music	0.04	0.15*	0.03
Frequency of vigorous exercise	0.01	0.14*	0.13*
Enjoys fine dining	0.03	0.13*	0.02
Self-critical	-0.09*	-0.12*	-0.06*
Likes to cook or bake	0.02	0.12*	0.02
Enjoys public radio	0.03	0.12*	-0.02
Excel/led in music	0.00	0.11*	-0.04
Conservative regarding abortion	0.09*	-0.11*	0.05*
Enjoys puzzles	-0.01	0.11*	0.01
Conservative regarding gay marriage	0.07*	-0.10*	0.06*

Table 4. (Continued).

Criterion	Caring	Inquisitiveness	Self-Control
Liberal regarding gay marriage	-0.07*	0.09*	-0.07*
Conservative regarding immigration	0.01	-0.09*	0.08*
Liberal regarding immigration	0.05	0.09*	-0.08*
Level of education	-0.03	0.08*	-0.02
Liberal regarding abortion	-0.08*	0.08*	-0.01
Enjoys down time	0.07*	-0.07*	-0.03
Will vote for Democratic president	-0.04	0.07*	-0.04
Will vote for Republican president	0.06*	-0.07*	0.03
College grades	-0.07*	0.07*	0.06*
Pays attention to fashion	0.05	0.06*	0.01
Believes government should care for disadvantaged	-0.01	0.06*	-0.04
<i>Self-control</i>			
Meets deadlines	-0.04	0.00	0.29*
Eats a lot of junk food	0.06*	-0.11*	-0.28*
Spends thrift	0.08*	-0.03	-0.28*
Tardy	0.04	0.00	-0.26*
Eats nutritiously	-0.04	0.13*	0.24*
Punctual	-0.02	-0.03	0.23*
Has a steady mood	0.14*	0.07*	0.21*
Got into trouble in school	-0.06*	0.15*	-0.19*
Enjoys contact sports	0.03	-0.01	0.15*
Has trouble getting to bed on time	-0.03	-0.01	-0.13*
Enjoys fast food	0.07*	-0.09*	-0.12*
High school grades	-0.08*	0.01	0.11*
Excelled in math	-0.06*	0.06*	0.10*
Contributes regularly to retirement account	0.04	0.00	0.08*

Notes: IRQS = Interpersonal Relationship Quality Scale; NA = Negative Affect Scale; PA = Positive Affect Scale; RSE = Rosenberg Self-Esteem Scale.
* $p < 0.05$.

Results

Factor analyses

Although the focus was on the three-factor model of the VIA Classification, two analyses were conducted to determine the number of reliable factors underlying the VIA-120 scales. Parallel analysis involved creating 100 random data matrices with the same number of variables and cases as the raw data matrix. The true data matrix and each of the random data matrices was then submitted to PCA without rotation. For a component to be retained, the eigenvalue for the real data had to exceed 95% of the eigenvalues for the corresponding component generated with the random data sets (Glorfeld, 1995). The minimum average partial procedure involved sequentially partialing each PCA component from the data and computing the mean value for the resulting squared partial correlation matrix. Partialing a true component reduces common variance, so the mean should decline; when the component instead removes unique variance, the mean of the partial correlations should increase. Extraction stops when the mean squared partial correlation reaches a local

minimum. Velicer, Eaton, and Fava (2000) concluded the procedure's accuracy could be improved by raising the average partial correlation to the fourth rather than the second power. Both analyses were conducted using SPSS macros developed by O'Connor (2000).

Parallel analysis using the 95th percentile for eigenvalues from random data as a comparator suggested retaining five factors, consistent with prior findings for the VIA-IS (McGrath, 2014), while the minimum average partial procedure suggested four. These results highlight the conclusion that, whereas the three-factor solution may be the most reliable finding across data sets, it may not extract all reliable latent sources of variability, especially when the data are based on the VIA-IS.

As noted in Study 1, the VIA scales were then analyzed using promax rotation of a principal axis factor analysis. Scores for the three factors were generated in two ways. Regression-based factor scores were saved from the three-factor solution, so that each score was a composite of all 24 variables. Scores were also generated by averaging scores from the five scales with the highest mean loadings for each factor in Table 3. As could be expected, the corresponding scores from the two sets were largely redundant: Factor 1 scores and the sum of the five scales for caring correlated 0.91, Factor 2 scores correlated 0.89 with the self-control aggregate, and Factor 3 scores correlated 0.88 with inquisitiveness. The three factor scores correlated between 0.32 (inquisitiveness and self-control) and 0.48 (caring and self-control) among themselves, whereas the three unit-weighted scores correlated between 0.32 and 0.49. It may be noted the higher correlation between caring and self-control is consistent with Aristotle's ancient grouping of moral and behavioral virtues in one category. Since factor scores are rarely used in practice, subsequent results will be reported solely for the five-scale aggregates. Coefficient alphas for the three virtue aggregates all equaled 0.89.

Regression analyses

Research suggests that contributors to caring, such as kindness and forgiveness, contribute to better social relationships, greater self-esteem, increased positive affect, and less negative affect (e.g. Berry, Worthington, O'Connor, Parrott, & Wade, 2005; Leary, Tambor, Terdal, & Downs, 1995; Lounsbury, Fisher, Levy, & Welsh, 2009; Webb, Colburn, Heisler, Call, & Chickering, 2008; Wood, Joseph, & Linley, 2007). A similar pattern has emerged for self-control (e.g. Eisenberg et al., 1997; Lounsbury et al., 2009; Tangney, Baumeister, & Boone, 2004). Accordingly, we expected that both caring and self-control would contribute to the prediction of the standardized measures. We could find no evidence suggesting as strong an expectation concerning inquisitiveness, however, though traditionally all virtues

are seen as contributing to social success (e.g. Curren, 2013).

Regression analyses were conducted in which each of the four standardized criteria and the 78 remaining items from the questionnaire were simultaneously regressed onto the three summative scales. Table 4 provides results from these analyses. Criteria are ordered according to which of the three factors was associated with the highest absolute value for the semi-partial correlation, and then by size order of those correlations.²

Not surprisingly, three of the four standardized measures were the most highly correlated criteria with one of the virtues, reflecting the greater reliability and content coverage possible for multi-item scales. What was unanticipated was that inquisitiveness was the best single predictor of both positive affect and self-esteem. In fact, these correlations were stronger than those with variables more directly related to the traditional concept of inquisitiveness, such as enjoyment of reading or art. This finding most likely follows from the strengths comprising the inquisitiveness aggregate. The two strengths most strongly related to inquisitiveness according to Table 3 were curiosity and creativity. These were followed by zest and bravery; only then did learning appear on the list. What this suggests is that the inquisitiveness factor is more reflective of enthusiasm for and willingness to explore new information than it is of interest in academic learning. Inquisitiveness therefore emerges as a reasonable reflection of engagement, represented in this case by medium-sized relationships with positive feelings and positive self-perceptions. Except for this finding, the pattern of results is consistent with expectation.

Study 3

Method

The final study addressed whether the three factors are differentiable from broad domains of personality (Goldberg, 1993). Psychologists have often conceptualized character as a component of the larger construct of personality (e.g. Allport & Vernon, 1930; Watson, 1919). For example, Baumrind and Thompson (2002, p. 12) have referred to character as 'personality evaluated'. Given the present conceptualization of virtue as a superstructure to character, we wanted to assess whether scales measuring the three virtues are distinct from commonly accepted domains of personality. Prior research with a lexically derived four-factor model of virtue (empathy, order, resourcefulness, and serenity) in fact demonstrated substantial overlap between virtue dimensions and Five Factor Model personality domains, varying between 0.45 and 0.63 (Cawley, Martin, & Johnson, 2000).

The sample used for this study was described in Study 1 as Sample 11. In addition to the VIA-120, Mechanical Turk workers completed one personality inventory and a series of additional items and questionnaires that were developed or selected as criteria relevant to the study of character. The 200-item revised version of the HEXACO (HEXACO-PI-R; Ashton & Lee, 2008) was chosen for this study over other measures of personality because it includes a sixth factor called honesty/humility that adds a morally significant element to the traditional five factor model of personality, which on the HEXACO-PI-R are called emotional stability, extraversion, agreeableness, conscientiousness, and openness to experience. Each domain is represented by 32 items, with eight items representing each of four facets underlying the domain. Coefficient alpha values for the six domain scales varied between 0.90 and 0.95.

The Survey of Dictionary-based Isms (SDI; Saucier, 2013) is a 46-item inventory developed as a measure of five broad social attitudes: Tradition-Oriented Religiousness (eight items), Unmitigated Self-Interest (ten items), Communal Rationalism (ten items), Subjective Spirituality (eight items), and Egalitarianism (ten items). All reliabilities exceeded 0.70 except that for Communal Rationalism ($\alpha = 0.59$).

The remaining criteria represented a large array of constructs. Many of these were drawn from a set of 'consequential outcomes' described by Ozer and Benet-Martínez (2006) for use in personality research. The goal was to identify a variety of variables likely to reflect positive social functioning.

The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) is a widely used five-item indicator of general life satisfaction. Items are completed on a seven-point scale. Coefficient alpha was 0.94.

The Duke University Religion Index (DUREL; Koenig & Büssing, 2010) is a five-item measure of religiosity. The first two items have to do with frequency of religious activities and are completed on a six-point frequency scale. The last three items have more to do with religious experiences and are completed on a five-point self-descriptive scale. Despite the differences in focus and scale across items, reliability was 0.92.

The Patient Health Questionnaire-2 (Kroenke, Spitzer, & Williams, 2003) is a two-item depression screen that gauges the frequency of the two key symptoms of depression (depressed affect and anhedonia) on a four-point scale. The reliability for the measure was 0.89.

The three-item short form of the De Jong-Gierveld Social Loneliness Scale (Gierveld & Van Tilburg, 2006) was used to tap into lack of social involvement. Each item is completed on a four-point intensity scale. Coefficient alpha for the three items was 0.91.

A measure of community involvement consisting of five Yes-No items was adopted from Flowers (2010). Coefficient alpha for the five items was 0.65. Two items reflecting the respondent's community values also were taken from Townley and Kloos (2009). Coefficient alpha was 0.76.

Workers who were currently in a significant relationship with another person ($N = 286$) completed a seven-item measure of relationship satisfaction by Hendrick (1988). Level of satisfaction with various aspects of the relationship was rated on a five-point scale. Coefficient alpha was 0.67.

The criteria included several single-item measures as well. Two items were described by Talhelm et al. (2015) to measure political liberality relative to economic issues and social issues. Each is completed on a seven-point scale from *Very Liberal* to *Very Conservative*. Two items reflecting problems with gambling, having to do with uncontrolled gambling and lying to others, were taken from Johnson et al. (1997). Three items reflecting exercise frequency, duration, and intensity were drawn from the National Health Interview Survey Adult Health Behaviors Questionnaire (<http://www.cdc.gov/nchs/nhis.htm>). Participants with a job ($N = 375$) completed a one-item measure of job satisfaction on a five-point scale (Dolbier, Webster, McCalister, Mallon, & Steinhardt, 2005).

Several single-item variables developed by Paunonen (2003) were included as well. Participants rated their popularity on a nine-point scale from *Extremely Unpopular* to *Extremely Popular*, and completed items asking the average number of cigarettes smoked per day, the number of alcohol drinks consumed per week, and average monthly spending on lottery tickets in dollars. Respondents with a driver's license completed four questions reflecting imprudent driving: number of speeding tickets received, number of parking tickets, number of other traffic violations, and fastest speed driven.

The authors also generated several single-item measures. One asked about how frequently the respondent eats fast food or junk food on a five-point scale from *Never* to *Every day*. Another item gauged amount of time per week devoted to community organizations on a seven-point scale from *None* to *>15 hours*. A third asked for number of times arrested as an adult, another number of years of education completed, and yet another for current annual income. Weight in pounds and height in inches was requested for purposes of computing body mass index. Finally, two items asked about marijuana and other drug use for recreational purposes. In total, 36 criterion variables were used in this study. Except as noted above, all analyses included at least 490 cases.

Results

Factor analysis

Parallel analysis and the minimum average partial procedure were again used to estimate the maximum number of reliable factors to retain. In this case, parallel analysis suggested retaining three factors but the minimum average partial procedure suggested retaining four. Scores for the three virtues were again generated using the two methods described in Study 2. Factor 1 scores correlated 0.92 with the inquisitiveness aggregate scale, Factor 2 scores correlated 0.87 with caring, and Factor 3 scores correlated 0.84 with self-control. This time the three factor scores correlated between 0.51 and 0.62 and the unweighted aggregates of five strengths correlated between 0.58 and 0.64. Reliability estimates for the three virtue aggregates varied between 0.91 and 0.93.

Correlations between personality domains and virtues

Correlations among the summed virtue scales and personality domain scales may be found in Table 5. The lower matrix provides correlations after correction for attenuation. Correlations between virtue scales were all similar. These averaged 0.60 vs. 0.14 among personality domains. The relationship between caring and self-control was particularly strong, another finding supporting Aristotle's grouping of the non-intellectual virtues together.

Emotional stability was the most distinctive element in the set, correlating non-significantly with self-control, agreeableness, conscientiousness, and openness. Honesty/humility also did not correlate significantly with inquisitiveness. The failure to demonstrate a relationship between emotional stability and self-control was

unexpected. One possible explanation for this finding is that the capacity for behavioral self-regulation as reflected in character strengths is unrelated to the capacity for emotional self-regulation as a dimension of personality. The finding that inquisitiveness correlated very highly with extraversion, and more highly than with openness, was also unanticipated, especially since the facets underlying the latter include one called creativity and another explicitly called inquisitiveness. However, review of item contents indicate the HEXACO-PI-R inquisitiveness facet is primarily about academic topics, and the same is true for the aesthetic appreciation facet that loads on this domain. In contrast, the previous study suggested inquisitiveness based on the VIA strengths has more to do with a sense of engagement than intellectual pursuits, and prior research suggests that descriptors indicative of engagement (e.g. sociable, fun-loving, reserved) are more consistent with the extraversion domain than with openness to experience, which tends to have more to do with complexity of thinking (e.g. McCrae & Costa, 1987). Finally, it is worth noting that inquisitiveness and self-control each overlaps substantially with one of the personality domains, with correlations after correction for attenuation of 0.79 and 0.84. However, though the personality model incorporates two factors that are primarily interpersonal in nature (extraversion and agreeableness), caring was not as strongly reflected in any single personality domain.

Incremental validity analyses

The central analyses for this study focused on the incremental validity of virtue scales over personality domain scales and vice versa. It could be argued that the larger number of the latter offered an advantage to the personality domains in these analyses, so analyses were conducted

Table 5. Correlations between personality domains and virtue scales in Study 3.

	1	2	3	4	5	6	7	8
<i>Uncorrected</i>								
1. Caring								
2. Inquisitiveness	0.58							
3. Self-control	0.64	0.58						
4. Honesty/humility	0.30	-0.03	0.28					
5. Emotional stability	0.15	-0.22	-0.08	0.14				
6. Extraversion	0.56	0.70	0.39	-0.09	-0.27			
7. Agreeableness	0.58	0.17	0.34	0.37	-0.05	0.24		
8. Conscientiousness	0.43	0.47	0.73	0.31	-0.04	0.37	0.23	
9. Openness	0.25	0.55	0.25	0.13	-0.04	0.24	0.21	0.36
<i>Corrected</i>								
1. Caring								
2. Inquisitiveness	0.69							
3. Self-control	0.78	0.70						
4. Honesty/humility	0.34	-0.03	0.32					
5. Emotional stability	0.18	-0.25	-0.09	0.16				
6. Extraversion	0.64	0.79	0.45	-0.10	-0.29			
7. Agreeableness	0.66	0.19	0.39	0.39	-0.06	0.25		
8. Conscientiousness	0.49	0.54	0.84	0.33	-0.05	0.39	0.24	
9. Openness	0.29	0.64	0.29	0.15	-0.04	0.25	0.23	0.39

Note: All uncorrected correlations except the five italicized values are significant ($p < 0.05$).

twice. The first set used all six personality scales to predict the criterion variables. The second used only the three personality domains associated with the highest semi-partial correlations according to a simultaneous regression of each criterion variable on all six personality domains. This procedure still offered an advantage over the virtues since there was some capitalization on chance, but the results were essentially the same as those when all six were used. Given the lack of substantive differences, only the results from the latter set of analyses are reported.

Two hierarchical regression analyses were conducted for each criterion variable, one examining the incremental validity of the three virtue scales over the three strongest personality domains, the other reversing the order of entry. Results may be found in Table 6.

When HEXACO-PI-R scales were entered in the first step, they were associated with a significant squared multiple correlation in 32 of 36 analyses. This was true for the VIA-120 in 26 of 35 cases. Larger differences emerged in the second step. Virtue scales resulted in a significant increment in fit in only 12 of 36 analyses; in contrast, personality domains offered incremental validity in 27 cases. The mean increase in the proportion of variance accounted for was 0.06 for the HEXACO-PI-R and 0.02 for the VIA-120.

Results reported for the individual scales focus on significant test outcomes for consistency with the next set of analyses below. Consistent with conclusions drawn from Table 5 about its relative uniqueness, caring was the most common virtue contributing over the top three personality domains, associated with a significant increment in fit in nine analyses. In contrast, inquisitiveness was a significant predictor in only three analyses and self-control in five. Though agreeableness and conscientiousness rarely significantly improved on the virtues, the other domains were associated with significant increments in 8–15 analyses, with openness the most frequent contributor to incremental validity.

Recently, Westfall and Yarkoni (2016) have criticized the use of multiple regression for the evaluation of incremental validity. Though these statistics are appropriate to the practical question of whether one set of scales enhances prediction over another set of scales, the failure to consider the effect of measurement error on significance test results in multiple regression means they are not relevant to the question of whether one set of constructs underlying the scales enhances prediction over another set of constructs. This issue of discrimination between the underlying constructs is clearly relevant in the current study, so results were replicated using structural equation modeling. Specifically, the three virtues and three personality domains used in the hierarchical regressions were instead modeled as latent variables, using the scales comprising each as the manifest indicators. These latent variables were

then used as predictors of each criterion variable. Analyses were conducted using maximum likelihood estimation with the CALIS procedure available in SAS version 9.4 (SAS Institute, Inc., 2013).

The number of significant outcomes dropped substantially in the latent trait analyses (see Table 7). Each of the three virtues now provided incremental validity in only 2–3 analyses. The change was even greater for the personality domains. Openness was still a significant predictor in six analyses, but no other domain was associated with more than three significant effects. That is, consideration of measurement error suggested neither set was substantially better than the other as a contributor to predictive accuracy, although openness performed best.

Discussion

Several limitations to this series of studies should be noted. Though the three-virtue model is believed to be generally cross-culturally valid, in reality the majority of participants in these studies came from Western countries. Even the samples drawn from non-Western countries tended to be highly educated, suggesting a fairly high degree of Westernization.

There are also several assumptions underlying the VIA Classification that influenced the conduct of these studies, but should be recognized as assumptions. One is that the 24 character strengths provide a comprehensive taxonomy of character. Another is the assumption that virtues can be reasonably conceptualized as latent variables underlying character variables. With these caveats in mind, each of the three studies we have reviewed offers interesting implications about the three-virtue model.

Study 1

Study 1 provided consistent evidence of the three-factor solution across populations, measurement devices, instructional sets, and statistical methods. The results of the study have implications for the three-factor model as an empirical model for the latent structure of the VIA Classification strengths, and for the three-factor model as an adequate model of the social concept of virtue.

Regarding the first issue, the study should not be taken as evidence that the three-factor model is the optimal representation of the latent structure for VIA strengths across contexts. Techniques for setting the number of factors suggested no more than three reliable factors for some of the samples. For example, McGrath (2015) concluded three was the optimal number of factors to retain for Samples 3 and 4, and the three-factor solution was offered as one of several reasonable solutions in Samples 6 and 9. Duan et al. (2012) drew the same conclusion for Sample 5, though

Table 6. Incremental validity analyses using hierarchical regression.

Isms	HEXACO-PI-R, then VIA-120										VIA-120, then HEXACO-PI-R													
	R ²	ΔR ²	Caring	Inq	Self-Cont	R ²	ΔR ²	Honesty	Emotion	Extra	Agree	Conscien	Openness	R ²	ΔR ²	Honesty	Emotion	Extra	Agree	Conscien	Openness			
Religiousness	0.11*	0.03*	sig	ns	ns	0.07*	0.08*	sig	ns	ns	ns	sig	sig	0.07*	0.08*	sig	ns	ns	ns	ns	ns	ns	sig	
Self-interest	0.27*	0.01	ns	ns	ns	0.05*	0.22*	ns	ns	ns	ns	ns	ns	0.05*	0.22*	ns	ns	ns	ns	ns	ns	ns	sig	
Rationalism	0.16*	0.03*	sig	ns	ns	0.13*	0.06*	sig	ns	ns	ns	sig	sig	0.13*	0.06*	sig	ns	ns	ns	ns	ns	ns	sig	
Spirituality	0.09*	0.02*	sig	ns	sig	0.08*	0.03*	ns	sig	ns	ns	ns	ns	0.08*	0.03*	ns	ns	ns	ns	ns	ns	ns	ns	
Egalitarianism	0.18*	0.01	ns	ns	ns	0.01	0.17*	ns	ns	ns	ns	ns	ns	0.01	0.17*	ns	ns	ns	ns	ns	ns	ns	sig	
SWLS	0.32*	0.03*	sig	ns	ns	0.23*	0.12*	sig	ns	ns	ns	ns	ns	0.23*	0.12*	sig	ns	ns	ns	ns	ns	ns	sig	
DUREL	0.08*	0.05*	sig	ns	ns	0.10*	0.03*	ns	ns	ns	ns	ns	ns	0.10*	0.03*	ns	ns	ns	ns	ns	ns	ns	sig	
PHQ	0.32*	0.01*	ns	sig	ns	0.19*	0.15*	sig	ns	ns	ns	ns	ns	0.19*	0.15*	ns	ns	ns	ns	ns	ns	ns	sig	
SLS	0.33*	0.08*	sig	ns	ns	0.36*	0.05*	ns	ns	ns	ns	ns	ns	0.36*	0.05*	ns	ns	ns	ns	ns	ns	ns	sig	
Community involve	0.14*	0.01	ns	ns	ns	0.12*	0.03*	ns	ns	ns	ns	ns	ns	0.12*	0.03*	ns	ns	ns	ns	ns	ns	ns	sig	
Community values	0.23*	0.02*	sig	ns	ns	0.21*	0.04*	ns	ns	ns	ns	ns	ns	0.21*	0.04*	ns	ns	ns	ns	ns	ns	ns	sig	
Relationship sat	0.08*	0.01	ns	ns	ns	0.05*	0.04*	ns	ns	ns	ns	ns	ns	0.05*	0.04*	ns	ns	ns	ns	ns	ns	ns	ns	
Economic liberality	0.08*	0.00	ns	ns	ns	0.01	0.07*	ns	sig	ns	ns	ns	ns	0.01	0.07*	ns	ns	ns	ns	ns	ns	ns	ns	
Social liberality	0.11*	0.01	ns	ns	ns	0.02*	0.10*	ns	sig	ns	ns	ns	ns	0.02*	0.10*	ns	ns	ns	ns	ns	ns	ns	ns	
Gambling 1	0.09*	0.00	ns	ns	ns	0.03*	0.07*	ns	sig	ns	ns	ns	ns	0.03*	0.07*	ns	ns	ns	ns	ns	ns	ns	ns	
Gambling 2	0.06*	0.01	ns	ns	ns	0.03*	0.05*	ns	sig	ns	ns	ns	ns	0.03*	0.05*	ns	ns	ns	ns	ns	ns	ns	ns	
Exercise frequency	0.03*	0.01	ns	ns	ns	0.02*	0.01	ns	sig	ns	ns	ns	ns	0.02*	0.01	ns	ns	ns	ns	ns	ns	ns	ns	
Exercise length	0.04*	0.01	sig	ns	ns	0.04*	0.01	ns	ns	ns	ns	ns	ns	0.04*	0.01	ns	ns	ns	ns	ns	ns	ns	ns	
Exercise intensity	0.03*	0.00	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	ns	ns	
Job satisfaction	0.20*	0.06*	ns	sig	ns	0.18*	0.08*	ns	ns	ns	ns	ns	ns	0.18*	0.08*	ns	ns	ns	ns	ns	ns	ns	sig	
Popularity	0.42*	0.01*	sig	ns	ns	0.27*	0.16*	sig	ns	sig	ns	ns	ns	0.27*	0.16*	sig	ns	sig	ns	ns	ns	ns	sig	
Smoking	0.02	0.01	ns	ns	ns	0.02	0.01	ns	ns	ns	ns	ns	ns	0.02	0.01	ns	ns	ns	ns	ns	ns	ns	ns	
Alcohol	0.07*	0.02	ns	ns	sig	0.04*	0.04*	ns	sig	ns	ns	ns	ns	0.04*	0.04*	ns	ns	ns	ns	ns	ns	ns	sig	
Lottery	0.03*	0.00	ns	ns	ns	0.01	0.02*	ns	sig	ns	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	ns	ns	
Speeding tickets	0.04*	0.00	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	ns	ns	
Parking tickets	0.02*	0.01	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	ns	ns	
Other violations	0.02	0.00	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	0.01	0.02*	ns	ns	ns	ns	ns	ns	ns	ns	
Fastest speed	0.12*	0.01	ns	ns	sig	0.04*	0.10*	ns	sig	ns	ns	ns	ns	0.04*	0.10*	ns	sig	sig	ns	ns	ns	ns	ns	
Fast foods	0.04*	0.02*	ns	ns	sig	0.05*	0.01	ns	ns	ns	ns	ns	ns	0.05*	0.01	ns	ns	ns	ns	ns	ns	ns	ns	
Community vol	0.04*	0.00	ns	ns	ns	0.03*	0.01	ns	ns	ns	ns	ns	ns	0.03*	0.01	ns	ns	ns	ns	ns	ns	ns	ns	
Arrests	0.04*	0.01	ns	ns	ns	0.04*	0.02*	ns	ns	ns	ns	ns	ns	0.04*	0.02*	ns	ns	ns	ns	ns	ns	ns	sig	
Years educated	0.01	0.00	ns	ns	ns	0.00	0.01	ns	ns	ns	ns	ns	ns	0.00	0.01	ns	ns	ns	ns	ns	ns	ns	ns	
Income	0.00	0.00	ns	ns	ns	0.00	0.00	ns	ns	ns	ns	ns	ns	0.00	0.00	ns	ns	ns	ns	ns	ns	ns	ns	
BMI	0.02*	0.02*	ns	sig	sig	0.03*	0.01	ns	ns	ns	ns	ns	ns	0.03*	0.01	ns	ns	ns	ns	ns	ns	ns	ns	
Marijuana	0.07*	0.00	ns	ns	ns	0.03*	0.04*	sig	ns	ns	ns	ns	ns	0.03*	0.04*	sig	ns	ns	ns	ns	ns	sig	sig	
Other drugs	0.09*	0.01	ns	ns	ns	0.04*	0.06*	ns	ns	ns	ns	ns	ns	0.04*	0.06*	ns	ns	ns	ns	ns	ns	ns	sig	
M/sig ^a	0.11	0.02	9	3	5	0.07	0.06	11	8	10	1	3	15	0.11	0.02	9	3	5	0.07	0.06	11	8	10	15

Notes: R² = multiple correlation for the first inventory; ΔR² = change in multiple correlation for the second inventory; Inq = Inquisitiveness; Self-cont = Self-control; Emotion = Emotional stability; Extra = Extraversion; Agree = Agreeableness; Conscien = Conscientiousness; SWLS = Satisfaction with Life Scale; DUREL = Duke University Religion Index; PHQ = Patient Health Questionnaire; SLS = Social Loneliness Scale; Community involve = Community involvement; Relationship sat = Relationship satisfaction; Gambling 1 = Uncontrolled gambling; Gambling 2 = Lying about gambling; Community vol = Community volunteering; BMI = body mass index; sig = significant incremental validity; ns = non-significant incremental validity.

^avalues in this row represent means for multiple correlations and number of significant outcomes for the remaining columns.

*p < 0.05.

Table 7. Incremental validity analyses using structural equation modeling.

Outcome	VIA-120					HEXACO-PI-R			
	Caring	Inq	Self-Control	Honesty	Emotion	Extraversion	Agreeable	Conscientious	Openness
Isms									
Religiousness	ns	sig	ns		ns	ns			sig
Self-interest	ns	ns	ns	ns				ns	ns
Rationalism	ns	ns	ns	ns				ns	ns
Spirituality	ns	ns	ns		ns	ns			ns
Egalitarianism	ns	ns	ns	ns		ns			sig
SWLS	ns	ns	ns			sig	ns		ns
DUREL	ns	ns	ns		ns	ns			sig
PHQ	sig	ns	ns	sig		sig			ns
SLS	sig	ns	sig		sig	sig	sig		
Community involvement	ns	ns	ns		ns	ns	ns		
Community values	ns	ns	ns		ns	ns	ns		
Relationship satisfaction	ns	ns	ns			ns		ns	ns
Economic liberality	ns	ns	ns		ns			ns	ns
Social liberality	ns	ns	ns		ns		ns		sig
Gambling 1	ns	ns	ns	sig				ns	ns
Gambling 2	ns	ns	ns	sig	ns				ns
Exercise frequency	ns	ns	ns		ns	ns	ns		
Exercise length	ns	ns	ns		ns		ns	ns	
Exercise intensity	ns	ns	ns	ns	ns	ns			
Job satisfaction	ns	sig	sig			ns	ns		sig
Popularity	ns	ns	ns	ns		ns		ns	
Smoking	ns	ns	ns		ns			ns	ns
Alcohol	ns	ns	ns	ns	ns				ns
Lottery	ns	ns	ns	ns	ns	ns			
Speeding tickets	ns	ns	ns		ns	ns	ns		
Parking tickets	ns	ns	ns			ns		ns	ns
Other violations	ns	ns	ns		ns			ns	ns
Fastest speed	ns	ns	ns		ns		ns		ns
Fast foods	ns	ns	ns	ns	ns			ns	
Community volunteering	ns	ns	ns		ns	ns			ns
Arrests	ns	ns	ns		ns			ns	ns
Years educated	ns	ns	ns	ns			ns		ns
Income	sig	ns	sig			ns	sig		sig
BMI	ns	ns	ns	ns				ns	ns
Marijuana	ns	ns	ns	ns				ns	ns
Other drugs	ns	ns	ns	ns				ns	ns
Sig ^a	3	2	3	3	1	3	2	0	6

Notes: Inq = Inquisitiveness; Emotion = Emotional stability; Agreeable = Agreeableness; Conscientious = Conscientiousness; SWLS = Satisfaction with Life Scale; DUREL = Duke University Religion Index; PHQ = Patient Health Questionnaire; SLS = Social Loneliness Scale; Community involve = Community involvement; Relationship sat = Relationship satisfaction; Gambling 1 = Uncontrolled gambling; Gambling 2 = Lying about gambling; Community vol = Community volunteering; BMI = body mass index; sig = significant incremental validity; ns = non-significant incremental validity.

^aNumber of significant outcomes for the column.

he did not fully justify this decision. The optimal number of factors in Sample 12 was not an issue for the present study, but relevant analyses were conducted. Parallel analysis suggested four factors while the minimum average partial procedure suggested only two.

For the remaining six samples, all of which completed the VIA-IS or its 120-item short form, there was evidence of five reliable factors. The most reasonable general conclusion to draw from these findings is that the VIA-IS is usually optimally represented by five reliable factors, but the best structural model for other measures of the VIA Classification tends to be more consistent with the three-factor model.

It is also the case that not every strength fit well with the three-factor model. As noted previously, four strengths demonstrated substantial relationships with two of the virtues: appreciation of beauty, fairness, judgment, and

perspective. The interstitial status of these strengths generally made sense. Fairness is the strength most closely aligned with the concept of justice, a concept that several of the sources reviewed earlier connected with virtues reflecting self-control (Bartlett & Collins, 2007; Worthington & Hampson, 2011). The involvement of both inquisitiveness and self-control in judgment and perspective similarly makes sense. The association of appreciation of beauty with caring as well as inquisitiveness could follow from a relationship between the ability to appreciate beauty and the ability to experience empathic feelings towards others (Vuoskoski, Thompson, McIlwain, & Eerola, 2012).

Three of the strengths also failed to meet this standard for any of the virtues. Humor, social intelligence, and spirituality are not particularly well-reflected in the three-virtue model, though spirituality tends to be associated with caring, while social intelligence and humor are

associated with both caring and inquisitiveness in most samples. The combination of limitations to the three-factor model as an optimal solution, substantial cross-loadings for some strengths, and strengths unreliably related to any of the virtues suggests it is unlikely, for example, that confirmatory factor analysis of the three-virtue model would achieve adequate fit.

As to the second issue, it is worth considering the degree to which the three-factor model provides necessary and sufficient conditions for a taxonomy of virtue. Based on the ubiquitous emergence of the three-factor model in Study 1, and on the variety of sources converging on variants of the same three factors we cited in the introduction, we would propose that the concepts of interpersonal concern, intrapersonal regulation, and information seeking are essential components of any attempt at a comprehensive model of virtuous principles. To suggest otherwise would require suggesting either that one or more of the three are non-essential for a thriving community, or that some even simpler solution is sufficient. Of course, it is not easy to get simpler than three dimensions, but there is precedent in Aristotle's distinction between moral virtues, which encompass both caring and self-control, and intellectual virtues. We would assert that the distinction between caring and self-control is essential, because it is not hard to identify instances in which self-controlled behavior is immoral. It is also a distinction consistent with Piaget's (1932/1997) delineation of the morality of constraint and the morality of cooperation as distinct nodes in moral development (see also Davidson, Lickona, & Khmelkov, 2008).³

This assertion comes with recognition of some caveats. As Kinghorn (2016) has pointed out, it is reasonable to assume any system of virtues is shaped by the perceptions of the society in which it is rooted, and the VIA Classification on which the model is built was largely the product of Western researchers who collected data over the Internet with largely Western or Westernized participants. The same concern can be raised about all 12 samples used in Study 1, and about the various sources for virtue models cited in the introduction. That said, we would consider it a reasonable hypothesis that any human society – if it is to survive and to thrive, and if its denizens are to feel productive and fulfilled – must value and provide means to reward some aspect of each of these three dimensions.

The challenge to proposing the three factors as a sufficient model of virtue is greater. In fact, it may be that a sufficient accounting of virtue is impossible for at least two reasons. First, it is unlikely that any model of virtue could satisfy all constituencies interested in the topic of the essential limits for good citizenship. Second, it may well be impossible even to achieve a sufficient accounting of the three virtues we discuss.

A useful framework for exploring these issues is provided by a conceptual comparison with the six-virtue model that was originally proposed for the VIA Classification by Peterson and Seligman (2004). The three-virtue model collapses courage and temperance into self-control, and humanity and justice into caring. The potential importance of the latter distinction is echoed in Worthington and Hampson's (2011) differentiation of justice from the warmth-based virtues. Transcendence is omitted completely from our empirically derived model.⁴

Courage and temperance can be conceived of as complementary components of self-control. The former has to do with taking action despite resistance, whether that be internal (fear) or external (social resistance); the latter has to do with the ability to resist taking action despite the potential for immediate gain for the pursuit of long-term goals. Similarly, Peterson and Seligman (2004) separated the domain we call caring into humanity strengths that are relevant for one-to-one interactions, such as kindness; and justice strengths such as fairness that are useful in considering one-to-many situations.

Certain comparisons between cultures highlight the potential importance of the distinctions Peterson and Seligman (2004) drew between courage and temperance, and between humanity and justice. Judeo-Christian morality tends to emphasize humanity, e.g. kindness and love towards others, while the Athenian Greek philosophers tended to focus more on the virtue of justice in their discussions (MacIntyre, 2007). Cultures during periods of relative instability are more likely to reward courage, e.g. bravery in battle, while relatively stable societies are more likely to reward the delay of gratification for long-term achievements. Is it important, then, for a full accounting of virtue to incorporate these (and possibly other) distinctions? Is transcendence, and spirituality in particular, a virtue in its own right or primarily a personal attribute that enhances and reinforces virtuous efforts? These sorts of questions are probably incapable of resolution, and the goal of a sufficient model of virtue unrealistic.

Study 2

Where Study 1 used latent structure to characterize the nature of the three virtues, Study 2 focused instead on external correlates. The strongest correlates for caring reflected not just interest in social relationships, but also concern for others, e.g. trying not to judge others or be critical. The correlates for inquisitiveness reflected a variety of intellectual pursuits, as well as the multi-item scales indicating positive self-esteem and affect. Interestingly, inquisitiveness was a negative predictor of being self-critical. It may well be that respondents were interpreting this item as referring to excessive self-criticality. It is also

a possibility, and perhaps one worth pursuing in future research, that the Western conception of the intellectual virtues tends not to emphasize challenging one's self. There is also evidence of a small but reliable relationship (at least across items administered in this study) between intellectual virtues and liberalism. In contrast, while the correlations were slightly smaller, both caring and self-control were related to a tendency towards conservative views in the present study. These findings are consistent with a pattern described by Park and Peterson (2010) in which cities where residents reported greater intellectual strengths tended to vote for the more liberal presidential candidate in 2008.

Self-control tended to correlate with items reflecting the maintenance of healthy habits such as eating nutritiously. Another set of correlates suggested positive school performance, a topic that we will return to in discussing the results of Study 3. Finally, there was a set of items that suggested someone who could be considered trustworthy, such as meeting deadlines or punctuality. Interestingly, there were several items best predicted by caring that were also significantly related to self-control in a way that suggests self-control can be associated with self-advancement over others. For example, self-control was negatively correlated with regular acts of kindness, valuing independence over close relationships, and prioritizing one's career. Whether these findings indicate selfish disinterest in others cannot be inferred from these results, however, since self-control was also associated with trying not to criticize others and with attention to certain social niceties such as sending birthday and holiday greetings. The individual higher on self-control on average may just be less likely to prioritize relationships.

Study 3

Results from Study 3 raise concerns about the distinction between virtue and personality, and even among the virtues themselves. After correcting for attenuation, the three virtues were very highly correlated with each other, with the correlation between caring and self-control approaching 0.80 (a finding that reinforces the conclusion from Study 2 associating self-interest but not necessarily disinterest in others with self-control). Clearly, at a minimum any research using these aggregate virtue scales to predict consequential outcomes should examine residuals after controlling for the other two scales. Efforts to develop measures of the three virtues from scratch will need to emphasize discriminant validity in the item selection process as well.

The importance of considering measurement error when studying the incremental validity of one set of constructs over another is also highlighted by these results. In addition

to a substantial decline in the number of significant analyses when structural equation modeling was used instead of hierarchical regression, the pattern of findings changed. Significant results became non-significant, but non-significant results also became significant in five instances for the VIA-120 virtues and four instances for the HEXACO-PI-R domains. Many relationships that would have been expected intuitively did not emerge. Neither set of variables was particularly effective at accounting for social attitudes after accounting for measurement error, for example. The relationships between liberality and inquisitiveness, and between academic behavior and self-control, reported in Study 2 did not replicate, although it is possible the latter finding may have occurred because academic behavior and educational attainment are not strongly correlated.

The most significant issue to emerge from these results is the extent of overlap with the personality domains. The corrected correlations between extraversion and inquisitiveness, and between conscientiousness and self-control, were >0.78 . The latter finding raises similar concerns to those recently voiced about the practical value of the concept of grit, which on average correlated 0.84 with conscientiousness across studies after correcting for attenuation (Credé, Tynan, & Harms, 2016). The largest correlations for caring, those with agreeableness and extraversion, were smaller but still substantial. Given the overlap, finding that the personality domains and virtues failed to achieve significance in most of the prediction equations when measurement error is taken into consideration is unsurprising.

We will consider the implications of this study for understanding virtue in a larger context. The comparison of virtue to broad domains of personality was based on psychologists' historical classification of character as an aspect of personality. To the extent the concept of virtue is used to refer to attributes of an individual, that equation also makes sense for virtue. The introduction to this article offered another parallel, that between virtue and skill. Two of the models described (National Research Council, 2012; Park et al., 2017) discussed the same three dimensions of functioning but in the context of academic and career skills, but the association of virtues with skills is far older than that with personality. In his *Nichomachean Ethics* (Bartlett & Collins, 2007), Aristotle discussed the growth of virtue through practice, and this discussion has inspired a philosophical dialog about the relationship between virtues and skills that continues to this day (Annas, 1995, 2011; Stichter, in press).

The comparison of virtues with skills on the one hand, and personality on the other, is a useful tool for clarifying the nature of virtue. Associating virtue with skill emphasizes the prescriptive aspects of the concept of virtue: virtue as the product of a developmental process (Mascolo

& Fischer, 2015), as the product of intentional instruction in socially valued ways of behaving and thinking, as the result of gradual improvement towards a desired end state, as the basis for aspirations for change, and as the product of practice. Skills tend to be relevant to specific situations, and so the equation also draws attention to the importance of considering which virtues are most relevant in what contexts (Lerner & Schmid Callina, 2014). Associating virtue with personality instead emphasizes virtue as a descriptive concept reflecting the individual's current status as a virtuous actor, the use of that status to judge ourselves and others on dimensions such as trustworthiness, and the spontaneous unfolding of natural virtuous tendencies such as moral sentiments (e.g. Putnam, Neiman, & Schloss, 2014).

There is an essential component to the concept of virtue that is captured neither by the concept of skill nor personality, though, as abstract and socially valued principles of optimal functioning. For example, we can talk about both paragons of skill and paragons of virtue, but only the latter is reflected in culturally shared idealizations that have survived for centuries such as the saint or the bodhisattva. Research that focuses exclusively on virtue as person description is incapable of providing a full accounting of the concept of virtue.

The measurement of virtue

The preceding point has important implications for the future of virtue measurement. The results offer little differentiation between virtue and personality. In particular, when the goal of a study is person description relative to normative behavior at one point in time, as was true in the present case, it probably makes little difference whether behavioral control is operationalized using instruments developed by aggregating across the strengths most associated with the virtue of self-control, or a measure of conscientiousness, or of grit, or perhaps even of intrapersonal skill (see also Block, 1996). However, it is important to keep in mind that virtue is more than a set of individual difference constructs; it also has to do with functioning relative to certain social ideals of behavior. Even if it is accepted that the three-factor model provides an adequate representation of essential elements for a theory of virtue, the types of scales used in the present studies are unlikely to provide an adequate representation of those virtues.

Virtue measurement requires a firmer understanding of the virtues as both psychological and social constructs. Measures appropriate to the social role of virtue might, for example, include items addressing the willingness to make the moral choices regardless of personal cost, to demonstrate discipline without external structure, or to challenge even cherished personal beliefs. The irony of this

conclusion is that the original hypothesis put forward by Peterson and Seligman (2004) that the latent dimensions underlying elements of manifest character would reflect social virtues, allowed for the detection of the three-virtue model, but probably cannot provide a sufficient basis for developing an optimal measure of those virtues.

Notes

1. Duan et al. (2012) also presented results from a three-factor confirmatory factor analysis using a second random subsample. The results are not strictly comparable with those reported for the 12 samples we used, since (as is typical with confirmatory analysis) secondary loadings were set to zero. However, the estimated loadings were essentially consistent with conclusions we draw below.
2. The total percent of variance statistic available through commonality analysis (Thompson, 2006), which considers the shared as well as unique contribution of the predictors, offered an alternative approach to estimating overlap between the three aggregate scales and the criteria. Commonality analyses were conducted using the `yhat` package in R (Nimon, Lewis, Kane, & Haynes, 2008). The resulting total percent of variance statistic was correlated with the square of the semi-partial correlations in Table 4 for each of the three predictors across the 82 criteria. These three correlations varied between 0.69 and 0.83, suggesting substantial overlap in the ordering of the values. Results from these analyses are available from the first author upon request.
3. For the sake of completeness, it should be noted that an alternate two-virtue model was offered by G. E. Moore (1903), but his focus on interpersonal and aesthetic enjoyment falls outside the mainstream of virtue theory.
4. This is a conceptual parsing and simplification of the evidence for purposes of exposition. Empirically, in Study 1 strengths Peterson and Seligman (2004) associated with transcendence divided between caring and inquisitiveness, while courage strengths split between inquisitiveness and self-control.

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