RESEARCH PAPER

Strengths Use as a Predictor of Well-Being and Health-Related Quality of Life

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Abstract   There is a growing body of research devoted to the examination of character strengths as conceptualized by Values-In-Action (VIA) strengths classification system. However, there remains a dearth of research examining generic strengths use and its relationship with well-being, health-related quality of life (HRQOL), and VIA character strengths. In this crosssectional study, 135 undergraduate university students completed measures of strengths use, subjective well-being (SWB), self-esteem, self-efficacy, and HRQOL, and endorsed five top VIA strengths. Results revealed strengths use is a unique predictor of SWB, but not HRQOL. The VIA strengths of hope and zest were significant positive predictors of life satisfaction. The most commonly-endorsed VIA strengths were: love, humor, kindness, social intelligence, and open-mindedness. The least-endorsed VIA strengths were: leadership, perseverance, wisdom, spirituality, and self-control. Overall, results suggest an important link between generic strengths use and specific VIA strengths and their impact on SWB.

Keywords   Strengths use · Subjective well-being · Life satisfaction · Health-related quality of life

1 Introduction

Throughout the history of psychology, value-laden topics such as virtue and/or character have remained primarily the interest of philosophers and theologians (Biswas-Diener

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2006). Traditionally, the primary focus of psychology has been on the treatment and diagnosis of psychological illness, with psychologists arguing for a "value-free" profession (Cassell 2002). However, with the advent of positive psychology, there has been a reawakening of focused research in the area of good character (virtues).

Indeed, from the time of Aristotle, man has concerned himself with uncovering the route to the "good life", a life of happiness and well-being. Aristotle termed the pursuit and achievement of this end, eudaimonia. In *The Nicomachean Ethics* (Aristotle c. 330 BCE/ 1925), eudaimonia is defined as virtuous activity, that is, the exercising of good character. Grounded in Aristotelian theory, positive psychology has reformulated and contemporized ancient philosophizing and applied it to the modern day human life situation (Jorgensen and Nafstad 2004). In accordance with Aristotelian theory, from the positive psychological perspective it is through the habituation and exercising of good character that we can achieve the "good life" (Seligman and Csikszentmihalyi 2000).

Burgeoning interest in empirical examinations of positive topics among research psychologists has led to the development of a theoretical framework and classification system of virtues, the Values-In-Action—Inventory of Strengths (VIA-IS; Peterson and Seligman 2004). From this conceptualization, positive traits reflected in thoughts, feelings, and behaviours are referred to as "character strengths" (Park et al. 2004). The VIA-IS brings together 24 ubiquitous character strengths, organized under six broad virtues. According to Peterson and Seligman (2004; see also Seligman 2002), people possess five "signature" or "top five" character strengths out of 24. The hypothesis behind "signature strengths" is that the use of them is fulfilling and linked to an individual's sense of self, identity, and authenticity (Peterson and Seligman 2004), and therefore, arguably their well-being. Signature strengths are determined from scores on the VIA measure, which are ranked from 1 (top) to 24 (bottom); respondents rate each item on a scale that ranges from "very much like me" to "not like me at all". Recent research evaluating the 24 VIA strengths of character across cultures has demonstrated strong similarities in the endorsement (ranking of VIA strengths from 1 to 24) of the included character strengths (in this article the terms "character strengths" and "signature strengths" refer to the VIA conceptualization of strengths). For example, in an Internet study of 117, 676 adults from 54 nations and all 50 American states, Park et al. (2006) found that the most commonly-endorsed VIA strengths (frequently top ranked) included kindness, fairness, honesty, gratitude, and judgment and the lesser-endorsed VIA strengths (frequently bottom ranked) included prudence, modesty, and self-regulation, and that with the exception of religiousness, the profile of character strengths among the American population converged with the profiles of respondents from each of the other 54 nations (cf. Biswas-Diener 2006; Linley et al. 2007; Shimai et al. 2006; Steger et al. 2007). Moreover, these findings are consistent with research conducted by Park et al. (2004), which has demonstrated that the most commonly-endorsed VIA strengths are those associated with interpersonal strengths (e.g., emotional feelings and interaction), whereas the lesser-endorsed VIA strengths are those associated with cognition and temperance. In general, research findings to date have supported the use of the VIA strengths classification as a ubiquitous representation of character strengths.

Currently, there is a growing body of research devoted to the examination of character strengths as conceptualized by the VIA character strengths classification system and their interrelationship with various situational, personal, and environmental variables. Prominent among these are recent studies which have found consistent and robust associations between life satisfaction and the VIA strengths of hope, zest, gratitude, love, and curiosity, also referred to as "strengths of the heart" (see Park and Peterson 2006; Park et al. 2004; Peterson et al. 2007). Throughout the research literature, scores on measures of life

satisfaction are used as an indication of happiness or unhappiness (Proctor et al. 2009b). Within psychology, the study of "happiness" generally falls under investigations of subjective well-being (SWB); the terms life satisfaction, happiness, and SWB are often used interchangeably as synonyms. The SWB construct comprises emotional responses (i.e., positive and negative affect) and global judgments of life satisfaction. As an overall appraisal of life as a whole, life satisfaction is not considered to be susceptible to change due to short-term emotional reactions to life events (such positive and negative affect), and therefore, is considered to be the key indicator of positive SWB (Diener and Diener 1995). The "strengths of the heart" have been consistently linked to happiness and life satisfaction, whereas the "strengths of the mind" have not (Park and Peterson 2006). Indeed, Park et al. (2004) found the VIA strengths of hope, zest, gratitude, love, and curiosity to be consistently and robustly associated with life satisfaction, whereas the intellectual VIA strengths of appreciation of beauty, creativity, judgment, and love of learning were only weakly associated. Similarly, Peterson et al. (2007) found that among both American and Swiss adults the VIA strengths most highly linked to life satisfaction included hope, zest, love, and curiosity; gratitude was among the most robust predictors of life satisfaction in the American sample, whereas perseverance was among the most robust predictors in the Swiss sample. Similarly, the VIA strengths most associated with life satisfaction (i.e., hope, zest, gratitude, love, and curiosity) have also been shown to be associated with the three orientations to happiness: pleasure (hedonism), engagement [flow activities (see Csikszentmihalyi 2002)], and meaning (eudaimonia; Peterson et al. 2007; Seligman 2002). However, as the majority of research to date has been conducted among American samples, it is unclear whether the association between these character strengths and life satisfaction remains across populations. Indeed, Peterson et al. (2007) has suggested that the character strengths most associated with life satisfaction may vary among different populations. Currently, there remains a paucity of research examining these five VIA strengths, reportedly strongly linked with life satisfaction, outside of American populations.

Recent research also suggests that recovery from serious illness and psychological disorder can sometimes be associated with increased endorsement of specific character strengths (see Peterson et al. 2006). For example, Peterson et al. (2006) found that individuals who had recovered from a serious illness or psychological disorder showed elevated endorsement of character strengths that contributed to increased life satisfaction (e.g., appreciation of beauty, forgiveness, gratitude, humor, and kindness), whereas a history of illness was associated with lower levels of life satisfaction among those who had not recovered (Peterson et al. 2006). Similarly, Peterson and Seligman (2003) found that endorsement of the VIA strengths of gratitude, hope, kindness, leadership, love, spirituality, and teamwork increased and remained elevated for 10 months following the September 11, 2001 terrorist attacks in America (cf. Bromley et al. 2006; Fagin-Jones and Midlarsky 2007). Moreover, findings of recent research have demonstrated that performing strengths interventions or exercises, such as counting one's own acts of kindness for 1 week (Otake et al. 2006) or counting blessings and participating in self-guided daily gratitude exercises (Emmons and McCullough 2003) is associated with higher levels of positive affect and life satisfaction. Furthermore, Seligman et al. (2005) have demonstrated that using signature strengths (as measured by the VIA-IS) in a new way each day for 1 week increases happiness and decreases depressive symptoms for 6 months. Overall, results of these research studies add support to general assertions that character strengths and character strength interventions are associated with increased well-being and life satisfaction.

From a more generic perspective, "strengths" are considered positive traits and/or natural capacities or talents which have been refined with knowledge and skill (Clifton and Anderson 2002); these capacities may include moral virtues, but are not limited by them. To date, there is a dearth of positive psychological research examining more generic aspects of strengths (as personality characteristics and/or individual natural talents) and strengths use, more specifically (in this article the terms "strengths" and "strengths use" refer to the generic conceptualization of strengths). Similar to the VIA conceptualization of character strengths, it is theorized that strengths use is energizing and authentic (Clifton and Anderson 2002; Linley and Harrington 2006), and that "when we use our strengths, we feel good about ourselves, we are better able to achieve things, and we are working toward fulfilling our potential" (Linley and Harrington 2006, p. 41). Linley (2008) offers the following definition of a generic strength: "a strength is a pre-existing capacity for a particular way of behaving, thinking, or feeling that is authentic and energising to the user, and enables optimal functioning, development and performance" (p. 9). Recent research into strengths use has shown that similar to specific VIA strengths, strengths use is positively associated with well-being. For example, Govindji and Linley (2007) examined the relationship between strengths use and SWB and found that not only is strengths use positively associated with well-being and vitality, but also it is a unique predictor of the variance in SWB (see Govindji and Linley 2007). In line with these findings, Shogren et al. (2006) examined the association between the positive personality characteristics of hope [as measured using the Children's Hope Scale (Snyder et al. 1997)], optimism, locus of control (LOC), and life satisfaction in adolescents with and without cognitive disabilities and found that hope and optimism equally predicted life satisfaction for students with and without cognitive disabilities. Research also offers support for conceptualizations of personality strengths as buffers against the negative effects of stress and the development of psychological problems. For example, Bromley et al. (2006) found that youths with greater numbers of personality strengths at the mean age of 16 were at a decreased risk of developing psychiatric disorders, educational and occupational problems, interpersonal difficulties, and criminal behaviors at the mean age of 22, than those with fewer personality strengths. Taken together these findings indicate that strengths and strengths use are related to increased SWB and life satisfaction, and that strengths may act as a buffer against negative life outcomes.

Based on the findings of previous research, this study has four purposes. Firstly, given that previous research examining strengths and strengths use has largely focused on the VIA classification system conceptualization of character strengths, is to assess the relationship between strengths use, as measured by a self-report strengths use measure, and SWB and health-related quality of life (HRQOL). That is, to determine to what extent strengths use predicts SWB and HRQOL. Research has demonstrated that individuals with positive SWB have consistently been shown to report high levels of life satisfaction, as well as, satisfaction across multiple life domains (e.g., marriage, income, physical health), positive emotions, increased mental health, and a longer life (for a review see Lyubomirsky et al. 2005). Indeed, cross-sectional, longitudinal, and experimental data have all shown that well-being and happiness precede diverse positive personal, behavioral, psychological, and social outcomes (Lyubomirsky et al. 2005), just as low life satisfaction and/or unhappiness can predict the onset of depression and psychological disorder up to 2 years prior to diagnosis (see Lewinsohn et al. 1991). Moreover, a number of recent studies have evaluated general health by investigating HRQOL (e.g., Muscari-Tomaioli et al. 2001; Turner-Bowker et al. 2003). Health-related quality of life refers to the impact of general medical conditions or symptoms on functional health and well-being and includes physical,

mental, emotional, and social aspects of health (Turner-Bowker et al. 2003). Secondly, is to further validate previous research which has demonstrated a robust association between the VIA strengths of hope, zest, gratitude, love, and curiosity (the "strengths of the heart") and life satisfaction in a UK sample (e.g., Park et al. 2004; Peterson et al. 2007). That is, to determine the mean level of life satisfaction for those individuals for whom the VIA strengths of hope, zest, gratitude, love, and curiosity were among their top five strengths and to what extent these five character strengths predict life satisfaction. Research has demonstrated consistent and robust associations between the "strengths of the heart" and life satisfaction, however, these research findings have primarily been reported among American samples. As noted by Peterson et al. (2007), it is yet unclear that these associations will hold across different populations. Thirdly, is to add to previous research which has demonstrated that the most commonly-endorsed VIA strengths are those associated with interpersonal strengths (e.g., emotional feelings and interaction), whereas the lesser-endorsed VIA strengths are those associated with cognition and temperance (e.g., Park et al. 2004), by assessing endorsement among a UK sample. That is, to determine which VIA strengths are most commonly-endorsed and which are lesser-endorsed as signature strengths. Research to date has not explored endorsement of the VIA strengths outside of findings resulting from taking the VIA-IS; endorsement in this study will be based on selection of signature strengths from a definitional list of the 24 VIA strengths. Finally, to determine if there is a relationship between common-endorsement of VIA strengths as signature strengths and the degree to which strengths use predicts SWB and HRQOL. That is, to determine if among the VIA strengths most commonly-endorsed as signature strengths there is a relationship between endorsement (chosen VIA strengths) and the degree to which strengths use predicts SWB and HRQOL. Research to date has not explored possible links between endorsement of strengths as conceptualized by the VIA classification system and strengths use as conceptualized generically and their impact on SWB and HRQOL.

In line with recent research, character strengths examined in this study are those included in the VIA strengths classification system (see Peterson and Seligman 2004). Further, in accordance with Govindji and Linley (2007), in order to control for overlap between well-being constructs and to demonstrate the effects of strengths use independent of more established constructs, measures of self-esteem and self-efficacy have been included. Both self-esteem (Rosenberg 1979) and self-efficacy (Bandura 1997) are positively associated with a variety of indicators of well-being (Lucas et al. 1996).

2 Method

2.1 Participants

Participants were 135 undergraduate psychology students (102 females, 33 males) from the University of Leicester, UK. The mean age of participants was 19.24 years (SD = 1.34, range 18–27). The mean time of completion of the questionnaires was 8.54 min (SD = 5.66 min, range 2.00–49.00 min).

2.2 Measures

1. *Short Form 8*[TM]*Health Survey* (SF-8: Ware et al. 2001) is a 8-item self-report generic multipurpose short-form health survey. The SF-8 Health Survey uses one question to

measure each of the eight domains of the Short Form 36 Health Survey (SF-36). Both the SF-8 and the SF-36 measure eight domains commonly represented in widely used health surveys: Physical Functioning (PF); Role limitations due to Physical health problems (RP); Bodily Pain (BP); General Health (GH); energy/fatigue or Vitality (VT); Social Functioning (SF); Role limitations due to Emotional problems (RE); and psychological distress and well-being or Mental Health (MH). Two summary measures are produced, the Physical Component Summary (PCS-8) and Mental Component Summary (MCS-8). Alternate forms reliability for the PCS-8 and MCS-8 summary scales is .88 and .82, respectively (Ware et al. 2001). Test–retest reliability estimates for the eight items range from .59 to .70, and test–retest reliability for the PCS-8 and MCS-8 summary scales is .73 and .74, respectively (Ware et al. 2001). The SF-8 scales and summary measures are scored using norm-based scoring methods based on the 2000 general US population. Scoring of the SF-8 is done via scoring software provided by the publisher QualityMetric Inc. (http://www.qualitymetric.com). Example items include: "Overall, how would you rate your health during the past 4 weeks?" and "During the past 4 weeks, how much did your physical health or emotional problems limit your usual social activities with family or friends?" The SF-8 meets standard criteria for the purposes of evaluating content, construct, and criterion related validity. Overall, the SF-8 is a reliable, valid, and accurate brief measure of HRQOL.

2. *Satisfaction With Life Scale* (SWLS: Diener et al. 1985) is a 5-item self-report measure of global life satisfaction. Respondents are required to respond to each item (e.g., "I am satisfied with my life") using a 7-point Likert scale (Strongly Disagree to Strongly Agree); higher scores are indicative of higher global life satisfaction. The SWLS has been demonstrated to have strong internal reliability ($r = .87$) and moderate temporal stability ($r = .82$, 2 month test–retest reliability; Diener et al. 1985). The SWLS has been shown to correlate with appropriate criterion measures (see Diener et al. 1985; Pavot et al. 1991). Further, the SWLS has been demonstrated to correlate meaningfully and in hypothesized directions with other related measures and constructs (see Neto 1993). Construct validity has been provided among young adults through differentiation between life satisfaction and health status (see Arrindell et al. 1999). Overall, research supports the SWLS as a psychometrically sound brief measure of life satisfaction.

3. *The Positive and Negative Affect Schedule* (PANAS: Watson et al. 1988) is a 20-item self-report measure made up of two subscales each consisting of ten items: ten positive affects (PA: interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, and active) and ten negative affects (NA: distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid). Respondents use a 5-point Likert scale response format (Very Slightly or Not At All to Extremely) to indicate to what extent they have felt each way during the past week. Intercorrelations and internal consistency reliabilities are all acceptably high, ranging from .86 to .90 for PA and from .84 to .87 for NA, whereas the correlation between the NA and PA scales is invariably low, ranging from −.12 to −.23. The PANAS has been demonstrated to compare favorably with other brief affect measures and to have good external validity through its correlation with measures of related constructs (see Watson et al. 1988). In general, the PANAS is seen as a reliable, valid and efficient means of measuring positive and negative affect.

4. *Strengths Use Scale* (SUS: Govindji and Linley 2007) is a 14-item self-report scale designed to measure individual strengths use. In developing the scale, 19 items were

created to assess generic strengths use, that is, how much people use their strengths ("the things you are able to do well or do best") in a variety of settings. Principal components analysis revealed three components with eigenvalues greater than one. A single component above a marked elbow was found using Cattell's (1966) scree test. Fourteen items comprising this component were analysed using principle components analysis. These items were found to load at .52–.79 on a single "strengths use" factor that accounted for 56.2% of the variance. These 14 items were taken forward to constitute the Strengths Use Scale. Sample items include: "I am able to use my strengths in lots of different ways" and "Using my strengths is something I am familiar with". Respondents use a 7-point Likert scale response format (Strongly Disagree to Strongly Agree); higher scores are indicative of greater strengths use. Preliminary research has reported an alpha of .95 for the scale. The SUS has been shown to correlate with appropriate criterion measures, such as the Rosenberg Self-Esteem Scale ($r = .56$) and the New General Self-Efficacy Scale ($r = .63$), and with other related constructs, such as SWB ($r = .51$) and psychological well-being ($r = .56$). Overall, preliminary results provide support for this scale as being internally consistent and to correlate meaningfully and in hypothesized directions with other related measures and constructs.

5. *Strengths Endorsement*—respondents were presented with a list of the 24 VIA strengths and a brief definition of each (see Park et al. 2004 for an example), and required to choose (endorse) which strengths from the list of 24 they felt were their top five strengths. The following instructions were provided: "Listed below are 24 universal strengths. From the list choose five that you feel describe the real you. Which ones make you who you are?"

6. *Rosenberg Self-Esteem Scale* (RSE: Rosenberg 1965) is a 10-item self-report measure of self-esteem. Respondents are required to respond to each item (e.g., "On the whole I am satisfied with myself") using a 4-point Likert scale (Strongly Disagree to Strongly Agree); higher scores are indicative of higher self-esteem. Internal coefficient alphas ranging from .80 to .92 have been reported for the scale (e.g., Fleming and Courtney 1984; Reynolds 1988; Rosenberg 1979; Sam 2000), with a test–retest correlation for the total score having been reported at .82 (see Fleming and Courtney 1984). Convergent validity for the scale has been demonstrated through negative correlations with psychological constructs associated with low self-regard, such as anxiety ($r = -.64$) and depression ($r = -.59$; see Fleming and Courtney 1984). Discriminant validity has been demonstrated through correlations between the RSE and grade point average ($r = .10$), LOC ($r = .04$), and vocabulary ($r = -.06$; see Reynolds 1988). Overall, the RSE is a psychometrically sound brief measure of global self-esteem.

7. *New General Self-Efficacy Scale* (NGSES: Chen et al. 2001) is a 8-item self-report measure of general self-efficacy. Respondents are required to respond to each item (e.g., "I will be able to achieve most of the goals that I have set for myself") using a 5-point Likert scale (Strongly Disagree to Strongly Agree); higher scores are indicative of higher general self-efficacy. Internal consistency reliabilities for the NGSES have been demonstrated to range from .85 to .90 and temporal stability from .62 to .86 (e.g., Chen et al. 2001, 2004; Scherbaum et al. 2006). General self-efficacy as measured by the NGSES has been demonstrated to be distinct from self-esteem, providing support for the discriminant validity of the scale (see Chen et al. 2001, 2004). Evidence has also been provided for the content and predictive validity of the scale (see Chen et al. 2001). Moreover, the NGSES has been demonstrated to

outperform other measures of general self-efficacy in terms of item discrimination, item information, and the relative efficiency of the test information functions as analysed using Item Response Theory (see Scherbaum et al. 2006).

2.3 Procedure

The study was placed on-line via the University of Leicester's Experimental Participation Requirement system following research ethics board approval. Participants received one course credit for their participation.

2.4 Data Analysis

In line with previous research (e.g., Govindji and Linley 2007; Sheldon and Elliot 1993), a composite SWB variable was calculated by standardizing the total scores for life satisfaction, positive affect, and negative affect, and then subtracting negative affect from the sum of life satisfaction and positive affect. Correlational analyses were used to assess the relationships between the study variables. Linear regression analyses were used to test the hypothesis that strengths use is a unique predictor of SWB and HRQOL.

3 Results

The internal consistency reliabilities and descriptive statistics for the study variables are presented in Table 1. The intercorrelations between the study variables are presented in a correlation matrix in Table 2. Results revealed that strengths use was positively correlated with SWB, self-esteem, self-efficacy, and HRQOL (i.e., the PCS-8 and MCS-8 of the SF-8). Further, each of the study variables was significantly correlated.

To test the hypothesis that strengths use would act as a unique predictor of SWB and HRQOL, three linear regressions were conducted in which strengths use served as the predictor variable while holding constant self-esteem and self-efficacy. Results revealed that strengths use is a unique predictor of SWB, $\beta = .203$, $t(134) = 2.60$, $P = .010$, once self-esteem and self-efficacy are accounted for. Specifically, strengths use uniquely accounted for 2.1% of the variance (R^2 change), $R^2 = .597$, $F(1, 131) = 64.67$, $P = .010$, in SWB not already accounted for by self-esteem and self-efficacy. Results further revealed that strengths use is not a unique predictor of either the physical, $\beta = .120$, $t(134) = 1.02$,

Table 1 Descriptive statistics for study variables	Variable/measure	Mean (SD)	Alpha α
	Satisfaction with life scale	24.84 (5.87)	.88
	Rosenberg self-esteem scale	28.37 (4.53)	.89
	Positive affect	29.99 (7.66)	.91
	Negative affect	21.70 (7.02)	.86
	General self-efficacy	29.47 (4.71)	.90
	Strengths use scale	68.81 (13.66)	.95
	Subjective well-being (unstandardized)	33.13 (15.33)	–
	Physical component summary	49.99 (7.44)	–
	Mental component summary	41.89 (12.09)	–

Table 2 Pearson product correlation coefficients between study variables

	1	2	3	4	5	6
Rosenberg self- esteem scale	–	.72	.70	.50	.23	.45
Subjective well-being		–	.67	.58	.30	.68
General self-efficacy			–	.70	.27	.43
Strengths use scale				–	.25	.34
Physical component summary					–	.23
Mental component summary						–

All correlations significant at $P < 0.01$

$P = .308$, or the mental, $\beta = .077$, $t(134) = 0.72$, $P = .475$, components of HRQOL, once self-esteem and self-efficacy are accounted for (see Table 3). As a result of these findings, two additional linear regressions were conducted in which SWB served as the predictor variable while holding constant self-esteem and self-efficacy, in order to test if SWB would act as a unique predictor of HRQOL. The rationale for these additional regression analyses is based on the fact that significant small first order correlations were found between SWB and both the physical and mental components of HRQOL (see Table 2) and that extant literature strongly suggests a link between SWB and increased health (e.g., Lyubomirsky et al. 2005). Results revealed that SWB is a marginally unique predictor (i.e., $P = .05–.10$ (Motulsky 1995)) of the physical summary component of HRQOL, $\beta = .222$, $t(134) = 1.74$, $P = .084$, and is a unique predictor of the mental summary component of HRQOL, $\beta = .748$, $t(134) = 7.62$, $P < .001$, once self-esteem and self-efficacy are accounted for. Specifically, SWB accounted for 2.1% of the variance (R^2 change), $R^2 = .096$, $F(1, 131) = 4.66$, $P = .004$, in the physical summary component and 23.7% of the variance (R^2 change), $R^2 = .465$, $F(1, 131) = 37.93$, $P < .001$, in the mental

Table 3 Regression of strengths use on subjective well-being and health-related quality of life

Variable	R^2	R^2 change	Beta	(SE) beta	Significance	F
Subjective well-being						
Self-efficacy			.196	.045	.039*	
	.576	.576				
Self-esteem			.482	.038	.010**	
Strengths use	.597	.021	.203	.013	.010**	64.67**
Physical health						
Self-efficacy			.133	.223	.350	
	.075	.075				
Self-esteem			.075	.191	.523	
Strengths use	.083	.007	.120	.064	.308	3.94*
Mental health						
Self-efficacy			.166	.332	.202	
	.227	.227				
Self-esteem			.296	.285	.006**	
Strengths use	.231	.003	.077	.095	.475	13.08**

* $P < 0.05$, ** $P < 0.01$

Table 4 Regression of subjective well-being on health-related quality of life

Variable	R^2	R^2 change	Beta	(SE) beta	Significance	F
Physical health						
Self-efficacy			.140	.194	.257	
	.075	.075				
Self-esteem			−.030	.215	.817	
Subjective well-being	.096	.021	.222	.422	.084	4.66*
Mental health						
Self-efficacy			−.031	.243	.741	
	.227	.227				
Self-esteem			−.067	.269	.511	
Subjective well-being	.465	.237	.748	.528	<.001***	37.93**

* $P < 0.05$, ** $P < 0.01$, *** $P < .001$

summary component of HRQOL, not already accounted for by self-esteem and self-efficacy (see Table 4).

To determine the mean level of life satisfaction for those individuals for whom the VIA strengths of hope, zest, gratitude, love, and curiosity were among their top five character strengths a frequency analysis was conducted of all the endorsed top five character strengths. The sample was then divided into character strengths subgroups based on selection of each of the 24 strengths as a signature strength. Within each subgroup an examination of life satisfaction total mean scores was conducted. Results revealed that the mean level of life satisfaction was in the positive range (i.e., above 20) for each of the five character strengths subgroups considered: hope ($M = 27.71$, SD = 4.45, $n = 21$), zest ($M = 26.58$, SD = 4.79, $n = 19$), gratitude ($M = 24.92$, SD = 5.31, $n = 26$), love ($M = 25.23$, SD = 5.61, $n = 90$), and curiosity ($M = 22.73$, SD = 6.30, $n = 26$). It was hypothesized based on previous research findings that the mean level of life satisfaction for those individuals for whom the VIA strengths of hope, zest, gratitude, love, and curiosity were among their top five character strengths would be in the "satisfied" (i.e., 26–30) to "extremely satisfied" (i.e., 31–35) range (Pavot and Diener 1993; see Proctor et al. 2009a for a review). However, results revealed that only hope ($M = 27.71$) and zest ($M = 26.58$) had mean scores within the anticipated range; gratitude ($M = 24.92$), love ($M = 25.23$), and curiosity ($M = 22.73$) each fell within the "slightly satisfied" (i.e., 21–25) range.

In order to determine if the VIA strengths of hope, zest, gratitude, love, and curiosity are positive predictors of life satisfaction a stepwise regression analysis was conducted on the entire sample, where the five variables entered were binary indicating endorsement. Stepwise regression was chosen for this analysis because it is the method used to test explicit hypotheses; that is, stepwise regression is theoretical whereas standard multiple regression is atheoretical or a shotgun approach (Tabachnick and Fidell 2001). Moreover, for the purposes of this analysis significance for inclusion was set at $P = .10$ and removal at $P = .15$ in order to ensure that marginally significant variables ($P = .05$–.10 (Motulsky 1995)) would not be excluded. More liberal probability levels for entry, rather than the standard .05, are recommended in stepwise regression in order that important variables are less likely to be excluded from the model (Tabachnick and Fidell 2001). Results revealed that the VIA strengths of hope and zest were significant positive predictors, $\beta = .179$, $t(134) = 2.13$, $P = .035$ and $\beta = .192$, $t(134) = 2.32$, $P = .022$, respectively, whereas

Table 5 Stepwise regression of character strengths and life satisfaction

Variable	R^2	R^2 change	Beta	(SE) beta	Significance	F
Life satisfaction						
Hope	.102	.022	.179	1.36	.035**	
Zest	.102	.022	.192	1.07	.022**	
Curiosity	.102	.022	−.151	1.25	.073*	4.97**
Love			.034	–	.703	
Gratitude			.007	–	.930	

* $P < 0.10$, ** $P < 0.05$

curiosity was a significant negative predictor, $\beta = -.151$, $t(134) = -1.81$, $P = .073$, of life satisfaction in the model. Specifically, the VIA strengths of hope, zest, and curiosity accounted for 2.2% of the variance (R^2 change), $R^2 = .102$, $F(1, 131) = 4.97$, $P = .003$, in life satisfaction scores. In order to control for effects based on the included combination of predictors, a comparison of mean life satisfaction scores of individuals who chose the VIA strength of curiosity as a signature strength with those who did not was conducted. Results revealed a significant effect for group, $t(133) = 2.06$, $P = .041$, with individuals who did not choose curiosity as a signature strength having significantly higher mean life satisfaction than those who did. The VIA strengths of love and gratitude were not significant predictors of life satisfaction, $\beta = .034$, $t(134) = 0.38$, $P = .703$ and $\beta = .007$, $t(134) = 0.09$, $P = .930$, respectively and therefore, were not included in the model (see Table 5).[1]

To determine what signature strengths are most commonly-endorsed (i.e., top five) and which are lesser-endorsed (i.e., bottom five) for this population a frequency analysis was conducted on the entire sample on all chosen top five character strengths. The five most commonly-endorsed VIA strengths were: love, humor, kindness, social intelligence, and open-mindedness, and the five least-endorsed VIA strengths were: leadership, perseverance, wisdom, spirituality, and self-control (see Table 6).

To determine whether among those signature strengths most commonly-endorsed, there is a relationship between endorsement (choice of a specific VIA strength as a signature strength) and the degree to which strengths use predicts SWB (HRQOL was not included in these regression analyses because strengths use was not a unique predictor of HRQOL) five linear regressions were conducted, one among each of the VIA strengths subgroups. In each regression analysis, strengths use served as the predictor variable while holding constant self-esteem and self-efficacy. Results revealed that strengths use is a unique predictor of SWB among the love ($\beta = .234$, $t(89) = 2.34$, $P = .022$), kindness ($\beta = .240$, $t(48) = 2.07$, $P = .045$), social intelligence ($\beta = .457$, $t(38) = 3.33$, $P = .002$), and open-mindedness ($\beta = .505$, $t(37) = 3.0$, $P = .005$) VIA strengths subgroups, and a marginally unique predictor (i.e., $P = .05$–.10 (Motulsky 1995)) of SWB among the humor ($\beta = .210$, $t(78) = 1.87$, $P = .065$) VIA strengths subgroup, once self-esteem and self-efficacy are accounted for. Specifically, strengths use significantly accounted for 2.8% ($R^2 = .555$, $F(1, 86) = 35.81$, $P < .001$), 2.4% ($R^2 = .742$, $F(1, 45) = 43.15$, $P < .001$), 12.0% ($R^2 = .622$, $F(1, 35) = 19.16$, $P < .001$), and 10.5% ($R^2 = .601$, $F(1, 34) = 17.09$, $P < .001$) of the variance (R^2 change) in SWB among the love, kindness, social intelligence, and open-mindedness VIA strengths subgroups, respectively, and marginally significantly

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[1] The same results were found using both forward and backward multiple linear regression analysis.

Table 6 Strengths endorsement

Strength	Total	Percent of sample
Love	90	66.67
Humor	79	58.52
Kindness	49	36.30
Social intelligence	39	28.89
Open-mindedness	38	28.15
Self-control	12	8.89
Spirituality	12	8.89
Wisdom	9	6.67
Perseverance	8	5.93
Leadership	5	3.70

Table 7 Regression of strengths use on subjective well-being—commonly-endorsed strengths

Variable	R^2	R^2 change	Beta	(SE) beta	Significance	F
Love (*n* = 90)						
Self-efficacy			.137	.055	.250	
	.527	.527				
Self-esteem			.484	.049	<.001***	
Strengths use	.555	.028	.234	.016	.022*	35.81**
Humor (*n* = 79)						
Self-efficacy			.126	.058	.353	
	.451	.451				
Self-esteem			.473	.046	<.001***	
Strengths use	.476	.024	.210	.014	.065	22.68**
Kindness (*n* = 49)						
Self-efficacy			.208	.074	.176	
	.717	.717				
Self-esteem			.509	.071	<.001***	
Strengths use	.742	.024	.240	.021	.045*	43.12**
Social intelligence (*n* = 39)						
Self-efficacy			−.007	.108	.968	
	.502	.502				
Self-esteem			.547	.067	<.001***	
Strengths use	.622	.120	.457	.030	.002**	19.16**
Open-mindedness (*n* = 38)						
Self-efficacy			−.354	.105	.117	
	.496	.496				
Self-esteem			.666	.110	<.001***	
Strengths use	.601	.105	.505	.035	.005**	17.09**

* $P < 0.05$, ** $P < 0.01$, *** $P < .001$

accounted for 2.4% ($R^2 = .476$, $F(1, 75) = 22.68$, $P < .001$) of the variance (R^2 change) in SWB among the humor VIA strengths subgroup, not already accounted for by self-esteem and self-efficacy (see Table 7).

4 Discussion

The purpose of this study was to assess the relationship between self-reported strengths use and SWB and HRQOL. In addition, this study sought to further research relating to the association between character strengths and life satisfaction, and common-endorsement of strengths in a UK sample. Furthermore, the relationship between endorsement of VIA strengths and strengths use and the degree to which strengths use predicts SWB and HRQOL was explored.

4.1 Study Limitations

Several primary limitations of this study are noteworthy. First, the sample was relatively small and consisted mainly of females. Second, endorsement of signature strengths in this study was based on individually endorsed strengths (i.e., strengths were chosen from a list containing the 24 VIA strengths and their corresponding definitions) and not on those resulting from taking the VIA-IS. Further, this study was cross-sectional and future research examining the impact of strengths use on well-being and health would greatly benefit from a longitudinal examination of these variables. Finally, additional research is required in order to confirm the psychometric properties of the strengths use measure in order to support preliminary findings of this study and that of Govindji and Linley (2007).

4.2 Study Findings

Results of this study revealed that strengths use was positively correlated with SWB, self-esteem, self-efficacy, and HRQOL, and that each of the study variables was significantly positively associated with each other. Regression analyses showed that strengths use is a unique predictor of SWB, but that it is not a unique predictor of either the physical or mental summary components of HRQOL, once self-esteem and self-efficacy are accounted for. It was anticipated based on extant research that has demonstrated positive relationships between strengths use and well-being (e.g., Govindji and Linley 2007), and well-being and health (e.g., Lyubomirsky et al. 2005; Zullig et al. 2005), that strengths use would be a unique predictor of HRQOL. Indeed, additional regression analyses revealed that SWB is a significant unique predictor of the mental summary component of HRQOL and is a marginally significant unique predictor of the physical summary component of HRQOL. These findings support previous research which suggests that increased positive SWB is associated with increased mental and physical health (see Lyubomirsky et al. 2005 for a review). Moreover, these finding are interesting in light of research which has demonstrated that experiencing simultaneous negative emotion and inhibited self-expression in social interaction (Type D personality) is linked to decreased HRQOL (see Fruyt and Denollet 2002).

Based on previous research findings supporting the robust association between life satisfaction and the "strengths of the heart": hope, zest, gratitude, love, and curiosity (see Park et al. 2004; Peterson et al. 2007), it was hypothesized that the mean level of life satisfaction for those individuals for whom these VIA strengths were among their chosen signature strengths would be in the "satisfied" to "extremely satisfied" range. However, only the VIA strengths of hope and zest were in the anticipated "satisfied" and "extremely satisfied" range; gratitude, love, and curiosity each fell within the "slightly satisfied" range. These findings may be best explained by considering the each of these character strengths' orientation to happiness as discussed by Peterson et al. (2007). Accordingly, the

VIA strengths of hope, zest, and curiosity are strongly associated to a life of engagement (flow activities), whereas the VIA strengths of love and gratitude are strongly associated to a life of meaning (eudaimonia), and that each of these character strengths are highly correlated with life satisfaction. Results of this study suggest that, among this UK sample, a life of engagement provides only slightly greater happiness than a life of meaning. This is further evidenced by the results of subsequent regression analyses which demonstrated that only the VIA strengths of hope and zest were positive predictors of life satisfaction among this UK sample. Results further suggest that engagement in activities related to curiosity have less of an impact on life satisfaction among this sample than those reported by Peterson et al. (2007). In fact, results of subsequent regression analysis revealed the VIA strength of curiosity to be a significant negative predictor of life satisfaction in the model. Moreover, mean score analysis revealed that those who did not choose the VIA strength of curiosity as a signature strength had significantly higher life satisfaction than those who did. Considering the mean age of the sample, one possible explanation for this finding is that children are increasingly being brought up in more constricting environments due to real and potential risks to safety. Various research findings suggest that behavioral inhibition, which can result in insecure attachment in childhood, impacts the expression of curiosity and openness to experience in adulthood (see Siegel 1999). However, the specific environmental and cultural conditions (curiosity is activated by person-environment interactions) likely to be influencing the results found here need further examination (Peterson and Seligman 2004). For example, it may be for this sample that those endorsing curiosity as a signature strength do so as a consequence of unchallenging study programs which negatively impacts life satisfaction, or alternatively perhaps those who endorse curiosity as a virtue are viewed less favorably by others which negatively impacts life satisfaction. Future research examining the "strengths of the heart" in different populations should consider specific cultural and generational differences. Additionally, it could be argued that the methodology of self-choice endorsement used for designation of the five signature strengths instead of assignment based on scores from the VIA-IS explains the results. However, the underlying theory presented should not be influenced to such an extent by the instrument used. In fact, it could be argued that self-endorsed signature strengths would predict better than raw VIA-IS scores. Indeed, the most commonly-endorsed and least-endorsed VIA signature strengths, as chosen by participants of this study, were in accordance with those found using the VIA-IS measure. Furthermore, the methodology adopted in this study is comparable to that reported by Biswas-Diener (2006) where identification of VIA strengths and determination of the existence, desirability, and development of character in diverse populations was established via presentation of each virtue to research participants.

For this population, the most commonly-endorsed signature strengths were: love, humor, kindness, social intelligence, and open-mindedness, and the least-endorsed signature strengths were: leadership, perseverance, wisdom, spirituality, and self-control. These findings are in line with previous research which has shown that the most commonly-endorsed character strengths are those associated with interpersonal strengths (e.g., emotional feelings and interaction), and lesser-endorsed character strengths are those associated with cognition and temperance (e.g., Park et al. 2004). Moreover, these findings suggest that self-selection of signature strengths based on presentation of a list of the 24 VIA strengths and their corresponding definitions is a valid alternate method of assessing strengths endorsement to the VIA-IS measure.

Further, this research sought to examine whether among those signature strengths most commonly-endorsed if there is a relationship between endorsement and the degree to

which strengths use predicts SWB. Results of regression analyses showed that strengths use is a unique predictor of SWB among four of the five of the most commonly-endorsed signature strengths subgroups: love, kindness, social intelligence, and open-mindedness, once self-esteem and self-efficacy are accounted for. Initial regression analyses revealed strengths use as a unique predictor of SWB, accounting for 2.1% of the variance. However, strength use was found to be a stronger unique predictor of SWB when endorsement of specific VIA strengths as signature strengths was considered in the relationship. Specifically, strengths use accounted for 12, 10.5, 2.8, and 2.4% of the variance in SWB among the social intelligence, open-mindedness, love, and kindness VIA strengths subgroups, respectively. These results suggest an important link between strengths use and character strengths, as conceptualized by the VIA classification system, and their impact on SWB. Further, as evidenced by Peterson et al. (2007), these four VIA strengths are strongly associated to a life of meaning (eudaimonia). Overall, these results provide support for both the generic conceptualization of strengths and the VIA classification system conceptualization of character strengths and suggest that there are specific benefits to well-being for those who both refine their natural talents through knowledge and skill and cultivate their virtues. Indeed, strengths use was a greater predictor of SWB among those individuals whose signature strengths were associated with a life of meaning.

5 Conclusion

In general, findings of this study indicate that individuals who use their strengths experience greater subjective well-being, and that increased subjective well-being is related to both mental and physical HRQOL. These results are in accordance with the findings of Govindji and Linley (2007) and add to the existing literature by demonstrating a link between strengths use, subjective well-being, and endorsement of signature strengths. Findings reported here further suggest that additional research is required to support the generalizability of previous research that has demonstrated consistent and robust positive associations between the character strengths of hope, zest, gratitude, love, and curiosity and life satisfaction. Results indicate that among this population only two of the five theorized "strengths of the heart" are related to increased life satisfaction and that one of these strengths is related to reduced life satisfaction. Overall, this research has shown that strengths use is a unique predictor of subjective well-being when controlling for self-esteem and self-efficacy, and that strengths use is further able to predict the unique influence of specific character strengths on subjective well-being. These findings extend current knowledge by demonstrating important theoretical and practical links between existing strengths conceptualizations. Further this research has important implications for applications in work and education, since it appears that enabling people to use their strengths more will be associated with increased subjective well-being.

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