

# Differences in Character Strengths Levels and Associations with Positive Outcomes across Contexts

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## Abstract

Using character strengths is associated with optimal functioning, psychological fulfilment, and wellbeing in general. While Peterson and Seligman (2004) assumed that character strength use may vary across specific contexts and situations, little research has examined whether these assumptions are true. The current study (a) examined whether level of character strengths differs across general as well as specific eating, exercising, and work contexts, (b) determined how contextualized strengths are, and (c) assessed if the relationships between strengths and positive outcomes in eating, exercise, and work contexts were similar. Participants ( $N = 270$ ) recruited through Amazon Mechanical Turk completed questionnaires assessing character strengths in various contexts as well as psychological need satisfaction, job satisfaction, and eating and exercise behaviors. Results showed that strengths did vary by context, with participants commonly using strengths in general (no context suggested) and at work more than while exercising and while eating. Most strengths demonstrated moderate levels of contextualization by domain, with about half of the variance due to between-person and about half due to within-person variability, except for the less-contextualized strength of religiousness. Finally, across eating, exercising, and work contexts, a set of all (or almost all) strengths related to satisfaction of self-determination theory's psychological needs of competence, autonomy, and relatedness. Although there are differences in how applicable strengths are across specific contexts, using character strengths appears advantageous in each of these contexts.

## Keywords

Character strengths, signature strengths, domain, competence, relatedness, autonomy, and psychological need satisfaction

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For many people, understanding the factors that enhance positive outcomes, including success and psychological fulfillment, is important. As part of the Values in Action project, Peterson and Seligman (2004) identified a set of character strengths that both produce positive effects to the self and others when expressed and are fairly universal, morally-valued, and stable positive traits. In all, 24 character strengths (e.g., creativity, bravery, kindness, teamwork, forgiveness, gratitude) were identified. Research consistently shows that using character strengths in new ways increases happiness, life satisfaction, positive affect, vitality, and wellbeing and decreases depression and stress (e.g., Gander, Proyer, Ruch, & Wyss, 2012; Mongrain & Anselmo-Matthews, 2012; Seligman, Steen, Park, & Peterson, 2005; Wood, Linley, Mattby, Kashdan, & Hurling, 2011). These effects have been shown in both the short-term (e.g., improving mood that day, Lavy, Littman-Ovadia, & Bareti, 2014) and in the long-run (e.g., greater wellbeing 3 and 6 months later, Wood et al., 2011). Strengths use can also predict higher satisfaction of the psychological needs and assist with progress towards goals (e.g., Linley, Nielsen, Gillett, & Biswas-Diener, 2012). Consistently, using strengths is associated with positive outcomes, psychological fulfillment, and wellbeing in general. However, how consistently are strengths used across contexts, and are strengths similarly effective across contexts?

While past work has consistently demonstrated that using character strengths has many positive outcomes, Peterson and Seligman (2004) acknowledged that not all character strengths will be used equally in all settings. In fact, Peterson and Seligman distinguished between tonic and phasic strengths. According to Peterson and Seligman (2004, p. 23),

A tonic characteristic (e.g., kindness or humor) shows itself steadily in a variety of settings, which means that it can be assessed by deliberately general questions posed to an individual and/or informant (“Do you like to tease others?”). A phasic characteristic comes and goes because it is relevant only in settings that afford it. Bravery, for example, does not – indeed, cannot – show itself as one is standing in the checkout line of a grocery store. But if the store is being robbed, then a person can manifest varying degrees of valor.

Throughout their book, Peterson and Seligman (2004) suggested that certain strengths are more tonic or phasic in nature. Peterson and Seligman described kindness, humor, curiosity, modesty, and zest as tonic strengths that would be displayed in a relatively steady and consistent pattern. In contrast, Peterson and Seligman described bravery, teamwork, and open-mindedness as phasic strengths displayed only in situations that elicit the strength. Peterson and Seligman also suggested that while some strengths like hope, optimism, and forgiveness have been commonly studied as if they are tonic, they may in fact be phasic in nature.

In essence, Peterson and Seligman (2004) assumed that (a) use of strengths may vary across contexts and situations and (b) some strengths may be more applicable across a broad variety of situations and will appear more consistent or less contextualized, while other strengths will be used less frequently in some specific situations and will appear more contextualized. However, little research has examined whether these assumptions are true.

In fact, only one study could be located that examined variability in character strengths across different situations. Harzer and Ruch (2013) examined variability in applicability of character strengths across situations at the workplace and in private life. They hypothesized that the formal

aspects of the work environment, in which norms are determined by job characteristics, co-workers, and supervisors, may limit freedom of expression of strengths. Harzer and Ruch found that the virtue of wisdom as well as the strengths of leadership, prudence, and self-regulation were more applicable in work than in private life. In contrast, the virtues of courage, humanity, and transcendence as well as the character strengths of forgiveness and modesty were more applicable in private life than at work. While Harzer and Ruch clearly demonstrated that strengths are more or less applicable in different contexts, only two broad contexts were examined.

The first purpose of the present study is to further examine the tonic and phasic nature of character strengths, while building on past work by Harzer and Ruch (2013) by examining character strengths across one general and three specific contexts (while eating, while exercising, and while working). On par with most measures of character strengths (e.g., Values in Action Inventory, Peterson & Seligman, 2004), participants responded to how much descriptions of character strengths are “like me” or “unlike me.” Character strengths in three contexts and general use were compared, enabling testing of Peterson and Seligman’s (2004) hypothesis that some character strengths are more phasic while others are more tonic in nature. First, work was selected because individuals working full-time will spend about half of their waking hours in that context. Second, eating was chosen because everyone must eat every day, and eating healthier is a way to improve health. Similarly, exercise was chosen because, while more voluntary in nature, exercise can also improve mental and physical health.

In addition, while general character strengths use has been associated with a host of positive outcomes such as life satisfaction, positive affect, and less depression, the positive outcome variables tend to be more global and less context-bound in nature. However, it is not clear if context-specific character strengths predict context-specific positive outcomes. For example, Chen and Chang (2017) demonstrated that a sport-specific measure of gratitude predicted athlete burnout and team satisfaction above and beyond a general measure of gratitude, emphasizing the importance of more context-specific assessment. It is also possible that, given differences between contexts, different character strengths will predict positive outcomes in each context. For example, eating healthy may be more conducive to using prudence as eating healthy will include saying no to delicious, yet unhealthy food options in the moment. In contrast, zest may better predict exercise behavior in which energy is required to start and complete an exercise session. Finally, work settings may be more conducive for interpersonal strengths such as social intelligence, kindness, and leadership because of the necessity of social interactions and hierarchical structures within many work settings.

The second main purpose of this study is to examine if the specific character strengths associated with positive outcomes in different contexts (i.e., eating, exercise, work) vary. This is an important question to ask, as context-specific interventions to improve outcomes will be most effective if they focus on those specific character strengths that are most closely linked to positive outcomes within that specific context. In the current study, positive outcomes within the specific contexts will be assessed with measures of exercise and eating behaviors and job satisfaction as well as psychological need satisfaction. Psychological need satisfaction within a specific context will be assessed with self-determination theory’s psychological needs of competence, autonomy, and relatedness, as satisfaction of these needs is considered essential for psychological growth, more adaptive forms of

motivation, and enhanced wellbeing (e.g., Deci & Ryan, 2000; Teixeira, Carraca, Markland, Silva, & Ryan, 2012; Van den Broeck, Ferris, Chang, & Rosen, 2016).

In the work context, several character strengths have been associated with positive outcomes. For example, using strengths such as zest, hope, curiosity, gratitude, spirituality and social intelligence have been associated with greater work satisfaction and seeing your job as a calling (e.g., Elangovan, Pinder, & McLean, 2010; Peterson, Stephens, Park, Lee, & Seligman, 2010). Perseverance may be the key to job performance (Littman-Ovadia & Lavy, 2015). General strengths use is associated with higher job satisfaction, wellbeing, harmonious passion, and sense of meaning in life at work (e.g., Harzer & Ruch, 2012, 2013, Littman-Ovadia & Steger, 2010). Another study by Littman-Ovadia, Lavy, and Boiman-Meshita (2017) demonstrated that using a set group of happiness strengths (i.e., hope, love, gratitude, zest, curiosity) predicted meaningfulness, engagement, and satisfaction at work better than use of an individual's own top strengths. Clearly, a broad variety of strengths are associated with positive outcomes in work settings.

In the eating and exercise contexts, very little research links character strengths with positive outcomes. One large study by Proyer, Gander, Wellenzohn, and Ruch (2013) examined the links between generally-measured character strengths and different aspects of health. Regarding physical activity, total physical fitness was significantly correlated with the strengths of curiosity, zest, self-regulation, leadership, and hope. Regarding a healthy diet, only self-regulation was significantly correlated. In another study, Stuntz (2017) demonstrated that the exercise-specific character strengths which best related to exercise behavior included the “fortitude” strengths of self-regulation, perseverance, zest, perspective, appreciation of beauty, hope, leadership, bravery, and gratitude. Thus, even when character strengths are measured at a general level, a variety of character strengths are associated with health behaviors, including exercise and eating.

The current study examined (a) similarity of levels of character strengths across different specific contexts, (b) how contextualized (tonic/phasic) strengths are, and (c) if the context-specific character strengths associated with exercise-, work-, and eating-related positive outcomes are similar or different. It was hypothesized that, in general, character strengths would vary across the contexts and that character strengths would be associated with more positive outcomes across contexts, although there may be different strengths identified in each context once assessed at the context-specific level. Thus, while past work has assessed character strengths at a very general level of measurement, the current study extended beyond past work by measuring strengths in three specific contexts, examining whether Peterson and Seligman's (2004) assumptions about the tonic and phasic nature of character strengths is supported by research, and comparing both levels of character strengths and links with positive outcomes across those different contexts. As these purposes are exploratory in nature, no hypotheses regarding specific strengths have been forwarded.

## **Method**

### **Participants**

Participants included 270 adults (173 male, 96 female, 1 other gender identity) between the ages of 18 and 68 years ( $M = 33.9$  years,  $SD = 9.7$ ). A majority of participants were White (68.1%), with

Asian (17.8%), Black or African American (6.7%), Hispanic (5.5%), American Indian or Alaska Native (1.1%), and Other (1.1%) also represented. Current employment was a necessary selection criteria. Participants were recruited through Amazon Mechanical Turk with a notice describing an academic survey about character strengths in different aspects of their life, and each participant was paid \$2 (USD) for their participation.

## Measures

**Character Strengths.** Participants completed a modified version of the 24-item character strengths measure developed and validated by Ruch, Martinez-Marti, Proyer, and Harzer (2014). Ruch et al. recommend this scale for use in studies when “economy of instruments is at a premium” (p. 53), such as the repeated measures design of the current study that asked participants to complete the items once in general and also for three specific contexts (modification) during a single session. This measure has been used successfully in past work (e.g., Martinez-Marti & Ruch, 2014). The instructions stated,

“The following 24 statements reflect characteristics that many people would find desirable, but we want you to answer only in terms of whether the statement describes what you are like. Please be honest and accurate! Please do not describe yourself as someone you aspire to be but as you actually are. You will respond to each character strength four times regarding how you think and act in different aspects of your life:

1. *In general across all aspects of your life.*
2. *While eating.* This can include any time you are planning or preparing to eat as well as how you think and act while eating.
3. *While exercising.* This can include any time you are planning or preparing to be physically active as well as how you think and act during physical activity sessions.
4. *While working at your place of employment.*

The way you think and act may be similar across these contexts or it may differ. Please respond with how you actually are, not as someone you aspire to be within each context.”

A sample character strength description reads, “*Bravery (valor):* Brave and courageous people do not shrink from threat, challenge, difficulty, or pain. They speak up for their opinions and convictions even if there is opposition.” After reading each strength description, participants responded on a Likert-type scale ranging from 1 (*very much unlike me*) to 7 (*very much like me*) four times (in general, while eating, while exercising, while working). Due to a clerical error, humor was not included in the questionnaire; thus this measure included 92 items total. Reliability for each strength across the four versions ranged from .71 (curiosity) to .96 (religiousness).

**Psychological Need Satisfaction.** Participants completed a modified version of the 9-item measure from La Guardia, Ryan, Couchman, and Deci (2000) assessing perceived competence, relatedness, and autonomy three times, once for each stem “When I am eating,” “When I am physically active,” and “When I am at work,” for a total of 27 items. Sample items include, “When I am eating, I have a say in what happens, and I can voice my opinion” (autonomy, eating), “When I am physically active, I feel very capable and effective” (competence, exercising), and “When I am at work, I feel loved and cared about” (relatedness, working). The Likert-type response scale ranged from 1 (*Not at all true*) to 7 (*Very true*). LaGuardia et al. demonstrated factorial and concurrent validity. In order

to achieve adequate reliability and maintain comparability across contexts in the current study, the reverse coded item for each need was removed. Final reliability was adequate to good for each of the nine subscales (competence: eating  $\alpha = .84$ , exercising  $\alpha = .81$ , working  $\alpha = .88$ ; autonomy: eating  $\alpha = .71$ , exercising  $\alpha = .73$ , working  $\alpha = .78$ ; relatedness: eating  $\alpha = .74$ , exercising  $\alpha = .83$ , working  $\alpha = .83$ ).

**Job Satisfaction.** Participants completed the 5 item Andrews and Withey Job Satisfaction Questionnaire validated by Rentsch and Steel (1992). Sample items read, “How do you feel about your job?” and “How do you feel about the work you do on your job – the work itself?” Response options ranged from 1 (*terrible*) to 7 (*delighted*). Reliability was strong in the current sample ( $\alpha = .88$ ).

**Eating and Physical Activity Behaviors.** To assess healthy eating patterns, participants responded to the item, “In general, how healthy is your overall diet?” with responses ranging from 1 (*poor*) to 5 (*excellent*) (CDC, 2017). They then responded to items, “How many days per week do you...eat at least two servings of fruit” and “...eat at least two servings of vegetables?” with responses ranging from 0 to 7 days per week (Troczel, Barnes, & Egget, 2000). Reliability for these three items representing overall diet quality was adequate at  $\alpha = .70$ . To assess exercise behavior, as in Troczel et al. (2000), participants were first provided with a description of moderate activity (“a moderate amount of physical activity is 30 minutes or more of moderately intense activities such as brisk walking, or 15-20 minutes of more intense activities such as jogging or playing basketball.”). Participants then indicated, “How many days per week do you... engage in at least a moderate amount of physical activity?” and “...engage in weight lifting or some form of strength training (including activities such as yoga)?” with responses ranging from 0 to 7 days per week. Reliability for these two items was weak ( $\alpha = .61$ ), but this indicator of physical activity behavior was retained in analyses for comparison purposes.

### **Data Analysis Plan**

Before running the main analyses, data were checked for skewness, kurtosis, and univariate and multivariate outliers. As a result, data from 17 participants were removed, leaving 270 participants. Then, several approaches to data analysis were taken to examine character strengths across contexts, including repeated measures ANOVAs to examine differences in mean scores across contexts, intraclass coefficients (ICC) to examine how contextualized the strengths were, and Spearman correlations to examine the degree of relationship in relative rank of strengths across contexts. Finally to determine if the character strengths that best associate with positive outcomes varied across the specific contexts, the relationship between the set of context-specific character strengths and a set of positive outcomes within the same context was examined using three separate canonical correlation analyses. Canonical correlation analysis was chosen to examine the relationships between these sets of variables because no specific groupings of character strengths needed to be specified in advance, multiple orthogonal significant canonical correlations are allowed, and the combinations of strengths and of positive outcomes can vary from one significant canonical correlation to another.

## Results

### Levels of Strengths across Contexts

In order to examine whether participants indicated using specific character strengths differently across the four contexts (in general, while eating, while exercising, while working), a series of repeated measures ANOVA were run with Greenhouse-Geisser corrections (see Table 1). A Bonferroni correction was employed to reduce the family-wise error rate ( $.05/23 = .002$ ). In all cases, the within-subjects effects were significant at  $p < .001$ , with between 4% (zest) and 29% (teamwork) of the variance explained. After examining post-hoc comparisons, several different patterns emerged. Among most of the character strengths, the highest values were for the “in general” and “while working” variations, and for many strengths those two contexts did not differ from each other (honesty, creativity, love of learning, judgment, perspective, social intelligence, zest, fairness, forgiveness, modesty). Also, the “while eating” and “while exercising” variations often did not differ from each other (creativity, love of learning, judgment, love, kindness, social intelligence, teamwork, zest, fairness, forgiveness, religiousness). For many strengths, the “while eating” and “while exercising” variations were often significantly lower (more “unlike me”) than the “in general” and “while working” variations ( $ps < .01$ , fairness, judgment, love of learning, zest, creativity, forgiveness, social intelligence, curiosity, perseverance, bravery, self-regulation, prudence, leadership).

To determine the degree of variation within and between-participants, the ICC was calculated for each strength using multilevel modeling (level 1: within individuals, level 2: between individuals). The ICC represents the population estimate of the percentage of variance in character strengths explained by differences between people and essentially shows how tonic, trait-like, or consistent across contexts each strength is. The strength with the highest ICC was religiousness indicating more between-person variability (86% variability between different participants) than within-person variability (14% variability within participants across the four measurements) (see Table 1). Thus, religiousness is less contextualized or more tonic. Similarly, the total variability for less-contextualized social intelligence consisted of more between-person variability (62%) than within person variability (38%), although this strength is more contextualized than religiousness. In contrast, more-contextualized (more phasic or situation-specific) curiosity had the lowest ICC value indicating more than half of the variability (62%) was within-person variability across the contexts while less than half (38%) was between-person variability. Most of the ICCs ranged from .43 to .58, indicating variability is fairly evenly split between between-person and within-person variability. Thus, most strengths are somewhat contextualized, but somewhat context-independent.

In addition, for each participant, the relative rank of each strength was calculated. (The rank of 1 was given to the strength with the highest score, so lower rank values indicated top strengths. Ties were given the lowest rank value.) Then, the mean rank across all participants was computed for each strength in each context. Mean rank of each strength was fairly consistent across the different contexts (see Table 1). To examine in general how related ranks of strengths were across contexts, Spearman rank order correlations were computed for each pair of contexts. Average Spearman correlations across the 23 strengths were then computed.

**Table 1.** Character strengths in general and across specific contexts: differences in mean values, intraclass correlations, and ranks

	Mean Values				Context differences	Overall Multivariate Effects		Within Subjects Effects		Mean Ranks				
	1. General	2. Eating	3. Exercise	4. Work		p	eta <sup>2</sup>	p	pe <sub>eta</sub> <sup>2</sup>	ICC	General	Eating	Exercise	Work
Curiosity	5.71	5.10	4.69	5.49	all diff	<.001	0.29	<.001	0.14	0.38	5.93	6.35	8.78	7.29
Perseverance	5.57	4.70	5.29	5.79	all diff	<.001	0.35	<.001	0.17	0.43	6.46	8.43	6.00	5.30
Fairness	5.94	5.16	5.07	5.84	1=4, 2=3	<.001	0.26	<.001	0.16	0.43	4.28	5.58	6.18	4.56
Judgment	5.79	4.92	5.00	5.68	1=4, 2=3	<.001	0.30	<.001	0.17	0.45	5.43	7.45	7.23	5.84
Love of learning	5.77	4.79	4.95	5.72	1=4, 2=3	<.001	0.32	<.001	0.19	0.45	5.88	7.66	6.98	5.57
Honesty	5.90	5.18	5.39	5.88	1=4	<.001	0.22	<.001	0.13	0.47	4.69	5.93	5.11	4.53
Teamwork	5.52	4.42	4.54	5.72	2=3	<.001	0.41	<.001	0.29	0.47	7.10	9.72	9.37	5.51
Bravery	4.99	4.20	4.76	5.19	all diff	<.001	0.27	<.001	0.15	0.48	11.47	11.15	8.34	10.08
Perspective	5.45	4.46	4.66	5.55	1=4	<.001	0.37	<.001	0.24	0.48	7.99	9.44	8.89	6.78
Self-regulation	5.39	4.84	5.09	5.62	all diff	<.001	0.21	<.001	0.10	0.49	8.06	8.57	7.27	6.57
Appreciation of beauty	5.70	5.01	4.79	5.15	2=4	<.001	0.27	<.001	0.12	0.49	6.11	6.71	8.17	9.29
Zest	5.18	4.83	4.97	5.30	1=4, 2=3	<.001	0.11	<.001	0.04	0.51	9.47	8.18	7.47	8.39
Modesty	5.60	4.84	5.04	5.55	1=4	<.001	0.22	<.001	0.13	0.51	6.89	7.23	7.13	6.78
Creativity	5.24	4.62	4.45	5.26	1=4, 2=3	<.001	0.28	<.001	0.14	0.51	9.13	9.29	10.47	8.97
Kindness	5.76	4.76	4.76	5.54	2=3	<.001	0.36	<.001	0.22	0.52	5.64	7.71	7.81	6.69
Gratitude	5.74	5.34	4.90	5.45	2=4	<.001	0.21	<.001	0.11	0.52	5.48	5.20	7.61	7.09
Prudence	5.53	4.70	4.99	5.66	all diff	<.001	0.28	<.001	0.17	0.53	7.43	8.51	7.30	6.64
Forgiveness	5.27	4.51	4.65	5.30	1=4, 2=3	<.001	0.23	<.001	0.13	0.53	8.67	8.95	9.01	8.46
Love	5.54	4.56	4.48	4.86	2=3	<.001	0.32	<.001	0.17	0.55	6.96	8.64	9.58	11.21
Hope	5.42	4.81	5.21	5.29	3=4	<.001	0.14	<.001	0.07	0.57	7.67	7.53	6.12	8.37
Leadership	4.93	4.14	4.31	5.14	all diff	<.001	0.29	<.001	0.18	0.58	10.76	11.28	11.10	9.55
Social intelligence	5.35	4.71	4.68	5.37	1=4, 2=3	<.001	0.26	<.001	0.15	0.62	8.09	7.90	8.49	7.76
Religiousness	3.59	3.19	3.23	3.42	2=3	<.001	0.10	<.001	0.05	0.86	15.39	14.78	15.32	16.21

Note: All mean context values were significantly different from one another with the exception of those with “=” A Bonferroni correction was used to minimize Type I error (.05/23 = .002). ICC = Intraclass coefficient. For ranks within a specific context, lower numbers indicate higher mean scores.



Fairly large positive correlations emerged between ranks for “in general” and “while working” (mean  $r_s = .56$ ) and between “while eating” and “while exercising” (mean  $r_s = .51$ ), indicating fairly strong positive relationships in the relative position of each strength between these two pairs of contexts. More moderate positive correlations emerged between the ranks of each strength across the remaining pairs of contexts: “while exercising” and “while working” (mean  $r_s = .43$ ), “in general” and “while exercising” (mean  $r_s = .42$ ), “in general” and “while eating” (mean  $r_s = .41$ ), and “while working” and “while eating” (mean  $r_s = .38$ ). While the strengths’ scores may vary from context to context, the relative rank of character strengths across contexts is fairly strongly related.

### **Context-Specific Strengths and Context-Specific Positive Outcomes**

**Exercise.** First, a canonical correlation analysis with the 23 exercise-focused character strengths as predictor variables and the exercise positive outcomes (exercise behavior, autonomy, competence, relatedness) as criterion variables was conducted. The overall relationship between exercise character strengths and criterion variables was significant, Wilks’  $\lambda = .26$ ,  $F(92, 920.7) = 4.03$ ,  $p < .001$ . Four significant canonical correlations were identified.

The first canonical correlation between the two sets of variables was .72 (51.5% shared variance,  $p < .001$ ), indicating a strong relationship between character strengths and positive outcomes for the exercise context (see Table 2). Canonical loadings greater than .30 were used to identify which specific variables contributed to the multivariate relationship between the sets of variables. Examination of the canonical loadings revealed that all 23 character strengths and all of the positive outcomes were related. In other words, higher levels of all character strengths were associated with greater exercise behavior as well as satisfaction of the needs of autonomy, competence, and relatedness. The redundancy index was 32.6%, indicating the variance in the criterion set explained by the set of predictor variables.

The second significant canonical correlation was .47 (22.5% shared variance,  $p < .001$ ), indicating a moderately strong relationship between the sets of variables. Examination of the canonical loadings revealed that higher religiousness and lower honesty, judgment, and gratitude were important predictor variables, while higher exercise behaviors and lower exercise autonomy were important criterion variables. Thus, individuals with the combination of higher religiousness and lower honesty, gratitude, and critical judgment were more likely to exercise but also felt more controlled while exercising. An additional 3.5% of the variance in the criterion set was explained by these character strengths.

The third significant canonical correlation was .44 (19.3% shared variance,  $p < .001$ ), indicating a moderately strong relationship between the sets of variables. Examination of the canonical loadings revealed that higher zest and lower love, kindness, gratitude, and religiousness were important predictor variables, while higher perceived competence and lower perceived relatedness were important criterion variables. An additional 2.2% of the variance in the criterion set was explained by these character strengths. Individuals who had the combination of more energy (zest) and lower personal connections to others through love, kindness, gratitude, and religiousness felt they were good at exercise but did not feel as connected to others through exercise.

**Table 2.** Canonical correlation results between character strengths and positive outcomes in exercise, work, and eating contexts

	Canonical Loadings for Each Variate								
	1 <sup>st</sup> Exercise	2 <sup>nd</sup> Exercise	3 <sup>rd</sup> Exercise	4 <sup>th</sup> Exercise	1 <sup>st</sup> Work	2 <sup>nd</sup> Work	1 <sup>st</sup> Eating	2 <sup>nd</sup> Eating	3 <sup>rd</sup> Eating
<b>Character Strengths Set</b>									
Bravery	<b>-0.64</b>	0.10	0.01	-0.13	<b>-0.58</b>	-0.28	<b>-0.45</b>	0.15	0.02
Honesty	<b>-0.55</b>	<b>-0.46</b>	-0.05	-0.06	<b>-0.73</b>	0.06	<b>-0.59</b>	<b>-0.30</b>	0.03
Creativity	<b>-0.62</b>	0.08	-0.05	0.29	<b>-0.61</b>	-0.12	<b>-0.34</b>	0.06	0.18
Love of learning	<b>-0.67</b>	-0.08	0.06	0.14	<b>-0.64</b>	-0.07	<b>-0.53</b>	-0.12	0.20
Judgment	<b>-0.59</b>	<b>-0.43</b>	-0.02	0.20	<b>-0.59</b>	0.12	<b>-0.52</b>	0.29	0.06
Perspective	<b>-0.68</b>	-0.18	-0.10	<b>0.37</b>	<b>-0.73</b>	-0.01	<b>-0.65</b>	0.17	0.29
Perseverance	<b>-0.65</b>	-0.12	0.26	0.16	<b>-0.69</b>	0.23	<b>-0.45</b>	-0.12	-0.06
Curious	<b>-0.69</b>	-0.20	0.11	0.16	<b>-0.57</b>	-0.24	<b>-0.40</b>	0.20	0.19
Love	<b>-0.55</b>	-0.15	<b>-0.41</b>	0.09	<b>-0.52</b>	<b>-0.54</b>	<b>-0.53</b>	0.10	-0.10
Kindness	<b>-0.68</b>	-0.13	<b>-0.33</b>	-0.24	<b>-0.71</b>	-0.09	<b>-0.47</b>	0.11	-0.29
Social Intelligence	<b>-0.61</b>	-0.29	-0.28	0.04	<b>-0.63</b>	-0.13	<b>-0.65</b>	-0.05	-0.17
Teamwork	<b>-0.52</b>	-0.19	-0.19	0.00	<b>-0.74</b>	0.00	<b>-0.50</b>	0.09	-0.17
Zest	<b>-0.76</b>	-0.09	<b>0.37</b>	0.12	<b>-0.71</b>	<b>-0.34</b>	<b>-0.59</b>	-0.04	-0.26
Fairness	<b>-0.45</b>	-0.14	-0.16	0.12	<b>-0.82</b>	0.06	<b>-0.52</b>	-0.02	0.07
Leadership	<b>-0.65</b>	0.10	-0.23	0.13	<b>-0.61</b>	<b>-0.37</b>	<b>-0.62</b>	0.07	-0.10
Forgiveness	<b>-0.46</b>	-0.21	-0.16	-0.27	<b>-0.63</b>	-0.19	<b>-0.38</b>	0.25	-0.05
Modesty	<b>-0.35</b>	-0.11	-0.11	0.12	<b>-0.62</b>	0.02	<b>-0.33</b>	0.15	0.08
Prudence	<b>-0.61</b>	-0.14	-0.04	0.04	<b>-0.58</b>	0.07	<b>-0.49</b>	<b>0.36</b>	0.00
Self-regulation	<b>-0.65</b>	0.03	0.16	0.20	<b>-0.75</b>	0.10	<b>-0.58</b>	0.22	0.05
Appreciation of beauty	<b>-0.64</b>	0.10	0.03	-0.05	<b>-0.63</b>	-0.17	<b>-0.51</b>	0.00	-0.08
Gratitude	<b>-0.65</b>	<b>-0.30</b>	<b>-0.31</b>	0.15	<b>-0.63</b>	-0.29	<b>-0.49</b>	0.08	-0.14
Hope	<b>-0.66</b>	-0.05	0.15	-0.01	<b>-0.76</b>	-0.29	<b>-0.78</b>	-0.03	0.11
Religiousness	<b>-0.57</b>	<b>0.31</b>	<b>-0.44</b>	0.02	-0.23	<b>-0.61</b>	<b>-0.47</b>	0.18	<b>-0.32</b>
<b>Percent of variance in cov</b>									
Redundancy	0.373	0.042	0.047	0.027	0.422	0.062	0.275	0.028	0.026
<b>Positive Outcomes Set</b>									
Exercise behavior	<b>-0.69</b>	<b>0.55</b>	0.17	<b>0.43</b>					
Job satisfaction					<b>-0.81</b>	<b>-0.37</b>			
Healthy eating behavior							-0.24	<b>0.86</b>	<b>0.39</b>
Autonomy	<b>-0.79</b>	<b>-0.51</b>	0.08	<b>0.34</b>	<b>-0.75</b>	<b>-0.48</b>	<b>-0.85</b>	0.01	-0.08
Competence	<b>-0.87</b>	-0.23	<b>0.35</b>	-0.26	<b>-0.98</b>	0.14	<b>-0.97</b>	0.00	0.23
Relatedness	<b>-0.82</b>	0.02	<b>-0.54</b>	-0.18	<b>-0.52</b>	<b>-0.81</b>	<b>-0.77</b>	<b>0.31</b>	<b>-0.52</b>
<b>Percent of variance in DV</b>									
Redundancy	0.633	0.155	0.113	0.988	0.615	0.261	0.577	0.208	0.120
Canonical correlation	0.326	0.035	0.022	0.014	0.313	0.067	0.220	0.042	0.021
Canonical correlation	0.718	0.474	0.439	0.370	0.713	0.507	0.618	0.446	0.419

Note. Bold values are above 0.30 and contribute to the multivariate relationship. Percent of variance in cov/DV refers to the percentage of variance in the set of strengths/positive outcomes explained by the relevant canonical variate, respectively. Redundancy refers to how much variance in one set is explained by the other set's variate.

The fourth significant canonical correlation was .37 (13.7% shared variance,  $p = .016$ ), indicating a moderate relationship between the sets of variables. Examination of the canonical loadings revealed that greater perspective was an important predictor variable, while higher exercise behavior and perceived autonomy were important criterion variables. An additional 1.4% of the variance in the criterion set was explained by this character strength. People who are better at taking a big picture perspective also exercised more and believed they were more self-directed exercisers.

**Work.** Next, a canonical correlation analysis with the 23 work-focused character strengths as predictor variables and work positive outcomes (job satisfaction, autonomy, competence, relatedness) as criterion variables was conducted. The overall relationship between work character strengths and positive outcomes was significant, Wilks'  $\lambda = .30$ ,  $F(92, 908.91) = 3.54$ ,  $p < .001$ , with two significant canonical correlations identified.

The first significant canonical correlation between the two sets of variables was .71 (50.8% shared variance,  $p < .001$ ), indicating a strong relationship. All character strengths except religiousness and all work positive outcomes were related. In other words, higher levels of all work-related character strengths (except religiousness) were associated with greater job satisfaction as well as satisfaction of the needs of autonomy, competence, and relatedness. Also, 31.3% of the variance in work positive outcomes was explained by character strengths.

The second significant canonical correlation was .51 (25.7% shared variance,  $p < .001$ ), indicating a moderately strong relationship. Higher love, zest, leadership, and religiousness were important predictor variables, and higher job satisfaction, perceived autonomy, and perceived relatedness were important criterion variables. An additional 6.7% of the variance in the work positive outcomes was explained by the second set of character strengths. Thus, individuals who had the combination of being more loving, more religious, and kinder with having stronger leadership skills also had stronger social relationships at work, felt more autonomous in their jobs, and were more satisfied with their jobs (but work perceived competence was not related).

**Eating.** Finally, a canonical correlation analysis with the 23 eating-focused character strengths as predictor variables and the eating positive outcomes (healthy eating, autonomy, competence, relatedness) as criterion variables was conducted. The overall relationship between eating character strengths and outcome variables was significant, Wilks'  $\lambda = .37$ ,  $F(92, 932.65) = 2.88$ ,  $p < .001$ , with three significant canonical correlations identified.

The first correlation between the two sets of variables was .62 (38.2% shared variance,  $p < .001$ ), indicating a moderately strong relationship; 22% of the variance in the criterion variables was explained by character strengths. All 23 character strengths were important predictor variables and perceived autonomy, competence, and relatedness were important criterion variables. In other words, higher levels of all character strengths were associated with greater satisfaction of the needs of autonomy, competence, and relatedness (but not healthy eating behaviors).

The second significant canonical correlation was .45 (19.9% shared variance,  $p < .001$ ), indicating a moderate relationship, with an additional 4.2% of the variance in the criterion set explained by character strengths. Higher prudence and lower honesty were important predictor variables, while healthier eating behaviors and higher perceived relatedness were important criterion variables. Thus, individuals who were both more careful and cautious with their choices and who were less honest were more likely to report *healthier* eating and feel more connected to others while eating.

The third significant canonical correlation was .42 (17.5% shared variance,  $p = .003$ ), indicating a moderate relationship. Lower religiousness was an important predictor variable, while healthier eating behaviors and lower perceived relatedness were important criterion variables, with an additional 2.1% of the variance in positive outcomes explained by this character strength. Thus,

individuals who were more religious also both tended to eat *less healthy* and feel more connected to others while eating.

## Discussion

The current study examined whether levels of character strengths varied across specific contexts, assessed how contextualized character strengths really are, and determined whether the character strengths associated with positive outcomes within each specific context differed.

### Level of Strengths across Contexts

Peterson and Seligman (2004) suggested that some strengths would be more tonic and implemented consistently over a variety of contexts, while other strengths would be more phasic and elicited only in certain types of situations. To assess whether this assumption is true, the current study examined (1) differences in mean values for each strength across the different contexts, (2) the relative amount of between-person and within-person variability in each strength, and (3) the patterns of association of relative rank of strengths between different contexts.

As a result of these analyses, several conclusions emerged. For all of the character strengths, how descriptive of themselves or “like me” participants thought the character strengths were differed significantly across the contexts. First, for all character strengths except appreciation of beauty, gratitude, and hope, participants viewed themselves as enacting character strengths more in general (when any context or situation could be imagined) and for working (which encompasses a large portion of participants’ waking hours and a variety of tasks and situations) than for exercising and eating. Also, the association between ranks of strengths across general and working contexts was fairly strong, indicating similar perceptions of applicability across these contexts. However, several strengths did differ between in general and while working contexts. Similar to Harzer and Ruch (2013), leadership, prudence, and self-regulation were more applicable at work than in general/private life, and kindness, love, appreciation of beauty, hope, religiousness, and gratitude were more applicable in general/private life than at work. However, three strengths showed opposite relationships in Harzer and Ruch and the current study, with private life more than work in one study and work more than private life in the other (curiosity, bravery, and perseverance); in addition, many strengths showed significant findings in one study but not the other. Perhaps these differences stem from different assessment methods in the two studies, with applicability of strengths assessed in Harzer and Ruch and how well the strengths describe you in the current study.

Second, while the patterns were not completely consistent across the strengths, for many strengths both (a) participants reported believing the strengths were similarly descriptive of them for the “while eating” and “while exercising” contexts and (b) the association between relative ranks of strengths across eating and exercising contexts was fairly strong, indicating similar perceptions of applicability of these strengths to eating and exercising. Perhaps this is because eating healthy and exercising are events that occur less frequently and for less total time, yet are also behaviors that require effort and energy to enact. Regardless, responses to broader contexts with more possible situations to consider and longer time-frame (general, work) are more similar to each other than are the responses for contexts with a narrower scope and time-frame (exercise, eating).

Third, the vast majority of the strengths showed a moderate level of contextualization. For most strengths, about half of the variance in responses was due to between-people variation and about half of the variance was due to within-person variation across the specific situations. There were a few exceptions to this general description. Religiousness was by far the least contextualized (most tonic, least phasic) of all of the character strengths. Unlike Peterson and Seligman's (2004) suggestion that the strengths of humor, kindness, curiosity, modesty, and zest should be more tonic and consistent across contexts, the findings of the current study suggest that implementation of these strengths varies somewhat across the contexts considered. Peterson and Seligman also suggested that bravery, teamwork, and open-mindedness (judgment) would be more phasic in nature and less likely to be implemented across a variety of contexts; the current study showed a moderate level of contextualization for these strengths. Again, while there is variability in implementation across contexts, for these strengths, similar variability existed across people and contexts.

### **Are the Same Character Strengths Associated with Positive Outcomes While Eating, Exercising, and Working?**

In each of the three contexts, the best predictors of context-specific positive outcomes were very similar, and a large proportion of the variance in positive outcomes was explained. Scoring higher across all of the 23 context-specific strengths (with the minor exception of religiousness for the work context) related to feeling more competent, feeling more interpersonally connected, and more autonomous in all contexts. In addition, higher scores across the full sets of strengths specific to that context also related to more exercise behavior and higher job satisfaction, but not healthier eating. Similar to research that shows a broad variety of strengths (or strength across the strengths) is predictive of greater wellbeing (Young, Kashdan, & Macatee, 2015), these findings suggest that being higher and balanced across all of the strengths is beneficial.

While the sets of strengths that included all (or all but religiousness for work) explained a large amount of the variance in positive outcomes, other orthogonal solutions were significant as well. Regarding exercise, participants who combined being more religious with also being less grateful, less honest, and less judgmental while exercising were more physically active but felt they had less choice while exercising, although this effect size was rather small. Perhaps these individuals enacted their churches' teachings regarding behaviors to follow, including treating their body as a temple, but did not fully identify with or endorse those teachings. Also, individuals with the combination of more zest and fewer connections to others (lower love, kindness, gratitude, and religiousness) felt more confident but did not feel interpersonally connected while exercising, although again this was a fairly small effect. Finally, having wisdom and a bigger-picture perspective was related to exercising more and feeling more competent while exercising. While the effect size was small, it does suggest a possible additional benefit of encouraging a mature and wise view on life for exercise behaviors. These current-study findings align somewhat with Stuntz (2017) that found higher fortitude strengths emphasizing taking a longer-term, big-picture perspective predicted more exercise behavior.

While working, there were additional benefits for job satisfaction and feeling more socially connected and autonomous among individuals who also had higher leadership, zest, love, and religiousness. As this study was cross-sectional in nature, it is not clear whether these strengths

describe people who are already in higher-level leadership positions at their job or illustrates those personal characteristics that would best predict future job success and promotion.

While eating, individuals who were more prudent yet less honest also reported eating healthier and feeling more connected to others while eating. Perhaps this suggests that these less honest people are more prone to over-report how healthy their eating habits are, despite their cautious nature. Including observational measures of diet healthiness would complement self-report measures well. In addition, more religious individuals also reported eating less healthily but felt more connected to others. Perhaps religious individuals are more likely to sit down with others while eating or to involve others in prayer before meals, both of which could enhance feelings of social connection.

## Conclusions

Overall, the findings of the current study suggest that (a) in general, strengths are used more in some contexts than in others, (b) most strengths are moderately contextualized in nature, despite Peterson and Seligman's (2004) hypothesizing, and (c) in general, perceiving all strengths to be descriptive predicts positive outcomes across the different contexts.

However, the current study used a cross-sectional design rather than a longitudinal or an experimental one, so causality can only be inferred. Also, the possible mechanisms behind why these strengths help enhance positive outcomes remain unknown. Are the mechanisms behind the effective use of character strengths consistent across contexts, or are there specific aspects of each context that make use of character strengths easier or more applicable? Harzer and Ruch (2013), for example, examined perceptions of applicability of strengths within contexts rather than examining how "like me" descriptions of each strength are in different contexts (as in the current study). Which aspect is more important in predicting positive outcomes could be examined by future research. In addition, the influence of different cultures on strengths use may also be an important direction for future research.

A broader variety of contexts than work, exercise, and eating could be examined. Also, digging deeper within each context to examine more specific situations (e.g., individual or group settings, novel or familiar activities and skills, competitive or cooperative environments) could further examine the applicability and descriptiveness of character strengths across contexts. It may be interesting to examine whether people who excel in certain contexts (e.g., high level athletes or sales leaders) differ in terms of level of character strengths when compared to people who also participate in the same context but with lower levels of success (e.g., recreational sport participants or average salespeople).

Overall, it appears that character strengths are used across different contexts to varying degrees. Most of the character strengths are moderately contextualized, showing a fair amount of consistency across contexts and a fair amount of differences between people. Use of a broad group of character strengths relates to greater perceived autonomy, competence, and relatedness within the eating, exercising, and work contexts. Context-specific interventions may help identify new ways for participants to use character strengths within each context. In return when using these character strengths within specific contexts, participants are likely to reap context-specific gains in positive outcomes.

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