Character Strengths as Complementary Predictors of Anxiety Symptoms

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Introduction

Character strengths, such as leadership or creativity, have been identified within positive psychology as a class of individual difference psychological and behavioral mechanisms that promote adaptiveness and well-being (Peterson and Seligman 2004; Park and Peterson 2009; Baer 2015). The identification and elaboration of putative character strengths have been primarily theory-driven and have been organized in a corresponding fashion with putative character virtues, or widely agreed upon salutary moral characteristics, as their source (Peterson and Seligman 2004). There is evidence for the validity of the character strengths and virtues typology (Ruch and Proyer 2015; McGrath 2015; for an alternative perspective on cross-cultural applicability, see Banicki 2014). Moreover, character strengths individually and in the aggregate have accumulated considerable empirical support for their value in decreasing distress and enhancing quality of life and coping (Park and Peterson 2009; Gustems-Carnicer and Calderón 2016; Höfer et al. 2019).

However, the exact nature of the latent relationships amongst character strengths has been investigated less so, particularly in the context of related psychological variables. Moreover, many studies have used a specific operationalization of the various character strengths (i.e., the Values-in-Action Inventory of Strengths; VIA-IS; Peterson et al. 2005). Although this measurement consistency does not necessarily pose a threat to construct validity per se, given the presence of alternative validated measures of many of the character strengths, it may be beneficial to evaluate character strengths using diverse operationalizations. As such, there appears to be value in simultaneously examining alternative measures of specific character strengths and comparing and contrasting them with each other as well as with outcome variables. Thus, the goal of the present study is to consider the latent relationships between two aspects of character

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strengths, optimism and self-management, as they are related to each other and to the construct of anxiety.

Within a positive psychology framework, optimism has been identified as a specific expression of the character strength of hope. In turn, the corresponding character virtue in the case of optimism and hope has been identified as transcendence (Peterson and Seligman 2004). Optimism may be defined as a personality characteristic that is expressed as a durable expectation that good things will occur in the future (Scheier and Carver 1985). Put another way, given the epistemological unpredictability of future events, an optimist will prefer to attend to and emphasize that evidence and those potential future scenarios that are indicative of positive outcomes. In contrast, one who is not an optimist could equally or preferentially attend to evidence suggestive of possible negative outcomes.

A significant development in the definition of optimism over the years has centered around its conceptual inverse relationship with pessimism. In contrast to optimism, pessimism may be defined as the durable expectation that bad things will occur in the future. As such, pessimism has been conceptualized and operationalized as a deficiency in optimism, or as one extreme of a bipolar construct (Scheier and Carver 1985; Steed 2002). However, increasingly, the evidence has indicated that optimism and pessimism are in fact two separable constructs, and each may be operational in varying degrees in a specific situation (Herzberg et al. 2006; Glaesmer et al. 2012). Although the focus here is on the constructs of optimism and pessimism, the orthogonal nature of these constructs may be observed by considering sample items from the optimism and pessimism scales of the Life Orientation Test-Revised (LOT-R; Scheier et al. 1994), a gold standard measure of optimism and pessimism (Steed 2002). For example, an optimism item includes "Overall, I expect more good things to happen to me than bad," and a pessimism item includes "I rarely count on good things happening to me." At first reading these items may seem to represent opposites; however, one may very well expect more good things to happen than bad in the future while at the same time not taking for granted the occurrence of those good things. Thus, in the current study, we will be considering pessimism as a separate predictor variable that may be expected to have a relationship with the character strengths of optimism and self-management, while not explicitly considered a character strength in itself.

Self-management, the second character strength under consideration in the current study, is additionally labeled as self-control, or more broadly as self-regulation (Peterson and Seligman 2004). Self-control, and the more recent term self-management, may be defined as explicitly effortful self-regulation, and it is operational when environmental contingencies would favor a different course of action than goal pursuit (Kanfer and Karoly 1972; Mezo 2009). For example, self-management could be invoked when an individual wants to resist eating a treat with the goal of maintaining a healthy diet, or alternatively, self-management may help someone with social anxiety initiate and maintain conversations with others. The character strength of self-management is thought to be an expression of the character virtue of temperance (Peterson and Seligman 2004).

As representative character strengths, the value of optimism and self-management has been broadly established within the context of positive psychology (Park and Peterson 2009; Niemiec 2013). With regard to the outcome variable of anxiety, there are clear inverse relationships with both optimism (e.g., Dolcos et al. 2015) as well as

self-management (Febbraro and Clum 1998; Mezo et al. 2018). There is also evidence that optimism and self-management are related to each other (e.g., Gottschling et al. 2016). Moreover, as detailed above, the construct of optimism as it is frequently measured may itself be separable into the dual constructs of optimism and pessimism. Thus, the interrelationships of optimism, pessimism, self-management, and anxiety indicate the potential for evaluating a cohesive model.

The aim of the current study is to further elucidate the conceptual boundaries of the two character strengths of optimism and self-management. Although both of these constructs have been shown to be valuable in their own right, previous research has not considered them as simultaneous predictors of relevant outcome variables. Indeed, although theory has dictated a set of character strengths (Peterson and Seligman 2004), and there is evidence for these character strengths across cultures (McGrath 2015), the aim of this study is to obtain further empirical support for the distinction between character strengths. This study will evaluate the nature of the relationships amongst optimism, self-management, pessimism, and anxiety in an integrated structural model and will further examine their relationships in associated mediational models.

Specifically, to the extent that optimism and self-management remain differential predictors of anxiety in a structural model, it may be considered as evidence that optimism and self-management are indeed separate character strengths (hypothesis 1), consistent with current positive psychology theory (Peterson and Seligman 2004). Likewise, it is expected that mediational analyses will indicate that the complementary character strengths of optimism and self-management will exert their effects on anxiety both independently and in conjunction with each other (hypothesis 2a). In contrast, although pessimism is expected to be a unique predictor of anxiety, it is not conceptualized here as a character strength that would share a complementary pathway in its effect on anxiety (hypothesis 2b). Finally, it is predicted that the structural model will also demonstrate that optimism and pessimism are separate constructs and not opposite poles of a single construct (hypothesis 3).

Methods

Participants

The 735 participants who took part in data collection were college students with an average age of 19.07 years ($SD = 3.26$). A majority consisted of women ($n = 501$, 68.2%). Most participants were freshmen ($n = 420$, 57.1%) or sophomores ($n = 176$, 23.9%). The majority self-identified as Caucasian ($n = 535$, 80.1%), with additional identification as African American ($n = 103$, 15.4%), Hispanic/Latino ($n = 44$, 6.3%), and Asian ($n = 21$, 3.1%). These race/ethnicity categories were not mutually exclusive. Most individuals were single/not in a romantic relationship ($n = 436$, 60.6%), or in a non-married relationship ($n = 255$, 35.4%).

Materials

Life Orientation Test-Revised (LOT-R; Scheier et al. 1994) The LOT-R is a 10-item self-report measure that is composed of a 3-item optimism scale (e.g., "In uncertain times, I

usually expect the best"), a 3-item pessimism scale (e.g., "If something can go wrong for me, it will"), and 4 filler items that are not scored. Responses are provided on a 5-point Likert scale (A or 0 = *I DISagree a lot* to E or 4 = *I agree a lot*). When scored as an overall measure of optimism, pessimism items are reverse keyed, and higher scores indicate higher degrees of optimism. When scored as separate scales of optimism and pessimism, as is the case in the current study, higher scores on each scale indicate higher degrees of optimism and pessimism respectively. The LOT-R and the constituent optimism and pessimism scales have demonstrated reliability, construct validity, and factorial validity (Scheier et al. 1994; Carver et al. 2010). In the present study, the coefficient alpha for the optimism scale was 0.67, and 0.76 for the pessimism scale.

Self-Control and Self-Management Scale (SCMS; Mezo 2009) The SCMS is a 16-item self-report measure that assesses self-control and self-management as three components: Self-Monitoring (SM; e.g., "I become very aware of what I am doing when I am working towards a goal"), Self-Evaluating (SE; e.g., "The goals I achieve do not mean much to me"), and Self-Reinforcing (SR; e.g., "I give myself something special when I make some progress"). Responses are on a 6-point Likert scale (0 = *very undescriptive of me* to 5 = *very descriptive of me*). Higher scores indicate greater self-control and self-management skills, and the SE scale is negatively keyed. The SCMS and each of the SM, SE, and SR scales have demonstrated reliability, construct validity, and factorial validity (Mezo and Short 2012). In the present study, coefficient alpha values for the SCMS were 0.85, 0.77 for the SM scale, 0.76 for the SE scale, and 0.77 for the SR scale.

State-Trait Anxiety Inventory, Trait version (STAI-T; Spielberger et al. 1983) The STAI-T is a 20-item self-report measure that assesses anxiety as a stable trait as opposed to a fluctuating state. Anxiety is measured as a unidimensional construct, and an example item includes "I feel nervous and restless". Responses are endorsed on a 4-point Likert scale in terms of frequency (1 = *Almost Never* to 4 = *Almost Always*). Higher scores indicate higher degrees of trait anxiety. The STAI-T has demonstrated reliability, construct validity, factorial validity, and has established norms (Spielberger et al. 1983). In the present study, the coefficient alpha for the STAI-T was 0.92.

Procedure

The materials and procedures used in this study were approved by the appropriate university institutional review board. Participants were recruited from a large Midwestern university. Students in psychology classes had the option of signing up for this and other research studies online, for required class research points, with alternative assignments available. All materials for this study were completed securely online.

Data Analysis

First, we assessed missingness amongst our variables. We removed individuals from analyses who had more than 50% items missing on at least one scale. Therefore, we

excluded 29 individuals as a result. The following analyses are based on the effective sample of 706 participants.

We conducted descriptive statistics for the primary measures' observed scale scores. Next, we report results from intercorrelated confirmatory factor analyses (CFA) of our primary measures. Using Mplus Version 8 software, we conducted a one-factor CFA of the STAI-T, two-factor CFA of the LOT-R, and three-factor CFA of the SCMS. For all CFAs, we used weighted least squares estimation with a mean- and variance-adjusted chi-square. Because of the ordinal nature of items, we used a polychoric covariance matrix and estimated factor loadings using probit regression coefficients (DiStefano and Morgan 2014). To scale latent factors, each factor variance was fixed to a value of 1; all factor loadings were freely estimated. Nominal amounts of missing item-level data were estimated using a pairwise-present approach. We used benchmarks for CFA to determine adequate fitting models, based on goodness of fit values for the comparative fit index (CFI) of ≥ 0.90, Tucker-Lewis Index (TLI) ≥ 0.90, and root mean square error of approximation (RMSEA) < 0.08 (Hu and Bentler 1999).

Next, we conducted the hypothesized SEM model in Fig. 1, using the same analytic approach as in the CFAs. We modeled the SCMS in the context of the SEM model as a second-order model, with three first-order factors, to facilitate execution and interpretation of mediation analyses. This also supported the conceptualization of self-management as a single latent construct. We included gender as a covariate of anxiety, consistent with previous findings regarding the influence of gender on anxiety (see McLean et al. 2011). We present standardized direct effects in Fig. 2.

Finally, we conducted mediation tests to assess whether optimism mediates relations between self-management and anxiety, as well as whether self-management mediates relations between optimism and anxiety. Likewise, we conducted mediation/indirect tests to assess whether pessimism mediates relations between self-management and
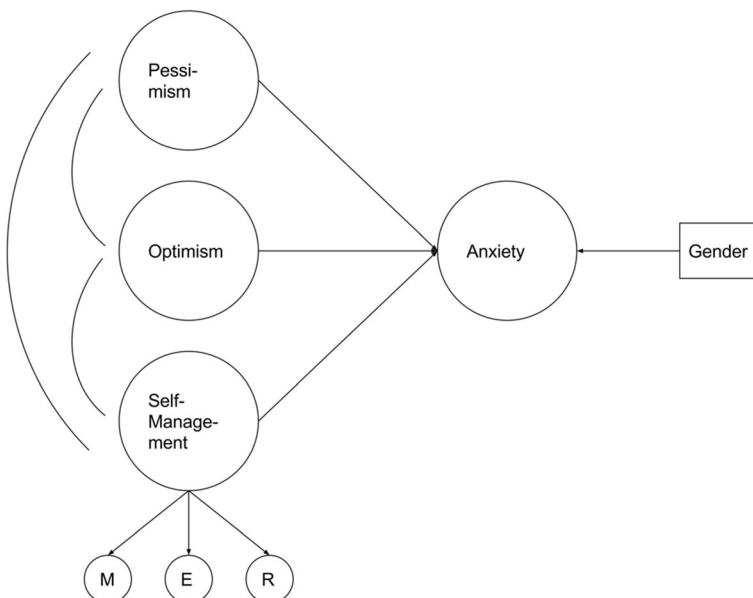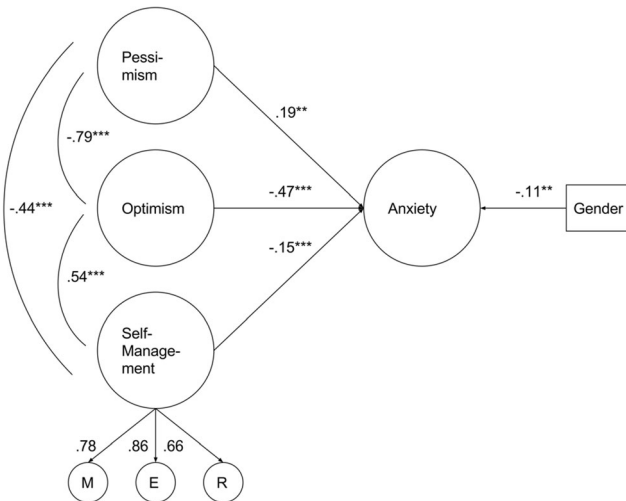

Fig. 1 Hypothesized SEM model

Fig. 2 SEM model. Note: All effects displayed are standardized. All circles are latent variables. Curved lines indicate correlations. M, monitoring, E, evaluating, R, reinforcing. Observed items are not displayed. *$p < .05$; **$p < .01$; ***$p < .001$

anxiety, as well as whether self-management mediates relations between pessimism and anxiety. For testing mediation, we computed cross-products of direct effects between a given predictor variable and mediator variable, and between the corresponding mediator and dependent variable. Standard errors for the mediation/indirect effects were calculated using the Delta method, with 500 bootstrapped simulations (MacKinnon 2008). We present standardized indirect effect estimates.

Results

In our sample, SCMS total scores averaged 55.40 ($SD = 10.48$). SCMS subscale scores averaged 21.37 for SM ($SD = 4.35$), 16.71 for SE ($SD = 4.59$), and 17.31 for SR ($SD = 4.44$). Optimism scale scores averaged 10.85 ($SD = 2.44$), and pessimism scale scores averaged 8.51 ($SD = 2.71$). STAI-T total scores averaged 42.91 ($SD = 9.84$).

The results of the series of CFA suggested that each of the three primary measures, namely, the three-factor SCMS, two-factor LOT-R, and one-factor STAI-T, produced modestly well-fitted models (see Table 1). Next, we tested the SEM model displayed in Fig. 2, and this model fit well (see Table 1). As displayed in Fig. 2, all direct effects were statistically significant.

We found that optimism mediated relations between self-management and anxiety ($\beta = -0.51$, $SE = 0.09$, $z = -5.69$, $p < .001$). When we reversed the order of the predictor variable (now optimism) and the mediator (now self-management), the mediation test was again significant ($\beta = -0.08$, $SE = 0.03$, $z = -2.42$, $p = .02$). Finally, pessimism mediated relations between self-management and anxiety ($\beta = -0.31$, $SE = 0.05$, $z = -6.10$, $p < .001$). However, when we tested pessimism as the predictor variable and self-management as the mediator, the mediation effect was not significant ($\beta = 0.01$, $SE = 0.02$, $z = 0.27$, $p = .79$).

Table 1 Fit indices for study measures and hypothesized SEM model

Model	χ^2	CFI	TLI	RMSEA
SCMS (3-factor)	$(101, N = 706) = 668.53, p < .001$	0.92	0.91	0.09
LOT-R (2-factor)	$(8, N = 706) = 72.84, p < .001$	0.98	0.96	0.11
STAI-T (1-factor)	$(170, N = 706) = 1342.49, p < .001$	0.91	0.90	0.10
H1 SEM	$(851, N = 706) = 3098.12, p < .001$	0.89	0.88	0.06

SCMS, Self-Control and Self-Management Scale; *LOT-R*, Life Orientation Test-Revised; *STAI-T*, State-Trait Anxiety Inventory, Trait version; *H1 SEM*, Hypothesized Structural Equation Model; *CFI*, Comparative Fit Index; *TLI*, Tucker-Lewis Index; *RMSEA*, root mean square error of approximation

Discussion

The character strengths of optimism and self-management, as expressions of the character virtues of hope and temperance respectively, have been the subject of extensive research both within and beyond positive psychology (McGrath 2015; Niemiec 2013; Baer 2015). The current study largely corroborated the value and the independent nature of these character strengths.

Support for the construct validity of the measures as well as the latent structure of the measured constructs was provided by the CFA results. Specifically, the CFA of the LOT-R was consistent with the separability of the optimism and pessimism scales. Similarly, the obtained latent structure of the SCMS indicated a three-factor solution, consistent with the three components of self-management (i.e., self-monitoring, self-evaluating, and self-reinforcing). Finally, the STAI-T trait scale was unidimensional, as would be expected given the nature of the measured anxiety construct.

The results for the measures supported further analyses regarding the interrelationships amongst the constructs. The obtained SEM model in which optimism, pessimism, self-management, and gender were all significant predictors of anxiety has implications for previous findings as well as for future research. For example, consistent with longstanding research that indicates that women tend to have higher degrees of anxiety, this model also finds that gender, specifically being a woman, is a predictor of anxiety (McLean et al. 2011).

More central to the goals of this study, and consistent with hypothesis 1, both optimism and self-management remained independent predictors of anxiety when considered in an integrated model, and in which they remained moderately related to each other. This finding may be considered consistent with positive psychology theory in that separate character strengths may have independent contributions to outcome variables, and yet remain related to each other due to their shared status as character strengths (Park and Peterson 2009; Niemiec 2013).

The complementarity of optimism and self-management is further borne out in the results of the mediational analyses. Namely, as posited by hypothesis 2a, regardless of which character strength was the predictor or the mediator variable, both optimism and self-management exhibited common, as well as the aforementioned unique pathways, in their influence on anxiety. In contrast, consistent with hypothesis 2b, pessimism appears to have only a unique effect on anxiety, one that is not mediated by the character strength of self-management. This finding may be taken to further illustrate

that although pessimism is a significant predictor of anxiety, and although pessimism and self-management are related to each other, they do not appear to be complementary in their effects on anxiety in the same manner as the character strengths of optimism and self-management.

Keeping to the point of the discernibility of optimism and pessimism, and consistent with hypothesis 3, the findings of this study provide further evidence supporting the premise that optimism and pessimism are indeed separable constructs and not opposite poles of a single construct. Despite the high inverse correlation between optimism and pessimism observed in the current model, both optimism and pessimism continued to exert significant direct effects on anxiety. This was the case even in the current college sample, a population in which optimism and pessimism have not tended to be as separable (see Glaesmer et al. 2012). Thus, there would seem to be value in considering optimism and pessimism as de facto separate constructs when considering their relevance to anxiety.

As stated in the introduction, alternative operationalizations of optimism and self-management apart from how they are measured in the VIA-IS may be desirable to increase the content validity of the findings regarding character strengths. The results of this study bear on this issue inasmuch as the relationships we would have expected amongst the character strengths and outcome variables were consistent with broad findings of character strengths that have been found with the VIA-IS (Niemiec 2013). Namely, the separability of the character strengths, as well as their relationships with outcome variables of value, such as anxiety, was replicated in the current study. Therefore, the results of this study extend previous findings pertaining to the relationship between character strengths and desired outcomes in at least three ways: (1) investigating optimism and self-management as predictors of anxiety, (2) conducting this investigation in a SEM, and (3) measuring optimism and self-management apart from the VIA-IS.

A possible caveat regarding the measurement of the character strengths is the definitional issues that are germane to these and other psychological constructs. For example, in this study, the character strength of self-regulation was operationalized by the SCMS. However, it may be the case that the SCMS, as a measure of self-management or goal-directed self-regulation, may be a more appropriate measure of the character strength of persistence (see Peterson and Seligman 2004). Future research should work toward establishing clearer conceptual delineation in this regard, perhaps by investigating the SCMS simultaneously with the VIA-IS to determine how the overall self-management construct, or its constituent components of self-monitoring, self-evaluating, and self-reinforcing, may be differentially related to the character strengths as measured by the VIA-IS.

In a similar vein, optimism may be identified as a component of the character strength of hope as it is in the current study (see Peterson and Seligman 2004), but it has also been identified as a separate construct (e.g., Martínez-Martí and Ruch 2017). Specifically, using the LOT-R as the measure of optimism in their study, Martínez-Martí and Ruch (2017) found that character strengths predicted resilience beyond what was accounted for by optimism and additional protective variables. However, if optimism may itself be considered a component of a character strength, it is not necessarily clear how or to what extent it may also serve as a separate salutary construct. Future research may endeavor to more

clearly define whether and to what degree optimism is an aspect of a character strength or a related, separate construct.

The interpretation and generalizability of these findings are also limited by the nature of the sample used in this study. Although a college student sample may be helpful as a first step in modeling the relationships amongst variables, and although this sample exhibits a wide range of presentations on each of the modeled variables (as demonstrated by the obtained standard deviations), it is likely that many potential applications of these findings would be to other populations. For example, this model could be particularly relevant amongst clinical or counseling populations. Thus, future research may attempt validation of this model amongst specialized populations.

Pursuing future directions of research is almost certainly warranted given the growing value of character strengths not only within positive psychology but also beyond, for example, within the similarly burgeoning research area of psychological applications of mindfulness (Baer 2015). Indeed, self-management as measured in this study has been linked to mindful attention (Mezo 2009), and thus, it may be a construct that serves as both a character strength as well as an element of mindfulness. Moreover, the current study offers an incremental contribution to the conceptualization and delineation of character strengths, specifically in relation to anxiety. Given the number and diversity of character strengths, future research may continue this incremental, "normal science" process amongst different operationalizations of different character strengths relative to valued outcome variables.

Engaging in this process of increasing the generalizability and ecological validity of the character strengths would likely not only enhance their theoretical clarity but could in turn also be helpful in various applications of positive psychology. For example, the finding in the current study regarding the separability and complementarity of the character strengths of optimism and self-management relative to anxiety may have direct implications for prevention and treatment programs. Namely, based on these results, it would seem warranted to address potential deficits in both optimism and self-management amongst individuals who are experiencing or at risk of experiencing maladaptive anxiety. Thus, there is great promise for similarly nuanced approaches to developing character strengths in evermore wide-ranging applications.

Compliance with Ethical Standards

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