



## **MINDSET, GRIT, OPTIMISM, PESSIMISM and LIFE SATISFACTION IN UNIVERSITY STUDENTS with and without ANXIETY and/or DEPRESSION**

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### **Abstract**

We explored mindset, grit, optimism, and pessimism as predictors of university students' life satisfaction. In consideration of the dual-factor model of mental health, we examined the strength of these predictors on life satisfaction in college students with self-reported anxiety and/or depression and those without. Optimism and pessimism predicted life satisfaction overall, but the relative contribution of each was significantly different based on self-reported anxiety/depression. College students with anxiety and/or depression also demonstrated significantly more fixed mindsets, lower levels of grit, optimism and life satisfaction, and higher levels of pessimism. We discuss the implications of these findings for university wellness programming and initiatives, and future research directions investigating these constructs for university students.

*Keywords: mindset, grit, optimism, college students, depression, anxiety*

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### **Introduction**

There are a number of important reasons for college/university communities to be proactive regarding the mental health of their students. In addition to obvious practical and ethical reasons to promote mental health among members of the university community, it is also notable that mental health status in young adulthood has significant implications for alcohol and substance abuse (Eisenberg, Gollust, Golberstein, & Hefner, 2007), academic performance/college GPA (Andrews & Wilding, 2004; Antaramian, 2015; Renshaw & Cohen, 2014), physical health (Renshaw & Cohen, 2014), and overall engagement in the college experience (Antaramian, 2015). Thus, the promotion of mental health during this developmental period can help guide young adults toward a developmental trajectory with fewer risky experiences (e.g., substance abuse) and more positive outcomes (Hunt & Eisenberg, 2009). Furthermore, the young adult brain is quite plastic well into the 20s (Martel & Fuchs, 2017), and

much can be accomplished during the emerging adult developmental period to promote mental health, healthy behaviors, and positive habits to promote long-term health, wellness, and success (Arnett, 2007).

However, recent data suggest that increasing numbers of university students are experiencing poor mental health. This trend has been referred to as the college “mental health crisis” (Pinder-Amaker & Bell, 2012; Schwartz & Kay, 2009). Although it is possible that the observed increased rates of mental health conditions among university students indicate increased willingness to seek help from formal university services, it is also likely that it is partially accounted for by a moderate increase in the actual rate of mental disorders among university students (Hunt & Eisenberg, 2009). By any metric, mental health disorders are considered highly prevalent among university students, and significant numbers of students report struggling with stress, anxiety, and depression (American College Health Association, 2014; Hunt & Eisenberg, 2009; Pinder-Amaker & Bell, 2012). Statistics fluctuate based on assessment of psychological distress (which may include reports of sub-clinical mental health symptoms) vs. assessment of DSM-5 criteria for a mental disorder. However, in one high quality study of mental illness prevalence among college students, the estimated prevalence of any anxiety or depressive disorder was 15.6% of undergraduates (Eisenberg et al., 2007). Awareness and promotion of mental health should be an important target for university communities.

### **Positive Psychology and Mental Health**

Within the field of psychology in the last two decades, a rapidly burgeoning interest in positive psychological development and outcomes has emerged. This shift from a primarily deficit-oriented focus is evident in the dramatic increase in empirical positive psychology research, which explores, broadly, that which “goes right in life” (Peterson, 2006; p. 4) and the correlates of human flourishing and thriving (Seligman, 2002). More traditional approaches to psychology, which have historically highlighted pathology and treatment, are now integrating frameworks from positive psychology to facilitate a more holistic approach to both the empirical study of and applied approaches to positive human functioning (Slade, 2010). This integration can be seen in recent, progressive approaches to clinical psychology and the related practice of mental health counseling, in which there is an increasing focus on both the treatment of pathology *and* the promotion of well-being (Antaramian, 2015; Slade, 2010).

**Dual factor model of mental health.** The *dual factor* or *two continua* model of mental health has emerged to suggest that mental health is comprised of not merely the absence of psychopathology, but also the presence of optimal psychological functioning and well-being (Renshaw & Cohen, 2014; Westerhof & Keyes, 2010). This comprehensive model of mental health takes into account positive indicators of wellness, such as subjective well-being, in conjunction with indicators of psychological distress (Suldo & Shaffer, 2008). Rather than conceptualizing mental health and illness as residing on one spectrum, this model suggests that psychological health / well-being is a complementary yet distinct construct from psychopathology (Eklund, Dowdy, Jones, & Furlong, 2011).

**Subjective well-being and life satisfaction.** Subjective well-being (SWB) is a positive psychology construct comprised of affective and cognitive components (Diener, Emmons, Larsen, & Griffin, 1985). The “subjective” aspect of SWB is essential to the construct, in that an

individual holds an understanding of his or her own degree of well-being based on a personal evaluation of it, without external evaluative criteria being imposed upon them (Diener et al., 1985). One component of subjective well-being is life satisfaction, which can be thought of as an individual's own cognitive appraisal of SWB, comprised of a subjective judgment of one's own quality of life (Diener et al., 1985). Life satisfaction is an important indicator of overall well-being and positive mental health in university students.

Recent research has suggested that the presence of positive mental health indicators may act as a buffer in the presence of negative mental health indicators. For example, Suldo and Shaffer (2008) found that adolescents with symptoms of psychopathology but also high degrees of subjective well-being perceived better social functioning and physical health when compared to their peers with similar degrees of psychopathology but lower levels of subjective well-being. Similarly, Renshaw and Cohen (2014) found that life satisfaction (a component of subjective well-being) was negatively correlated with college students' overall psychological distress and positively predictive of interpersonal connectedness, physical health and academic achievement. Broadly, subjective well-being has been linked to higher GPAs and higher levels of engagement in the college experience (Antaramian, 2015).

### **Positive Psychological Factors and College Students**

**Life satisfaction.** College student life satisfaction has been investigated across the globe and associated with higher GPAs (Rode et al., 2005), self-discipline and intrinsic motivation (Khrantsova, Saarnio, Gordeeva, & Williams, 2007), self-esteem (Zhang, Zhao, Lester, & Zhou, 2014), and self-efficacy (Coffman & Gilligan, 2002), as well as lower levels of stress (Kaya, Tansey, Melekoğlu, & Çakiroğlu, 2015) and depression (Pilcher, 1998). Research investigating the role of life satisfaction in university students from a dual factor model of mental health perspective revealed that when life satisfaction is considered alongside indicators of psychological distress (e.g., anxiety, depression, and/or somatization symptoms), it provides additional, unique predictive value relative to interpersonal functioning, academic achievement, and physical health (Renshaw & Cohen, 2014). In other words, life satisfaction is an important component of university students' experiences and outcomes in general, and should be explicitly considered a construct of interest for university students who are experiencing psychological distress.

**Optimism.** Upon reviewing the college student positive psychology and outcomes literature, optimism emerged as a construct of interest because it has significant predictive value on the life satisfaction levels of college students (Bailey, Eng, Frisch, & Snyder, 2007; Yalçın, 2011). Furthermore, optimism is malleable. Seligman (2006) popularized the notion that optimism can be learned, and research suggests that optimism interventions can result in increased happiness and decreased depression (Shapira & Mongrain, 2010), and elicit increased optimistic thinking (Peters, Flink, Boersman, & Linton, 2010). Thus, optimism can be shaped through intervention, and should be a construct of particular interest in terms of college student life satisfaction.

**Mindset and Grit.** Two additional constructs – mindset and grit – emerged in our review of the college student positive outcomes literature, because they relate to both psychological

processes (e.g., approach/avoidance, attribution, willpower, persistence) as well as educational ones (e.g., academic achievement, GPA, advanced course completion). The construct of mindset was popularized by the work of Carol Dweck (e.g., 2006) and can be defined in terms of two orientations: fixed or growth. Students with a fixed mindset view intelligence as a primarily inherent, stable trait that can't be changed, while those with a growth mindset view it as changeable in response to experiences and effort (Dweck, 2006). College students' growth or fixed mindset orientations toward intelligence and academic achievement are malleable and have been correlated to academic achievement scores (Aditomo, 2015; Aronson, Fried, & Good, 2002; Paunesku, Yeager, Romero, & Walton as cited in Yeager & Dweck, 2012; Shively & Ryan, 2012) and increased college retention of students from underrepresented groups (PERTS, 2017).

A related construct, grit, is conceptualized as persistence and passion for a goal that may have no immediate payoff (Duckworth, Peterson, Matthews, & Kelly, 2007). Duckworth and colleagues have investigated the outcome correlates of grit and have found that an individual's self-reported level of grit is more highly correlated with positive life outcomes than intelligence or academic achievement (Duckworth & Eskreis-Winkler, 2013; Duckworth et al., 2007; Duckworth, Kirby, Tsukayama, Berstein, & Ericcson, 2010; Robertson-Kraft & Duckworth, 2014). For example, grit has reliably predicted the retention rate among West Point cadets in challenging classes, and overall college G.P.A in Ivy League undergraduates, above and beyond I.Q. (Duckworth, et al., 2007). Duckworth and Eskreis-Winkler (2013) report that there are empirically-observed moderate positive correlations between grit and growth mindset. Grit has also been investigated in regard to life satisfaction, and at least one prior study found that grit significantly predicted college student life satisfaction (Singh & Jha, 2008).

***Theoretical links and conceptual framework.*** Optimism – a stable expectancy that “good things” will happen – is integral to students' abilities to cultivate and maintain growth-oriented mindsets. A growth mindset is inherently optimistic in that the individual holds an expectancy that after a period of prolonged experience or effort, a “good thing” will happen (e.g., intelligence will increase). Similarly, high levels of grit suggest an optimistic approach in that it is unlikely that most individuals would persist in challenging tasks without expectation of an eventual positive result. Thus, we were surprised at the lack of studies exploring the relative contributions of each of the constructs of optimism, mindset, and grit to college student life satisfaction. While studies have examined relationships among more psychologically-oriented constructs, such as hope and optimism, with life satisfaction (e.g., Bailey et al., 2007), we could not find a study that directly examined the relationship between the more educationally-oriented construct of mindset to life satisfaction in college students, and only one study that investigated the educationally-oriented construct of grit relative to life satisfaction in college students (Singh & Jha, 2008). We were surprised by this gap in the literature in light of the reported correlations among optimism and life satisfaction (e.g., Bailey et al., 2007), optimism, grit, and mindset (see Duckworth & Eskreis-Winkler, 2013; Tuckwiller, Dardick, & Kutscher, 2017), and grit and life satisfaction (Singh & Jha, 2008). Furthermore, in light of the dual factor model of mental health in which increased positive functioning is paramount, we wanted to understand the relationships among these positive variables for university students.

***Constructs in the context of mental health.*** Furthermore, in one meta-analytic review, researchers observed a correlation between an individual's mindset and affective state; that is,

those with more fixed mindsets were observed to report more negative emotions (Gal & Szamoskozi, 2016). This prompted us to think about university students with mental health issues, particularly those who report experiencing depression and anxiety, and we wanted to explore the relationships among optimism, mindset, grit, and life satisfaction in university students who self-report mental health conditions. Again, in light of the dual factor model of mental health, we believed it was especially important to explicitly describe the relationships among these positive variables and life satisfaction for this subset of the university student population.

## **The Present Investigation**

To investigate these relationships, we conducted an exploratory study of mindset, grit and optimism and student life satisfaction and examined differences between two groups of college students: those who self-report anxiety and/or depression, and those who self-report no mental health conditions. We hypothesized that optimism, mindset, and grit were correlated to and predictive of life satisfaction in college students. We hypothesized that both mindset and grit would provide additional unique predictive value of overall college student life satisfaction above and beyond optimism. However, we suspected that there would be significantly lower levels of optimism, mindset, grit and life satisfaction in college students who self-report mental health conditions, and that optimism, mindset, and grit may not demonstrate the same predictive patterns of life satisfaction for students with mental health conditions.

## **Method**

### **Participants**

Participants were selected through a stratified random sample of 2,000 undergraduate and graduate students at a mid-Atlantic university who were invited to participate via email. Two hundred and forty-five undergraduate and graduate students completed surveys. The responding sample identified as more female (69.8%) and Caucasian (63.67%) when compared to the initially invited participants who were 58.5% female and 51.9% Caucasian. Average age of the participants was  $M = 26.3$  ( $SD = 8.99$ ) years.

### **Procedure**

Students were asked to complete a survey delivered via the Qualtrics© platform with an option to enter a raffle for a new iPad© mini to incentivize participation. The survey included items from several psychological measures (see Measures section below) as well as 17 demographic items including for example, gender, ethnicity, GPA, and mental health conditions. Directions indicated that responses would remain anonymous and that there were no right or wrong answers.

### **Measures**

**Mindset: General and self-theory.** The Implicit Theories of Intelligence Scale (ITI-General) (Dweck, 2000) contains eight items, four measuring a “fixed” mindset factor and four measuring a “growth” mindset factor. The scale is designed to measure an individual’s attitudes about *general intelligence* and its malleability. De Castella and Byrne (2015) developed the

Revised Implicit Theories of Intelligence (Self-Theory) Scale (ITI-S) from the original ITI Scale (Dweck, 2000), with “all eight items reworded so that each statement reflected a first-person claim” (p. 250). The scale measures individuals’ beliefs about the malleability of *their own intelligence*. Both scales demonstrated good internal consistency in past research ( $\alpha = .87$  for ITI-General and  $\alpha = .90$  for ITI-Self). For our sample, the ITI-General Cronbach’s  $\alpha = .943$  and for the ITI-Self, Cronbach’s  $\alpha = .960$ .

**Optimism.** The Life Orientation Test – Revised (LOT-R) (Scheier et al., 1994) is a 10-item instrument designed to measure dispositional optimism. Three items measure optimism, three items measure pessimism, with four unscored filler items. A prior psychometric evaluation of the instrument ( $n = 2,055$ ), yielded an  $\alpha = .78$  (Scheier et al., 1994).

There is an ongoing discussion in the field of positive psychology regarding the structure of the LOT-R as either a unidimensional or two-factor model. That is, does it measure optimism as one factor, along a unidimensional spectrum (e.g., low to high optimism) or does it measure two factors – optimism and pessimism – as distinct constructs (e.g. pessimism is not merely “low optimism”) (e.g., Bailey et al., 2007; Cano-García et al., 2015; Creed, Patton, & Bartrum, 2002)? In light of this discussion, we conducted a confirmatory factor analysis of our LOT-R data. We tested two models, the first comprised of the LOT-R optimism items and pessimism items as one factor ( $n=6$ ), and the second model with the LOT-R optimism items as one factor (LOT-RO) ( $n=3$ ) and the LOT-R pessimism items as a second factor (LOT-RP) ( $n=3$ ). The two-factor model solution was the best fit for our data with a change in  $\chi^2 (1, n = 245) = 31.24$ , so the two-factor model was retained. Table 1 contains the fit statistics for the two models, confirming the two-factor model. Reliabilities for these subscales was good; LOT-RO  $\alpha = .794$  and LOT-RP  $\alpha = .856$ . Because the two-factor solution was the best fit for our data, we used both variables of optimism and pessimism in our analysis and discussion of results.

Table 1

*Fit Indices for One and Two Factor Models of LOT-R*

Model	$\chi^2$	df	AIC	GFI	CFI	RMSEA	SRMR
One-Factor	48.302	9	72.302	0.931	0.947	0.134 (0.098, 0.172)	0.047
Two-Factor	17.066	8	43.066	0.977	0.988	0.073 (0.021 0.113)	0.027

Note:  $\chi^2$  = chi-square, df = degrees of freedom, AIC = Akaike Information Criteria, GFI = Goodness of fit index, CFI = comparative fit index, RMSEA = root mean square error of approximation with 90% confidence intervals, SRMR = standardized root mean square residual

**Grit.** The eight-item Short Grit Scale (Grit-S) (Duckworth & Quinn, 2009) measures two factors of grit: consistency of interest and perseverance of effort. In eight separate samples across two studies, Cronbach’s  $\alpha$  ranged from .77 to .85 (Duckworth et al., 2007; Eskreis-Winkler, Duckworth, Shulman, & Beal, 2014). For our sample, Cronbach’s  $\alpha = .839$ .

**Life satisfaction scale.** The Satisfaction with Life Scale (SWLS) (Diener et al., 1985) is a five-item scale that measures an individual’s overall satisfaction with life and well-being. The

scale has demonstrated good internal consistency across diverse samples, typically in the  $\alpha = .80$  to  $.89$  range. For our sample, Cronbach's  $\alpha = .899$ .

**Scale scores.** Participants selected their amount of endorsement of items using a 6-point Likert response scale ranging from 'strongly disagree' to 'strongly agree.' On every measure, we used a 6-point scale without a neutral response, so that participants were required to select responses that indicated endorsement of an item in one direction or other (e.g., toward agree or disagree). Each aggregate score was created by summing the scores on the scale or subscale.

**Demographic items.** Participants responded to 17 demographic items including typical demographic variables (e.g., gender, ethnicity) and additional items including GPA, SAT/ACT score, disability status, and current mental health conditions.

**Mental health condition.** Fifty students in our sample self-identified as having anxiety and/or depression. They indicated this self-perception of mental illness by responding to a survey question: "Are you currently experiencing any mental health conditions?" If students responded "Yes," they were auto-directed to a drop-down menu of mental illness diagnoses including Anxiety, Bipolar Disorder, Depression, Eating Disorder, Schizophrenia, Substance Abuse, and Other. Fifty participants indicated that they were currently experiencing depression, anxiety, or both: thirteen indicated Anxiety, seven indicated Depression, and thirty indicated both Anxiety and Depression. We did not query participants regarding official psychiatric diagnoses from a medical professional, as our interest was in college students who perceived themselves to be experiencing a mental health condition and self-reported it. In the same way that subjective wellbeing is dependent upon the individual's understanding or personal evaluation of it, we believe that an individual's subjective evaluation of his or her mental health, without external evaluative criteria imposed upon that judgment, is an important and useful metric.

## Analyses

We used prior empirical findings and theory to guide the development of our data analytic plan. We conceptualized life satisfaction as an outcome variable and the other variables as potential predictors of life satisfaction. We analyzed descriptives for outliers and examined correlations among variables of interest. We compared the mean group scores, using independent samples t-tests and effect sizes, of optimism, pessimism, mindset, grit and life satisfaction scores of university students with anxiety and/or depression and those without any reported mental health conditions. As discussed, we conducted comparative confirmatory factor analysis of the LOT-R data. We then conducted a system of regression models to examine the predictive values of general mindset, self-mindset, optimism, pessimism, and grit with life satisfaction.

## Results

### Descriptives for the Scales

Internal consistency for all of the scales and subscales was adequate with a range of  $\alpha = .794$  to  $\alpha = .960$ , as reported in the Measures section. Correlations among all six of the scales/subscales (general mindset, self-theory mindset, optimism, pessimism, grit, and life satisfaction) were statistically significant. See Table 2 for correlations.

Table 2

*Correlations Among Constructs*

	LS	GM	SM	LO	LP	GR
LS	1	0.162*	0.226**	0.606**	0.548**	0.265**
GM		1	0.881*	0.229*	0.285**	0.145*
SM			1	0.297**	0.322**	0.166**
LO				1	0.696**	0.345**
LP					1	0.207**
GR						1

Note: \* significant at the .05 level. \*\* significant at the .001 level. LS = life satisfaction; GM = general mindset; SM = self-mindset; LO = optimism; LP = pessimism; GR = grit.

**Mean group differences on scales by mental health condition.** An independent samples t-test was conducted for each of the scale and subscale values to determine if the means of those who self-reported anxiety and/or depression were different from those who self-reported no mental health conditions. See Table 3 for mean differences and standard deviations of each of the six subscales. Means for each of the scale/subscale scores were statistically significantly different for those with and without self-reported mental health conditions, with the exception of general mindset. The effect size  $d$  ranged from small to medium effect,  $d = -0.308$  for *general mindset* to a large effect,  $d = -1.066$  for *optimism* on life satisfaction. Participants who did not report mental health conditions consistently reported higher scaled scores on general mindset, self-mindset, optimism, grit, and life satisfaction and lower levels of pessimism than did those with anxiety and/or depression.

Table 6

*Mean Group Differences: With and Without Self-Reported Mental Health Condition*

	Mean difference	95% CL Mean difference	$\sigma^2$	t	sign	d
SWLS	-4.568	-6.001 -3.135	4.580	-6.280	<.0001	-0.997
ITI-G	-2.429	-4.896 0.039	7.884	-1.940	0.054	-0.308
ITI-S	-2.659	-5.199 -0.119	8.117	-2.060	0.040	-0.328
LOTR-O	-2.926	-3.785 -2.068	2.744	-6.710	<.0001	-1.066
LOTR-P	-2.406	-3.289 -1.524	2.820	-5.370	<.0001	-0.853
Grit	-3.037	-4.998 -1.076	6.268	-3.050	0.003	-0.485

Note: the df for all Independent sample t tests was 239; SWLS=Satisfaction with Life Scale; ITI-G = Implicit Theories of Intelligence Scale - General Mindset' ITI-S = Implicit Theories of Intelligence Scale – Self-Theory; LOTR- O = Life Orientation Test – Revised, Optimism Items; LOTR-P = Life Orientation Test – Revised, Pessimism Items.

### Regression Analyses

We ran a system of six multiple regression models. The first two models were nested and tested whether life satisfaction could be predicted from general mindset, self-mindset, optimism and grit, later adding mental health condition on the data set as a whole to determine if the



change in  $R^2$  was significant. We further conducted two sets of additional regressions: two on the sub-sample of participants who had identified as having anxiety and/or depression ( $n=50$ ) and the others on the remaining participants who had not reported any mental health conditions ( $n=191$ ). The set of regressions on the sub-samples focused on optimism and pessimism as predictors as a baseline model, and determined if either could be removed with the use of backward elimination, which starts with all effects and deletes effects that do not meet the criteria to be left in the model ( $p < .10$ ). Models 3 and 4 were reported as baseline models prior to backward elimination of variables and models 5 and 6 were examined to see if optimism or pessimism alone in the model functioned as a significant predictor for our model. Four participants had missing data for the question asking if they were currently experiencing a mental health condition and were not included in the model. The multicollinearity for all regressions with multiple predictors was adequate with tolerance above .10 and variance inflation factor less than 10 for all predictors.

**Model 1.** After confirming the two-factor model of optimism, we conducted the regression with five predictor variables (general mindset, self-theory mindset, optimism, pessimism, and grit) to predict life satisfaction. The results of model 1 indicated that the five predictors explained a total of 40.6% of the total variance in life satisfaction ( $R^2 = .406$ ,  $F=(5,239) 32.60$ ,  $p<.001$ ). Optimism ( $t=5.44$ ,  $df=1$ ,  $p<.001$ ) and pessimism ( $t=3.55$ ,  $df=1$ ,  $p<.001$ ) were statistically significant predictors with unstandardized slopes (.662, .414) and standardized partial slopes (.397, .251) respectively. The other predictors in the model were not significant after accounting for optimism and pessimism.

**Model 2.** Next, we examined mental health status as an additional sixth predictor variable of life satisfaction. The results of model 2 indicated that the predictors explained a total of 42% of the total variance in life satisfaction ( $R^2 = .42$ ,  $F=(6,234), 28.23$ ,  $p<.001$ ). The change in  $R^2$  between model 1 and model 2 was significant ( $R^2 = .02$   $F=(1,234), 7.20$ ,  $p=.008$ ). Optimism ( $t=4.80$ ,  $df=1$ ,  $p<.001$ ) and pessimism ( $t=3.28$ ,  $df=1$ ,  $p=.001$ ) remained significant predictors with unstandardized slopes (.589, .381) and standardized partial slopes (.356, .230). In addition, self-reported mental health condition was also significant ( $t=2.68$ ,  $df=1$ ,  $p=.008$ ) with an unstandardized slope (1.779) and standardized partial slope (.147), indicating that participants who self-reported no mental health conditions reported significantly higher levels of life satisfaction. These results indicated that even after accounting for the effects of general mindset, self-mindset, optimism, pessimism, and grit, self-reported mental health status was still a significant predictor of life satisfaction.

**Models 3 and 4.** The results of Model 3, predicting life satisfaction of college students with self-reported depression and/or anxiety, indicated that the overall model was significant ( $R^2 = .255$ ,  $F=(2,47) 8.03$ ,  $p=.001$ ) but that no individual predictor was significant. Model 4, predicting life satisfaction of college students without depression and/or anxiety, indicated that the overall model was significant ( $R^2 = .347$ ,  $F=(2,188) 49.95$ ,  $p<.001$ ). In Model 4, optimism ( $t=5.89$ ,  $df=1$ ,  $p<.001$ ) and pessimism ( $t=2.85$ ,  $df=1$ ,  $p=.005$ ) were statistically significant predictors with unstandardized slopes (0.749, 0.345) and standardized partial slopes (.437, .211), respectively.

**Models 5 and 6.** Considering Model 3 for college students with self-reported depression and/or anxiety (in which the overall model was significant and the two predictors – optimism and pessimism – which *were* significant in Models 1 and 2, were not significant), we chose to conduct a backward selection to determine if optimism or pessimism alone could explain significant effects from the previous model. Model 5 was a backward elimination method of baseline Model 3 and removed optimism, predicting life satisfaction of college students with depression and/or anxiety, and indicated that the overall model was significant ( $R^2 = .239$ ,  $F=(2,48) 15.08$ ,  $p<.001$ ). Pessimism ( $t=3.88$ ,  $df=1$ ,  $p<.001$ ) was a statistically significant predictor with an unstandardized slope (0.783) and standardized partial slope (.489). Model 6 retained both predictors and is the same as Model 4 for college students without self-reported depression and/or anxiety.

## Discussion

### Findings and Implications

The present study offers several broad insights regarding the relationships among and measurement of the selected variables of mindset, grit, optimism, pessimism, and life satisfaction in university students. It also provides important information about levels and predictors of life satisfaction of university students who self-identify as having anxiety and/or depression.

**Optimism and pessimism predict life satisfaction.** Our LOT-R data measuring optimism in university students indicated that a two-factor model of optimism and pessimism was the best-fitting model for our data. While we considered the perspective that optimism may in fact be a unidimensional construct (e.g., Vautier, Raufaste, & Carioux, 2003), our data suggested that pessimism was a distinct and important construct to consider for our sample of college students, particularly those with anxiety and depression. We observed that pessimism was the strongest predictor of life satisfaction for those self-reporting anxiety and depression, and we discuss these findings more fully below.

Using this two-factor model of optimism, we found that in our total sample of 245 college students, approximately 40.6% of the variance in life satisfaction could be predicted by general and self-theory mindset, optimism, pessimism, and grit. While the overall model was significant, only optimism and pessimism were significant predictors, indicating that after accounting for optimism and pessimism, mindset (both general and self-theory) and grit did not add any significant predictive value to the model. These significant findings relative to optimism and pessimism on college student life satisfaction are similar to a prior study (Bailey et al., 2007), and when considered in the context of the dual factor model of mental health, have important implications for university wellness services and developmental programming. That is, optimism is malleable and can be learned, and targeted interventions to increase levels of optimism may be an important component of university-wide initiatives to support increased wellbeing among university students. Programs targeting the development of optimism may be an important part of first-year experiences, residence hall advisor trainings, and college-wide messaging and mission statements, and the presence of these programs would signal university cultures that value and promote wellness.

***Optimism and pessimism are distinct predictors / intervention targets.*** Furthermore, we found evidence that had we analyzed optimism as a unidimensional construct, we would have masked important information about the nuanced relationship of optimism and pessimism to life satisfaction for university students. We found that pessimism, above and beyond optimism, was an important and significant predictor of life satisfaction in college students overall. This finding is similar to those of Bailey et al. (2007) in which pessimism predicted life satisfaction. However, we took our analysis one step further and compared the role of pessimism as a predictor of life satisfaction between university students with and without self-reported anxiety and/or depression. We were surprised to find that in university students with anxiety and depression, *pessimism* had a much stronger effect on life satisfaction than optimism. The opposite was true for students without anxiety and depression, for whom optimism was the stronger predictor of life satisfaction.

These intriguing findings suggest a distinct effect of pessimism specifically on the life satisfaction of university students with anxiety and/or depression, indicating the need for further exploration of the role of pessimism for these students. As Chang, Maydeu-Olivares, and D’Zurilla (1997) stated relative to the two-factor model of the LOT-R, “the value of a two-dimensional model rests in its ability to specify the relative contributions of the two variables (i.e., optimism and pessimism) to the prediction of adaptational outcomes...” (p. 439). Our findings indicate that there are clearly different relative contributions of optimism and pessimism on the life satisfaction of college students with and without anxiety and depression, indicating the value of applying this two-factor model for this population. Furthermore, from a dual factor model of mental health perspective, these findings suggest that addressing optimism alone for university students with anxiety and/or depression may not be enough. Perhaps targeted interventions aimed to explicitly decrease pessimistic cognitions may enhance wellness and mental health programming, especially for students with anxiety and/or depression. These findings and their implications require further investigation.

**The relationships between anxiety and depression on selected constructs.** We found that university students with self-reported anxiety and/or depression had statistically significantly more fixed self-theory mindsets; lower levels of grit, optimism and life satisfaction; and higher levels of pessimism when compared to their peers without mental health conditions. It is important to note that even when we accounted for all of the other variables in the model, self-reported anxiety and/or depression was still significantly predictive of decreased life satisfaction in college students. As universities move toward more holistic models of student mental health and wellness programming, it is important to recognize that university students with anxiety and/or depression have significantly more fixed mindsets and lower levels of grit, which may place them at risk for substandard academic and nonacademic college outcomes. This is an important consideration in light of evidence indicating that growth mindset is associated with college persistence, especially for students from underrepresented groups (PERTS, 2017). If university officials know that students who self-report anxiety and depression also tend to have more fixed mindsets, they can provide mindset interventions and potentially increase college wellness *and* retention rates among these students. Furthermore, these students also experience lower levels of optimism and life satisfaction and higher levels of pessimism, all of which may contribute to decreased levels of subjective well-being and negative college experiences. University communities should be aware of the significant differences in these orientations for

students who self-report anxiety and/or depression and consider these variables as potential developmental and wellness programming themes and intervention targets. Measuring and documenting the effects of programs to explicitly increase mindset, grit, and optimism and decrease pessimism, including investigation of any requisite changes in university student life satisfaction, will be an important area of future research.

**GPA may not be an effective risk indicator.** We also found, contrary to prior studies (e.g. Antamarian, 2015; Rode et al., 2005), that life satisfaction did not correlate with GPA. Our findings were similar to that of Renshaw and Cohen (2014) who found that when looking at life functioning indicators (e.g., physical health, academic achievement, interpersonal relationships, etc.) academic achievement seems to be the *least* effected by mental health status. In our sample of students with self-reported anxiety and/or depression and decreased life satisfaction, there were virtually no differences in GPA when compared to students without mental health conditions and higher levels of life satisfaction. This suggests that GPA does not serve as a reliable risk indicator for lower levels of life satisfaction and/or psychological distress. When academic performance is used a sole or “first-line” risk indicator, these students may fly under the radar and not come to the attention of established university services (e.g., referrals to college counseling center) or wellbeing programs. Thus, average GPA/academic performance does not necessarily indicate mental health and wellbeing.

### **Limitations**

There were several limitations to this study. We relied upon the self-report of our participants, and the requisite cautions of interpreting self-report data apply to this study. We did not use clinical measures to assess the presence of depression and/or anxiety symptoms as meeting the threshold for a DSM-V diagnosis; rather we identified a group of college students who self-identified as having depression and/or anxiety. However, this group of students measured statistically significantly differently on every variable (with the exception of general mindset) when compared to those who did not identify as having depression and/or anxiety. Thus, their self-report was a reliable predictor in our data. An additional limitation was our unbalanced sample and relatively small sample size of individuals with a mental health condition. In future work, an increased sample size will improve the validity and reliability of the current findings.

### **Future Directions**

Future research should continue to investigate the potential role of a pessimism factor in the life satisfaction of college students, especially for those who self-report anxiety and/or depression. Another important line of research will be clarifying the overlap between mindset, grit and optimism for university students. Although one prior study found that grit predicted life satisfaction in college students (Singh & Jha, 2008), our findings in the present study indicated that grit had no significant predictive value on college student life satisfaction after accounting for optimism and pessimism. This finding calls into question the reported role of grit in college student life satisfaction. Further study is needed to clarify this relationship. Although mindset had not been explicitly explored relative to college student life satisfaction prior to this study, our findings indicated that it too had no predictive value above and beyond optimism and pessimism.

What role then does optimism play in growth mindset and the development of grit? Perhaps, as several researchers have suggested, mindsets are domain-specific and apply narrowly to related outcomes (e.g., a theory of intelligence predicts academic achievement; a theory of anxiety predicts symptoms of psychological distress) (Schroder et al., 2015). However, this may not be the case. This finding caused us to reflect on the recent article by Anderson, Turner, Heath and Payne (2016) addressing the “parsing” of ideas and constructs of interest into narrowly defined conceptualizations. They caution, “[f]ailure to think about potential similarities among differently-labeled ideas makes it more difficult to appreciate the underlying power of the core idea...” specifically in relation to educational outcomes of children who are vulnerable (Anderson et al., 2016). We agree that it is important to focus investigations on constructs that have meaningful outcome correlates for college student outcomes, and we suggest that those outcomes are both academic and nonacademic. It is important to use sophisticated modeling to assess potential overarching constructs and orientations, which may organize some of the newer positive constructs. For example, an overarching “implicit theory of self-change” construct may be at work in some of the overlap we observe in current constructs of interest. Thus, we believe it will be important for future investigations to utilize structural equation modeling and confirmatory analytic techniques that may elucidate a potential higher order factor(s) which may organize a number of the factors currently being explored in the literature.

Finally, universities must conceptualize the university community writ large as an ecology around each individual student and consider how positive development and mental health and wellbeing programming can reach their students through student-, faculty-, administrative-, and campus-level outreach. Thus, university communities must consider, develop and implement effective approaches to increase the well-being of their students. While students are often made aware of resources available in times of difficulty, they are rarely directed to consider the active cultivation of increased psychological wellbeing. It is critical that universities actively engage in the creation of college cultures of well-being, an “often neglected dimension on the college campus” (Eichner, 2015, p.1). Selected positive activity interventions have shown promise in relieving depressive symptoms and increasing happiness (Layous et al., 2011) and hold the potential to inform effective university-wide wellbeing programs. The application of the dual factor model of mental health to college orientation activities, clinic interventions, and campus-wide developmental programming can benefit students with and without mental health conditions. The relationships among life satisfaction, psychological wellbeing, interpersonal connectedness, and physical health are clear and intentional action to support positive outcomes in these domains for college students is an important step in addressing college student wellbeing, particularly for students who self-report mental health conditions. These efforts will fortify students as they tackle the developmental challenges of the college years and promote cultures of mental health and wellbeing on college and university campuses.

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