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The role of perceived stress in the relationship between purpose in life and mental health.

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THE ROLE OF PERCEIVED STRESS IN THE RELATIONSHIP BETWEEN PURPOSE IN LIFE AND MENTAL HEALTH

by

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ABSTRACT

Although purpose in life (PIL) has been consistently related to better mental health, there is little understanding of whether that may be explained by reducing appraisal of or reactivity to stress. The sample consisted of 546 undergraduate students who completed measures of PIL, perceived stress, and measures of both positive mental health (positive affect, life satisfaction) and negative mental health (negative affect, anxiety, depression). The hypotheses were that PIL would (1) be related to more positive and less negative mental health and (2) be related to less perceived stress, and (3) reduce the effects of perceived stress in increasing negative mental health and decreasing positive mental health. Regression analyses were conducted to test each of the hypotheses in the overall sample and subsamples of male, female, and each ethnicity. The results supported hypotheses 1 and 2. In addition, for hypothesis 1, there were significant interaction effects for negative affect and life satisfaction for the subsample of American Indian/ Alaska Native participants versus the rest of the sample. However, the results were not significant for the hypothesis 3 except for depression in the subsample of male participants. Finally, significant mediation was found with perceived stress acting as mediator between PIL and each mental health outcome.

Keywords: purpose in life, perceived stress, mental health, anxiety, depression, negative affect, positive affect, life satisfaction, appraisal, reactivity, ethnicity

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The Role of Perceived Stress in the Relationship between Purpose in Life and Mental Health

The potential value of a sense of meaning and purpose in life has long been written about in variety of disciplines including psychology, philosophy, theology, and religion. For example, Viktor Frankl (1963, 1967), well known for his writings on the importance of having meaning in one's life, observed that psychological illness can result from a lack of meaning in life. In Seligman's PERMA (Positive emotions, Engagement, positive Relationships, Meaning, and Achievement) model of well-being (2011), a sense of meaning or purpose in life is one of the five components of well-being. As an example of meaning in psychological clinical practice, Acceptance and Commitment Therapy (ACT) focuses on valued living through clients clarifying their values and moving towards a sense of meaning in their life. There are many ways that people search for meaning through their relationships, careers, spirituality, or through giving back to others.

With the many benefits and sources of meaning in one's life, it can be a very broad and challenging area to study. A sense of purpose in life (PIL) is one central aspect of meaning that can be concisely defined and may be of particular importance for well-being. PIL can be defined as central and organizing life aim (Kashdan & McKnight, 2009). Ryff writes that a person with a strong PIL "has goals in life and a sense of directedness; feels there is meaning to present and past life; holds beliefs that give life purpose; has aims and objectives for living" (Ryff, 1989, 1072).

The understanding of PIL may be particularly helpful both scientifically and clinically because it allows for the targeting of a specific area of change. McKnight and Kashdan (2009) identify three aspects of PIL that can be may be important: strength, awareness, and scope. Each of these lend themselves to specific kinds of targets for research

and interventions. The strength of PIL, for example, may be increased with engaging in activities related to one's PIL. Strength of PIL, through engagement in valued activities, can be targeted alone or in conjunction with other interventions. The awareness of one's PIL can be similarly targeted by encouraging someone to work on exploring and more clearly defining what has brought or may bring them PIL. The scope of PIL can be increased by connecting smaller goals into a larger scheme of overarching PIL (Schnitker & Emmons, 2013). In an example of clinical work, ACT addresses all three where the therapist helps the client delineate the importance of their personal values and act in accordance with those values despite negative emotions, cognitions, or experiences (Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

The ability to target and change the strength of a person's PIL makes it a beneficial area to study in relation to mental health outcomes. Both theory and research have already indicated that PIL may particularly enrich one's mental health (McKnight & Kashdan, 2009). PIL "provides a bedrock foundation that allows a person to be more resilient to obstacles, stress, and strain," per Kashdan and McKnight (2009, p. 303). Ryff (1989) includes PIL as a key component in her Scales of Psychological Well-Being. Initial research supports the theory that PIL is related to better mental health outcomes (e.g., Abdelrahman, Abushaikha, & al-Motlaq, 2014; Hedberg, Gustafson, Alex, & Brulin, 2010; Smith & Zautra, 2004).

Relationships between PIL and Mental Health

PIL has been found to be related to multiple domains of mental health. Stronger PIL has been linked to more positive affect and life satisfaction and to lower negative mental health outcomes. Studies have both directly examined the relationships between PIL and depression, anxiety, negative affect, positive affect, and life satisfaction as well as how PIL

may interact with other variables to affect those dependent variables. One argument for why PIL is related to better mental health is that having a central organizing goal may reduce the likelihood that one will develop anxiety, depression, or any kind of negative affect. Frankl (1963, 1967) writes about how a lack of meaning can cause an existential crisis that can be the underlying cause behind depression and anxiety.

When it comes to negative mental health outcomes and PIL, depression has been most frequently related to having a lower PIL. One common symptom of depression is a lack of desire to engage in meaningful activities. PIL is defined as a directing and focusing aspect of someone's life. Someone with high PIL would be more likely to engage in meaningful activities and less likely to experience depression. Several studies have focused on the relationship between PIL and depression in very old adults (>80 years old). Haugan (2014) showed a negative relationship between PIL and depression in nursing home patients and PIL had the strongest relationship with depression out of the four variables studied. Hedberg et al. (2010) conducted a longitudinal study with a very old population and showed PIL was negatively correlated with depression at the first time-point.

While the relationship between PIL and depression may be particularly strong in very old adults, the results are not limited to this population. Kaji et al. (2010) showed that participants were more likely to be depressed when they lost a sense of PIL in a very large sample of adults ranging in age from 50 to over 80. In a population with a mean age of 67.2 years, patients recovering from knee surgery that had higher PIL had lower levels of depression both at baseline and after six months (Smith & Zautra, 2004). Briggs & Shoffner (2006) looked at PIL as one of four components of spiritual well-being and reported that higher PIL was the only component that related to lower depression in both older adolescents

and midlife adults. Across adulthood, the relationship between depression and PIL is consistently negative and moderate to strong.

Another mental health outcome that has been negatively related to PIL is anxiety. While pursuing a difficult career path consistent with one's PIL may be thought to increase anxiety, previous research has generally found the opposite. Frankl offers an explanation in his discussions of Logotherapy (Frankl, 1963, 1967). He writes about anxiety as potentially arising from a lack of meaning. Having a PIL can address meaning and provide some organization to someone's life reducing their chance of having anxiety. Research with anxiety and PIL has resulted in the relationships hypothesized by Frankl. Kashdan & McKnight (2013) found that participants with social anxiety disorder that made effort or progress towards their PIL had more self-esteem, meaning in life, and positive affect. In the Smith & Zautra (2004) study of how PIL affects recovery from knee surgery, there was a correlation between PIL and anxiety where higher PIL was related to lower levels of anxiety, even when controlling for several other protective factors. Haugan (2014) also reported a significant negative relationship between PIL and anxiety in nursing-home patients.

The final negative mental health outcome that has been related to PIL is negative affect. The tripartite theory of anxiety and depression contends that negative affect is the common factor between anxiety and depression (Clark & Watson, 1991). PIL may act as a resource for psychological stability to help maintain a more positive emotional perspective and therefore experience less negative affect. This has been shown in multiple areas where negative affect may be expected. Having a strong PIL was found to be related with lower negative affect in the face of reductions in life satisfaction (Burrow, Sumner, & Ong, 2014). After knee surgery, where pain and frustration may be common in recovery, PIL was

negatively related to negative affect even when controlling for several other personality variables including pessimism (Smith & Zautra, 2004).

Mental health was originally defined as the absence of mental illness. With the advent of positive psychology and research into well-being, mental health has been redefined as not only the absence of mental illness, but also the presence of positive mental health characteristics such as positive affect and life satisfaction (Knutson, 1963; Ryff, 1989). While negative and positive mental health outcomes are not simply alternate ends of the same spectrum, the same things that affect negative mental health often affect positive mental health in opposite directions. The effect of a strong PIL appears to be both related to lower negative mental health and higher positive mental health.

Research has shown that PIL is positively related with the positive mental health outcomes of life satisfaction and positive affect. Blazek, Kazmierczak, and Besta (2015) showed that PIL was a significant predictor of life satisfaction. Peter et al. (2014) found a correlation between PIL and life satisfaction in spinal cord injury patients and suggested it would be a good variable to target for intervention. A similar positive relationship between PIL and positive affect has been found (Burrow & Hill, 2011). In addition, the Smith & Zautra (2004) study of PIL and knee surgery showed that PIL related to higher positive affect even when controlling for several other personality variables including optimism.

The Role of Stress

Although the relationship between PIL and mental health is well-documented, it may be important to better understand *how* and *when* PIL may affect mental health. One possible explanation is stress. It is generally well accepted that stress, whether measured through perceived stress or life events, is related to worse mental health (Cohen, Kamarck, &

Mermelstein, 1983; Hammen, 2005; Marin et al., 2011; Paykel, 2003). More stress is correlated with more depression, anxiety, and negative affect. Conversely, although the relationship may sometimes be weaker, higher levels of stress is generally related to lower levels of positive affect and life satisfaction. This relationship follows Lazarus and Folkman's (1984) definition of stress that precludes a threat to one's wellbeing. More stress indicates more threats to one's wellbeing. More perceived threats logically relate to a higher incidence of negative mental health outcomes and fewer positive mental health outcomes.

Stress can mean a multitude of things. It can be the sum of challenging or threatening events in a day, the autonomic response in the body shown by increased heart rate and blood pressure, or the feeling of being overburdened that someone has. Even when just focused on just autonomic response, it can be measured with heart rate, blood pressure, or cortisol level. Similarly, when just focusing on challenging or threatening events, there are a range of definitions. Bolger & Zuckerman (1995) measured stressors with a self-report of interpersonal conflict, while others have exposed participants to stressful stimuli such as rollercoaster rides (Ishida & Okada, 2006, 2011). When it comes to feeling overburdened or "stressed," this is a subjective measure of how someone perceives their state. The more subjective measure of perceived stress may be more closely related to the outcomes of potentially stressful events (Cohen et al., 1983). This study focuses on perceived stress because of the importance of perceptions and because it is not necessarily to identify the kinds of stressful events through which PIL may best operate.

Perceived stress may factor into a model with PIL and mental health because stress is a factor in life that one can never completely escape or be completely free of. Additionally, Bolger and Zuckerman (1995) have proposed a model of how individual differences such as

PIL may affect mental health through the stress process. To clarify the potential ways that individual differences may affect mental health through the stress process, Bolger and Zuckerman (1995) have proposed that these individual differences may affect mental health in two primary ways. Figure 1 displays these potential pathways with PIL shown as the individual difference in the model and adding the direct effect of PIL on mental health. Path A shows the direct effect of PIL on mental health that has been most frequently studied and demonstrated. Path B shows the potential effect of PIL in decreasing perceived stress which, in turn, could improve mental health through reducing attribution of perceived stress. Path C shows the potential effect of PIL in decreasing reactivity to perceived stress which also could improve mental health.

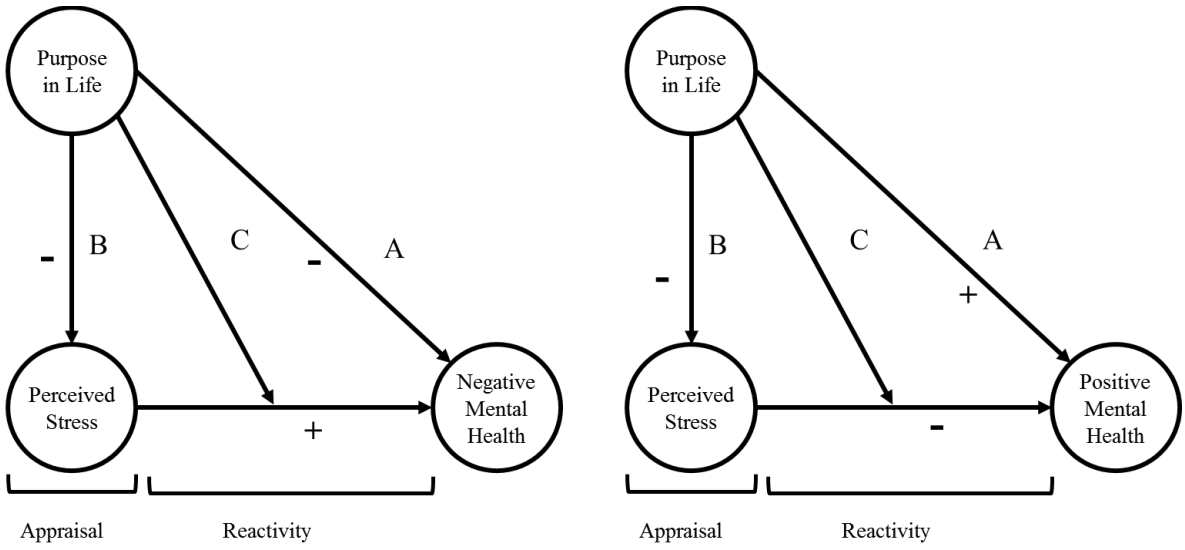

Figure 1. The ways that purpose in life may affect mental health through reducing appraisal of and reactivity to stress.

Purpose in Life and Appraisal of Perceived Stress

The concept of perceived stress is important for understanding the hypothesis shown in Path B in Figure 1. Focusing on perceived stress examines how individuals *categorize*

events in their lives. Most people are regularly exposed to events that people may categorize as stressful (potentially stressful events, PSEs). There may be some amount of difference in exposure to events, but most have at least a few PSEs daily. What often differs between individuals who report perceiving a lot of stress and those who report less perceived stress is how they view the event. To perceive an event as stressful, it must be viewed as burdening one's resources and as a threat to one's well-being (Lazarus & Folkman, 1984). However, when stress is related to one's goals, one may be more likely to view events as a challenge to be overcome. When a PSE is viewed as part of a challenging goal or PIL, then that event may be less likely to be viewed as a threat and therefore not included in one's report of perceived stress. Identification of goal-related events as challenges rather than threats may also apply to other PSEs. Like so much of what humans do, when we frequently engage in a behavior, it can become a pattern in our daily lives. As one starts categorizing goal-related PSE as challenges, one may also start categorizing goal-unrelated PSEs as challenges instead of threats.

Some research has already found reduced stress in those who have a higher PIL with multiple definitions of stress. Ishida & Okada (2006, 2011) found that those with a firm PIL had a reduced autonomic response to stressful stimuli such as rollercoaster rides. Yiu-kee & Tang (1995) showed that having a higher PIL was related to less burnout in mental health professionals. Abdelrahman et al. (2014) reported a negative relationship between perceived stress and purpose in life in a sample of Jordanian menopausal women. These previous studies support that having a higher PIL may result in reduced perceptions of stress.

Purpose in Life and Reactivity to Perceived Stress

In addition to acting directly on perceived stress, PIL may influence one's reactivity to stress. Path C in Figure 1 tests whether reactivity is affected by PIL. While appraisal of PSEs as challenging reduces perceptions of stress, focus and reward potential may affect the relationship between stress and mental health when a PSE is categorized as stressful. Having a strong PIL may help one feel more focused in general and therefore offer protection from the outcomes of stress such as increased negative mental health and decreased positive mental health. Engagement in one's goals and purpose may allow one to recover more quickly from a stressful event as one's focus is on one's goals instead of attending to negative occurrences. Working towards a meaningful outcome may change the effects of stress because overcoming that stress is rewarding. Having a strong PIL directs one on a certain path in their life that is personally fulfilling. Through focus and worthwhile action, PIL may change the relationship between perceived stress and mental health through acting as a buffer.

Previous studies of personal characteristics have indicated that individual differences can moderate the relationship between stress and outcomes. Bolger and Zuckerman (1995) studied how neuroticism moderated the relationship between daily conflicts and outcomes. Of exposure and reactivity, they reported that reactivity to stressful events was more detrimental to mental health. PIL is a concrete expression of values that can influence one's reactivity. Like Bolger and Zuckerman's (1995) study with neuroticism, PIL may also be a moderator of the effects of stress on mental health, except that it may buffer rather than exacerbate these effects. While some portion of difference in outcomes for those higher in PIL is explained by a reduction in appraisal of events as stressful, there likely is also an

additional difference in outcomes even at the same level of perceived stress. This is because of a potential ability to maintain focus on goals instead of focusing on the stressful events. Instead of focusing on stress, goals provide a target for one to focus on and therefore prevent dwelling on the stressful events. Like in ACT, having a strong PIL does not decrease *exposure* to PSEs and, while it may help, may not entirely suppress the appraisal of events as stressful, but instead helps someone to place focus outside of stress so they can engage in more valued activities, thereby preventing negative mental health outcomes.

Current Study

The goal of this study is to extend previous research by working towards understanding how PIL may affect mental health through the stress process. That is, investigating if PIL decreases the perception of stress which may in turn improve mental health and investigating if PIL reduces reactivity to perceived stress which would also improve mental health. In addition, since most studies have focused on the effects of PIL on measures of negative mental health such as anxiety and depression, this study will also include measures of positive mental health such as positive affect and life satisfaction. Finally, there may be differences in the ways that PIL may affect perceived stress and mental health depending on gender and ethnicity. Women and members of non-dominant cultural groups experience different stressors such as more chronic stressful events, different domains of stress, and minority stress (Hammen, 2005; Smith, 1985) so there may be a different relationship between PIL, perceived stress, and mental health in these groups.

There are three primary hypotheses. First, PIL will be related to lower scores on the measures negative mental health and higher scores on the measures of positive mental health. Second, PIL will be related to lower scores on a measure of perceived stress. Third, PIL will

be related to reduced reactivity to perceived in relation to measures of mental health. Specifically, it is predicted that those higher in PIL will have better mental health (both higher positive mental health outcomes and lower negative mental health outcomes) in the context of stress than those lower in PIL. In addition, the levels of PIL and the relationship between PIL, stress, and the mental health outcomes will be examined to determine whether there are any gender or ethnic differences.

Methods

Participants

Of 596 participants that started the survey, only 546 completed the entirety of the survey and thus were included in the analyses. Of these participants, 197 (36.1%) identified as non-Hispanic White, 229 (41.9%) as Latino, 14 (2.6%) as Black, 30 (5.5%) as Asian American or Pacific Islander, 23 (4.2%) as American Indian or Alaska Native, 6 (1.1%) as an ethnicity not listed, and 45 (8.2%) as having multiple ethnicities. The majority of the sample was female (*N*=388/71.1%) with one participant listing "other" for gender. Ages of the participants ranged from 18 to 66 with a mean of 20.42 (*SD* 5.55). Most participants (91.7%) were under the age of 24. Participants were recruited from a medium-sized metropolitan area in the southwestern U.S.

Procedures

Participants were recruited using an online recruitment website that students used to sign up to participate in experiments in return for course credit. The data for this paper was collected during the fall of 2015. Students were at least 18 years of age and answered the questionnaires through a secure survey system used by the University of New Mexico. All

forms, questions, and procedures were approved by the Human Research Review Committee at the University of New Mexico.

Participants were directed to the online recruitment website by their classes that offered extra credit in the form of research participation. Other extra credit options were also available for students. Students viewed a brief description of the study stating that they would be able to participate online or in person in a study to learn more about positive psychology variables. If they chose to participate, they would sign up for the study on the online recruitment website, then receive an email with an Opinio survey system link to consent. After reviewing the approved consent documents and consenting to participate, the participants were provided a random system-generated ID and provided a separate Opinio survey system link to answer the demographic questions and study measures. The participants completed measures in the same order with each measure on a separate page, but could not go back and edit their previous answers.

Measures

Demographics. Participants completed questions about their age, ethnicity, gender, work status, parental and personal income, spirituality, and religious affiliation, if any.

Anxiety and depression. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was used to assess anxiety and depression. There were seven items in each subscale to assess anxiety and depression (e.g., “I felt tense or wound up” for anxiety or “I have lost interest in my appearance” for depression) with one reverse coded for anxiety (e.g., “I could sit at ease and feel relaxed”) and five reverse coded for depression (e.g., “I enjoyed the things I used to enjoy”). The items were scored on a four-point scale from 0 to 3 with

differing anchors for each question. For the anxiety subscale, Cronbach's alpha was .838. For the depression subscale, Cronbach's alpha was .759.

Positive and Negative Affect. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess both positive and negative affect during the past week. There were ten positive affect items (e.g., "active," "enthusiastic") and ten negative affect items (e.g., "nervous," "upset") responded to on a five-point scale from 1 = "not at all" to 5 = "extremely." Cronbach's alpha for positive affect was .871. Cronbach's alpha for negative affect was .857.

Life Satisfaction. The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was used to assess life satisfaction. There were five items (e.g., "in most ways my life is close to my ideal") that were scored on a seven-point scale from 1 = "strongly disagree" to 7 = "strongly agree." Cronbach's alpha was .858.

Purpose in Life. The Scales of Psychological Well-Being (Ryff & Keyes, 1995) was used to assess purpose in life. The items were scored on a six-point scale from 1 = "strongly disagree" to 6 = "strongly agree." There were six items (e.g., "I have a sense of purpose and direction in life") with three reverse coded (e.g., "I don't have a good sense of what I am trying to accomplish in life"). Cronbach's alpha was .762.

Perceived Stress. The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to assess perceived stress experienced in the last week. The scale includes ten items (e.g., "how often have you felt nervous and "stressed"?") with four reverse coded (e.g., "how often have you felt that you were on top of things?") The items were scored on a five-point scale from 0 = "never" to 4 = "very often." Cronbach's alpha was .874.

Statistical Analyses

The statistical analyses were conducted using SPSS Version 23. For Hypothesis 1, regression analyses were conducted predicting each outcome (depression, anxiety, negative affect, life satisfaction, & positive affect) from PIL. For Hypothesis 2, regression was used predicting perceived stress from PIL. For Hypothesis 3, regression analyses were used predicting each outcome from perceived stress, PIL, and the interaction between PIL and perceived stress. In addition, each of the above analyses were repeated separated by gender and ethnicity. Finally, a mediation analysis was conducted using the Process macro by Hayes (2013) to determine if perceived stress acted as a mediator between PIL and each mental health outcome.

Results

Descriptive Statistics

Table 1 displays the means and standard deviations for the overall sample as well as for male and female participants. Independent samples *t* tests were conducted to compare means between male and female participants. Results show a significant difference in means for perceived stress, $t(539) = 3.188$, $p = .002$; anxiety, $t(538) = 2.655$, $p = .008$; and positive affect, $t(538) = -2.631$, $p = .009$ where males have lower perceived stress and anxiety and higher positive affect, indicating that males in this sample had some indications of better mental health in both negative measures and positive.

Table 2 displays the means and standard deviations for the ethnicity groups in the sample. Independent sample *t* tests were conducted to compare means between the different groups. The only significant difference in means was for life satisfaction between participants that identified as American Indian/Alaska Native and “Other Ethnicity” in the

survey, $t(26) = 2.838$, $p = .009$ where participants in this sample that identified as American Indian/ Alaska Native had higher life satisfaction than participants that identified as "Other Ethnicity."

Table 1. *Means and Standard Deviations of Predictors and Outcomes by Gender*

	Male		Female		Overall Sample		
	M	SD	M	SD	M	SD	Scale Range
Purpose in Life	4.39	0.91	4.47	0.91	4.45	0.91	1-6
Perceived Stress	2.65[a]	0.69	2.87[a]	0.70	2.80	0.70	1-5
Depression	0.64	0.50	0.65	0.49	0.65	0.49	0-3
Anxiety	1.10[b]	0.61	1.26[b]	0.66	1.22	0.65	0-3
Negative Affect	2.42	0.78	2.54	0.78	2.51	0.78	1-5
Positive Affect	3.67[c]	0.72	3.48[c]	0.72	3.54	0.72	1-5
Life Satisfaction	4.72	1.22	4.76	1.32	4.75	1.29	1-7

Note. Superscripts a, b, and c indicate $p < .01$ for each pair of each.

Table 2.*Means and Standard Deviations of Predictors and Outcomes by Ethnicity*

	Non-Hispanic White (N=197)		Latino (N=229)		Black (N=14)		Asian Am. / Pacific Islander (N=30)		Am. Indian/ Alaska Native (N=23)		Other Ethnicity (N=6)		Multiple Ethnicities (N=45)	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Purpose in Life	4.39	0.94	4.49	0.90	4.56	0.98	4.58	0.84	4.43	0.96	4.24	0.47	4.43	0.96
Perceived Stress	2.80	0.76	2.82	0.67	2.77	0.82	2.63	0.68	2.93	0.61	2.88	0.34	2.83	0.69
Depression	0.64	0.48	0.69	0.51	0.61	0.60	0.50	0.38	0.53	0.47	0.81	0.36	0.61	0.52
Anxiety	1.24	0.67	1.23	0.65	1.11	0.57	1.03	0.63	1.14	0.57	1.45	0.45	1.24	0.62
Negative Affect	2.45	0.80	2.54	0.78	2.51	0.76	2.34	0.84	2.41	0.63	2.98	0.52	2.70	0.77
Positive Affect	3.47	0.73	3.57	0.73	3.84	0.87	3.61	0.62	3.74	0.67	3.52	0.40	3.45	0.73
Life Satisfaction	4.77	1.33	4.71	1.29	5.09	1.42	4.72	1.06	5.15[a]	1.08	3.77[a]	0.98	4.66	1.30

Note. [a] $p < .01$

Correlation Analyses

Table 3 displays the correlations for all predictor and outcome variables. All variables were correlated in expected directions: PIL and the measures of positive mental health (positive affect and life satisfaction) were each positively correlated with each other, and negatively correlated with perceived stress and measures of negative mental health outcomes (depression, anxiety, and negative affect). In addition, perceived stress and all measures of negative mental health were positively correlated with each other. Each of these correlations were statistically significant (*p*s < .01).

Table 3. *Correlations Between Purpose in Life, Perceived Stress, and Mental Health Outcomes*

	PIL	PS	DEP	ANX	NA	PA	LS
Purpose in Life	---						
Perceived Stress	-.547**	---					
Depression	-.470**	.612**	---				
Anxiety	-.355**	.662**	.631**	---			
Negative Affect	-.413**	.666**	.533**	.723**	---		
Positive Affect	.449**	-.468**	-.485**	-.363**	-.336**	---	
Life Satisfaction	.412**	-.490**	-.549**	-.463**	-.436**	.485**	---

Note. N=543-545. ** $p < .01$.

Hypothesis 1

To test the hypothesis that PIL would be related to better negative and positive mental health outcomes, regression analyses were conducted predicting the negative and positive mental health outcomes from PIL as the sole predictor. Tables 4 and 5 show the standardized beta weights for negative mental health and positive mental health, respectively. In the overall sample, as well as in the subsamples of female, male, non-Hispanic White, Latino/a, and multiple ethnicity participants, PIL was significantly related to all the negative and

positive mental health outcomes. PIL was significantly related to most of the measures of mental health in the subsamples of Black and Asian American/Pacific Islander participants and to depression in the subsample of American Indian/Alaska Native participants. PIL was not significantly related to any measure of mental health in the subsample of participants who identified as "Other Ethnicity." Green (1991) indicates that more participants (23 to 53 for large to medium effect sizes) in these subgroups would be required to detect an effect.

Based on differences in standardized beta weights for Black and American Indian/Alaska Native participants, an interaction variable was created for each group and analyses completed with PIL, either Black, Asian American/ Pacific Islander, or American Indian/Alaska Native participants versus the rest of the sample, and the relevant interaction terms. The results of the calculations are presented in tables 6 and 7 for negative and positive mental health, respectively. There were significant interaction effects for negative affect and life satisfaction for American Indian/ Alaska Native participants versus the rest of the sample. Figures 2 and 3 show the interaction effects for negative affect and life satisfaction, respectively. For negative affect, American-Indian/ Alaska Native participants do not show an effect of PIL on negative affect, while the rest of the sample shows lower negative affect at higher levels of PIL. For life satisfaction, American Indian/ Alaska Native participants appear to have lower life satisfaction at higher levels of PIL while the rest of the sample shows the opposite relationship.

Table 4. *Standardized Beta Weights for Purpose in Life Predicting Negative Mental Health Outcomes (Hypothesis 1)*

	Depression			Anxiety			Negative Affect		
	β	*t*	*p*	β	*t*	*p*	β	*t*	*p*
Overall Sample	-0.470	-12.38	< .001	-0.355	-8.84	< .001	-0.413	-10.56	< .001
Gender									
Female	-0.469	-10.40	< .001	-0.370	-7.81	< .001	-0.413	-8.89	< .001
Male	-0.483	-6.82	< .001	-0.341	-4.48	< .001	-0.427	-5.85	< .001
Ethnicity									
Non-Hispanic White	-0.470	-7.44	< .001	-0.365	-5.47	< .001	-0.437	-6.79	< .001
Latino	-0.475	-8.12	< .001	-0.351	-5.63	< .001	-0.427	-7.10	< .001
Black	-0.644	-2.92	0.013	-0.501	-2.00	0.068	-0.606	-2.64	0.022
Asian Am./ Pacific Islander	-0.493	-3.00	0.006	-0.433	-2.54	0.017	-0.310	-1.73	0.095
Am. Indian/ Alaska Native	-0.436	-2.17	0.042	-0.203	-0.93	0.365	0.054	0.24	0.813
Other Ethnicity	-0.681	-1.86	0.136	0.066	0.13	0.901	-0.334	-0.71	0.517
Multiple Ethnicities	-0.397	-2.84	0.007	-0.299	-2.05	0.046	-0.431	-3.13	0.003

Table 5. *Standardized Beta Weights for Purpose in Life Predicting Positive Mental Health Outcomes (Hypothesis 1)*

	Positive Affect			Life Satisfaction		
	β	t	p	β	t	p
Overall Sample	0.449	11.69	< .001	0.412	10.50	< .001
Gender						
Female	0.443	9.68	< .001	0.400	8.55	< .001
Male	0.489	6.94	< .001	0.447	6.18	< .001
Ethnicity						
Non-Hispanic White	0.452	7.07	< .001	0.390	5.92	< .001
Latino	0.446	7.49	< .001	0.482	8.26	< .001
Black	0.647	2.94	0.012	0.649	2.96	0.012
Asian Am./Pacific Islander	0.477	2.87	0.008	0.337	1.90	0.068
Am. Indian/Alaska Native	0.272	1.26	0.221	-0.144	-0.65	0.524
Other Ethnicity	0.694	1.93	0.126	0.255	0.53	0.625
Multiple Ethnicities	0.394	2.81	0.007	0.338	2.35	0.023

Table 6. *Standardized Beta Weights for Purpose in Life and Ethnicity Predicting Negative Mental Health Outcomes (Hypothesis 1)*

	Depression			Anxiety			Negative Affect		
	β	*t*	*p*	β	*t*	*p*	β	*t*	*p*
Black									
PIL	-0.462	-11.99	< .001	-0.353	-8.65	< .001	-0.410	-10.31	< .001
Black	0.002	0.04	0.968	-0.019	-0.46	0.643	0.011	0.28	0.783
PIL*Black	-0.044	-1.14	0.253	-0.009	-0.21	0.832	-0.022	-0.54	0.587
Asian Am./ Pacific Islander									
PIL	-0.471	-12.11	< .001	-0.349	-8.47	< .001	-0.415	-10.34	< .001
AAPI	-0.058	-1.50	0.135	-0.056	-1.37	0.170	-0.041	-1.03	0.305
PIL*AAPI	0.014	0.35	0.726	-0.022	-0.53	0.594	0.012	0.29	0.773
Am. Indian/ Alaska Native									
PIL	-0.470	-12.16	< .001	-0.360	-8.80	< .001	-0.429	-10.80	< .001
AIAN	-0.040	-1.05	0.292	-0.021	-0.51	0.610	-0.027	-0.68	0.495
PIL*AIAN	0.004	0.11	0.912	0.030	0.74	0.459	0.087	2.18	0.030

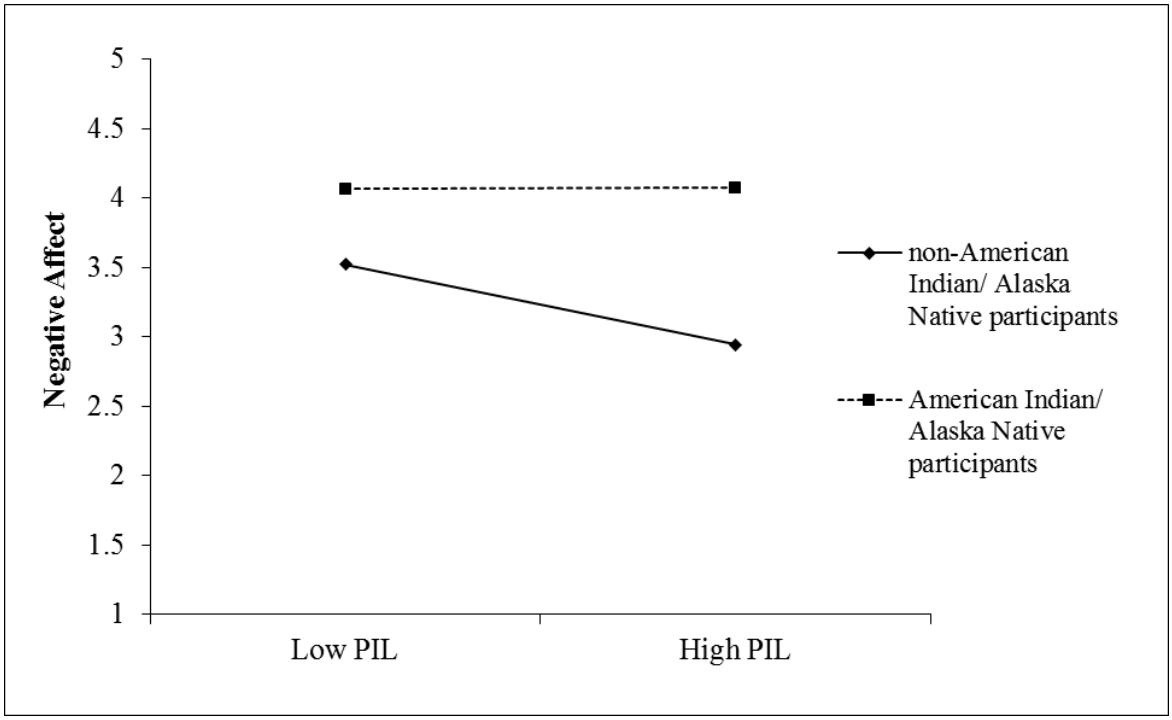

Figure 2. PIL x American Indian/ Alaska Native interaction predicting score of negative affect.

Table 7. *Standardized Beta Weights for Purpose in Life and Ethnicity Predicting Positive Mental Health Outcomes (Hypothesis 1)*

	Positive Affect			Life Satisfaction		
	β	*t*	*p*	β	*t*	*p*
Black						
PIL	0.440	11.32	< .001	0.404	10.16	< .001
Black	0.056	1.44	0.149	0.030	0.77	0.440
PIL*Black	0.046	1.19	0.236	0.043	1.08	0.281
Asian Am./ Pacific Islander						
PIL	0.449	11.40	< .001	0.418	10.40	< .001
AAPI	0.008	0.21	0.830	-0.015	-0.37	0.708
PIL*AAPI	-0.002	-0.05	0.961	-0.025	-0.62	0.539
Am. Indian/ Alaska Native						
PIL	0.454	11.63	< .001	0.429	10.84	< .001
AIAN	0.052	1.34	0.181	0.068	1.74	0.082
PIL*AIAN	-0.034	-0.85	0.393	-0.102	-2.57	0.010

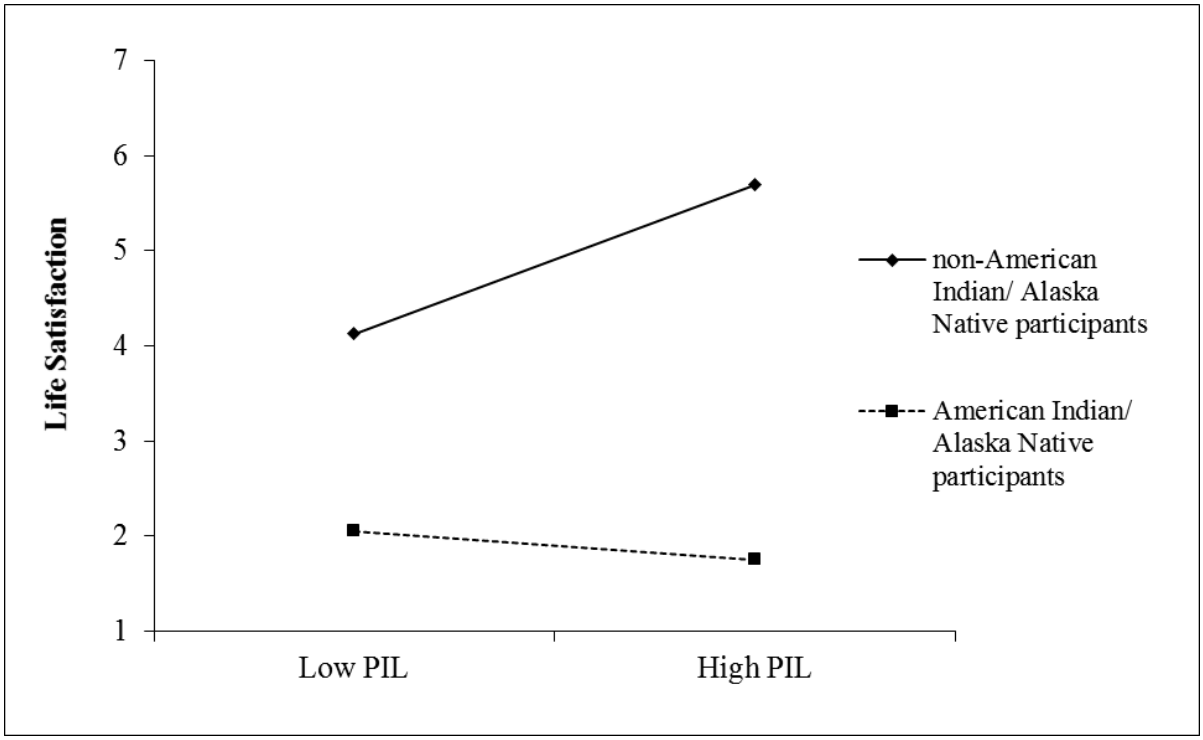

Figure 3. PIL x American Indian/ Alaska Native interaction predicting score of life satisfaction.

Hypothesis 2

To test the hypothesis that PIL would be related to lower perceived stress, regression analyses were conducted predicting perceived stress from PIL as the sole predictor. Table 8 displays standardized beta weights for PIL predicting perceived stress for the overall sample as well as for subgroups of male, female, and each ethnicity. Each regression was statistically significant for the overall sample and each subgroup except participants who identified as "Other Ethnicity."

Based on differences in standardized beta weights for Black and Asian American/ Pacific Islander participants, an interaction variable was created for each group and analyses completed predicting perceived stress from PIL, either Black or Asian American/ Pacific Islander participants, and the relevant interaction terms. The results of the calculations are presented in table 9. There were no significant interaction effects for either subsample.

Table 8. *Standardized Beta Weights for Purpose in Life Predicting Perceived Stress (Hypothesis 2)*

	β	t	p
Overall Sample	-0.547	-15.23	< .001
Gender			
Female	-0.548	-12.84	< .001
Male	-0.578	-8.76	< .001
Ethnicity			
Non-Hispanic White	-0.607	-10.65	< .001
Latino/a	-0.519	-9.15	< .001
Black	-0.638	-2.87	0.014
Asian Am./Pacific Islander	-0.384	-2.20	0.036
Am. Indian/Alaska Native	-0.472	-2.45	0.023
Other Ethnicity	-0.681	-1.86	0.137
Multiple Ethnicities	-0.491	-3.99	0.001

Table 9. *Standardized Beta Weights for Purpose in Life and Ethnicity Predicting Perceived Stress (Hypothesis 2)*

	β	t	p
Black			
PIL	-0.544	-15.00	< .001
Black	0.005	0.15	0.883
PIL*Black	-0.023	-0.64	0.524
Asian Am./ Pacific Islander			
PIL	-0.552	-15.01	< .001
AAPI	-0.046	-1.27	0.204
PIL*AAPI	0.032	0.85	0.394

Hypothesis 3

To test the hypothesis that PIL may buffer the effects of perceived stress on mental health, regression analyses were conducted predicting the negative and positive mental health outcomes from PIL, perceived stress, and the interaction term PIL*perceived stress. Tables 10 and 11 display results of testing the interaction of PIL and perceived stress as a predictor for negative and positive mental health outcomes, respectively. In the overall sample, there were no significant interaction effects. When evaluating subgroups, PIL*perceived stress was a significant predictor of depression in the subsample of male participants, but not any other subgroup, β = -.134, $t(155)$ = -2.11, p =.036. Figure 4 shows the interaction effect of PIL*perceived stress on depression in male participants. For this subsample, PIL does moderate the relationship between perceived stress and depression so that the effects of perceived stress on depression are reduced. However, with multiple analyses, there is an increased chance of finding a significant result. This would need to be replicated in another study to be conclusive.

Table 10. *Standardized Beta Weights for Purpose in Life and Perceived Stress Predicting Negative Mental Health Outcomes (Hypothesis 3)*

	Depression			Anxiety			Negative Affect		
	β	*t*	*p*	β	*t*	*p*	β	*t*	*p*
PS	0.508	12.73	< .001	0.667	17.25	< .001	0.629	16.42	< .001
PIL	-0.190	-4.82	< .001	0.009	0.23	0.817	-0.070	-1.83	0.068
PIL*PS	-0.020	-0.69	0.493	-0.006	-0.18	0.860	-0.027	-0.84	0.403

Table 11. *Standardized Beta Weights for Purpose in Life and Perceived Stress Predicting Positive Mental Health Outcomes (Hypothesis 3)*

	Positive Affect			Life Satisfaction		
	β	*t*	*p*	β	*t*	*p*
PS	-0.322	-7.33	< .001	-.382	-8.68	< .001
PIL	.273	.273	< .001	.203	4.63	< .001
PIL*PS	.051	.051	.170	.049	1.33	.183

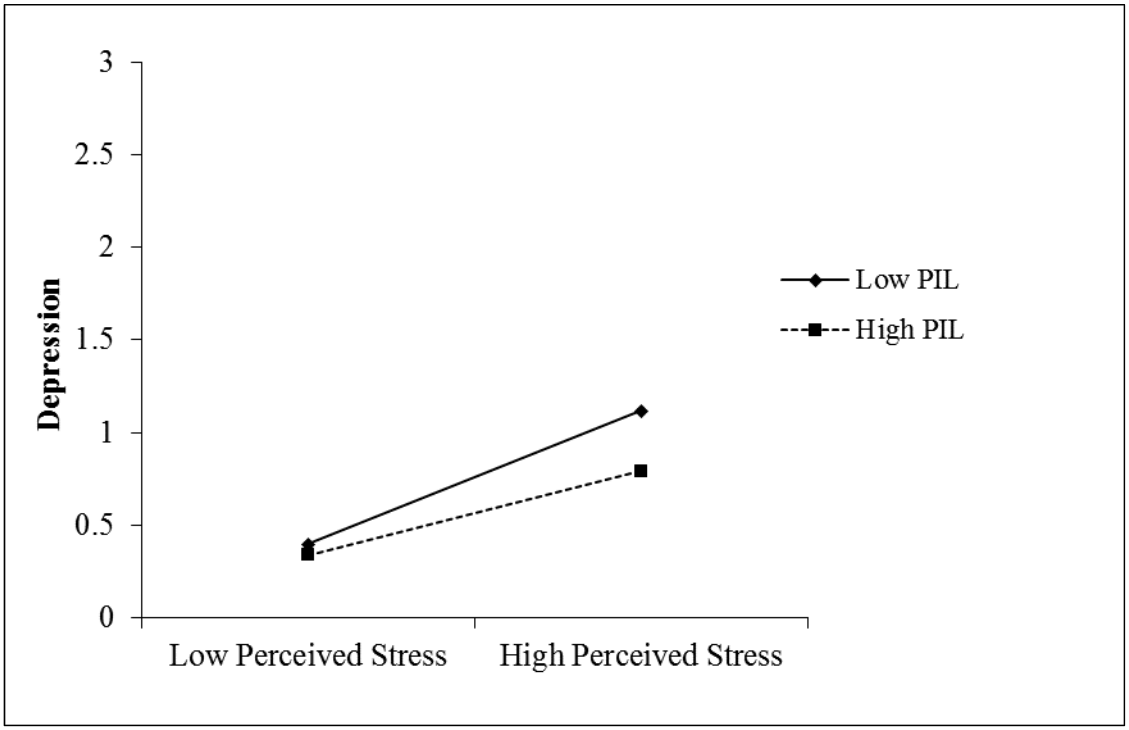

Figure 4. PIL x perceived stress interaction predicting score of depression in male participants.

Mediation

One possible way that perceived stress may affect the relationship between PIL and positive mental health may be a complete or partial mediation. To test this possibility, a mediation analysis was conducted using the Process macro for SPSS by Hayes (2009) and interpreted based on the recommendations in both Baron & Kenny (1986) and Hayes & Rockwood (2016). Figure 5 shows each of the mediation models with standardized beta weights for each relationship between PIL, perceived stress, and each mental health outcome variable. Perceived stress did act as a mediator in this sample for each mental health outcome when interpreted both based on Baron & Kenney (1986) by comparing beta weights and the Sobel test and based on the bootstrap confidence interval described in Preacher & Hayes (2004) and Hayes (2009). Table 12 shows the completely standardized indirect effect of PIL on each mental health outcome with Z and *p* values based on the Sobel test as well as the bootstrap confidence intervals.

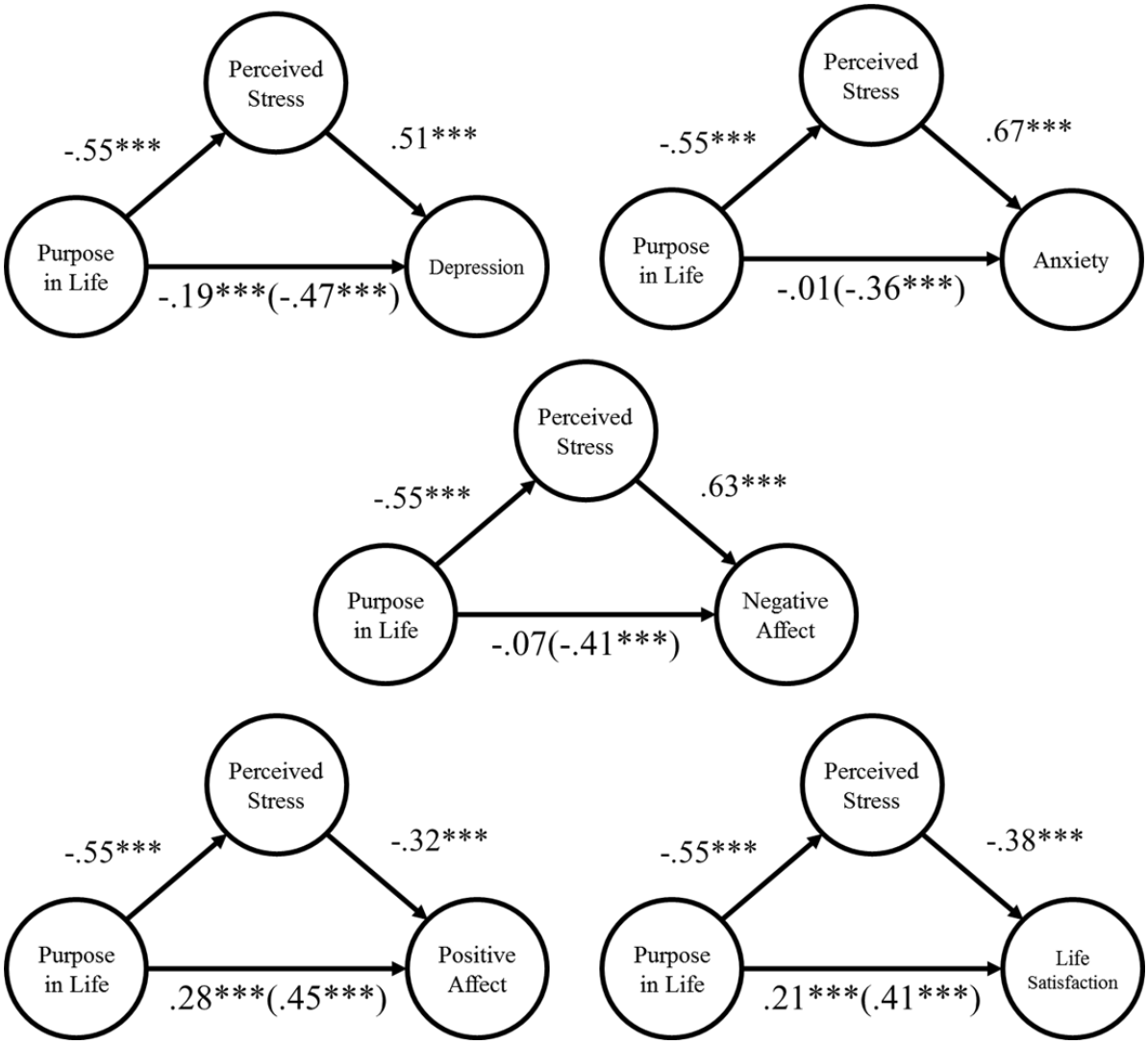

Figure 5. Mediation models with standardized beta weights for perceived stress as a mediator between PIL and each negative and positive mental health variable. Note: ****p* < .001.

Table 12. Completely Standardized Indirect Effect of PIL on Each Positive and Negative Mental Health Outcome with Bootstrap Confidence Interval.

	Effect	*Z*	*p*	95% CI
Depression	-0.28	-9.73	< .001	-.33 to -.23
Anxiety	-0.36	-11.39	< .001	-.43 to -.31
Negative Affect	-0.34	-11.12	< .001	-.40 to -.29
Positive Affect	0.17	6.52	< .001	.12 to .23
Life Satisfaction	0.21	7.46	< .001	.15 to .26

Discussion

This study was designed as a preliminary study to examine the role of stress in the relationship between PIL and mental health. First, this study examined the relationship between PIL and measures of both negative and positive mental health. Second, this study examined how PIL affects the appraisal component of the stress process by calculating the relationship between PIL and perceived stress. Third, this study examined the reactivity component of the stress process by calculating the relationship between the interaction of PIL*perceived stress and mental health. The above analyses were repeated with the subsamples of male, female, and each ethnicity to elucidate possible differences in these groups. Finally, this study examined how perceived stress may mediate the relationship between PIL and mental health.

Hypothesis 1

The hypothesis that mental health would be related to PIL was supported with significant standardized beta weights for the overall sample, male and female participants, and most of the ethnic groups of the sample. This outcome aligns with previous literature that show that PIL relates to better positive mental health and reduced negative mental health outcomes. This lends support to McKnight & Kashdan's (2009), Ryff's (1989), and Frankl's (1963, 1967) theories about the relationship between PIL and mental health. This also supports the theory that PIL is a variable that can be targeted to affect mental health outcomes for better well-being. However, as the study is correlational, it is not possible to make conclusions about the direction or causality of the relationship between PIL and mental health. Likely, there is a bidirectional relationship between PIL and mental health where having better mental health encourages more engagement in PIL and more engagement in

PIL contributes to mental health. In addition, there are likely many other variables that contribute to the simple relationship described here, as PIL only accounts for 12 to 21% of the variance in each of the mental health outcomes.

Based on large differences from other subsamples in standardized beta weights for the subsamples of Black, Asian American/ Pacific Islander, and American Indian/ Alaska Native participants, the mental health outcomes were predicted from PIL, relevant ethnicity, and relevant interaction term. Results showed that the interaction was significant for negative affect and life satisfaction specifically for the subsample of American Indian/ Alaska Native participant compared to the rest of the sample. This could provide some evidence that PIL may have a different relationship to mental health for American Indian/ Alaska Native individuals. Graphing the results show that PIL has less of a relationship with both negative affect and life satisfaction in American Indian/ Alaska Native participants in this sample.

Little research has explored PIL with American Indian/ Alaska Native participants outside comparing means (Garner, Byars, & Garner, 2009). With little research support, a small sample size, and correlational data, it is hard to interpret the lack of relationship between PIL and negative affect and life satisfaction in American Indian/ Alaska Native participants. One possible explanation is that PIL is not a significant predictor of negative affect or life satisfaction in this group because of differences in etiology of negative affect or life satisfaction for this group. Other possible explanations are that this subgroup places different importance on PIL or has a different understanding of what PIL means than the questions used. Replications with larger sample would be beneficial to explore this relationship.

Hypothesis 2

The hypothesis that PIL would be related to perceived stress was supported with significant standardized beta weights for the overall sample, and all gender and ethnic subgroups except the group of participants that identified as another ethnicity not listed. Based on the consistent significant relationship between PIL and perceived stress in all other subgroups in the sample, it is likely that, had there been more participants in that category, the group of other ethnicities not listed would have shown a similar relationship. Once again, however, it is important not to infer any causality to the relationship between perceived stress and PIL. As with the relationship between PIL and mental health, there are likely multiple variables involved. However, PIL accounts for 30% of the variance in perceived stress in this sample, which highlights its importance.

Based on differences in standardized beta weights for Black and Asian American/ Pacific Islander participants, an interaction variable was created for each group and analyses completed predicting perceived stress from PIL, either Black or Asian American/ Pacific Islander participants, and the relevant interaction terms. The lack of any significant interaction may reflect that the relationship between PIL and perceived stress is not different for Black or Asian American/ Pacific Islander individuals compared to other ethnicities, or it may be reflective of small sample sizes in those subsamples. Replication with larger samples of Black and Asian American/ Pacific Islander individuals would be needed to add evidence for one conclusion or the other.

Hypothesis 3

There is no evidence of an interaction with PIL*perceived stress predicting mental health outcomes in the overall sample or any ethnic subsample. Based on the previous

discussion of the models above, it appears PIL does not have the same relationship to stress and mental health that neuroticism was found to in the work by Bolger & Zuckerman (1995) showing that reactivity was the most detrimental for mental health. However, part of the reason that reactivity to stress is not impacted by level of PIL may be because of the measure of perceived stress instead of life events. Reactivity in the definition of Bolger & Zuckerman (1995) may encompass the appraisal of life events that would have occurred prior to the measurement of perceived stress. It is different measuring PSEs such as life events versus measuring perceived stress. In perceiving stress, the participant has already appraised the event as "stressful" or threatening to their wellbeing. Therefore, measuring perceived stress encompasses a different concept and more subjective experience than life events does. In addition, the study by Bolger & Zuckerman (1995) was a diary study with multiple time points, while this study was at a single time, which may limit the power to detect interaction effects. Based on the information here, it is difficult to conclude that PIL acts differently than neuroticism because of the other differences in design.

The only subsample that had a significant interaction was males for PIL*perceived stress predicting depression. This may indicate that PIL is particularly relevant for male individuals with higher perceived stress who are at risk for depression. One reason that PIL may be particularly important for men is that men tend to relate their sense of identity on their career and experience depression when this purpose is lost during retirement (Oliffe et al., 2013). Further research into the relationship is needed to elucidate the potential benefit of a focus on PIL with men.

Mediation

Based on analyses of mediation with the Process macro for SPSS by Hayes (2009) and interpretation based on recommendations in both Baron & Kenny (1986) and Hayes & Rockwood (2016), perceived stress acts a mediator in this sample for each mental health outcome. This indicates that having a high PIL is related to a lower perceived stress, which then affects mental health, where it is the changes in perceived stress that account for the differences in mental health. Perceived stress appears to be a particularly good mediator for anxiety, negative affect, and life satisfaction based on large reductions in beta weights between predicting those outcomes from PIL alone and predicting them from PIL and perceived stress. This is particularly relevant in the relationships between PIL and the outcomes of anxiety and negative affect. Those beta weights became non-significant as perceived stress was added to the regression equation. While Baron & Kenny (1986) would interpret this as a full mediation, additional information from Hayes & Rockwood (2016) would hesitate to claim a full mediation due to the large sample size of 543 participants included in this analysis.

Beyond the question of partial or full mediation, both the Sobel tests and the bootstrap confidence intervals shown in table 12 indicate that perceived stress is a significant mediator. As with the discussion of hypothesis 2, however, it is important to recognize that perceived stress encompasses the perspective of the participant and the appraisal of events as threatening and therefore "stressful." It is likely that PIL does affect one's perspective of PSEs and this perspective is what protects one from increased negative mental health outcomes and decreased positive mental health outcomes. The analyses would suggest that perceived stress is a particularly important mediator for anxiety and negative affect, and

potentially for life satisfaction. However, all relationships between PIL and each outcome was mediated by perceived stress, indicating the importance of perceived stress in the relationship between PIL and mental health.

Gustafsson & Skoog (2012) found that perceived stress acts as a mediator between optimism and burnout, likely because those who are optimistic may employ different coping methods in response to stress than those who are pessimistic. A similar relationship may explain why PIL relates to lower perceived stress which then relates to better mental health in both reduced negative and increased positive outcomes. PIL was found to be related to less perceived stress for each mental health outcome, suggesting that having a high PIL encourages one to perceive less events as threating and more as challenging (Lazarus & Folkman, 1984). When events are viewed as challenging, one likely attends and responds to these events differently. In addition, the relationship between perceived stress and mental health is well-known and expected, so changes in perceived stress would be expected to affect mental health outcomes.

Limitations

First, this study was cross-sectional and correlational. While the results are consistent with the theory that PIL affects mental health, no definitive conclusions can be drawn about causality. The benefits of this study are as preliminary analyses showing a relationship between these variables. To determine if increasing PIL would result in a change to perceived stress or negative or positive mental health, a different study design that evaluates levels of these variables over time would be needed.

It is also important to recognize that the sample here is not representative of the community at large. Traditional undergraduate students undoubtedly experience different

pressures than older adults or adults in different situations, which likely shapes their PIL. While there is research in different populations, much of the research on PIL and mental health has a sample with a mean age over 50 (Burrow et al., 2014; Haugan, 2014; Hedberg et al., 2010; Kaji et al., 2010; Smith & Zautra, 2004). PIL may be particularly important for one or more age groups due to different pressures and developmental period. While this study adds to the fewer studies with a large sample of young adults (Briggs & Shoffner, 2006; Burrow & Hill, 2011), this study is limited specifically to young adults in an undergraduate community. PIL also may be differentially important for individuals who have different education levels, access to higher education, or interest in higher education, or those who are non-traditional students. In addition to sample limitations of age and education level, the sample sizes for ethnicity were smaller than needed to detect significant relationships between variables. This study design cannot answer these questions due to the sample surveyed as well as lack of measures to determine which students are "non-traditional."

Future Research Directions

The second hypothesis, that PIL and perceived stress would be related, was supported by the results of the regression analyses. One possible reason that PIL may affect perceived stress is that, with more PIL, one may be more likely to appraise a PSE as a challenge rather than a threat. The next step would be to determine if appraisal is a mediator in the relationship between PIL and perceived stress. A future study could examine appraisal as a potential mediator by assessing participants' appraisal of events as threatening or challenging.

Mediators besides perceived stress should also be considered for their role in the relationship between PIL and mental health. For example, another mediator to investigate may be optimism. Farber et al. (2010) found that optimism mediated the relationship between personal meaning, a concept closely related to PIL, and wellbeing in a cross-sectional design. They suggest that personal meaning protects against declines of optimism, and optimism then contributes to well-being. Optimism, and other possible related variables, could be either controlled for or entered as a mediator in future research into the relationship between PIL and mental health.

In addition, to assess the causal relationship between PIL and perceived stress and/or mental health, it might be possible to use a randomized controlled trial where the experimental condition involves the manipulation of PIL. For example, veterans dealing with PTSD can also struggle with finding their PIL after dealing with war. It may be beneficial to incorporate some exploration of PIL with their PTSD treatment to see if there is additional improvement. Some possible interventions that may affect PIL may be values exploration through a values card sort and discussion, modules for values in ACT therapy, use of the VIA to discuss character strengths and how to target those, or exploration with a client or participant about the directions they view in their life.

A further direction would be to investigate quality or type of PIL. PIL may be particularly salient if it is a certain type of purpose. Based on the work of Kasser & Ryan (1996), intrinsic goals may be beneficial to mental health while extrinsic goals may be detrimental. An example of this is a purpose that is focused on personal growth or improvement, compared to a desire to be wealthy. It may be helpful to determine what an individual's PIL is and how they conceptualize it in terms of the focus. It is possible that

there is a differential relationship between extrinsic PIL or intrinsic PIL and mental health and stress.

With the three components of PIL identified by McKnight & Kashdan (2009), it may be helpful to determine an individual's strength, awareness, and scope of PIL to see if any component is more beneficial for stress or mental health. Increased scope of PIL is one of the theories why PIL may moderate the relationship between perceived stress and mental health. Specifically, an individual may start to relate more events as related to their PIL and therefore see overcoming PSEs as beneficial, reducing reactivity to stress. To evaluate this, it would be important to measure PSEs and whether the individual relates these PSEs to their PIL. It also could be helpful to determine if scope, strength, or awareness of PIL is changed with an intervention designed to increase PIL.

Clinical Implications

Further research needs to be conducted to determine causality and develop a deeper understanding of when and how PIL affects mental health. If additional research supports that increasing PIL, or types of PIL, results in increasing positive mental health and decreasing negative mental health, then PIL would be an important variable to target in therapy. This would mean asking clients who may be experiencing depression and/or anxiety about their PIL and encouraging discussion about PIL. While therapies like ACT likely already increase PIL, it may be beneficial to discuss PIL with more clients.

Some studies about PIL focused on very old adults because of the propensity for that population to suffer from depression (Haugan, 2014; Hedberg et al., 2010; Kaji et al., 2010). Rodin & Langer (1977) found beneficial outcomes for elderly participants who simply had to take care of plants. Discussing PIL with this population would likely have similar beneficial

outcomes. It would likely benefit this group to include activities or therapeutic sessions to develop PIL or help transition previous PIL to their current living arrangement.

Some populations that may be helped include those at transition periods in their lives, like soldiers returning from war or those who are retiring. There is some evidence that increased negative mental health may be related to retirement specifically (Latif, 2013; Oliffe et al., 2013). In addition, soldiers returning from war not only struggle with higher rates of depression, but this may be linked to their ability to reintegrate into society (Milliken, Auchterlonie, & Hoge, 2007). One explanation is that transition periods can mean a loss of PIL as one moves from one role to another. These populations may benefit from increasing their attention on and development of PIL.

Conclusions

This study supports the theory that PIL is a beneficial resource for positive mental health and a protective factor for negative mental health. It also adds that PIL relates to perceived stress, which acts as a mediator between PIL and mental health. This study is correlational, however, so a different study design, with other populations, and more diverse populations is needed. This study also offers limited support that PIL is important for multiple subgroups, including males, females, and most ethnic subgroups included here. However, there are some outcomes that may point to a different relationship between PIL, stress, and mental health in males and American Indian/ Alaska Native individuals. With additional research into this topic, the hope is that this relationship may be elucidated further to determine the benefits of increasing PIL and when and in what circumstances it is best to do so.

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