

RESEARCH ARTICLE

# Gratitude Moderates the Relationship Between Perceived Support, Stress, and Mental Health in Women

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**History**

Received: 8 September 2025

Accepted: 10 December 2025

Published: 2 February 2026

**Citation**

Deichert, N. T., & Fekete, E. M. (2026). Gratitude moderates the relationship between perceived support, stress, and mental health in women. *European Journal of Mental Health*, 21, e0050, 1–15. <https://doi.org/10.5708/EJMH.21.2026.0050>

**Introduction:** Social support is strongly associated with positive mental health outcomes. One reason for this association is that support is able to reduce perceptions of stress. Identifying factors that influence this link may be particularly important for women given their greater incidence of anxiety and depression. Gratitude may play a key role in this context, as research suggests the benefits of support are stronger for individuals with higher levels of gratitude.

**Aim:** The purpose of the current study was to examine whether the indirect association between social support and women's mental health through perceived stress was moderated by gratitude.

**Methods:** To test our research question, we conducted a cross-sectional correlational study of 278 women who completed questionnaires assessing social support, perceived stress, depression, anxiety, and gratitude.

**Results:** Consistent with previous research, our results indicated that the association between social support and depression was partially mediated by perceived stress. In contrast, the association between support and anxiety was fully mediated by perceived stress. Furthermore, our results showed that conditional indirect effects of support on depression and anxiety through perceived stress were only significant at high levels of gratitude and not at low levels of gratitude.

**Conclusions:** Our results add to the literature showing that gratitude strengthens the positive association between social support and mental health in women.

**Keywords:** gratitude, social support, stress, mental health, women's health

## Introduction

Social support has been strongly linked to the promotion of positive psychological health (Zell & Stockus, 2025), in part due to its ability to reduce the negative consequences of stress (Cohen & Wills, 1985). Given that women report higher rates of stress, depression, and anxiety across the lifespan (Goodwin et al., 2020, 2022; Graves et al., 2021; Grocke-Dewey et al., 2023; Salk et al., 2017), it is important that research identify factors that enhance the effectiveness of support to help prevent the development of these disorders. One key variable to consider in this process is gratitude. Not only is gratitude associated with better psychological well-being (Cregg & Cheavens, 2021; Portocarrero et al., 2020), it is also associated with higher levels of perceived support (Feng & Yin, 2021; Kong et al., 2015) and greater utilization of positive coping strategies (Lambert et al., 2009, 2012; Lin, 2016;

Wood et al., 2007), and it has been shown to strengthen the association between social support and psychological outcomes (Deichert et al., 2021; Xin, 2022). Therefore, the purpose of the current study was to examine whether gratitude strengthened the association between social support and mental health outcomes in women.

### Social Support and Psychological Health

Studies have repeatedly shown that social support is positively associated with better mental health outcomes, both in terms of preventing the onset of and enhancing recovery from mental disorders (Bjørlykhaug et al., 2022). In fact, this association may be particularly important in cases of depression (Turner & Brown, 2010). Specifically, a meta-analysis examining the association between support and depression in adolescents found that greater amounts of support were linked to less depression (Rueger et al., 2016), with research suggesting that this association holds across the lifespan (Gariépy et al., 2016). More recently, several reviews concluded that social support was related to greater rates of remission and reduced symptom severity for both depression and anxiety in prospective longitudinal studies (J. Wang et al., 2018; Wickramaratne et al., 2022).

While support has been linked to positive mental health outcomes in general, this association is significantly stronger for women compared to men (Kendler et al., 2005; Shin & Park, 2023). Theory suggests that this difference may be explained, at least in part, by gender differences related to social support. From an evolutionary perspective, cooperative social connections between women may have served important adaptive functions (Bedrov & Gable, 2022). According to the tend-and-befriend model (Taylor et al., 2000; Taylor & Master, 2011), women are posited to respond to stressful events in a more socially affiliative fashion, thus providing resources that aided with food acquisition, caring for offspring, as well as coping with environmental stressors. Importantly, this affiliative behavior is thought to be moderated by oxytocin, a neural hormone that plays a key role in social bonding and whose effects are heavily influenced by estrogen levels, which are higher in females (Taylor, 2000).

In addition to the evolutionary advantages associated with a more socially affiliative response to stress, social roles may also explain gender differences in the support process. According to the social support activation process model, gender is theorized to influence several aspects of the support process (Barbee et al., 1993). This is due to women being more socially skilled than men which can influence various aspects of the support process including decisions to seek support, differences in help seeking behaviors, as well as the supportive behaviors received. Empirical findings are consistent with these theories suggesting that women have been shown to have more intimate social connections and are more likely to engage with members of their network than are men (Acitelli & Antonucci, 1994; Kahn & Antonucci, 1980; Shin & Park, 2023). Furthermore, women report greater utilization of both emotional and instrumental support than men (Graves et al., 2021; Heerde & Hemphill, 2018) and social support has been shown to be a stronger predictor of active coping for women (Lin, 2016).

### Stress as a Mediator of the Social Support – Mental Health Relationship

One potential pathway through which support may positively impact mental health outcomes is through its association with stress (Cohen & Wills, 1985; Kawachi & Berkman, 2001). It is posited that differences in the experience of stress may be attributable to the appraisal process with individuals higher in support more likely to appraise events as less stressful, thereby reducing stress (Cohen & Wills, 1985; Kawachi & Berkman, 2001). Moreover, even when events are perceived as stressful, support may attenuate the negative cognitive, emotional, and behavioral responses to the event. Not only has research found that greater levels of social support predict reduced levels of stress (Zell & Stockus, 2025), studies also show that the association between stress and negative psychological outcomes is weaker for individuals with higher levels of support (Chao, 2012; X. Wang et al., 2014). Furthermore, several studies have found that perceived stress mediates the relationship between social support and mental health outcomes. Specifically, perceptions of stress have been shown to mediate the relationship between social support and both anxiety and depression (Acoba, 2024; Roohafza et al., 2014), although this relationship may be bi-directional (Glazier et al., 2004).

### Gratitude as a Moderator of the Support – Mental Health Relationship

Although research shows that social support is indirectly associated with better mental health through reduced perceptions of stress, it is important to examine factors that may influence this relationship. Gratitude, or the “generalized tendency to recognize and respond with grateful emotion to the roles of other people’s benevolence

in the positive experiences and outcomes that one obtains” (McCullough et al., 2002, p. 112), is important to consider given its connections to social support, stress, and mental health. In relation to social support, gratitude has not only been theorized to build social resources, including establishing new social connections, but it is also posited to help strengthen already-established relationships (Algoe, 2012; Fredrickson, 2004). Empirical research supports this link showing that gratitude is associated with positive aspects of social relationships including increased relationship and friendship quality (Algoe et al., 2008; O’Connell et al., 2018) as well as greater feelings of social connectedness (Kerr et al., 2015). Furthermore, gratitude has been correlated with social support, such that individuals higher in gratitude tend to report increased perceptions of support (Algoe & Stanton, 2012; Wood et al., 2008; Zhang & Tsai, 2023).

In addition to the positive gains in social relationships, recent studies suggest that gratitude strengthens the positive associations between social support and psychological outcomes. For example, a study by Xin (2022), examining college students’ levels of academic engagement, found social support was positively associated with satisfaction with one’s basic psychological needs. Importantly, this association was found to be stronger for individuals with greater dispositional gratitude, providing evidence that the benefits of support are stronger for more grateful individuals. Similar findings were demonstrated in an experiment with undergraduate students who took part in a brief gratitude writing exercise prior to delivering a stressful speech (Deichert et al., 2021). During the speech, participants were randomly assigned to receive social support or no support. Results indicated that while a main effect of social support emerged, such that receiving support was associated with perceiving the speech task as less stressful, there was an interaction between social support and gratitude. Specifically, participants who received support and were assigned to the gratitude writing condition reported the speech as the least stressful.

Beyond its associations with social support, gratitude is also linked to positive psychological well-being. For example, gratitude has been found to be negatively correlated with levels of anxiety and depression (Cregg & Cheavens, 2021; Portocarrero et al., 2020) as well as lower levels of perceived stress (Lee et al., 2018; Sirois & Wood, 2017; Wood et al., 2008). Moreover, research has directly examined gratitude’s moderating effects on the relationship between perceived stress and psychological health and found that gratitude buffers the negative impact of stress. Specifically, a daily diary study found that more grateful individuals reported being less negatively affected when experiencing daily stressors over time (Krejtz et al., 2016). Another study reported similar results in a sample of college students, such that individuals reporting greater amounts of appreciation of others showed a weaker association between stressful life events and depressive symptoms (Deichert et al., 2019).

Taken together, research in this area strongly suggests that gratitude is an important factor in overall mental health. Specifically, gratitude has been shown to moderate the association between support and psychological outcomes and mitigate the negative effects of stress on mental health. It is important to note that gender differences have also been observed in relation to gratitude. Specifically, women report greater levels of dispositional gratitude (Froh et al., 2009; Jans-Beken et al., 2018; Kashdan et al., 2009) and stronger feelings of gratitude in response to a gift and also view expressions of gratitude more favorably than men (Kashdan et al., 2009). Furthermore, gratitude was shown to be a stronger predictor of social relatedness over time for women compared to men. Therefore, gratitude may be particularly important in the building of social resources for women, which may have important implications for their psychological well-being.

## The Present Study

The goal of this study was to examine whether gratitude moderated the associations between social support, lower stress, and better psychological well-being in a sample of women. Our first hypothesis was that social support would be indirectly associated with better psychological well-being (i.e., fewer depressive symptoms and less anxiety) through lower perceived stress. Our second hypothesis predicted that gratitude would moderate (a) the indirect relationship of social support on psychological well-being through decreased perceived stress and (b) the direct effect of social support on psychological well-being. Specifically, we expected that high levels of gratitude would strengthen the association between support and lower stress (i.e., path between the predictor and mediator) as well as the relationship between lower stress and better psychological well-being (i.e., path between the mediator and outcome). Moreover, we anticipated that higher levels of gratitude would strengthen the direct association between social support on psychological well-being (i.e., path between the predictor and outcome).

## Methods

### Participants and Data Collection

Data from this study consisted of secondary data analysis from a cross-sectional correlational study conducted between February and March 2016. The study included 278 women who completed an online survey about their attitudes and experiences regarding their health and weight. All participants from this study were included in the present analyses. All study procedures were approved by the Institutional Review Board at the University where the study was conducted. To be eligible for the study, women had to be at least 18 years of age or older and verbally fluent in the English language, but those who had been diagnosed with an eating disorder or were pregnant were excluded. A convenience sample of participants were recruited through a psychology undergraduate subject pool, snowball sampling, and social media outlets including Facebook and Twitter. Interested participants were provided with a link to a Qualtrics survey where they were asked to complete a set of questions to determine their eligibility for the study. Eligible participants then completed an informed consent document and a survey that took about 20 minutes to complete. Every 10<sup>th</sup> person to complete the survey was awarded a \$20.00 gift card. Women had a mean age of 31.15 ( $SD = 13.48$ , range = 18–74, skewness = 1.11, kurtosis = 0.20). Most women identified as White (83.5%), middle class, and college educated. Table 1 presents the full range of participants' demographic characteristics.

Table 1. Participant's Sociodemographic Characteristics

Variable		<i>M</i>	<i>(SD)</i>
Age		31.15	(13.48)
Self-Rated Health		3.25	(.86)
Income		<b>Median</b>	
		\$40,000-\$59,000	
		<b><i>n</i></b>	<b><i>(%)</i></b>
Race	White	232	(83.5%)
	Hispanic	14	(5.0%)
	Asian	9	(3.2%)
	Black/African American	8	(2.9%)
	Biracial/Multiracial	5	(1.8%)
	Did Not Respond	10	(3.6%)
Education	High School Graduate	153	(55.0%)
	College Graduate	69	(24.9%)
	Graduate Degree	46	(16.5%)
	Did Not Respond	10	(3.6%)
Employment Status	Full-time Student	97	(34.9%)
	Work Full-time	88	(31.7%)
	Work Part-time	57	(20.5%)
	Retired/Unemployed	26	(9.3%)
	Did Not Respond	10	(3.6%)

### Measures

#### *Demographics*

Participants were asked to disclose their demographic information, including age, race/ethnicity, employment status, education level, income, and self-rated health. Self-rated health was measured using a one-item question that asked, "In general, would you say your health is: poor, fair, good, very good, excellent" (Ware & Sherbourne, 1992). Responses ranged from 1 to 5, with higher scores indicating better health. The mean self-rated health score was 3.25 ( $SD = 0.88$ , range 1–5, skewness = -0.07, kurtosis = -0.08).

### *Multidimensional Scale of Perceived Social Support (MSPSS)*

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) assessed participants' perceived social support. The scale consists of 12 items rated on a scale from 1 (*very strongly disagree*) to 7 (*very strongly agree*). The items were averaged to obtain a mean score, with higher scores indicating greater levels of perceived social support. Women's mean amount of total perceived social support in the present study was 5.76 ( $SD = 1.16$ , range = 1–7, skewness = -1.21, kurtosis = 1.76,  $\alpha = .94$ ).

### *Perceived Stress Scale (PSS-10)*

The 10-item version of the Perceived Stress Scale (PSS-10; Cohen et al., 1983) assessed the extent to which participants appraised life situations as being unpredictable and uncontrollable over the past month. Items were rated on a 5-point scale from 0 (*never*) to 4 (*very often*). Positive items were reversed scored, and items were summed to create a total score, with higher scores reflecting higher levels of perceived stress. Women's mean amount of perceived stress in the present study was 17.77 ( $SD = 7.25$ , range = 0–35, skewness = 0.18, kurtosis = 0.29,  $\alpha = .88$ ).

### *Center for Epidemiologic Studies Depression Scale-Revised (CESD-R 10)*

The 10-item Center for Epidemiologic Studies Depression Scale-Revised (CESD-R 10; Björgvinsson et al., 2013) measured depressive symptomatology. Participants indicated whether they had experienced different depressive symptoms over the past week on a scale of 0 (*rarely or none of the time*) to 3 (*all of the time*). Positive items were reversed scored, and items were summed to create a total scale score, with higher scores indicating higher levels of depressive symptomatology. Women's mean amount of depressive symptoms was 9.02 ( $SD = 5.71$ ; range = 0–26, skewness = 0.74, kurtosis = -0.21,  $\alpha = .85$ ). 38.5% of women in the current sample scored ten or above on this measure, which has been identified as a cut-off for being at risk for depression (Andresen et al., 1994).

### *State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA)*

State anxiety was assessed using the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Grös et al., 2007). Participants indicated how they felt over the past month on a scale ranging from 1 (*not at all*) to 4 (*very much so*). The STICSA measures both cognitive and somatic symptoms of anxiety. The 21 items were summed to create a total scale score, with higher scores reflecting greater anxiety. The mean level of anxiety in the current study was 36.14 ( $SD = 10.20$ , range = 21–68, skewness = 0.59, kurtosis = -0.47,  $\alpha = .90$ ). 34.2% of the women in the current sample scored 40 or higher on this measure, which has been identified as a cut-off for being at possible risk for an anxiety disorder (Van Dam et al., 2013).

### *Gratitude Questionnaire-Six Item Form (GQ-6)*

Dispositional gratitude was measured using the Gratitude Questionnaire-Six Item Form (GQ-6; McCullough et al., 2002), which utilizes a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Negative items were reversed scored, and items were summed to obtain a total gratitude score, with higher scores reflecting greater dispositional gratitude. Women's mean amount of gratitude was 36.68 ( $SD = 6.03$ , range = 12–42, skewness = -1.48, kurtosis = 1.96,  $\alpha = .87$ ).

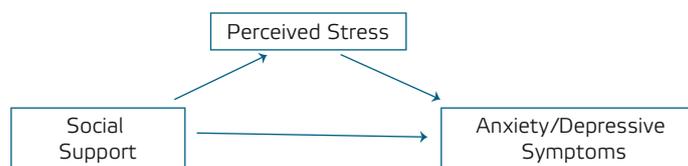
## Statistical Analysis

Pearson correlations and one-way ANOVAs were conducted to examine relationships and group differences among sociodemographic variables and the mediator (perceived stress) and outcome variables (depressive symptoms, anxiety). Significant correlations or group differences found between any demographic variables and the mediator variable or outcome variables were controlled for in all analyses.

To examine our first hypothesis that perceived stress would mediate the relationship between social support and psychological well-being in women, we utilized a mediation model (Model 4, see Figure 1) in the PROCESS macro for SPSS (Hayes, 2022). To establish the significance of the indirect effects, we examined bootstrapped confidence intervals, as they provide a more accurate and stable assessment of indirect effects (Preacher & Hayes,

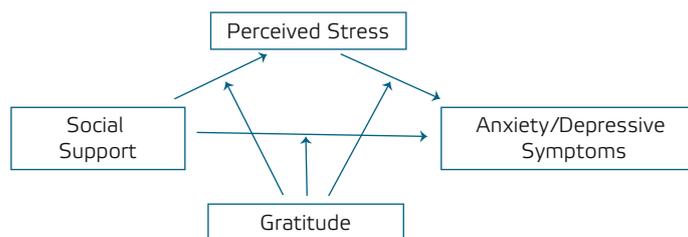
2004). In addition, we reported the completely standardized indirect effect as a measure of the effect size of the indirect effect.

Figure 1. Perceived Stress as a Mediator of Social Support and Psychological Well-Being



To examine our second hypothesis that gratitude would moderate the relationship between social support, perceived stress, and psychological well-being, we used Model 59 (see Figure 2) in PROCESS (Hayes, 2022). Model 59 is a moderated mediation model that examines interactions between the predictor (social support) and moderator (gratitude) in explaining the mediator (perceived stress), between the mediator and moderator in explaining the outcomes (depression and anxiety), and between the predictor and moderator in explaining the outcomes. We again used bootstrapped confidence intervals to examine the conditional indirect effects at 1 standard deviation above and below the centered mean of the moderator. To aid in the interpretation of the conditional indirect effects, the predictor and moderator variables were centered prior to conducting the moderated mediation analysis. Significant interactions were interpreted using simple slopes and Johnson-Neyman analyses.

Figure 2. Gratitude as a Moderator of Social Support and Perceived Stress on Psychological Well-Being



## Results

### Correlations Among Main Study Variables

Table 2 presents the Pearson correlations and descriptive statistics for all main study variables. Social support was correlated with less perceived stress ( $r = -.33, p < .001$ ), fewer depressive ( $r = -.37, p < .001$ ) and anxiety symptoms ( $r = -.26, p < .001$ ), and more gratitude ( $r = .57, p < .001$ ). Perceived stress was associated with more depressive ( $r = .77, p < .001$ ) and anxiety ( $r = .73, p < .001$ ) symptoms and less gratitude ( $r = -.43, p < .001$ ). Depressive symptoms were associated with more anxiety ( $r = .78, p < .001$ ) and less gratitude ( $r = -.43, p < .001$ ), and anxiety was associated with less gratitude ( $r = -.32, p < .001$ ).

Table 2. Pearson Correlations and Descriptive Statistics for the Main Study Variables ( $n = 278$ ).

Variable	M	SD	1	2	3	4	5
Social Support	5.76	1.16	-				
Perceived Stress	17.77	7.25	-.33***	--			
Depressive Symptoms	9.02	5.71	-.37***	.77***	-		
Anxiety	36.14	10.20	-.26***	.73***	.78***	-	
Gratitude	36.68	6.03	.57***	-.43***	-.43***	-.32***	-

\*\*\* $p < .001$

### Covariate Analysis

Individuals who were older and who had better self-rated health reported less perceived stress ( $r = -.29, p < .001$  for age;  $r = -.37, p < .001$  for health), fewer depressive symptoms ( $r = -.18, p = .003$  for age;  $r = -.38, p < .001$  for health), and less anxiety ( $r = -.18, p = .003$  for age;  $r = -.35, p < .001$  for health). Participants with higher incomes reported less perceived stress ( $r = -.18, p = .003$ ) and fewer depressive symptoms ( $r = -.16, p = .007$ ).

A one-way ANOVA revealed significant group differences in education for perceived stress, ( $F [3, 274] = 3.95, p = .009, \eta^2 = .04$ ) and anxiety ( $F [3, 274] = 3.52, p = .016, \eta^2 = .04$ ) but not for depressive symptoms ( $F [3, 274] = 2.41, p = .067, \eta^2 = .03$ ). Compared to those participants who reported having graduate degrees, those participants with high school degrees had higher levels of perceived stress (High School  $M = 18.87, SD = 7.04$ ; Graduate  $M = 15.15, SD = 6.94$ ) and anxiety (High School  $M = 37.82, SD = 10.95$ ; Graduate  $M = 32.92, SD = 7.89$ ). Group differences also emerged for employment status for perceived stress ( $F [4, 273] = 3.20, p = .014, \eta^2 = .05$ ) and depressive symptoms ( $F [4, 273] = 3.14, p = .015, \eta^2 = .04$ ), but not for anxiety ( $F [4, 273] = 2.18, p = .072, \eta^2 = .03$ ). Those participants who worked full time reported lower levels of perceived stress (Full Time  $M = 15.74, SD = 7.24$ ; Student  $M = 19.37, SD = 6.72$ ) and depressive symptoms (Full Time  $M = 7.49, SD = 5.02$ ; Student  $M = 10.23, SD = 5.88$ ) compared to those participants who were full time students. No significant group differences emerged for race/ethnicity. Therefore, age, self-rated health, income, education level, and employment status were controlled for in all analyses. As covariates, age, self-rated health, and income were continuous variables and education and employment were categorical. All categories of education and employment were included in the analyses.

### Perceived Stress as a Mediator of Social Support and Psychological Well-Being

#### Depressive Symptoms

As shown in Table 3, after accounting for covariates, the total effect of social support on fewer depressive symptoms was significant. Social support was associated with less perceived stress, and perceived stress, in turn, was associated with more depressive symptoms. The indirect effect of social support on less depression through decreased perceived stress was significant and indicated a large effect size. After including perceived stress in the model, the direct effect of social support on depression was reduced in magnitude, indicating that perceived stress partially mediated the association between social support and depressive symptoms.

Table 3. Perceived Stress as a Mediator of Social Support and Depression and Anxiety

	<i>b</i>	<i>SE</i>	<i>p</i>	95% CI	
				Lower	Upper
Total Effects					
Social Support → Depression	-1.45	0.26	<.001	-1.96	-0.93
Social Support → Anxiety	-1.72	0.50	.001	-2.69	-0.74
Path Coefficients					
Social Support → Perceived Stress	-1.65	0.33	<.001	-2.31	-1.0
Perceived Stress → Depression	0.55	0.04	<.001	0.48	0.62
Perceived Stress → Anxiety	0.98	0.07	<.001	0.85	1.12
Completely Standardized Indirect Effects					
Social Support → Perceived Stress → Depression	-0.18	0.04		-0.26	-0.12
Social Support → Perceived Stress → Anxiety	-0.19	0.03		-0.25	-0.12
Direct Effects					
Social Support → Depression	-0.55	0.04	<.001	0.48	0.62
Social Support → Anxiety	-0.10	0.39	.81	-0.86	0.68

Note. Values presented are unstandardized regression coefficients. Social support and perceived stress were all centered prior to analyses being conducted.

### *Anxiety*

As shown in Table 3, after accounting for covariates, the total effect of social support on less anxiety was significant. Social support was associated with less perceived stress, and perceived stress, in turn, was associated with greater anxiety. The indirect effect of social support on less anxiety through decreased perceived stress was significant and indicated a large effect size. After including perceived stress in the model, the direct effect of support on anxiety was reduced to non-significance, indicating that perceived stress fully mediated the relationship between social support and anxiety.

## Gratitude as a Moderator of Social Support, Perceived Stress, and Psychological Well-Being

### *Depressive Symptoms*

As predicted (Table 4), gratitude emerged as a moderator of the indirect effects of social support on depression through perceived stress. Specifically, a significant interaction was found between social support and gratitude in explaining perceived stress, and between perceived stress and gratitude in explaining depressive symptoms. The interaction between social support and gratitude in explaining depressive symptoms was not significant.

Simple slopes analysis revealed that at low levels of gratitude, the relationship between social support and perceived stress was not significant ( $b = -.39$ ,  $SE = .40$ ,  $p = .332$ ). However, at high levels of gratitude, the relationship between social support and lower perceived stress was significant ( $b = -1.78$ ,  $SE = .51$ ,  $p = .001$ ). Further, a Johnson-Neyman analysis indicated that the effect of social support on perceived stress was statistically significant when the centered gratitude value was greater than  $-3.13$  ( $b = -.74$ ,  $SE = .38$ ,  $p = .050$ ), where 76.98% of the sample falls above  $-3.13$ . Additionally, the effect of social support was also significant when gratitude was less than  $-25.57$  ( $b = 1.90$ ,  $SE = .96$ ,  $p = .049$ ); however, only about 0.36% of the sample falls below  $-25.57$ ; therefore, this region is not interpretable.

Simple slopes analysis also revealed that at low levels of gratitude, the relationship between perceived stress and depressive symptoms was significant ( $b = .58$ ,  $SE = .05$ ,  $p < .001$ ). Similarly, at high levels of gratitude, the relationship between perceived stress and depressive symptoms was also significant ( $b = .47$ ,  $SE = .05$ ,  $p < .001$ ). A Johnson-Neyman analysis indicated that there were no statistically significant transition points within the observed range of values for the moderator variable. Finally, as shown in Table 4, the conditional indirect effects of social support on depressive symptoms through perceived stress were significant at high levels (i.e., 1 *SD* above the mean) of gratitude but not at low levels (i.e., 1 *SD* below the mean) of gratitude.

### *Anxiety*

As predicted (Table 4), gratitude emerged as a moderator of the indirect effects of social support on depression through perceived stress. Specifically, a significant interaction was found between social support and gratitude in explaining perceived stress. However, the interaction between perceived stress and gratitude in explaining anxiety was not significant. Further, the interaction between social support and gratitude in explaining depressive symptoms was not significant.

Consistent with the results reported for the model examining depressive symptoms, simple slopes analyses revealed that the effect of social support on stress was not significant at low levels of gratitude but was significant at high levels of gratitude. Further, a Johnson-Neyman analysis indicated that the effect of social support on perceived stress was statistically significant when gratitude was less than  $-25.57$  ( $b = 1.90$ ,  $SE = .96$ ,  $p = .049$ ) and greater than  $-3.13$  ( $b = -.74$ ,  $SE = .38$ ,  $p = .050$ ). Only about .36% of the sample falls below  $-25.57$ , and 76.98% of the sample falls above  $-3.13$ . Finally, as shown in Table 4, the conditional indirect effects of social support on depressive symptoms through perceived stress were significant at high levels (i.e., 1 *SD* above the mean) of gratitude but not at low levels (i.e., 1 *SD* below the mean) of gratitude.

Table 4. Gratitude as a Moderator of Social Support, Perceived Stress, and Depression and Anxiety

	<i>b</i>	<i>SE</i>	<i>p</i>	95% CI	
				Lower	Upper
Path Coefficients					
Social Support → Perceived Stress	-1.13	0.40	.005	-1.91	-0.35
Gratitude → Perceived Stress	-0.40	0.08	<.001	-0.55	-0.24
Perceived Stress → Depressive Symptoms	0.52	0.04	<.001	0.45	0.60
Gratitude → Depressive Symptoms	-0.05	0.05	.314	-0.15	0.05
Perceived Stress → Anxiety	0.97	0.07	<.001	0.83	1.11
Gratitude → Anxiety	0.009	0.10	.933	-0.19	0.21
Interactions					
Social Support x Gratitude → Perceived Stress	-0.12	0.04	.003	-0.20	-0.04
Social Support x Gratitude → Depressive Symptoms	-0.05	0.03	.071	-0.10	0.004
Perceived Stress x Gratitude → Depressive Symptoms	-0.01	0.005	.042	-0.02	-0.0004
Social Support x Gratitude → Anxiety	-0.05	0.05	.344	-0.15	0.05
Perceived Stress x Gratitude → Anxiety	-0.01	0.01	.572	-0.03	0.01
Conditional Indirect Effects					
Social Support → Perceived Stress → Depressive Symptoms (LOW GRATITUDE)	-0.23	0.24		-0.69	0.23
Social Support → Perceived Stress → Depressive Symptoms (HIGH GRATITUDE)	-0.84	0.23		-1.29	-0.38
Social Support → Perceived Stress → Anxiety (LOW GRATITUDE)	-0.39	0.24		-1.15	-0.23
Social Support → Perceived Stress → Anxiety (HIGH GRATITUDE)	-1.09	-0.58		-1.02	-0.16

Note. Values presented are unstandardized regression coefficients. Social support, gratitude, and perceived stress were all centered prior to analyses being conducted.

## Discussion

Consistent with previous work, our results indicated that perceived social support was linked to more positive psychological health outcomes (Gariépy et al., 2016; J. Wang et al., 2018; Wickramaratne et al., 2022) and that this relationship was explained by support's association with perceived stress (Cohen & Wills, 1985; Kawachi & Berkman, 2001). Specifically, women who reported having greater perceptions of social support reported significantly less stress and fewer symptoms of depression and anxiety. Furthermore, our results suggest that this reduction in perceived stress mediated the relationship between social support and both depression and anxiety. More importantly, our results extend previous findings by showing that the indirect effects of social support on psychological well-being are strengthened by gratitude, with individuals higher in gratitude showing stronger indirect effects of support.

Our findings add to the literature by identifying several ways in which gratitude results in better psychological health. Consistent with previous research (Deichert et al., 2021), we found that gratitude moderated the association between support and perceived stress, such that the association between support and stress was strongest for females with higher levels of gratitude. One explanation why the association between social support and mental health is strongest for individuals with greater levels of gratitude is that gratitude strengthens social relationships. Research suggests that gratitude is linked to increased feelings of trust and intimacy and less avoidant and anxious attachment in adult relationships (Drażkowski et al., 2017; Murray & Hazelwood, 2011; Park et al., 2019). Such changes may improve relationship quality (Algoe et al., 2008; Barton et al., 2023), which is an important antecedent of support effectiveness that can lead to positive mental health (Rini et al., 2006). Indeed, studies show that gratitude is associated with greater perceptions of support which, in turn lead to better psychological outcomes (Kong et al., 2021; Yang et al., 2025). Although the correlation between support and stress became stronger for women as gratitude increased, it should be noted that the Johnson-Neyman analysis revealed that this association

remained significant for women with lower levels of gratitude, suggesting that even modest amounts of gratitude may have positive implications for the link between social relationships and mental health.

Not only did gratitude moderate the relationship between social support and perceived stress, our results show that gratitude attenuated the association between perceived stress and depressive symptoms, suggesting gratitude acts as a stress-buffer. This buffering effect may be due to grateful individuals utilizing more positive coping strategies (Lau & Cheng, 2017; Sun et al., 2019) which have been linked to positive outcomes in relation to depression and anxiety (Roohafza et al., 2014). Gratitude has also been linked to more positive cognitive interpretations of events through the use of positive reframing (Lambert et al., 2012) which have been found to reduce the individual's subjective reactions to stress (Liu et al., 2019).

## Strengths and Limitations

Several limitations of this study should be noted. This study is cross-sectional; therefore, no causal relationships can be determined. However, other research, including experimental research, confirms gratitude enhances the beneficial effects of social support on mental health (Algoe et al., 2008; Deichert et al., 2021). Another limitation of the current study is the lack of cultural diversity within our sample. The women in our study were from the United States, who tend to view themselves as more independent (i.e., self-separate from others) than individuals from Eastern cultures (Markus & Kitayama, 1991). Such beliefs about the self have important implications regarding social relationships and emotional experiences. Research explicitly examining the associations between independent self-construal and social support suggests that these variables are correlated. Specifically, independent individuals showed greater utilization of social support as a coping mechanism (Taylor et al., 2004) and also benefit more from explicit support (i.e., aid solicited from social resources) than implicit support (i.e., engaging with social connections without self-disclosure; Taylor et al., 2007). These differences may limit the generalizability of our findings to women from more Western cultures, given cultural differences in individuals' perceptions and utilization of support.

In addition to social support, cultural differences have been found in relation to emotion regulation. For example, individuals from independent cultures have been shown to savor and maintain the experience of positive emotions relative to individuals from interdependent cultures (Miyamoto & Ma, 2011). Therefore, the experience of gratitude for women in our sample may have differed in ways that strengthened the moderating effects of gratitude. Research on cultural differences in gratitude has shown that the experience of gratitude may vary by culture. Specifically, individuals from more interdependent cultures report greater levels of gratitude (Shimai et al., 2006; D. Wang et al., 2015; for exception see Robustelli & Whisman, 2018). However, individuals from independent cultures tend to experience better psychological outcomes and benefit more from interventions than individuals from Eastern cultures (Boehm et al., 2011; Kerry et al., 2023). Given cultural differences in emotion regulation and the experience of gratitude, our findings should be interpreted with caution when considering these associations in more interdependent samples.

While the current study found that gratitude moderated the indirect effects of perceived support on mental health through reduced perceived stress, our results cannot speak to whether this pattern holds for enacted or received support. This is an important distinction to consider as received support is less consistently linked to positive psychological well-being (e.g., Zell & Stockus, 2025). One reason for this is that enacted support may have negative psychological consequences for the potential support recipient. Bolger and colleagues have found that support visibility is associated with poorer psychological outcomes in both laboratory and field settings (Bolger et al., 2000; Bolger & Amarel, 2007). Given that gratitude is associated with positive aspects of social relationships including greater perceptions of warmth and increased likelihood of affiliation (Nelson-Coffey & Coffey, 2024; Williams & Bartlett, 2015), future research should examine whether gratitude enhances the benefits of received social support.

Despite its limitations, our study has several strengths. First, this correlational study replicated experimental data finding that gratitude enhanced the stress-buffering effects of social support on perceived stress during a laboratory speech task (Deichert et al., 2021). Although experimental research can establish causal relationships, it is limited in external validity. Replicating these findings in correlational research provides more confidence in the ecological validity of these findings. Furthermore, data from our current study were able to examine the specific pathways that account for the beneficial effects of gratitude on social support.

## Conclusion, Implications, and Future Directions

This study found that social support is indirectly linked to both symptoms of depression and anxiety through lower perceived stress. More importantly, our study is the first to show that this pathway is stronger for individuals with greater levels of dispositional gratitude. These results add further evidence to the notion that gratitude moderates the positive health effects of social support and buffers the negative psychological reactions to stress.

Our results showed that the positive associations observed between social support and mental health outcomes were strongest for women who were higher in gratitude. These results have potential implications in therapeutic settings. Specifically, gratitude interventions, which have been found to positively impact mental health (Cregg & Cheavens, 2021; Dickens, 2017), may be particularly important for clients reporting lower levels of social support. Engaging in such activities has been shown to improve people's perceptions of relationships with others (Algoe et al., 2008; Czynowska & Gurba, 2022). Such changes are important as improved relationship quality has been shown to be an important predictor of support effectiveness, which has been linked to decreased levels of anxiety in pregnant women (Rini et al., 2006; Rini & Dunkel Schetter, 2010). Furthermore, our data suggests that interventions that result in even small gains in gratitude have the potential to enhance social support and promote positive psychological health outcomes.

Future research should continue to examine the various contexts in which gratitude strengthens the associations of support and mental health. One avenue that may be particularly important to examine is the identification of pathways through which received support may influence health outcomes. Given the significant differences between perceived and received support, direct examination of such mechanisms is needed.

### Acknowledgement

The authors would like to thank Michael Craven, Jeanette Hoeksema, and Rose Herndier for their help in collecting data for this project.

### Funding

The authors received neither financial nor non-financial support for the research (including data acquisition) and/or authorship and/or publication of this article.

### Author contribution

Nathan T. DEICHERT: conceptualization, design, methodology, interpretation, supervision, writing original draft, writing review and editing.

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### Declaration of interest statement

The authors have no conflicts of interest to disclose.

### Ethical statement

This manuscript is the authors' original work.

All participants engaged in the research voluntarily and anonymously.

Their data are stored in coded materials and databases without personal data.

The studies involving human participants were reviewed and approved by the Institutional Review Board at the University of Indianapolis, Study #0747.

### Data availability statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

### Declaration on using artificial intelligence in research and manuscript preparation

The authors have not used AI technologies in their research or the preparation of this manuscript.

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