



A longitudinal analysis of the relationship between self-compassion and the psychological effects of perceived stress

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ABSTRACT

Self-compassion is consistently associated with psychological well-being, but most research has examined their relationship at only a single point in time. This study employed a longitudinal design to investigate the relationship between baseline self-compassion, perceived stress, and psychological outcomes in college students ($n = 462$) when the outcomes were measured both concurrently with perceived stress and after a lag of six months. Self-compassion moderated the effects of perceived stress such that stress was less strongly related to depression, anxiety, and negative affect among participants who scored high rather than low in self-compassion. Self-compassion also moderated the effects of perceived stress on depression and anxiety prospectively after six months. Self-compassion predicted positive affect but moderated the effects of perceived stress on positive affect in only one analysis. This study suggests that high self-compassion provides emotional benefits over time, partly by weakening the link between stress and negative outcomes.

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Emotion regulation is a process that is essential to psychological well-being (Gross, 1998; Rottenberg & Gross, 2003). People who do not effectively regulate their emotional responses to negative events tend to ruminate on their problems, perceive life as more stressful, and experience more severe and persistent periods of distress, including chronic depression or anxiety (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Self-compassion can be viewed as an adaptive emotional regulation strategy that involves taking a kind, non-judgmental, caring approach toward oneself in the face of challenges and stressors (Fong & Loi, 2016; Neff, 2003). Self-compassion facilitates psychological well-being by replacing maladaptive emotion-regulation strategies (i.e., rumination, self-judgment, catastrophizing) with adaptive ones (i.e., self-kindness, common humanity, mindful nonjudgment). For example, students who are high in self-compassion might react to stressors such as failing a test by reminding themselves that everyone makes mistakes rather than personalizing the failure and castigating themselves; they would likely promote their future well-being by working harder on the next exam.

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Self-compassion is consistently associated with psychological well-being. In a meta-analysis of 79 studies, Zessin, Dickhäuser, and Garbade (2015) found a sizable relationship between self-compassion and well-being; the average correlation-based effect size was .47. Similarly, MacBeth and Gumley (2012) found that the relationship between self-compassion and psychopathology across 14 studies was $r = -.54$. Most self-compassion research has assessed variables associated with stress, depression, anxiety, self-esteem, or subjective well-being (e.g., Allen, Goldwasser, & Leary, 2012; Fong & Loi, 2016; Homan, 2016; Hope, Koestner, & Milyavskaya, 2014; Marshall & Brockman, 2016; Neff, 2011; Neff & McGehee, 2010), but some studies have examined cognitive outcomes such as ruminative thoughts, negative self-views, and suicidal ideation (Chang et al., 2017) or physiological responses (Bluth et al., 2016). For example, Chang et al. (2017) found that certain aspects of self-compassion (common humanity, mindfulness, and overidentification) mediated the relationship between negative events and depression.

The vast majority of research on self-compassion has used cross-sectional designs in which self-compassion and its correlates were assessed at a single point in time (e.g., Allen et al., 2012; Bluth et al., 2016; Homan, 2016; Neff, Hsieh, & Dejitterat, 2005; Yarnell & Neff, 2013). Although such studies have demonstrated important relationships between self-compassion and a variety of outcomes, their results are limited by two considerations. The first is that cross-sectional designs do not permit strong inferences regarding directionality. When self-compassion and a psychological outcome such as stress, depression, or anxiety are measured concurrently, the possibility exists that the outcome is influencing participants' ratings of self-compassion. For example, people who are depressed may be less likely to rate themselves highly on certain aspects of self-compassion, leading to a negative correlation between self-compassion and depression.

Some studies have reduced this concern by measuring self-compassion days or weeks before the outcome of interest (e.g., Leary, Tate, Adams, Batts Allen, & Hancock, 2007; Marshall et al., 2015; Neff et al., 2005). For example, Gunnell, Mosewich, McEwen, Eklund, and Crocker (2017) measured self-compassion at the start of college and found that increases in self-compassion during the first semester of college were associated with decreases in negative affect and increases in psychological need satisfaction at the end of the first semester.

Second, most conceptualizations of self-compassion suggest that the emotional and behavioral effects of self-compassion should be most pronounced in the presence of negative events. Self-compassion should matter little when everything is going well and there is no special need to treat oneself compassionately. Thus, demonstrating the buffering effects of self-compassion on psychological outcomes requires not only that self-compassion be measured before the outcome of interest but also that participants' perceptions of negative events should be assessed separately from self-compassion. Along those lines, Neff et al. (2005) assessed self-compassion at the beginning of an academic semester, then studied students' reactions to subjective failure later in the class; they found that self-compassion was associated with emotion-focused and avoidance-focused coping strategies. Similarly, Hiraoka et al. (2015) found that self-compassion at baseline predicted trauma symptoms a year later in combat veterans, and Sbarra, Smith, and Mehl (2012) found that self-compassion measured at the beginning of the divorce process predicted less emotional intrusion of the divorce nine months later.

The present study examined the long-term effects of self-compassion in the context of ordinary stressful events that occur during college. College is a time of marked transition in

which students experience challenges from a variety of sources, including academic performance, relationships, financial resources, parental expectations, and diversity (Hurst, Baranik, & Daniel, 2013). Students differ markedly in their ability to navigate these challenges, leading to efforts to identify factors that promote resilience and well-being in the face of stress and negative life events (Denovan & Macaskill, 2017; Park & Baumeister, 2017; Vieselmeyer, Holguin, & Mezulis, 2017). The present study focused specifically on the relationship between self-compassion and indicators of psychological well-being in the face of perceived stress. The primary psychological outcomes of interest were depression and anxiety because they are common psychological problems among college students that are known to be inversely related to self-compassion (Beiter et al., 2015). In addition, we assessed negative and positive affect to examine how self-compassion may relate to generic “nonclinical” affect in the face of stress, including the tendency to experience positive emotions.

To address the problems that arise when self-compassion is measured at the same time as the outcomes of interest, this study employed a longitudinal design in which self-compassion was assessed at one point in time, perceived stress and psychological outcomes were measured six months later, and the psychological outcomes were measured again after a lag of six months. Thus, the relationships between self-compassion and psychological outcomes were assessed both concurrently with perceived stress and prospectively several months later. To examine whether obtained effects replicate, this three-time analysis was conducted in two consecutive years. In addition, to confirm that effects were not due to other variables that are highly correlated with self-compassion and associated with well-being, we controlled for baseline differences in neuroticism and optimism, both of which have been shown to correlate greater than $\pm .60$ with self-compassion in previous research (Neff, Rude, & Kirkpatrick, 2007; Pfattheicher, Geiger, Hartung, Weiss, & Schindler, 2017) and to be related to indicators of psychological well-being (Lahey, 2009; Scheier, Carver, & Bridges, 2001).

Method

Participants

These data were collected in the context of a longitudinal study of stress and well-being conducted at four colleges in the southeastern United States. The present analyses were based on data from 462 college students who provided full data across all six time points. The sample was 72% women and 41% students of color. Students were primarily in the age range of 18–20 years.

Measures

All measures are validated instruments with demonstrated high reliability (Table 2).

Baseline measures

At baseline, participants completed the neuroticism subscale of the Big Five Inventory (John, Donahue, & Kentle, 1991) and the Life Orientation Test, a measure of optimism (Scheier, Carver, & Bridges, 1994). The neuroticism subscale is an 8-item measure of people’s tendency to have strong negative reactions to stressful events (John et al., 1991). Participants respond to items (e.g., worries a lot) on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The

Life Orientation Test consists of six items that assess optimism about the future that are answered on a 5-point scale from 1 (*disagree a lot*) to 5 (*agree a lot*; Scheier et al., 1994). Sample items include “I’m always optimistic about my future” and “I rarely count on good things happening to me.” A total score was calculated for both measures by averaging the items.

Self-compassion

The Self-Compassion Scale-Short Form (SCS-SF; Raes, Pommier, Neff, & Van Gucht, 2011) is a 12-item scale that assesses the tendency to treat oneself with kindness, care, and compassion in the face of negative events. Individuals indicate how much they agree to each item (e.g., When I’m going through a very hard time, I give myself the caring and tenderness I need) on a 5-point Likert scale from 1 (*almost never*) to 5 (*almost always*). The SCS-SF has demonstrated good reliability and correlates highly with the original 26-item Self-Compassion Scale (Raes et al., 2011). The average score across items was calculated.

Perceived stress

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) is a 10-item measure that assesses the degree to which people feel that they have been able to control and cope with frustrating, upsetting, and stressful events during the past month. Sample items include “In the last month, how often have you felt that things were going your way?” and “In the last month, how often have you found that you could not cope with all of the things that you had to do?” Ratings on the scale (0 = *never*, 4 = *very often*) were summed to provide a total score.

Depression and anxiety

The depression and anxiety subscales of the Symptom Check-List-90 (SCL-90; Derogatis, 1994) assessed reactions that are associated with depression (12 items; e.g., feeling low in energy or slowed down, crying easily, feeling hopeless about the future) and anxiety (10 items; e.g., nervousness or shakiness inside, feeling tense or keyed up, trembling). For each symptom, participants indicated how much the problem distressed or bothered them in the past month (0 = *not at all*, 1 = *a little bit*, 2 = *moderately*, 3 = *quite a bit*, 4 = *extremely*). A total score was calculated for each subscale.

Positive and negative affect

To obtain ratings of affect without the overtones of psychopathology implied by the SCL-90 depression and anxiety scales, participants rated how they had felt during the past week on six negative affect terms (sad, blue, nervous, alone, shaky, scared) and six positive affect terms (happy, relaxed, at ease, cheerful, calm, and enthusiastic) drawn from the Positive Affect and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Participants indicated the extent they felt each emotion during the past week on a 5-point scale (1 = *very slightly or not at all*, 2 = *a little*, 3 = *moderately*, 4 = *quite a bit*, 5 = *extremely*). Measures of negative and positive affect were created by averaging the sets of items.

Procedure

The design of the study is shown in Table 1. The scales described above were included in a battery of measures that were collected in the context of a larger study of college student

Table 1. Study design.

	Time					
	0	1	2	3	4	5
	Before college	1st year Spring	2nd year Fall	2nd year Spring	3rd year Fall	3rd year Spring
Wave 1	Neuroticism Optimism	Self-compassion	Perceived stress Depression Anxiety Negative affect Positive affect	Depression Anxiety Negative affect Positive affect		
Wave 2	Neuroticism Optimism			Self-compassion	Perceived stress Depression Anxiety Negative affect Positive affect	Depression Anxiety Negative affect Positive affect

stress and resilience. Students were paid \$20 for completion of each survey and received a bonus of \$25 if they completed both surveys in a given year. This project was approved by the Institutional Review Board at each of the four institutions.

Baseline

At baseline (Time 0), participants completed the neuroticism subscale of the Big Five Inventory (John et al., 1991) and the Life Orientation Test (Scheier et al., 1994).

Wave 1

During the spring semester of their first year of college (Time 1), participants completed the Self-Compassion Scale-Short Form (Raes et al., 2011). Then, at Time 2, roughly six months later in the fall semester of the second year, participants completed the Perceived Stress Scale (Cohen et al., 1983), the depression and anxiety subscales of the SCL-90 (Derogatis, 1994), and the measures of negative and positive affect. Six months later, during the spring semester of the second year (Time 3), participants again completed these measures of depression, anxiety, negative affect, and positive affect.

Wave 2 (replication)

To assess the robustness of obtained relationships, variables were assessed at analogous time points in a second year of data collection. Self-compassion was reassessed in the spring of the second year (Time 3), the PSS was administered six months later at Time 4, and the depression and anxiety subscales of the SCL-90 (Derogatis, 1994) and the measures of negative and positive affect were administered at both Time 4 and Time 5.

Results

Descriptive statistics and inter-item reliabilities (Cronbach's α) for all measures are shown in Table 2. Neuroticism correlated with self-compassion $-.50$ (Time 1) and $-.51$ (Time 3), and optimism correlated with self-compassion $.33$ at both time points, supporting the decision to control for baseline neuroticism and optimism in the analyses. The one-year test-retest correlation for self-compassion (Time 1, Time 3) was $.63$. Correlations among the variables within each wave of data collection are shown in Table 3. Self-compassion correlated

Table 2. Descriptive statistics.

Time	Measure	Mean	Standard deviation	Potential range	Cronbach's alpha
0	BFI Neuroticism	2.95	.77	1–5	.83
0	Life Orientation Test	3.54	.73	1–5	.82
1	Self-compassion	3.00	.62	1–5	.83
3	Self-compassion	3.00	.68		.86
2	Perceived Stress Scale	18.56	6.53	0–40	.84
4	Perceived Stress Scale	17.63	7.05		.85
2	SCL-Depression	15.98	10.01	0–48	.91
3	SCL-Depression	14.80	9.51		.91
4	SCL-Depression	13.87	9.85		.92
5	SCL-Depression	14.63	9.81		.92
2	SCL-Anxiety	5.56	7.10	0–40	.92
3	SCL-Anxiety	5.31	6.37		.91
4	SCL-Anxiety	4.78	6.10		.91
5	SCL-Anxiety	5.13	6.46		.92
2	Negative affect	1.86	.70	1–5	.81
3	Negative affect	1.83	.70		.82
4	Negative affect	1.83	.71		.83
5	Negative affect	1.83	.73		.84
2	Positive affect	3.00	.82	1–5	.87
3	Positive affect	2.95	.83		.88
4	Positive affect	2.97	.87		.90
5	Positive affect	2.88	.85		.89

moderately and in the expected directions with perceived stress, depression, anxiety, negative affect, and positive affect across all measurement occasions.

Moderated multiple regression analyses were conducted in which self-compassion scores at Time 1, perceived stress at Time 2, and their interaction were used to predict the four outcomes (depression, anxiety, negative affect, positive affect) concurrently with perceived stress at Time 2, and prospectively at Time 3. In each analysis, neuroticism and optimism scores (Time 0) were entered in Step 1, followed by self-compassion (mean-centered, Time 1) on Step 2, perceived stress (mean-centered, Time 2) on Step 3, and the product of self-compassion by perceived stress on Step 4. Significant interactions were probed using the PROCESS macro in SPSS, using 5000 boot-strapped samples (Hayes, 2012).

To examine whether results replicate, identical analyses were conducted on the second wave of data, using self-compassion at Time 3, perceived stress at Time 4, and the four outcomes at Times 4 and 5. In addition, an additional set of analyses was conducted on the data from Wave 2 in which prior measures of the outcomes variables measured during Wave 1 were included as covariates.

Depression

Wave 1

The results for the analyses of the SCL-90 depression scores are shown in Table 4. When perceived stress and depression were measured concurrently at Time 2, self-compassion (assessed at Time 1) was significantly related to depression ($b = -3.79$), as was perceived

Table 3. Correlations.

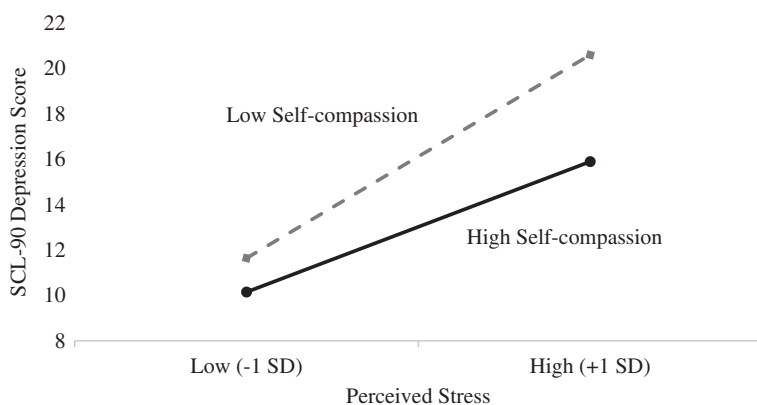
	1. Self-Comp	2. Perceived stress	3. SCL-depress	4. SCL-Anxiety	5. Negative affect	6. Positive affect	7. SCL-depress	8. SCL-anxiety	9. Negative affect	10. Positive affect
1. Self-compassion (Time 1)	1									
2. Perceived stress (Time 2)	-.40**	1								
3. SCL-depression (Time 2)	-.39**	.73**	1							
4. SCL-anxiety (Time 2)	-.27**	.52**	.69**	1						
5. Negative affect (Time 2)	-.33**	.58**	.73**	.66**	1					
6. Positive affect (Time 2)	.32**	-.56**	-.48**	-.28**	-.39**	1				
7. SCL-depression Time 3)	-.41**	.52**	.63**	.45**	.53**	-.39**	1			
8. SCL-anxiety (Time 3)	-.25**	.39**	.49**	.57**	.46**	-.26**	.67**	1		
9. Negative affect (time 3)	-.34**	.40**	.46**	.44**	.51**	-.30**	.72**	.70**	1	
10. Positive affect Time 3)	.34**	-.41**	-.39**	-.27**	-.29**	.60**	-.53**	-.34**	-.45**	1
1. Self-compassion (Time 3)	1									
2. Perceived stress (Time 4)	-.43**	1								
3. SCL-depression (Time 4)	-.38**	.72**	1							
4. SCL-anxiety (Time 4)	-.24**	.51**	.62**	1						
5. Negative affect (Time 4)	-.29**	.61**	.71**	.68**	1					
6. Positive affect (Time 4)	.33**	-.63**	-.49**	-.29**	-.43**	1				
7. SCL-depression (Time 5)	-.32**	.52**	.65**	.53**	.57**	-.35**	1			
8. SCL-anxiety (Time 5)	-.18**	.37**	.47**	.60**	.52**	.69**	.69**	1		
9. Negative affect (Time 5)	-.23**	.39**	.47**	.50**	.56**	-.21**	.76**	.73**	1	
10. Positive affect (Time 5)	.35**	-.41**	-.33**	-.25**	-.31**	.53**	-.49**	-.39**	-.39**	1

** $p < .001$ (two-tailed).

Table 4. Regression for depression outcome for Wave 1 and 2.

Step	Predictor	Time	<i>b</i>	β	95% CI	<i>F</i>	<i>p</i>	<i>R</i> ²
Concurrent (depression measured at Time 2)								
1	Neuroticism	0	5.28	.403	4.01, 6.56	49.45	<.001	.18
	Optimism		-.55	-.039	-1.40, .81			
2	Self-compassion	1	-3.79	-.236	-5.31, -2.27	23.97	<.001	.04
3	Perceived stress	2	1.01	.662	.91, 1.12	344.29	<.001	.34
4	Interaction	2	-.18	-.083	-.32, -.05	6.98	.009	.01
Prospective (depression measured at Time 3)								
1	Neuroticism	0	4.64	.373	3.43, 5.85	52.32	<.001	.19
	Optimism		-1.34	-.104	-2.65, -.09			
2	Self-compassion	1	-3.76	-.248	-5.21, -2.33	26.58	<.001	.05
3	Perceived stress	2	.56	.384	.43, 0.68	77.73	<.001	.11
4	Interaction	2	-.20	-.092	-.35, -.04	5.87	.016	.01
Concurrent (depression measured at Time 4)								
1	Neuroticism	0	4.29	.332	3.04, 5.55	51.18	<.001	.19
	Optimism		-2.10	-.153	-3.44, -.77			
2	Self-compassion	3	-3.20	-.219	-4.60, -.80	20.09	<.001	.04
3	Perceived stress	4	.90	.647	.80, 1.00	319.00	<.001	.33
4	Interaction	4	-.22	-.108	-.35, -.09	11.54	.001	.01
Prospective (depression measured at Time 5)								
1	Neuroticism	0	4.22	.329	2.95, 5.49	41.20	<.001	.16
	Optimism		-1.44	-.106	-2.79, -.09			
2	Self-compassion	3	-2.46	-.169	-3.89, -1.03	11.38	.001	.02
3	Perceived stress	4	.59	.427	.47, .71	93.10	<.001	.14
4	Interaction	4	-.04	-.018	-.20, .12	.21	.65	.00

Note: Error degrees of freedom for various *F*-tests vary slightly from 448 to 450.

**Figure 1.** Moderating effect of self-compassion on the relationship between stress and depression.

stress ($b = 1.01$), $ps < .001$. In addition, a significant interaction between self-compassion and perceived stress was obtained ($b = -.18$, $p = .009$). As can be seen in Figure 1, for students who were 1 standard deviation (SD) below the mean of self-compassion, the simple slope for the relationship between perceived stress and depression was 1.13, 95% CI [.99, 1.27], $p < .001$, while the simple slope for students 1 SD above the mean was .90, 95% CI [.77, 1.04], $p < .001$. Thus, although stress predicted depression generally, the relationship between perceived stress and concurrent depression was weaker for students who were high than low in self-compassion. Viewing the interaction the other way, at low perceived stress (-1

SD), the effect for self-compassion was not significant, $b = -.09$, 95% CI $[-1.50, 1.32]$, $p = .90$. However, at high perceived stress (+1 SD), participants high in self-compassion reported lower depression than those low in self-compassion, $b = -2.49$, 95% CI $[-4.04, -.94]$, $p = .002$. Also, the general pattern for our subsequent interactions are similar to Figure 1, so only one figure was included.

At Time 3, approximately 6 months later, depression was significantly predicted by self-compassion measured at Time 1 ($b = -3.76$, $p < .001$), perceived stress measured at Time 2 ($b = .56$, $p < .001$), and the interaction of self-compassion and perceived stress ($b = -.20$, $p = .016$). The simple slope for students 1 SD below the mean for self-compassion ($b = .68$, 95% CI $[.52, .84]$), was higher than the slope for students 1 SD above the mean ($b = .44$, 95% CI $[.28, .59]$), although both slopes were significant, $ps < .001$. Again, the relationship between perceived stress and depression was weaker for students who were higher in self-compassion. In addition, participants low versus high in self-compassion did not differ in depression when stress was low ($b = -1.19$, 95% CI $[-2.83, .44]$, $p = .15$) but did differ when stress was high ($b = -3.75$, 95% CI $[-5.54, -1.96]$, $p < .001$).

Wave 2 (replication)

Effects of self-compassion at Time 3, perceived stress at Time 4, and their interaction on concurrent depression at Time 4 replicated those just described for Wave 1 (Table 4). Both self-compassion ($b = -3.20$, $p < .001$) and perceived stress ($b = .90$, $p < .001$) predicted depression. Similar to Wave 1, the significant interaction between self-compassion and perceived stress ($b = -.22$, $p = .001$) showed that the simple slope for students 1 SD above the mean for self-compassion ($b = .75$, 95% CI $[.62, .88]$, $p < .001$) was smaller than the simple slope for students 1 SD below the mean ($b = 1.05$, 95% CI $[.92, 1.18]$, $p < .001$). At low perceived stress, self-compassion did not predict depression ($b = 1.10$, 95% CI $[-.26, 2.48]$, $p = .11$), but at high levels of stress, self-compassion was inversely related to depression ($b = -2.03$, 95% CI $[-3.54, -.53]$, $p = .008$).

Depression scores at Time 5 were predicted by self-compassion (Time 3; $b = -2.46$, $p = .001$) and by perceived stress (Time 4; $b = .59$, $p < .001$). However, the interaction between self-compassion and perceived stress was not significant ($b = -.04$, $p = .65$).

Covarying prior depression

The Wave 2 analyses just described were repeated while also including using Time 2 depression scores (from Wave 1) as a covariate, thereby controlling for prior depression. Of course, Time 2 depression predicted depression scores at both Time 3 and Time 4 (b 's = .64 and .56 for Time 3 and 4, respectively, p 's $< .001$). More importantly, the interaction between self-compassion and perceived stress was again significant for Time 3 depression ($b = -.18$, $p < .001$), but not for Time 4 depression ($b = -.017$, $p = .807$), thereby replicating the effects for both Time 3 and Time 4.

Anxiety

Wave 1

As shown in Table 5, self-compassion at Time 1 was related to anxiety at Time 2 ($b = -1.98$, $p = .001$). In addition, perceived stress (Time 2) significantly predicted concurrent anxiety ($b = .53$, $p < .001$), and the interaction between self-compassion and perceived stress was

Table 5. Regression for anxiety outcome for Wave 1 and 2.

Step	Predictor	Time	<i>b</i>	β	95% CI	<i>F</i>	<i>p</i>	<i>R</i> ²
Wave 1								
Concurrent (anxiety measured at Time 2)								
1	Neuroticism	0	2.60	.279	1.64, 3.56	19.46	<.001	.08
	Optimism		-.07	-.007	-1.09, .95			
2	Self-compassion	1	-1.98	-.173	-3.14, -.81	11.12	.001	.02
3	Perceived stress	2	.53	.481	.43, .62	111.08	<.001	.18
4	Interaction	2	-.20	-.125	-.32, -.07	9.84	.002	.02
Prospective (anxiety measured at Time 3)								
1	Neuroticism	0	3.07	.367	2.23, 3.90	37.31	<.001	.14
	Optimism		-.18	-.021	-1.07, .70			
2	Self-compassion	1	-.89	-.087	-1.90, .13	2.93	.09	.01
3	Perceived stress	2	.27	.272	.17, .36	31.92	<.001	.06
4	Interaction	2	-.16	-.111	-.27, -.04	6.90	.009	.01
Wave 2 (replication)								
Concurrent (anxiety measured at Time 4)								
1	Neuroticism	0	2.29	.286	1.47, 3.10	27.60	<.001	.11
	Optimism		-.64	-.076	-1.59, .22			
2	Self-compassion	3	-.82	-.091	-1.75, .10	3.05	.08	.01
3	Perceived stress	4	.41	.472	.33, .49	108.60	<.001	.17
4	Interaction	4	-.16	-.124	-.26, -.06	9.60	.002	.02
Prospective (anxiety measured at Time 5)								
1	Neuroticism	0	1.92	.226	1.04, 2.79	19.85	<.001	.08
	Optimism		-.84	-.093	-1.76, -.09			
2	Self-compassion	3	-.32	-.033	-1.32, .68	.39	.53	.00
3	Perceived stress	4	.29	.319	.20, .38	42.12	<.001	.08
4	Interaction	4	-.03	-.019	-.14, .09	.19	.66	.00

Note: Error degrees of freedom for various *F*-tests vary slightly from 448 to 450.

significant ($b = -.20$, $p = .002$). The simple slope for students 1 SD below the mean for self-compassion was .65, 95% CI[.53, .78], while the simple slope for students 1 SD above the mean was .40, 95% CI[.28, .53], $ps < .001$. Thus, as with depression, the relationship between perceived stress and concurrent anxiety was weaker for students who were high than low in self-compassion. In addition, at low perceived stress, self-compassion was unrelated to anxiety ($b = .53$, 95% CI[-.75, 1.81], $p = .42$), but at high perceived stress, participants higher in self-compassion were less anxious ($b = -2.06$, 95% CI[-3.47, -.66], $p = .004$).

The relationship between self-compassion at Time 1 and anxiety at Time 3 was not significant ($b = -.89$, $p = .09$). However, perceived stress (Time 2) predicted Time 3 anxiety ($b = .27$, $p < .001$), and the self-compassion by perceived stress interaction was significant ($b = -.16$, $p = .009$). The positive effect of perceived stress on prospective anxiety was again weaker for students who were high in self-compassion (+1 SD above the mean, $b = .17$, 95% CI[.05, .29], $p = .005$) than those low in self-compassion (-1 SD, $b = .36$, 95% CI[.25, .48], $p < .001$). Self-compassion was unrelated to anxiety when perceived stress was low ($b = .71$, 95% CI[-.50, 1.92], $p = .25$) but was related to anxiety when perceived stress was high ($b = -1.34$, 95% CI[-2.67, -.01], $p = .048$).

Wave 2 (replication)

Effects of self-compassion at Time 3, perceived stress at Time 4, and their interaction on anxiety at Time 4 replicated those obtained in Wave 1 (Table 5): self-compassion was not related to anxiety ($b = -.82$, $p = .08$), but perceived stress predicted anxiety ($b = .41$, $p < .001$), and the interaction of self-compassion and perceived stress was significant ($b = -.16$, $p = .002$). The simple slope for students 1 SD above the mean for self-compassion was .30,

95% CI [.20, .40], $p < .001$, while the simple slope for students 1 SD below the mean was .51, 95% CI [.41, .62], $p < .001$. However, unlike in Wave 1, self-compassion was related to anxiety when perceived stress was low ($b = 1.48$, 95% CI [.42, 2.54], $p = .006$), but not when perceived stress was high ($b = -.75$, 95% CI [-1.92, .42], $p = .21$).

Perceived stress (Time 4) significantly predicted anxiety at Time 5 ($b = .29$, $p < .001$). However, neither the effects of self-compassion ($b = -.32$, $p = .53$) nor the two-way interaction were significant ($b = -.03$, $p = .66$).

Covarying prior anxiety

The Wave 2 analyses just described were repeated while including using Time 2 anxiety scores from Wave 1 as a covariate, thereby controlling for prior anxiety. Predictably, Time 2 anxiety scores were associated with anxiety at both Time 3 and Time 4 (b 's = .55 and .49 for Time 3 and 4, respectively, p 's $< .001$). More importantly, the interaction between self-compassion and perceived stress was again significant for Time 3 anxiety ($b = -.18$, $p < .001$), but not for Time 4 anxiety ($b = -.05$, $p = .35$), thereby replicating the Wave 1 effects for both Time 3 and Time 4.

Negative affect

Wave 1

Self-compassion (Time 1; $b = -.24$, $p < .001$) and perceived stress (Time 2; $b = .06$, $p < .001$) were significantly related to negative affect at Time 2 (Table 6). In addition, the interaction between self-compassion and perceived stress was significant ($b = -.02$, $p = .008$). The

Table 6. Regression for negative affect outcome for Wave 1 and 2.

Step	Predictor	Time	b	β	95% CI	F	p	R^2
Wave 1								
Concurrent (negative affect measured at Time 2)								
1	Neuroticism	0	.33	.357	.24, .42	30.88	<.001	.12
	Optimism		.02	.019	-.08, -.12			
2	Self-compassion	1	-.24	-.212	-.35, -.13	17.71	<.001	.03
3	Perceived stress	2	.06	.518	.05, .07	145.23	<.001	.21
4	Interaction	2	-.02	-.101	-.03, -.004	7.16	.008	.01
Prospective (negative affect measured at Time 3)								
1	Neuroticism	0	.36	.386	.26, .45	43.39	<.001	.16
	Optimism		-.03	-.032	-.13, .07			
2	Self-compassion	1	-.20	-.177	-.31, -.09	12.78	<.001	.02
3	Perceived stress	2	.03	.255	-.02, -.04	29.27	<.001	.05
4	Interaction	2	-.01	-.035	-.02, .01	.71	.40	.00
Wave 2 (replication)								
Concurrent (negative affect measured at Time 4)								
1	Neuroticism	0	.28	.300	.19, .38	29.69	<.001	.12
	Optimism		-.07	-.073	-.17, .03			
2	Self-compassion	3	-.16	-.152	-.27, -.05	8.77	.003	.02
3	Perceived stress	4	.06	.571	.05, .07	185.24	<.001	.26
4	Interaction	4	-.02	-.112	-.03, -.01	9.14	.003	.01
Prospective (negative affect measured at Time 5)								
1	Neuroticism	0	.27	.280	.17, .37	26.13	<.001	.10
	Optimism		-.07	-.073	-.18, .03			
2	Self-compassion	3	-.09	-.082	-.20, .02	2.42	.12	.01
3	Perceived stress	4	.03	.321	.02, .04	43.98	<.001	.08
4	Interaction	4	-.01	-.069	-.02, .00	2.56	.11	.01

Note: Error degrees of freedom for various F -tests vary slightly from 446 to 450.

relationship between perceived stress and negative affect was weaker for students who were high rather than low in self-compassion ($b_{\text{high}} = .05$, 95% CI [.03, .06], $p < .001$; $b_{\text{low}} = .07$, 95% CI [.05, .08], $p < .001$). As with depression and anxiety, self-compassion was unrelated to negative affect when perceived stress was low ($b = -.003$, 95% CI [-.12, .12], $p = .96$), but related to negative affect when stress was high ($b = -.21$, 95% CI [-.34, -.08], $p = .002$).

When negative affect was measured at Time 3, self-compassion (Time 1) predicted negative affect ($b = -.20$, $p < .001$), as did perceived stress (Time 2; $b = .03$, $p < .001$). However, the interaction between self-compassion and perceived stress was not significant ($b = -.01$, $p = .40$).

Wave 2 (replication)

Analysis of the replication data showed the same patterns (Table 6). When affect was measured concurrently with perceived stress, both main effects and the interaction were significant: self-compassion (Time 3; $b = -.16$, $p = .003$); perceived stress (Time 4; $b = .06$, $p < .001$); self-compassion by perceived stress interaction ($b = -.02$, $p = .003$). As in Wave 1, the interaction showed that the effect of perceived stress on concurrent negative affect was weaker for students high in self-compassion ($b = .05$, 95% CI [.04, .06], $p < .001$) than for students low in self-compassion ($b = .07$, 95% CI [.06, .08], $p < .001$). Self-compassion was positively related to negative affect when perceived stress was low ($b = .13$, 95% CI [.02, .25], $p = .017$) but not related to negative affect when stress was high ($b = -.11$, 95% CI [-.23, .02], $p = .11$).

When negative affect (Time 5) was measured several months after perceived stress (Time 4), perceived stress significantly predicted negative affect ($b = .03$, $p < .001$), but neither self-compassion ($b = -.09$, $p = .12$) nor the interaction between self-compassion and perceived stress ($b = -.01$, $p = .11$) were significant.

Covarying prior negative affect

The Wave 2 analyses were repeated while including Time 2 negative affect scores from Wave 1 as a covariate, thereby controlling for prior negative affect. Time 2 negative affect predicted Time 3 and Time 4 negative affect (b 's = .49 and .48 for Time 3 and 4, respectively, p 's < .001). The interaction between self-compassion and perceived stress was again significant for Time 3 negative affect ($b = -.017$, $p < .001$), but not for Time 4 negative affect ($b = -.01$, $p = .063$).

Positive affect

Wave 1

Self-compassion measured at Time 1 ($b = .26$, $p < .001$) and perceived stress measured at Time 2 ($b = -.06$, $p < .001$) were significantly related to positive affect at Time 2 (Table 7). However, the interaction was not significant ($b = -.01$, $p = .11$). The same effects were obtained when positive affect was assessed at Time 3: self-compassion ($b = .25$, $p < .001$); perceived stress ($b = -.03$, $p < .001$); two-way interaction ($b = -.01$, $p = .66$).

Wave 2 (replication)

Findings from Wave 2 were consistent with those from Wave 1. Self-compassion significantly predicted positive affect ($b = .28$, $p < .001$), as did perceived stress ($b = -.07$, $p < .001$), and the interaction was not significant ($b = -.01$, $p = .17$).

Table 7. Regression for positive affect outcome for Wave 1 and 2.

Step	Predictor	Time	<i>b</i>	β	95% CI	<i>F</i>	<i>p</i>	<i>R</i> ²
Wave 1								
Concurrent (positive affect measured at Time 2)								
1	Neuroticism	0	-.33	-.313	-.44, -.23	27.41	<.001	.11
	Optimism		.03	.030	-.08, .15			
2	Self-compassion	1	.26	.199	.13, .39	15.34	<.001	.03
3	Perceived stress	2	-.06	-.508	-.07, -.05	1344.38	<.001	.20
4	Interaction	2	-.01	-.061	-.03, -.00	2.51	.11	.00
Prospective (positive affect measured at Time 3)								
1	Neuroticism	0	-.35	-.323	-.45, -.34	44.38	<.001	.17
	Optimism		.15	.132	.04, .26			
2	Self-compassion	1	.25	.188	.12, .38	14.55	<.001	.03
3	Perceived stress	2	-.03	-.266	-.05, -.02	32.16	<.001	.05
4	Interaction	2	-.01	-.018	-.02, .01	.20	.66	.00
Wave 2 (replication)								
Concurrent (positive affect measured at Time 4)								
1	Neuroticism	0	-.24	-.213	-.36, -.13	28.97	<.001	.12
	Optimism		.21	.176	.09, .34			
2	Self-compassion	3	.28	.219	.15, .42	18.49	<.001	.04
3	Perceived stress	4	-.07	-.584	-.08, -.06	202.07	<.001	.27
4	Interaction	4	-.01	-.050	-.02, .00	1.91	.17	.00
Prospective (positive measured at Time 5)								
1	Neuroticism	0	-.25	-.229	-.37, -.14	27.71	<<.001	.11
	Optimism		.18	.150	.06, .30			
2	Self-compassion	3	.32	.256	.20, .45	25.16	<.001	.05
3	Perceived stress	4	-.04	-.296	.05, .02	39.06	<.001	.07
4	Interaction	4	-.01	-.030	-.02, .00	.50	.48	.00

Note: Error degrees of freedom for various *F*-tests vary slightly from 447 to 450.

Self-compassion (Time 3) predicted positive affect prospectively at Time 5 ($b = .32$, $p < .001$), as did perceived stress ($b = -.04$, $p < .001$), but the interaction was not significant ($b = -.01$, $p = .48$).

Covarying prior positive affect

The Wave 2 analyses were repeated while including Time 2 positive affect scores as a covariate. Not surprisingly, Time 2 positive affect predicted both Time 3 and Time 4 positive affect (b 's = .49 and .51 for Time 3 and 4, respectively, p 's < .001). Unlike in the previous Wave 2 analysis, the interaction between self-compassion and perceived stress was significant for Time 3 negative affect ($b = -.014$, $p = .009$). However, for Time 4 negative affect ($b = .00$, $p = .83$), it was not significant.

Discussion

We have known for many years that self-compassion correlates with an array of indices of well-being, including depression and anxiety (for reviews, see MacBeth & Gumley, 2012; Neff, 2009; Zessin et al., 2015). However, the widespread use of cross-sectional designs in this research has limited the strength of conclusions that can be drawn about directionality and failed to account for the potential confounding influences of other variables.

The present study introduced six methodological features that increase our confidence that self-compassion is an adaptive emotion regulation strategy that buffers people against the psychological impact of stress. First, self-compassion was measured well in advance of both perceived stress and the psychological outcomes of interest, reducing the possibility

that stressful events or psychological distress contaminated self-reports of self-compassion. Second, both the main effects of perceived stress and its interaction with self-compassion were tested while partialing out the effect of self-compassion, thereby controlling for the fact that people who are low in self-compassion perceive life to be more stressful. Third, the psychological outcomes were measured both concurrently with perceived stress and again after a delay of six months. This feature lowers, though does not eliminate, the likelihood that self-reported stress was influenced by depression, anxiety, or other negative states. Fourth, the study employed an intraparticipant replication in which the effects were studied in two consecutive waves. With a couple of exceptions, the findings replicated across the waves, demonstrating that the effects are robust. Fifth, all of the analyses controlled for baseline levels of neuroticism and optimism, two variables that are known to be strong predictors of depression, anxiety, and affect and highly correlated with self-compassion (Chang, 1998; Neff et al., 2007; Saklofske, Kelly, & Janzen, 1995), and Wave 2 effects were tested while controlling for prior levels of depression, anxiety, and negative and positive affect. The fact that most effects were obtained while controlling for these important predictors of well-being show that the findings are not likely to be due to broad dispositional tendencies to experience negative affect, ruminate in dysfunctional ways, or view the future positively versus negatively; strong effects of self-compassion emerged while removing a sizable portion of variance associated with variables that are associated with dysphoric emotion. Although some have questioned whether self-compassion correlates so highly with neuroticism as to be conceptually and empirically redundant (Pfattheicher et al., 2017), our results clearly showed both that the correlation was not high enough to suggest redundancy, accounting for only about 25% of the shared variance, and that self-compassion predicted psychological outcomes even after neuroticism scores were partialled out.

With each of these methodological and analytical features in place, self-compassion predicted future indicators of emotional well-being that were assessed six to twelve months later. With a couple of exceptions, participants who scored higher in self-compassion scored lower in depression, anxiety, and negative affect, and higher in positive affect than participants who scored lower in self-compassion. Although previous research has demonstrated these relationships in cross-sectional studies, the present study shows that being high in self-compassion provides emotional benefits on an ongoing basis.

In addition to the general tendency for more self-compassionate participants to fare better emotionally than less self-compassionate ones, analyses of the interactions between self-compassion and perceived stress showed that perceived stress was less strongly linked to dysphoric reactions among participants who were higher in self-compassion. Stress obviously fosters depression, anxiety, and negative affect for virtually everyone, and, overall, the size of the relationships between perceived stress and these outcomes was substantial, accounting for between 5% and 34% of the variance even while controlling for self-compassion. Yet, self-compassion moderated the link between stress and dysphoria, documenting its utility as an emotion regulation strategy. Not surprisingly, these effects were strongest when stress and emotional well-being were measured concurrently; the self-compassion by stress interactions were significant for depression, anxiety, and negative affect in both Wave 1 and Wave 2.

When the outcomes were measured several months later than perceived stress, the interaction between self-compassion and perceived stress was obtained only in Wave 1 for depression and anxiety. In one sense, it is surprising that this long-term effect was obtained

at all. Given that stress fluctuates over time and individual differences in neuroticism, optimism, and self-compassion were statistically controlled, the moderating effects of self-compassion on stress at one point in time might not be expected to persist six months later. Yet in some cases, self-compassion during a particularly stressful episode may promote long-term well-being even after the stress has passed. Whereas people low in self-compassion may continue to ruminate about previous stressors, those high in self-compassion may return to baseline more quickly and, thus, show lower depression and anxiety months later.

Why the long-term effects of the self-compassion by stress interaction on depression and anxiety in Wave 1 did not replicate in Wave 2 is unclear. The fact that this study involved an intraparticipant replication in which the participants were the same across the two waves eliminates the otherwise reasonable explanation that the samples were not equivalent. Even so, strictly speaking, the participants were not precisely the same psychologically; they had matured a year from Wave 1 to Wave 2 and had an additional year of college behind them. Furthermore, average self-compassion scores and perceived stress scores did not differ between the two waves, the patterns of correlations among variables were strikingly similar across waves, and effects of self-compassion and perceived stress were obtained in both sets of analyses. Although high self-compassion was associated with lower depression, anxiety, and negative affect, as well as higher positive affect, the strength of the relationship between stress and these outcomes did not always differ as a function of self-compassion.

In contrast to the consistent effects for depression, anxiety, and negative affect, self-compassion moderated the relationship between perceived stress and positive affect in only one instance (when prior positive affect was controlled for), although self-compassion predicted higher positive affect in all four analyses. Perhaps self-compassion is more effective in attenuating the negative effects of stress than in promoting positive emotions when stress is present. Research on this asymmetry is needed.

In interpreting these findings, several limitations should be considered. First, the data were exclusively self-reports and subject to potential social desirability biases. In addition, the temporal framing for the measures differed; perceived stress, depression, and anxiety were assessed over the past month, whereas negative and positive affect were assessed over the past week. Finally, studies should also examine the relationship between self-compassion, stress, and psychological outcomes in other populations.

Although self-compassion clearly provides emotional benefits on an ongoing basis in college students, our results do not speak to the psychological processes that produce differences in well-being and resilience between people who are low versus high in self-compassion. Researchers generally assume that highly self-compassionate people cope better with negative events than less self-compassionate people for two broad sets of reasons: they inflict less unnecessary distress upon themselves through self-criticism, personalization, over-identification, and catastrophizing, and they attenuate whatever distress they experience by treating themselves with greater care, concern, and kindness, thereby soothing themselves psychologically (Leary et al., 2007; Neff et al., 2005). Nothing in our data delves into the processes that underlie the results, but this question should be central to the next generation of self-compassion research.

In addition, future research should examine how self-compassion moderates the relationship between stress and other outcome variables. For example, examining health outcomes such as sleep and disordered eating would be beneficial. In addition, it would be helpful to explore these relationships in populations with clinical levels of depression and

anxiety. Research could also examine whether these relationships differ across diverse populations and across cultures. Ultimately, continuation of this research will inform potential interventions that promote resilience in the face of negative life events.

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References

- Allen, A. B., Goldwasser, E. R., & Leary, M. R. (2012). Self-compassion and well-being among older adults. *Self and Identity*, 11(4), 428–453. doi:10.1080/15298868.2011.595082
- Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, 173, 90–96. doi:10.1016/j.jad.2014.10.054
- Bluth, K., Roberson, P. E., Gaylord, S. A., Fautot, K. R., Grewen, K. M., Arzon, S., & Girdler, S. S. (2016). Does self-compassion protect adolescents from stress? *Journal of Child and Family Studies*, 25(4), 1098–1109. doi:10.1007/s10826-015-0307-3
- Chang, E.C. (1998). Does dispositional optimism moderate the relation between perceived stress and psychological well-being?: A preliminary investigation. *Personality and Individual Differences*, 25(2), 233–240. doi:10.1016/S0191-8869(98)00028-
- Chang, E. C., Yu, T., Najarian, A. S., Wright, K. M., Chen, W., Chang, O. D., ... Hirsch, J. K. (2017). Understanding the association between negative life events and suicidal risk in college students: Examining self-compassion as a potential mediator. *Journal of Clinical Psychology*, 73, 745–755. doi:10.1002/jclp.22374
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385–396.
- Denovan, A., & Macaskill, A. (2017). Stress and subjective well-being among first year UK undergraduate students. *Journal of Happiness Studies*, 18(2), 505–525. doi:10.1007/s10902-016-9736-y
- Derogatis, L.R. (1994). *Symptom checklist 90–R: Administration, scoring, and procedures manual* (3rd ed.). Minneapolis, MN: National Computer Systems.
- Fong, M., & Loi, N.M. (2016). The mediating role of self-compassion in student psychological health. *Australian Psychologist*, 51(6), 431–441. doi:10.1111/ap.12185
- Gross, J.J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2, 271–299. doi:10.1037/1089-2680.2.3.271
- Gunnell, K. E., Mosewich, A. D., McEwen, C. E., Eklund, R. C., & Crocker, P. E. (2017). Don't be so hard on yourself! Changes in self-compassion during the first year of university are associated with changes in well-being. *Personality and Individual Differences*, 107, 43–48. doi:10.1016/j.paid.2016.11.032
- Hayes, A. F. (2012). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling* [White paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>

- Hiraoka, R., Meyer, E. C., Kimbrel, N. A., DeBeer, B. B., Gulliver, S. B., & Morissette, S. B. (2015). Self-compassion as a prospective predictor of PTSD symptom severity among trauma-exposed U.S. Iraq and Afghanistan war veterans. *Journal of Traumatic Stress*, 28(2), 127–133. doi:10.1002/jts.21995
- Homan, K.J. (2016). Self-compassion and psychological well-being in older adults. *Journal of Adult Development*, 23(2), 111–119. doi:10.1007/s10804-016-9227-8
- Hope, N., Koestner, R., & Milyavskaya, M. (2014). The role of self-compassion in goal pursuit and well-being among university freshmen. *Self and Identity*, 13(5), 579–593. doi:10.1080/15298868.2014.889032
- Hurst, C. S., Baranik, L. E., & Daniel, F. (2013). College student stressors: A review of the qualitative research. *Stress And Health: Journal of the International Society for the Investigation of Stress*, 29(4), 275–285.
- John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The big five inventory-versions 4a and 54*. Berkeley: University of California, Berkeley, Institute of Personality and Social Research.
- Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist*, 64, 241–256.
- Leary, M. R., Tate, E. B., Adams, C. E., Batts Allen, A., & Hancock, J. (2007). Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself kindly. *Journal of Personality and Social Psychology*, 92(5), 887–904. doi:10.1037/0022-3514.92.5.887
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, 32(6), 545–552. doi:10.1016/j.cpr.2012.06.003
- Marshall, E. J., & Brockman, R. N. (2016). The relationships between psychological flexibility, self-compassion, and emotional well-being. *Journal of Cognitive Psychotherapy*, 30, 60–72. doi:10.1891/0889-8391.30.L60
- Marshall, S. L., Parker, P. D., Ciarrochi, J., Sahdra, B., Jackson, C. J., & Heaven, P. L. (2015). Self-compassion protects against the negative effects of low self-esteem: A longitudinal study in a large adolescent sample. *Personality and Individual Differences*, 741, 16–121. doi:10.1016/j.paid.2014.09.013
- Neff, K. D. (2003). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, 2(2), 85–101. doi:10.1080/15298860309032
- Neff, K. D. (2009). Self-compassion. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 561–573). New York, NY: Guilford.
- Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and Personality Psychology Compass*, 5(1), 1–12. doi:10.1111/j.1751-9004.2010.00330.x
- Neff, K. D., Hsieh, Y., & Dejitterat, K. (2005). Self-compassion, achievement goals and coping with academic failure. *Self and Identity*, 4, 263–287. doi:10.1080/13576500444000317
- Neff, K. D., & McGehee, P. (2010). Self-compassion and psychological resilience among adolescents and young adults. *Self and Identity*, 9, 225–240. doi:10.1080/15298860902979307
- Neff, K. D., Rude, S. S., & Kirkpatrick, K. L. (2007). An examination of self-compassion in relation to positive psychological functioning and personality traits. *Journal of Research in Personality*, 41(4), 908–916. doi:10.1016/j.jrp.2006.08.002
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, 3, 400–424. doi:10.1111/j.1745-6924.2008.00088.x
- Park, J., & Baumeister, R. F. (2017). Meaning in life and adjustment to daily stressors. *The Journal of Positive Psychology*, 12(4), 333–341. doi:10.1080/17439760.2016.1209542
- Pfadttheicher, S., Geiger, M., Hartung, J., Weiss, S., & Schindler, S. (2017). Old wine in new bottles? The case of self-compassion and neuroticism. *European Journal Of Personality*, 31(2), 160–169. doi:10.1002/per.2097
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*, 18, 250–255. doi:10.1002/cpp.702
- Rottenberg, J., & Gross, J. J. (2003). When emotion goes wrong: Realizing the promise of affective science. *Clinical Psychology Science and Practice*, 10, 227–232. doi:10.1093/clipsy/bpg012
- Saklofske, D. F., Kelly, I. W., & Janzen, B. L. (1995). Neuroticism, depression, and depression proneness. *Personality and Individual Differences*, 18(1), 27–31. doi:10.1016/0191-8869(94)00128-F

- Sbarra, D. A., Smith, H. L., & Mehl, M. R. (2012). When leaving your ex, love yourself: Observational ratings of self-compassion predict the course of emotional recovery following marital separation. *Psychological Science*, 23(3), 261–269. doi:[10.1177/0956797611429466](https://doi.org/10.1177/0956797611429466)
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67(6), 1063–1078.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (2001). Optimism, pessimism, and psychological well-being. In E. C. Chang (Ed.), *Optimism and pessimism: Implications for theory, research, and practice* (pp. 189–216). Washington, DC: American Psychological Association.
- Vieselmeyer, J., Holguin, J., & Mezulis, A. (2017). The role of resilience and gratitude in posttraumatic stress and growth following a campus shooting. *Psychological Trauma: Theory, Research, Practice, and Policy*, 9(1), 62–69. doi:[10.1037/tra0000149](https://doi.org/10.1037/tra0000149)
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070.
- Yarnell, L. M., & Neff, K. D. (2013). Self-compassion, interpersonal conflict resolutions, and well-being. *Self and Identity*, 12(2), 146–159. doi:[10.1080/15298868.2011.649545](https://doi.org/10.1080/15298868.2011.649545)
- Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Applied Psychology: Health and Well-Being*, 7(3), 340–364. doi:[10.1111/aphw.1205](https://doi.org/10.1111/aphw.1205)