

# Effects of a Self-Compassion Break Induction on Self-Reported Stress, Self-Compassion, and Depressed Mood

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## Abstract

**Introduction:** The objective of the study was to determine whether practicing a self-compassion induction would reduce self-reported stress, depressed mood, and increase self-compassion in a randomized controlled study measuring variables of interest at two time points spanning three weeks.

**Method:** Participants were 129 students (91 females and 38 males,  $M_{\text{age}} = 19.47$ ,  $SD = 3.20$ ) divided into three groups: Self-compassion Break, Time Management Control Group, and a No-Induction Control Group. Participants were part of the general student body and were not diagnosed or screened for clinical depression. Self-compassion, stress, and depressed mood were assessed at baseline and follow-up. Participants practiced their respective inductions over three weeks after being guided through their respective inductions at Time 1.

**Results:** There were no significant differences between groups in outcome variables. Results of this study may indicate the importance of weekly group check-in meetings to facilitate positive change as findings in this study did not mirror those of similar studies using frequent meetings.

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**Keywords**

Self-compassion, stress, depressed mood, self-compassion induction

**Introduction**

Stress and depressed mood are commonly cited as prevalent problems for which students seek help, and rates of depression among college students have also been rising steadily (American College Health Association-National College Health Assessment [ACHA-NCHA], 2009; Hunt & Eisenberg, 2010; Moreno et al., 2011). A study conducted in 2008 (ACHA-NCHA, 2009) examining over 80,000 students from 106 postsecondary education institutions found that approximately 15% of students were diagnosed with depression within their lifetime and, of these, one-third of students had reported being diagnosed with depression within the past year. Past research also indicates that college students report high levels of stress (DeRosier, Frank, Schwartz, & Leary, 2013). More than 40% of college students report having felt greater than what they perceive to be the average or normal amount of stress within the past year (National Alliance on Mental Health Issues, 2014). Evidence-based self-help techniques designed to address stress and depressed mood could be greatly beneficial for college students. Because depression is an issue among college students, it is important to study nonclinical and preclinical levels of sadness or depressed mood among college students in addition to self-help interventions designed to lower existing mild levels of symptoms. Analog studies examining nonclinical levels of sad and depressed mood in students provide insight into possible experiences of clinically depressed individuals. It is also important to note that sad and depressed mood may become worse over time, moving from non-clinical to clinical levels; therefore, analog or nonclinical studies examining the positive effects of interventions designed to reduce sad and depressed mood offer insight into preventing worsening symptoms that could later reach clinical levels.

Although there are often free or slide-scale fee mental-health resources on campuses to help students dealing with emotional and psychological issues, research has shown that there are several barriers that students face, such as time constraints, living off campus, having fewer years of college (not having been in college very long), lack of knowledge of available resources, stigma, and lack of knowledge about cost of resources (Marsh, 2012; Yorgason, Linville, & Zitzman, 2008). Furthermore, students may have to wait for available counselors at school counseling centers or may not have a schedule that permits counseling during standard hours, which could be a potential barrier to returning to the center. With self-administered self-help interventions, students (especially those with nonclinical level mood issues) may not face the same

discouragements of having to wait to see a counselor or receive treatment. Such self-administered treatments may be beneficial to those wishing to address non-clinical levels of depressed mood and stress.

## **Self-compassion**

Self-compassion—a trait exercised during events that elicit stressful, self-conscious emotions such as embarrassment and shame—consists of mindfulness, self-kindness, and common humanity. Self-compassion is related to an objective awareness and acceptance of painful and stressful events. Self-compassion is also characterized by the understanding that negative experiences and emotions are part of the human experience. Those practicing self-compassion also engage in kind self-talk, offering words of comfort and encouragement to themselves as though they would to a dear friend (Neff, 2003a).

### *Depression, stress, and trait self-compassion*

The correlational relationship between self-compassion and negative constructs such as depression and stress has been well established (MacBeth & Gumley, 2012; Neff, 2003b; Neff & Dahm, 2014; Van Dam, Sheppard, Forsyth, & Earleywine, 2010). Self-compassion may be an effective buffer against stress and depressive symptoms because it is negatively related to irrational, stress-inducing, maladaptive cognitions (Podina, Jucan, & David, 2015). For example, Neff, Hsieh, and Dejitterat (2005) found that among students who received a dissatisfying grade, those higher in self-compassion were less likely to focus on negative emotions and more likely to show acceptance and positive reinterpretation of the grade compared with those who were lower in self-compassion. Participants asked to recall negative events are less likely to engage in negative self-talk related to the event if they are high in self-compassion (Leary, Tate, Adams, Batts Allen, & Hancock, 2007).

Researchers (Podina et al., 2015; Raes, 2011) have found that the self-kindness component of self-compassion moderates the irrational belief-depression relationship, which may allow self-compassion to act as a buffer against the development or worsening of depressive symptoms in nonclinical samples. Raes (2011) has shown that college students who completed self-compassion and depression measures at two different time points (five months apart) showed reductions or smaller increases in depressive symptoms if they were higher in self-compassion at baseline compared with students lower in self-compassion at baseline. The mindfulness, self-kindness, and common humanity components of trait self-compassion predicted decreased levels of depressive symptoms in children and adolescents over a span of three months without intervention, further supporting the idea that trait self-compassion may act as

a buffer against negative mood outcomes such as depression (Stolow, Zuroff, Young, Karlin, & Abela, 2016).

Self-compassion is also a buffer against stress via the same mechanisms of adaptive coping and cognitive restructuring (Allen & Leary, 2010). Without intervention, self-compassion has been shown to be related to adaptive coping by potentially reducing the perceived threat level of stressful events (Chishima, Mizuno, Sugawara, & Miyagawa, 2018). Self-compassion also affects cognitive appraisals of stress by increasing perception of controllability over stressors (Chishima et al., 2018).

### *Self-compassion interventions*

Self-compassion inductions studied in clinical populations are generally used in constructive treatment designs—that is, coupled with other, existing therapies. Programs such as Neff and Germer's (2013) Mindful Self-Compassion training program generally utilize Cognitive Behavioral Therapy (CBT) techniques with an emphasis on cultivating and increasing self-compassion. Both programs use meditative/imagery exercises, group setting interventions, and exercises in cultivating compassion toward the self.

Other programs, such as Compassionate Mind Training (CMT), have been found to reduce anxiety, depression, and hyperarousal stress responses in those who have experienced traumatic events (Beaumont, Galpin, & Jenkins, 2012). Like Neff and Germer's Mindful Self-Compassion program, CMT is also based on CBT and Dialectical Behavior Therapy principles with a focus on exercises designed to increase self-compassion (Gilbert and Proctor, 2005). In a study conducted by Gilbert (2006), CMT was found to be effective in significantly reducing depression symptoms and increasing self-soothing tendencies. Self-compassion is also beneficial for depression co-occurring with other psychological issues. For example, in individuals diagnosed with schizophrenia, Compassion Focused Therapy (which is also based on CBT principles with an emphasis on compassion) resulted in a greater decrease of depression compared with a Treatment as Usual group consisting of psychotropic medication, visits with psychiatrists and CPNs, occupational therapy, and day center support (Braehler et al., 2013).

Self-compassion interventions in nontherapeutic settings have also been beneficial in reducing stress and nonclinical levels of depressive symptoms. Research has found that brief self-compassion training has the ability to reduce biopsychological responses (salivary alpha-amylase, cardiac) as well as self-reported anxiety compared with a placebo condition when participants are faced with social evaluative stressors (Arch et al., 2014; Arch, Landy, & Brown, 2016). Mindfulness and self-compassion-based interventions have been found to improve mood, increase positive outcomes, and reduce stress as measured by salivary immunoglobulin A and salivary cortisol (Bellosta-Batalla et al., 2017).

Bluth, Gaylord, Campo, Mullarkey, and Hobbs (2015) created a multi-week program titled *Making Friends With Yourself: A Mindful Self-Compassion Program for Teens* which utilizes self-compassion and mindfulness techniques (such as mediation). The program has been shown to be successful in decreasing depressive symptoms and stress in adolescents in two separate studies (Bluth et al., 2015; Bluth & Eisenlohr-Moul, 2017). Dundas, Binder, Hansen, and Stige (2017) showed that a self-compassion induction practiced over a span of two weeks was effective in reducing depressive symptoms and increasing self-compassion in university students. Eirini and Anastasios (2017) structured a program based on Neff and Germer's (2013) Mindful Self-Compassion training program and randomly assigned college students to the training program or a control group. Self-compassion increased and depressive symptoms decreased in those assigned to the program compared with the control group. Galla (2016) showed that adolescents who participated in a five-day intensive meditation retreat experienced increases in self-compassion and decreases in depressive symptoms and perceived stress.

Other past research (Smeets, Neff, Alberts, & Peters, 2014) examining the effects of repeated self-compassion interventions designed to help college students cope with stressful events has yielded promising results. Smeets et al. (2014) designed a three-week study comparing a self-compassion intervention to a time management intervention. Groups had weekly meetings (three meetings total) focusing on their specific tasks for that week. Participants in the self-compassion group kept a self-compassion journal, wrote self-compassionate letters, and kept track of negative self-talk using bracelets. They also engaged in "informal" loving kindness meditation by simply repeating mantras related to loving kindness. These participants were compared with a Time Management Control Group which completed similar time-intensive tasks as the self-compassion group. The 27 participants in the self-compassion intervention had significantly greater increases in follow-up self-compassion, mindfulness, optimism, and self-efficacy in addition to decreases in rumination compared with the 25 participants in the time management group.

This study is a deconstructive extension (rather than replication) of the Smeets et al. (2014) study and was designed to be less time- and effort-intensive for participants while assessing well-being-related variables. This study was designed to assess self-reports of stress, self-compassion, and depressed mood from baseline to follow-up following a three-week period among three different conditions. Participants were not screened for diagnosable levels of depression or assessed for past diagnoses of depression. A goal of this study was to address stress and mood issues in a nonclinical population by teaching what can be considered a self-help technique. Such research in nonclinical populations is important as addressing stress and low-level mood issues early on may prevent worsening of symptoms that could later progress to clinical levels.

One goal of the current randomized controlled study to determine whether a self-compassion induction low in time-intensity could be beneficial without having participants attend several meetings or engage in multiple activities (e.g., meditation, as in the Smeets et al. study). The goal of having a low number of interactions and dynamic exercises was to determine whether individuals would benefit from self-compassion inductions by practicing them largely on their own after being taught the inductions in a lab. Past research has shown that students seeking mental-health resources to reduce symptoms of depression and stress report not having enough time to make and keep appointments for in-person meetings during standard business hours (Marsh, 2012; Yorgason et al., 2008). Because time may be a factor preventing those who may want to learn self-compassion techniques to prevent worsening of stress and depressed mood, a goal was to determine whether the self-compassion induction used in this study could address the barrier of time while still providing positive outcomes.

This study also compares a self-compassion induction to a Time Management Control Group, similar to the Smeets et al. (2014) study. The goal of having a Time Management Control Group was to utilize an attention control group design. The Time Management Control Group's purpose was to provide an induction comparable in time and intensity to the self-compassion induction group while not providing the "active ingredients" as the self-compassion group. Furthermore, a third control group (which had no intervention for three weeks) was also used. It was hypothesized that those practicing the self-compassion break induction for three weeks would have increased self-compassion levels and lower levels self-reported stress and depressed mood compared with the two control groups at follow-up.

## Method

### Participants

Participants were 129 (90 females, 38 males, 1 chose other,  $M_{\text{age}} = 19.43$ ,  $SD = 3.11$ ) students at a Midwestern university in the United States completing research for course credit. Originally, 198 participants had signed up and completed the baseline online measures. However, 69 participants either did not show up for the in-lab portion to learn their induction or did not complete online follow-up measures. Of the noncompleters, 46 completed the baseline measures but never came into the lab to be randomly assigned to a condition. Of the 23 who were assigned to a condition but did not finish the study as per protocol specifications by providing only one observation of the dependent variables, 7 were in the Time Management Control Group, 11 were in the No-induction Control Group, and 5 were in the Self-Compassion Control Group. Of the completers, there were 38 participants in the No-Induction

Control Group, 44 in the Self-compassion Break, and 47 in the Time Management Control Group. Those who completed all time points ( $M = 39.91$ ,  $SD = 8.93$ ) were not different in depressed mood from those who only completed one time point ( $M = 43.04$ ,  $SD = 9.33$ ),  $t(150) = 1.54$ ,  $p = .13$ ,  $d = .34$ . Those who completed both time points ( $M = 73.91$ ,  $SD = 17.22$ ) were also not different from noncompleters in their first measurement of self-compassion ( $M = 76.78$ ,  $SD = 18.11$ ),  $t(150) = .73$ ,  $p = .47$ ,  $d = .16$ . Finally, completers ( $M = 18.80$ ,  $SD = 5.96$ ) were not different from noncompleters in their first measurement of stress ( $M = 19.30$ ,  $SD = 5.33$ ),  $t(150) = .38$ ,  $p = .70$ ,  $d = .09$ . Of those who completed the study, 4 identified as Asian, 6 as African-American, 6 as Hispanic, 1 as Native American, 110 as white, and 2 as Other. Of those who did not complete the study, 4 were Hispanic and 19 were White.

## Materials

**Self-compassion.** The Self-Compassion Scale (SCS; Neff, 2003b) was used to assess self-reported self-compassion. The SCS consists of 26 items scored on a five-point Likert-type scale (1 = *almost never* to 5 = *almost always*). The 26 items encompass six subscales. These subscales include self-kindness, self-judgment, mindfulness, over-identification, common humanity, and isolation. Example items include, "I try to be loving toward myself when I'm feeling emotional pain" and reverse-scored items such as "I'm disapproving and judgmental about my own flaws and inadequacies." The total score for the SCS was used. The internal consistency (Cronbach's alpha) scores for the scale at Times 1 and 2 were .91 and .93, respectively.

**Depressed mood.** The Zung Self-Rating Depression Scale (ZSDS; Zung, 1965) was used to assess depressed mood. The ZSDS contains 20 items scored on a four-point Likert-type scale (1 = *a little of the time*, 4 = *most of the time*). The ZSDS is designed to assess depressed mood and cognitions as well as behavioral and somatic symptoms of depression. Example items include "I feel that others would be better off if I were dead" and "My heart beats faster than usual." The ZSDS has been tested in college students, has been found to be a potentially effective screening measure for counseling centers and is considered valid and reliable equally across different college-student demographics (Kitamura, Hirano, Chen, & Hirata, 2009; Smith, Rosenstein, & Granaas, 2001). The internal consistency (Cronbach's alpha) scores for the scale at Times 1 and 2 were .83 and .84, respectively.

Scores are categorized as normal range (25–49), mildly depressed (50–59), moderately depressed (60–69), and severely depressed (70 or higher). Although the scale (Zung, 1965) provides categories, scores were treated as a continuous variable in this study. At Time 1, participant scores ranged from 22 to 65

( $M = 39.91$ ,  $SD = 8.93$ ). At Time 2, participant scores ranged from 23 to 64 ( $M = 40.00$ ,  $SD = 9.40$ ).

### Perceived stress

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to assess self-reported perceived stress. The PSS contains 10 items scored on a five-point Likert-type scale (0 = *never*, 4 = *very often*). The PSS is designed to measure the degree to which one perceives their life circumstances and events as stressful. Example questions 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 the things that you had to do?" The internal consistency (Cronbach's alpha) scores for the scale at Times 1 and 2 were .84 and .86, respectively.

Score interpretations are often divided into low (0–13), moderate (14–26), and high (27–40) levels of stress (NH Department of Human Services (2010)). The scale was examined continuously rather than categorically in this study. At Time 1, scores ranged between 7 and 35 ( $M = 18.80$ ,  $SD = 5.96$ ). At Time 2, scores ranged from 2 to 35 ( $M = 19.00$ ,  $SD = 6.33$ ).

### Procedures

Facilitators were student research associates who had previously completed research methods courses. Facilitators spent roughly a month in training for study protocols for this study. Training involved practice sessions with the PI and other facilitators pretending to be a participant while all facilitators observed and took turns running the PI and peers through the protocol. All facilitators were trained in executing both the self-compassion and time management conditions and in instructing No-Induction Control Group participants that they had no induction but still needed to complete Time 2 responsibilities (debriefing, completing Time 2 measures online).

Participants signed up for the study using SONA, a research participation system. All participants were exposed to the same advertisement which stated that the goal of the study was to assess stress and personality-related factors and that some participants may be asked to learn an induction which they would practice over a span of 3 weeks. After signing up for the study online, all participants were e-mailed a link with an online consent form and baseline measures assessing self-compassion, stress, and depression with instructions to fill out measures before their first in-lab visit. Online baseline measures were estimated to take no more than 45 minutes to complete. The first lab visit was estimated to take no more than 1 hour to complete. The daily inductions (for groups that had them) were estimated to take no more than 10 minutes to complete.



All participants visited the lab after completing the online measures. Upon their lab visit, participants arrived at the lab in groups of up to three participants with groups being randomly assigned to learn an induction together or, in the case of the No-Induction Control Group, informed that they had no task to complete but had to complete Time 2 measures and debriefing. A random assignment sheet was used to decide how participants would be randomly assigned. Participants in the induction groups were then given materials (pamphlets) for their condition. For those learning an induction, experimenters read the instructions aloud with the participants (described later) and asked whether participants had any questions. Participants assigned to inductions were told to engage in their inductions for the following weeks until they completed their follow-up measures online and came for their follow-up visit during which they were debriefed.

*Self-compassion Break.* The components of self-compassion (self-kindness, common humanity, and mindfulness) were explained to participants in the self-compassion group during their first meeting. Experimenters then provided interactive exercises involving scenarios in which one would use self-compassion (scenario scripts available upon request). In these scenarios, the experimenter described a fictional character who lost their temper with their roommate and later felt guilty and ashamed of their behavior. The scenario involved examples of how the character would approach their problem with mindfulness, would show kindness to themselves, and how the character would connect their experience to that of the larger human experience in an effort to forge a sense of common humanity.

A second scenario was provided in which a character was rude to a waitress who took a while to bring the check at the end of a meal. Participants were asked to write how the character could show mindfulness, self-kindness, and common humanity. They were then asked to share aloud their answers for the different aspects. Participants were also asked to share whether they could think of any recent examples in their own life for which they did or should have used self-compassion.

Finally, participants were given the Self-compassion Break pamphlet (see Online Appendices) based on a technique created by Neff that was designed to reduce stress (instructions listed in the Online Appendix). This technique was obtained from Neff's (2015) website, [selfcompassion.org](http://selfcompassion.org). The technique involves engaging in positive, soothing, self-compassionate self-talk in stressful situations. Participants were instructed to practice mindfulness by taking a step back during a stressful situation and acknowledging their pain, distress, and/or discomfort. They were then instructed to practice common humanity by reminding themselves that suffering is part of life, that everyone suffers, and the participant is not alone in their suffering. Participants were asked to practice self-kindness by saying words of comfort to themselves. Participants were also

given log sheets so that they could keep track of their use of the technique. The log sheet contained three questions: “What happened or what did you do that made you feel like you need to show yourself compassion?”, “How did you feel before practicing SC? (e.g., mad at self, frustrated with self?)”, “How did you feel after practicing SC?” The log sheet was provided for comparative treatment design purposes as the Time Management Control condition also contained log sheets. Participants were not asked to turn in log sheets. Experimenters went over the pamphlet and induction aloud with participants and asked whether the participants had any questions.

*Time Management Control Group.* The Time Management Control condition was intended to be an attention control task that was equal in time and effort to the Self-compassion Break without being equal in the “active” cognitive and emotional components of the self-compassion induction. During their lab visit, participants were asked to provide examples of potential things they would list on their to-do list to give an idea of how they would use it. Experimenters informed them that common things people might list are: Read for class, work on assignments, and study for tests.

Those in the Time Management Control condition were also given pamphlets (see Online Appendices). Material on these pamphlets is loosely based on tools obtained from the Mind Tools Time Management website (Mind Tools, 2015). As part of the Time Management task, participants are asked to create to-do lists of things they felt were important while also ranking items from most to least important. It was explained that managing one’s time has the ability to help one reduce stress by being more efficient. Participants were also told to write down completed tasks in their activity log as well as a brief description of how they felt about completing the task.

*No-Induction Control Group.* The second control condition simply filled out the same online measures at baseline and follow-up. They did not complete any tasks or log sheets during the time between baseline and follow-up measures.

*Follow-up procedures.* All groups performed their respective tasks for three weeks (or no task, in the case of the No-Induction Control Group). During the third week, participants were sent follow-up measures. Participants were allowed to come individually to be debriefed in the lab (a procedure taking 5–10 minutes). The follow-up measures were estimated to take no more than 45 minutes each to complete online. Similar to past research (e.g., Smeets et al., 2014), individual assignments/log sheets for participants in both the self-compassion and time management were not analyzed. Participants were not asked to return these log sheets.

### Statistical analysis plan and study design based on hypotheses

This study is a randomized controlled study. Bivariate correlations were used to examine the relationships between self-compassion, depressed mood, and stress. A series of factorial ANOVAs were used to examine the effects of time within all participants on depressed mood, self-compassion, and stress, as well as differences between groups (Self-compassion Break, Time Management Control Group, and No-Induction Control Group) in depressed mood, self-compassion, and stress. Finally, Bayesian versions of the aforementioned factorial ANOVAs were conducted to address any potential issues with small sample sizes.

### Results

As per the suggestions of Gravetter and Wallnau (2014), a value of 2 was used to determine the level of skewness and kurtosis of the data in this study. All variables were below 2, indicating that data are relatively normally distributed. Any outliers were not removed as there was no justifiable reason to remove them. Participants who did not complete Time 2 measures online ( $N = 69$ ) were removed from the study.

Bivariate correlations indicated that self-compassion was significantly and negatively related to depressed mood and stress and Time 1. Depression and stress were significantly and positively correlated with one another (see Table 1).

A series of mixed factorial ANOVAs (Time  $\times$  Induction) were conducted to examine the differences between groups and changes within groups on outcome measures. There were no significant changes in self-compassion, depressed mood, or stress from Time 1 to Time 2. Type of induction did not have a significant effect on self-compassion, depressed mood, or stress. There were no significant interaction effects between time and type of induction on any outcome variables. All effect sizes ( $\eta^2$ ) were between .01 and .03, which is considered a small effect size (see Cohen, 1988; small = .01, medium = .06, large = .14; see Table 2 for ANOVA statistics and significant values). A breakdown of  $M$ s and  $SD$ s can be found in Table 3.

Despite having similar or larger group sizes compared with past studies (e.g., Adams & Leary, 2007; Gilbert & Procter, 2006; Smeets et al., 2014), it is acknowledged that a small sample size may be a concern in light of null results.

**Table 1.** Bivariate correlations at pretest.

Measure	1	2
1. Depressed mood	–	
2. Perceived stress	.66*	–
3. Self-compassion	–.59*	–.56*

\* $p < .01$ .

**Table 2.** Main and interaction effects for mixed factorial ANOVAs.

Variable	<i>F</i>	<i>p</i>	$\eta_p^2$ effect size
Self-compassion			
Main effect of time	<i>F</i> (1, 126) = 2.17	.14	.02
Main effect of induction	<i>F</i> (2, 126) = 1.09	.34	.02
Interaction effect of time and induction	<i>F</i> (2, 126) = .48	.62	.01
Depressed mood			
Main effect of time on	<i>F</i> (1, 126) = .05	.82	.00
Main effect of induction	<i>F</i> (2, 126) = 1.98	.14	.03
Interaction effect of time and induction	<i>F</i> (2, 126) = .70	.50	.01
Stress			
Main effect of time	<i>F</i> (1, 126) = .28	.60	.00
Main effect of induction	<i>F</i> (2, 126) = 1.97	.14	.03
Interaction effect of time and induction	<i>F</i> (2, 126) = .74	.48	.01

ANOVA: analysis of variance.

**Table 3.** Pre- and posttest means and standard deviations.

	No-Induction Control Group (N = 38)		Self-compassion Break (N = 44)		Time Management Control Group (N = 47)	
	Pretest M (SD)	Posttest M (SD)	Pretest M (SD)	Posttest M (SD)	Pretest M (SD)	Posttest M (SD)
Self-compassion	73.31 (16.82)	73.55 (17.18)	76.31 (18.21)	78.75 (16.51)	72.15 (16.68)	73.44 (17.17)
Depressed mood	40.71 (8.96)	41.74 (10.28)	38.15 (9.19)	37.59 (7.99)	40.91 (8.60)	40.83 (9.62)
Perceived stress	19.10 (6.60)	20.13 (7.19)	17.50 (5.36)	17.63 (5.52)	19.76 (5.85)	19.36 (6.22)

Because of this, Bayesian mixed factorial ANOVAs were also conducted (using JASP statistical software; JASP, 2016). Compared with tests relying on *p* values (which are prone to show differences in groups when the differences lack practical significance), Bayesian analyses require a much smaller ratio of parameters to observations (Jarosz & Wiley, 2014; Lee & Song, 2004). Bayesian analyses address small sample size issues by comparing the likelihood that data fit under the null hypothesis with the likelihood that data fit under the alternative hypothesis. As  $BF_{10}$  increases, evidence for the alternative hypothesis—that the conditions (time and induction) would affect follow-up self-compassion, depressed mood, and stress—increases (Marsman & Wagenmakers, 2017; Wagenmakers, 2007).  $BF_{10}$  scores should be 1 to 3 in order to provide “weak” or “anecdotal” support for the alternative hypothesis, with scores ideally being above 3 to provide “substantial” or “positive” support (Jarosz & Wiley, 2014; Jeffreys, 1961; Raftery, 1995).

**Table 4.** Bayesian mixed factorial  $BF_{10}$  (support for alternative hypotheses) scores.

Variable	$BF_{10}$ score	P(M)	P(M Data)	$BF_M$
Self-compassion				
Main effect of time	.42	.20	.20	.99
Main effect of induction	.46	.20	.22	1.12
Interaction effect of time and induction	.12	.20	.01	.04
Depressed mood				
Main effect of time	.14	.20	.07	.30
Main effect of induction	.71	.20	.36	2.27
Interaction effect of time and induction	.13	.20	.01	.03
Stress				
Main effect of time	.15	.20	.08	.36
Main effect of induction	.57	.20	.31	1.82
Interaction effect of time and induction	.15	.20	.01	.03

P(M): prior model probabilities; P(M|Data): posterior model probabilities.

The  $BF_{10}$  scores for the main effects of time and induction (and their interaction) were all below 1 (see Table 4). According to Raftery's (1995) and Jeffreys's (1961) criterion for evaluating inverse Bayes factors, this is below even what is considered "weak" or "anecdotal" support for the alternative hypothesis. Essentially, there was no strong support for the hypotheses that there would be a significant main effect time, induction, and a significant interaction effect. Sample size is likely not a factor contributing to null findings in this study (see Table 4 for Bayesian statistics). Current analyses used the default parameter specifications set by JASP, which is  $r = .5$  for fixed effects. The prior model probabilities, P(M), and the posterior model probabilities, P(M|Data), and the change from the prior to posterior model odds,  $BF_M$ , are also presented in Table 4.

It should be noted that  $BF_{10}$  is the inverse of  $BF_{01}$ , a model which examines support for the null hypothesis. To obtain  $BF_{10}$  scores one must divide 1 by  $BF_{01}$ .  $BF_{01}$  scores of .33–1 (and higher) are considered weak/anecdotal evidence for the null hypothesis (Jeffreys, 1961; Raftery, 1995). For example, finding a main effect of induction on self-compassion (as illustrated in Table 4) of .46 when testing a model for the alternative hypothesis would equate to a  $BF_{01}$  of 2.17 (e.g.,  $1/BF_{01} [2.17] = .46 [BF_{10}]$ ). All  $BF_{10}$  scores listed in Table 4 result in  $BF_{01}$  scores larger than 1, indicating weak/anecdotal support for the null hypothesis.

## Discussion

Elevated levels of depressed mood and stress significantly impact college students. Interventions designed to reduce stress and depressed mood and that are

easily practiced alone without weekly meetings could be of great value to college students with busy schedules. This study was designed with the goal of helping students increase self-compassion and learn skills to reduce depressed mood and stress and increase self-compassion while comparing a self-compassion training group to two control groups. Despite having larger group sizes than that of previous research (e.g., Arch et al., 2014; Smeets et al., 2014), the hypotheses of this study were not supported. Although higher levels of outcome self-compassion were related to lower levels of stress and depressed mood (as exemplified by correlational analyses of self-reported stress and self-compassion), the induction in this study did not lead to lower levels of depressed mood or perceived stress, nor did it increase self-compassion.

One potential limitation of the study is the fact that the logs and journals that participants kept were not obtained at follow-up and analyzed. Because keeping a log was not enforced, participants may not have practiced their induction. However, it is important to note that similar past research (e.g., Smeets et al., 2014) using logs also did not analyze such data.

Another limitation might be sample size. However, the number of participants per group for this study was similar to or larger than that of previous, similar studies (e.g., Adams & Leary, 2007, who had 84 participants in three groups; Gilbert & Procter, 2006, who had 9 participants; Smeets et al., 2014, who had 52 participants divided between two groups, as well as several other self-compassion studies relying on inductions). Bayesian versions of analyses were also conducted to address any potential issues of small sample sizes. The Bayesian analyses supported the original ANOVAs, indicating sample size is likely not the culprit behind the null findings of this study.

Learning the induction in a group setting could have been a limitation. Participants arrived in groups to save time due to limited space and limited available research associates in addition to roughly emulating aspects of the Smeets et al. (2014) study. Although group settings are just as effective at affecting positive change as one-on-one conditions when it comes interventions (Brown & Lewinsohn, 1984), most group interventions involve multiple exposures during which people are introduced and trust is built. The participants in this study were not introduced to one another and they only met once as a group. It is plausible that participants may have been anxious about discussing their stressors and practicing their inductions in front of strangers during their first visit, thus making it more difficult to retain information about the induction.

The measure of depression used to assess depressed mood could also be a limitation—it may have been more appropriate for clinically depressed individuals despite having been previously found appropriate to use in college populations (e.g., Kitamura et al., 2009; Smith et al., 2001). The average score of participants at Time 1 fell within the “normal” range of depression. The measure may not have been sensitive enough to detect changes in negative mood outcomes among potentially nonclinical participants. Although participants may

not have been clinically depressed, it is still important to assess nonclinical and preclinical changes in depressed mood as a result of self-compassion inductions. Such findings can be of benefit to those who have low-level mood issues and who wish to engage in self-help techniques to prevent worsening of symptoms. Replicating the study with a more sensitive measure of negative mood would be beneficial.

Although participants had normal levels of depressed mood, the average score of stress fell within the “moderate” range of stress at Time 1. Scores across groups remained in the 17.5–20 range without much change from baseline to follow-up within groups. Again, lack of enforcement of the self-compassion induction may have resulted in participants not diligently practicing their induction. This would mean participants did not gain the potential stress-reduction benefit of the induction. Another related limitation may be having participants log their usage of the self-compassion induction. Perhaps the lack of change in the condition of interest—the self-compassion group—was due to the burden of being asked to document and keep logs of their self-compassion practice. Adding a documentation process may have made participants less inclined to practice their exercise if they felt they had to keep track of each time they used it, thus preventing them from benefitting from the possible stress-reduction techniques of the self-compassion exercise. Perhaps future research could provide easy to access online spaces for participants to log their self-compassion use.

Not using meditation or weekly group meetings may have been a limitation. The majority of past similar research involving repeated self-compassion inductions involved weekly group meetings and some form of meditative experience (e.g., Bluth & Eisenlohr-Moul, 2017; Bluth et al., 2015; Neff & Germer, 2013; Smeets et al., 2014). The self-compassion inductions in past research may have been more efficacious compared with this study due to *nonspecific factors*. Nonspecific factors are factors outside of the intervention itself that may contribute to the success of the intervention (Spokas, Rodebaugh, & Heimberg, 2008). For example, having repeated contact with experimenters, taking action toward managing the presenting problem, gaining more knowledge about the problem in the context of the study, and developing expectations for improvement may facilitate positive change more so than the induction itself. Unlike similar past research, participants in this study only met once as a group and did not engage in meditation. A goal of this study was to determine whether a self-compassion induction could increase self-compassion and decrease negative factors without weekly meetings. Although meetings were kept to a minimum to increase real-world effectiveness as the experimenters in this study would not be holding weekly dynamic meetings indefinitely, perhaps participants require more frequent guided inductions and instructions when first learning about self-compassion interventions. Such activities may act as a self-compassion “booster” which inoculates them against stress and fortifies their newly developing self-compassion skills. Meditation types of exercises

might also be nonspecific factors in past studies. It is unclear whether positive change in past studies might be due to self-compassion inductions used or to the meditative experiences that accompanied the inductions.

The number of dropouts may also be a limitation. The fact that 23 people chose not to continue to participate in the study after learning their inductions may indicate that the requirements of the study or the inductions may be too involved or perceived as time-consuming. It should be noted that those who attended their first lab visit but dropped out of the study were no different in depressed mood, stress, or self-compassion compared with those who completed the study.

Although the hypotheses of this study were not supported, it is still worthwhile to continue to explore less time-intensive self-compassion inductions and their deliveries. Given the busy schedules and stressors that college students face, it would be beneficial to find ways to efficaciously introduce easily self-administered and maintained self-compassion inductions designed to reduce stress and negative mood. It would also be beneficial to determine whether the success of past similar studies lies in their addition of meditation exercises and multiple group meetings or to self-compassion inductions themselves. This might be accomplished by conducting deconstructive replication designs comparing groups who undergo self-compassion inductions to those who undergo such inductions + meditation and weekly meetings, and so on. Doing so could help determine whether it is the self-compassion induction itself or nonspecific factors that contribute to positive outcomes.

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### **Supplemental material**

Supplemental material is available for this article online.

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