Personality and Individual Differences 87 (2015) 288–292

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Associations of self-compassion and global self-esteem with positive and negative affect and stress reactivity in daily life: Findings from a smart phone study

Tobias Krieger [a,*], Helena Hermann [b], Johannes Zimmermann [c], Martin grosse Holtforth [a,d]

[a] University of Bern, Department of Clinical Psychology and Psychotherapy, Fabrikstrasse 8, 3014 Bern, Switzerland
[b] University of Zurich, Institute of Biomedical Ethics and History of Medicine, Pestalozzistrasse 24, 8032 Zurich, Switzerland
[c] University of Kassel, Department of Psychology, Holländische Str. 36-38, 34127 Kassel, Germany
[d] Bern University Hospital, Division of Psychosomatic Medicine, Inselspital, 3010 Bern, Switzerland

ARTICLE INFO

Article history:
Received 9 January 2015
Received in revised form 1 August 2015
Accepted 3 August 2015
Available online 28 August 2015

Keywords:
Self-compassion
Self-esteem
Positive affect
Negative affect
Stress reactivity

ABSTRACT

The present study examined trait self-compassion and trait self-esteem in relation to positive (PA) and negative affect (NA), as well as their associations with stress reactivity in daily life. One hundred and one subjects completed questionnaires on perceived stress and affect twice a day for 14 consecutive days on smart phones. Results indicated that self-compassion and global self-esteem were positively related to PA and negatively to NA. After controlling for self-esteem, self-compassion remained significantly associated with PA and NA, whereas self-esteem was no longer associated with PA and NA after controlling for self-compassion. Furthermore, results indicated that self-compassion buffered the effect of stress on NA, whereas this was not the case for global self-esteem. Neither self-compassion nor self-esteem moderated the relation of stress on PA in separate models. The results of the present study add to the growing literature regarding beneficial relations of self-compassion and psychological well-being and further emphasize the distinction of self-compassion and global self-esteem.

Global self-esteem (GSE) (Rosenberg, 1965) refers to a general positive or negative orientation toward the self. High GSE has been defined as a person's appraisal of his or her value involving positive self-regard and the belief that one is valued by others. High levels of GSE are associated with enhanced initiative and pleasant feelings. However, high levels of GSE are not consistently related to adaptive behaviors (Baumeister, Campbell, Krueger, & Vohs, 2003).

Inspired by Buddhist tradition, Neff (2003) has introduced the concept of self-compassion (SC) as an alternative way of looking at positive self-regard. SC involves "being open to and moved by one's own suffering, experiencing feelings of caring and kindness toward oneself, taking an understanding, nonjudgmental attitude toward one's inadequacies and failures, and recognizing that one's experience is part of the common human experience" (p. 224; Neff, 2003). During the last decade, a large body of research has shown that high levels of SC are positively associated with psychological health and well-being (Barnard & Curry, 2011) and there has been considerable interest in the mental health benefits of self-compassion.

Although there are some similarities between SC and GSE, an overview by Neff (2011) concludes that self-compassion represents a more straightforward way to conceptualize a healthy way of relating to oneself than the more general construct of self-esteem, since "[…] it provides a stable foundation of positive self-regard" [p. 9]. This assumption finds support in a study by Neff and Vonk (2009), that demonstrates that SC is associated with more non-contingent and stable feelings of self-worth than are trait levels of GSE.

GSE and SC relate to central constructs in health and well-being research, such as positive and negative affect (PA and NA). Research on GSE has consistently found that high levels of GSE are associated with high levels of PA and low levels of NA as well as depressive symptoms (e.g., Neff & Vonk, 2009; Nezlek & Plesko, 2001). Similarly, several studies have shown that SC is positively related to PA and negatively to NA and depressive symptoms (Leary, Tate, Adams, Allen, & Hancock, 2007; Neff & Vonk, 2009).

Since SC seems to be particularly important when confronted with challenging situations, it has been argued that SC plays a role in self-regulation in service of coping with stress (Allen & Leary, 2010): A more self-compassionate individual is assumed to respond to adverse feelings by attending to them with an open and kind attitude, as well as by acknowledging that experiences of imperfection and difficulties are part of human life. Such attitude or coping promotes proactive and non-avoiding ways of dealing with adversities and stress such as automatic positive thinking, likely reducing NA and/or maintaining PA

* Corresponding author at: Department of Clinical Psychology and Psychotherapy, University of Bern Fabrikstrasse 8, CH - 3012 Bern, Switzerland.
E-mail addresses: tobias.krieger@psy.unibe.ch (T. Krieger), helena.hermann@uzh.ch (H. Hermann), johannes.zimmermann@uni-kassel.de (J. Zimmermann), martin.grosse@psy.unibe.ch (M. grosse Holtforth).

http://dx.doi.org/10.1016/j.paid.2015.08.009
0191-8869/

(Arimitsu & Hofmann, 2015; Diedrich, Grant, Hofmann, Hiller, & Berking, 2014).

So far, several studies found that a self-compassionate attitude buffers the effect of stressful situations on negative affect or depressive symptoms. For example, it may buffer the effect of homesickness (Terry, Leary, & Metha, 2013 Self and Identity) and divorce (Sbarra, Smith, & Mehl, 2012) or when being confronted with real, remembered, and imagined negative events (Leary et al., 2007). However, to our knowledge there is no study that has investigated the effect of levels of self-compassion on the relation of perceived stress on momentary affect. Regarding GSE, studies investigating potential stress buffering effects on NA or depressive symptoms yielded mixed results. In one of the most comprehensive studies so far, Orth, Robins, and Meier (2009) showed that low levels of GSE as well as high levels of stress independently lead to negative affect or depressive symptoms and that a stress-buffering model did not adequately represent the data. Although measures of SC and GSE are typically moderately positively correlated, studies investigating the unique effects of the two constructs (e.g., by controlling for each other in a joint regression analysis) found differential associations with psychological outcomes (for an overview see Barnard & Curry, 2011). Regarding buffering effects, Neff and colleagues (Neff, Kirkpatrick, & Rude, 2007) showed that SC, but not GSE, helps to buffer against anxiety in self-evaluative situations (after controlling for the effect of the other variable).

Based on research and theoretical considerations mentioned above, we tested the following hypotheses: (1) Both SC and GSE will be negatively associated with NA and positively with PA, and (2) SC, but not GSE will buffer the relation of perceived stress on NA and PA. We applied an ecological momentary assessment (EMA) design using smart phones, that allowed for assessing participants in their natural environment.

1. Methods

1.1. Participants

A sample of 105 non-clinical participants was recruited from the Swiss German-speaking general population via flyers, posters, a mailing list of the psychology department, and by word of mouth among the social environment of the authors. Of the initial sample, data of four participants were excluded due to technical assessment problems. The final sample consisted of 101 participants (21 male, 80 female). Mean age of the sample was 28.5 years ($SD = 12.2$; range = 18–61 years). Sixty-eight (67%) participants were students. Education level was rather high, with 56% having at least a college degree ("Matura" or "Abitur"), and 31% having at least a university degree. All participants were Caucasian.

1.2. Procedure

The study was advertised as a diary study investigating the relationships between personality, stress, and well-being. After first contact via an email expressing interest, a research assistant invited participants in groups of up to eight to the lab. During an introductory session, participants were instructed in handling a smart phone, provided demographic information and completed a questionnaire package including measures of SC and GSE. The study used a time-based protocol with fixed interval schedules and participants were prompted acoustically twice a day (midday: 11 a.m. and evening 7 p.m.) to answer the questions. These assessments were collected for the following 14 days in people's everyday life. If participants did not answer the prompt within 3 h, the response window was closed in order to prevent backfilling of data (and the data point was treated as missing). Participants were equipped with HTC Diamond Touch 2 smart phones, on which questionnaires were implemented using *mQuest* data entry software (*cluetec* GmbH, Karlsruhe, Germany). Upon completion of the study period, all participants took part in a raffle for one of eight gifts, worth approximately US $50 each. All subjects provided written informed consent before participating.

1.3. Measures

1.3.1. Trait measures

1.3.1.1. Self-compassion. SC was assessed with the German Version of the Self-Compassion Scale (Hupfeld & Ruffieux, 2011). The SCS is a 26-item self-report inventory that consists of six subscales: self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. Participants answered each item on a 5-point Likert-scale from 1 (*I strongly disagree*) to 5 (*I strongly agree*). The German SCS has also shown high internal consistency good construct validity, and a higher-order confirmatory factor analyses demonstrated that the single factor of SC adequately explains the inter-correlations of the six subscales (Hupfeld & Ruffieux, 2011). In this study. Cronbach's alpha for the total mean score was .85.

1.3.1.2. Global self-esteem. Global self-esteem was assessed using the German version of the 10-item Rosenberg Self-Esteem Scale (von Collani & Herzberg, 2003). The RSES is the most commonly used and a well-validated measure of GSE. Several studies in different samples gave support to its reliability and stability. Responses were given on a 4-point Likert-scale ranging from 0 (*strongly disagree*) to 3 (*strongly agree*). In the present study, Cronbach's alpha for the total mean score was .87.

1.3.2. EMA measures

Repeated measures were given to all participants via smart phone twice a day for 14 consecutive days. Between- and within-person reliability (i.e., Cronbach's alpha) were computed for all these measures according to the recommendations of Geldof and colleagues (Geldhof, Preacher, & Zyphur, 2014)[1].

1.3.2.1. Positive and negative affect. PA and NA were assessed with 10 mood adjectives. In the present study, each item was preceded by the instruction "How did you feel since the last assessment?" and participants rated each item on a Likert scale from 1 (*not at all or a little*) to 5 (*very much*). Consistent with previous studies (Jacobs et al., 2011) a PA scale and a NA scale was built using the mean score of the respective items per entry. NA was measured with the items: *worried*, *angry*, *frightened*, *nervous*, and *anxious*. PA was measured with the items *elated*, *excited*, *motivated*, *awake*, and *determined*. For PA, between-person reliability was .84 and within-person reliability was .72. For NA, between-person reliability was .89 and within-person reliability was .67.

1.3.2.2. Perceived stress. Perceived stress was assessed in eight different domains: romantic partnership, family, friends, work/school/university, spare time/hobbies/sports, errands, financial affairs, and physical health/well-being. Participants rated one item per domain on a Likert-scale with the endpoints of 0 (*not at all*) and 10 (*very much*) to what extent they had experienced stress in each of these domains since the last assessment. The mean level in the eight domains was used as a person's total score of perceived stress since the last assessment (Sowislo, Orth, & Meier, 2014). The mean score of this measure has shown convergent validity ($r = .59$, $p < .001$) with the widely used Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) in a sample of 274 non-clinical individuals in an unpublished cross-sectional dataset of our research group. For this measure, between-person reliability was .85 and within-person reliability was .45. Although the latter value might

[1] We obtained separate within- and between-person alpha coefficients by specifying fully saturated indicator covariance matrices in both levels of a multilevel confirmatory factor analysis.

seem low, within-person reliability estimates often range around .5 (Tomko et al., 2014), and daily stress seems unlikely to occur with high consistency across the eight domains[2].

1.4. Statistical procedures

Addressing the nested structure of the data, we performed multilevel analyses with repeated data entries at level 1 nested within participants at level 2. We used Mplus 7 (Muthén & Muthén, 2012) for all two-level models. Since some variables were not normally distributed (see the Results section) we used maximum likelihood estimation with robust standard errors (MLR).

Between-subject predictors were centered at the grand mean. Perceived stress was not centered prior to the analyses because of the natural zero point of the scale[3]. In preliminary analyses, we tested the appropriateness of multilevel modeling using intraclass correlations (ICCs) for level 1 variables.

In the first part investigating main effects, SC and/or GSE were entered into the models as predictors and repeated measures (NA, PA, Stress) were entered as dependent variable. In the second part, we first tested whether there was significant variability in slopes predicting PA or NA from stress. For this purpose, we investigated the significance of the random slope variance and compared models with and without random slope by means of the Bayesian information criterion (BIC). If there was significant slope variability, we tested whether SC and/or GSE moderate the association of stress and affect (cross-level interactions), in order to explain this variability. Because of a significant correlation between SC and GSE, suppression effects were a concern. Therefore, after testing a combined model, we verified for both level 2 variables whether the inclusion of only one of them led to the same result.

We report effect sizes for cross-level interactions following the approach outlined by Peugh (2010) by reporting the percentage reduction in unexplained variance in the slope, relative to a model without this interaction. This provides an estimate of the incremental interactive effect of SC and GSE, respectively. Significant cross-level interaction effects were further explored by calculating simple slopes for selected levels of the independent variable, which were defined as one *SD* above or below the mean for high and low levels, respectively (see Preacher, Curran, & Bauer, 2006).

2. Results

2.1. Descriptive statistics and preliminary analyses

Regarding level 2 variables, there were no outliers in SC ($M = 3.23$, $SD = 0.56$, skew $= -0.12$, kurtosis $= -0.28$) and GSE ($M = 2.40$, $SD = 0.47$, skew $= -0.84$, kurtosis $= 0.39$) as defined by a deviation greater than three *SD*s from the mean. A total of 2408 valid data points were collected from the 101 participants. Although there are no common rules to rate compliance with a diary protocol (Shiffman, Stone, & Hufford, 2008), protocol compliance in the present study can be judged as 'satisfactory' (completion rate = 85%). The mean amount of data points per person was 23.8 ($SD = 3.7$, range = 7–28).

Of all entries, 1729 (71.8%) were entered on a weekday (vs. weekend) and 1212 (50.3%) were entered at midday (vs. evening). Regarding level 1 variables, mean PA was 2.98 ($SD = 0.75$, skew $= -0.02$, kurtosis $= -0.15$), mean NA was 1.55 ($SD = 0.62$, skew $= 1.49$, kurtosis $= 2.21$), and mean stress level was 1.32 ($SD = 1.07$, skew $= 1.11$, kurtosis $= 1.31$).

Participants experienced significantly more PA on weekend days than on weekdays (weekend: $M = 3.05$ (0.77); weekdays: $M = 2.95$ (0.74); $p = .007$), whereas there was no significant difference between NA experienced on weekdays and weekend-days (weekend: $M = 1.55$ (0.64); weekdays: $M = 1.56$ (0.62); $p = .691$). Participants reported significantly more PA in the evening than at midday (midday: $M = 2.95$ (0.75); evening: $M = 3.01$ (0.76); $p = .039$), whereas there was no significant difference for NA (midday: $M = 1.57$ (0.63); evening: $M = 1.54$ (0.62); $p = .371$).

The percentage of variability in the repeated variables attributable to between-person influences was 41% in NA, 37% in PA, and 57% in stress. These ICCs suggested that level 2 variance has to be considered for the analysis of the present data.

Table 1
Associations of self-compassion and global self-esteem with affect, and perceived stress.

		NA *B* (*SE*)	PA *B* (*SE*)	Stress *B* (*SE*)
SC		−0.343 (0.059)***	0.274 (0.100)**	−0.367 (0.144)*
GSE		−0.391 (0.101)***	0.233 (0.118)*	−0.487 (0.222)*
SC	(Controlled for	−0.214 (0.091)*	0.261 (0.126)*	−0.153 (0.183)
GSE	each other)	−0.218 (0.148)	0.022 (0.144)	−0.363 (0.294)

Note. SC = self-compassion. GSE = global self-esteem. NA = negative affect. PA = positive affect. *B* = unstandardized betas in models with SC/GSE as independent variables and NA, PA and stress as dependent variables.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

2.2. Associations between self-compassion, self-esteem and affect and stress

As in previous studies, SC and GSE were significantly positively correlated ($r = .69$, $p < .001$). Table 1 gives an overview of the associations of SC and GSE with NA, PA, and Stress. Separate multilevel analyses revealed that both SC and GSE were significantly negatively associated with NA and perceived stress. Furthermore, SC and GSE were significantly positively associated with PA. We reran the above analyses including both constructs in the same model in order to partition out the shared variance of SC and GSE. Results indicated that SC remained significantly associated with NA and PA, but not with perceived stress. In contrast, GSE was no longer associated with any of the variables.

2.3. Stress reactivity

In a model predicting NA by stress and another model predicting PA by stress, there was significant variability in slopes between participants (random slope coefficient for NA by stress: 0.028, $SE = 0.009$, $p = .001$; random slope coefficient for PA by stress: 0.029, $SE = 0.011$, $p = .006$). These findings were corroborated by comparing fit indices of models without and with a random slope ($NA_{NoRandomSlope}$: BIC = 3257.9; $NA_{RandomSlope:}$ BIC = 3180.9; $PA_{NoRandomSlope}$: BIC = 4638.5; $PA_{RandomSlope:}$ BIC = 4614.3) and indicated that there is significant variance in the slope between stress and affect that can be explained by level 2 variables.

With regard to NA, Table 2 gives an overview for the analyses of stress reactivity. Results indicated that the cross-level interaction effect of *SC* × *stress* is significant, whereas this was not the case for the *GSE* × *stress* interaction[4]. Separate models with only one level 2 variable corroborated the results of the combined model (*SC* × *stress*:

[2] We additionally calculated a multilevel exploratory factor analysis. Results indicated that the best fitting model shows two within-person and one between-person factors. The second within-person factor consisted basically only of one item (spare time/hobbies/sports). We reran the main analyses with a stress score without this item. The pattern of results remained the same.

[3] In addition to models with an uncentered stress variable, we also tested a model with a person-centered stress variable and the inclusion of the person-specific average stress levels as a level 2 covariate. This model led to the same conclusions.

[4] The general pattern of results remained the same when the model was tested with the inclusion of the following covariates: sex, age, and education on level 2, and sequence of entry, morning or evening and weekend or working day. This speaks of the robustness of our findings.

Table 2
Estimates of fixed effects of multilevel models predicting negative affect (NA).

	B	*SE*	95%-*CI*	ES
Level 1				
Intercept	1.203***	0.030	1.143 to 1.262	
Stress	0.275***	0.022	0.232 to 0.318	
Level 2				
GSE	−0.169	0.087	−0.339 to 0.001	
SC	−0.013	0.071	−0.153 to 0.127	
Cross-level interactions				
GSE × stress	0.068	0.069	−0.067 to 0.203	4.2%
SC × stress	−0.161**	0.069	−0.296 to −0.026	11.5%

Note. NA = negative affect. GSE = self-esteem. SC = self-compassion. 95%-*CI* = lower and upper bounds within a 95% confidence interval. ES = effect size. Effect sizes represent the percentage reduction of random slope variance and were calculated relative to a model without the respective interaction.
** $p < .01$.
*** $p < .001$.

$B = -0.123$, $SE = 0.049$, $p = .013$; *GSE* × *stress*: $B = -0.068$, $SE = 0.047$, $p = .145$).

A simple slope test for the significant interaction between SC and perceived stress revealed that among participants with low levels of SC (−1 *SD*), stress was significantly positively related to NA (*slope* = .344, $t(97) = 8.06$, $p < .001$). Among participants with high levels of SC (+1 *SD*), there was also a significant, but weaker positive relation between stress and NA (*slope* = .208, $t(97) = 8.28$, $p < .001$) (see Fig. 1).

With regard to PA, in a combined model, there was a significant cross-level interaction effect for *SC* × *stress* ($B = 0.127$, $SE = 0.062$, $p = .042$) and not for *GSE* × *stress* ($B = -0.118$, $SE = 0.073$, $p = .103$) on PA. However, testing separate models revealed that neither SC ($B = 0.054$, $SE = 0.039$, $p = .163$) nor GSE ($B = -0.013$, $SE = 0.049$, $p = .782$) moderated the relation of stress on PA. Therefore, the results of the combined model are probably driven by a suppression effect.

3. Discussion

Results of separate analyses for SC and GSE indicated that higher levels of SC were associated with less NA, more PA, as well as with less perceived stress in daily life. These results add to the existing literature on the positive associations of SC and daily well-being. Furthermore, the results indicate that higher levels of SC are related to less NA and more PA in the face of higher levels of perceived stress, even when controlled for the effects of GSE.

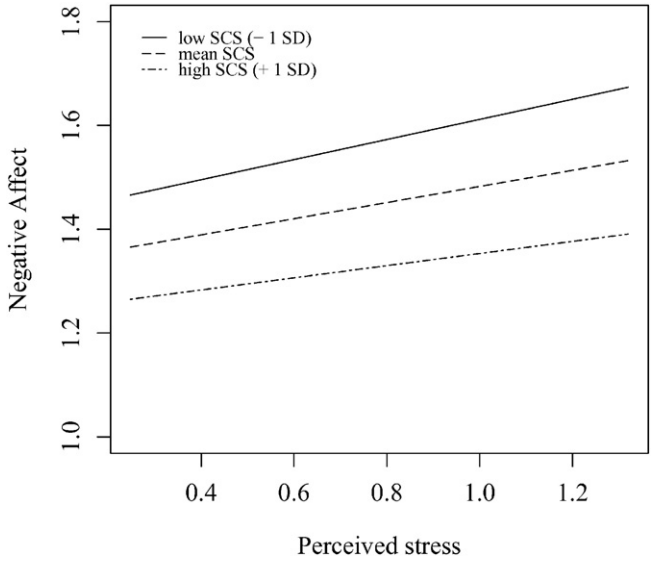

Fig. 1. Relation between perceived stress and negative affect as a function of self-compassion.

This study also aimed at further disentangling the unique contributions of SC and GSE to subjective well-being in everyday life (e.g., Leary et al., 2007; Neff & Vonk, 2009; Neff et al., 2007). Indeed, both SC and GSE independently predicted NA and PA, but only SC predicted affect when controlled for GSE, and not vice versa. Additionally, only SC buffered the effect of perceived stress on NA. These results are in line with the notion that SC may help people preserve their emotional balance, especially when being faced with stressful events (Allen & Leary, 2010). A possible explanation for this finding is that SC has been consistently associated with lower levels of avoidant ways of coping such as avoidance or rumination (Krieger, Grosse Holtforth, Altenstein, Baettig, & Doerig, 2013; Neff et al., 2007; Raes, 2010), as well as with increased emotional-coping skills (Neff, Hsieh, & Dejitterat, 2005). In contrast, although evaluating the self as positive – as in high GSE – is generally positively related to well-being, it is not consistently related to adaptive behaviors (Baumeister et al., 2003). This may be an explanation why GSE did not show to buffer the effect of stress on NA. In line with the present findings, a recent study by Breines et al. (2015) found that self-compassionate individuals – independently of their levels of self-esteem – show reduced activation of a marker of the sympathetic nervous system (salivary alpha-amylase) in response to psychosocial stress.

In models testing a buffering effect of SC and GSE on the relation of stress on PA, results revealed that only in a combined model SC showed a stress buffering effect on PA while this was not the case in a separate model. The reason for this might be that only variance in SC that shows no overlap with GSE is responsible for such an effect. However such a conclusion may be premature. More research is needed disentangling different facets of self-evaluation (cf. Leising et al., 2013).

Many researchers agree that boosting self-esteem cannot be recommended without any qualification (Baumeister et al., 2003; Crocker & Park, 2004). However, a different recommendation may be justified with regard to increasing SC. Studies demonstrate that a self-compassionate attitude is amenable to change and can be increased in the short term (e.g., Diedrich et al., 2014; Leary et al., 2007). A growing body of research shows that specific interventions may have the potential to increase the level of SC in clinical as well as in non-clinical subjects in the long term (Gilbert & Irons, 2004; Neff & Germer, 2012; Neff et al., 2007). Therefore, results of intervention studies in combination with results of the present and previous studies (e.g., Leary et al., 2007; Sbarra et al., 2012; Terry et al., 2013 Self and Identity) suggest that it may be advisable to enhance SC in healthy subjects at risk or clients entering counseling or psychotherapy to reduce stress reactivity and foster resilience.

Several limitations have to be acknowledged: First, the present study only encompasses a short interval, and more studies are needed to investigate the long-term effects. Second, we assessed subjectively perceived stress with a face-valid measure. Although we deem such a rather subjective approach reasonable, future studies should also more objectively assess daily hassles or life events. In addition, the complex factor structure and low reliability at the within-person level suggest that our stress measure was not ideal for examining day-to-day changes. Low reliability reduces the precision of results, and can (e.g.) inflate the Type II error rates (Mathieu, Aguinis, Culpepper, & Chen, 2012). Third, due to the contemporaneous assessment of affect and perceived stress, we could not ascertain the direction of causality among variables of affect and stress in the present study. Fourth, the present results are based on a non-clinical, highly educated sample of Caucasians. Thus, the generalizability of the results to other more diverse samples needs to be explored.

Acknowledgments

This research was supported in part by the Swiss National Science Foundation Grant PP00P1-123377/1 awarded to the last author. We

thank all participants who participated in the research. Special thanks to Kathrin Kuepeli for her assistance in recruitment and data management.

References

Allen, A. B., & Leary, M. R. (2010). Self-compassion, stress, and coping. *Social and Personality Psychology Compass*, *4*(2), 107–118. http://dx.doi.org/10.1111/j.1751-9004.2009.00246.x.

Arimitsu, K., & Hofmann, S. G. (2015). Cognitions as mediators in the relationship between self-compassion and affect. *Personality and Individual Differences*, *74*, 41–48. http://dx.doi.org/10.1016/j.paid.2014.10.008.

Barnard, L. K., & Curry, J. F. (2011). Self-compassion: Conceptualizations, correlates, & interventions. *Review of General Psychology*, *15*(4), 289–303. http://dx.doi.org/10.1037/a0025754.

Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological Science in the Public Interest*, *4*, 1–44. http://dx.doi.org/10.1111/1529-1006.01431.

Breines, J. G., McInnis, C. M., Kuras, Y. I., Thoma, M. V., Gianferante, D., Hanlin, L., et al. (2015). Self-compassionate young adults show lower salivary alpha-amylase responses to repeated psychosocial stress. *Self and Identity*, *14*(4), 390–402. http://dx.doi.org/10.1080/15298868.2015.1005659.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 385–396.

Crocker, J., & Park, L. E. (2004). The costly pursuit of self-esteem. *Psychological Bulletin*, *130*(3), 392–414. http://dx.doi.org/10.1037/0033-2909.130.3.392.

Diedrich, A., Grant, M., Hofmann, S. G., Hiller, W., & Berking, M. (2014). Self-compassion as an emotion regulation strategy in major depressive disorder. *Behaviour Research and Therapy*, *58*, 43–51. http://dx.doi.org/10.1016/j.brat.2014.05.006.

Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods*, *19*(1), 72–91. http://dx.doi.org/10.1037/a0032138.

Gilbert, P., & Irons, C. (2004). A pilot exploration of the use of compassionate images in a group of self-critical people. *Memory*, *12*(4), 507–516. http://dx.doi.org/10.1080/09658210444000115.

Hupfeld, J., & Ruffieux, N. (2011). Validierung einer deutschen Version der Self-Compassion Scale (SCS-D) [Validation of a German version of the Self-Compassion Scale (SCS-D)]. *Zeitschrift für Klinische Psychologie und Psychotherapie*, *40*(2), 115–123. http://dx.doi.org/10.1026/1616-3443/a000088.

Jacobs, N., van Os, J., Derom, C., Thiery, E., Delespaul, P., & Wichers, M. (2011). Neuroticism explained? From a non-informative vulnerability marker to informative person-context interactions in the realm of daily life. *The British Journal of Clinical Psychology/The British Psychological Society*, *50*(1), 19–32. http://dx.doi.org/10.1348/014466510X491397.

Krieger, T., Grosse Holtforth, M., Altenstein, D., Baettig, I., & Doerig, N. (2013). Self-compassion and depression: Associations with depressive symptoms, rumination, and avoidance in depressed outpatients. *Behavior Therapy*, *44*(3), 501–513. http://dx.doi.org/10.1016/j.beth.2013.04.004.

Leary, M. R., Tate, E. B., Adams, C. E., Allen, A. B., & 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. http://dx.doi.org/10.1037/0022-3514.92.5.887.

Leising, D., Borkenau, P., Zimmermann, J., Roski, C., Leonhardt, A., & Schütz, A. (2013). Positive self-regard and claim to leadership: Two fundamental forms of self-evaluation. *European Journal of Personality*, *27*(6), 565–579. http://dx.doi.org/10.1002/per.1924.

Mathieu, J. E., Aguinis, H., Culpepper, S. A., & Chen, G. (2012). Understanding and estimating the power to detect cross-level interaction effects in multilevel modeling. *Journal of Applied Psychology*, *97*(5), 951–966. http://dx.doi.org/10.1037/a0028380.

Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity*, *2*(3), 223–250. http://dx.doi.org/10.1080/15298860390209035.

Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and Personality Psychology Compass*, *5*(1), 1–12. http://dx.doi.org/10.1111/j.1751-9004.2010.00330.x.

Neff, K. D., & Germer, C. K. (2012). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, *69*(1), 28–44. http://dx.doi.org/10.1002/jclp.21923.

Neff, K. D., Hsieh, Y. P., & Dejitterat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity*, *4*(3), 263–287. http://dx.doi.org/10.1080/13576500444000317.

Neff, K. D., Kirkpatrick, K. L., & Rude, S. S. (2007). Self-compassion and adaptive psychological functioning. *Journal of Research in Personality*, *41*(1), 139–154. http://dx.doi.org/10.1016/j.jrp.2006.03.004.

Neff, K. D., & Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *Journal of Personality*, *77*(1), 23–50. http://dx.doi.org/10.1111/j.1467-6494.2008.00537.x.

Nezlek, J. B., & Plesko, R. M. (2001). Day-to-day relationships among self-concept clarity, self-esteem, daily events, and mood. *Personality and Social Psychology Bulletin*, *27*(2), 201–211. http://dx.doi.org/10.1177/0146167201272006.

Orth, U., Robins, R. W., & Meier, L. L. (2009). Disentangling the effects of low self-esteem and stressful events on depression: Findings from three longitudinal studies. *Journal of Personality and Social Psychology*, *97*(2), 307–321. http://dx.doi.org/10.1037/a0015645.

Peugh, J. L. (2010). A practical guide to multilevel modeling. *Journal of School Psychology*, *48*(1), 85–112. http://dx.doi.org/10.1016/j.jsp.2009.09.002.

Preacher, K. J., Curran, P. J., & Bauer, D. J. (2006). Computational tools for probing interactions in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*, *31*(4), 437–448. http://dx.doi.org/10.3102/10769986031004437.

Raes, F. (2010). Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety. *Personality and Individual Differences*, *48*(6), 757–761. http://dx.doi.org/10.1016/j.paid.2010.01.023.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.

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. http://dx.doi.org/10.1177/0956797611429466.

Shiffman, A., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology*, *4*, 1–32. http://dx.doi.org/10.1146/annurev.clinpsy.3.022806.091415.

Sowislo, J. F., Orth, U., & Meier, L. L. (2014). What constitutes vulnerable self-esteem? Comparing the prospective effects of low, unstable, and contingent self-esteem on depressive symptoms. *Journal of Abnormal Psychology*, *123*(4), 737–753. http://dx.doi.org/10.1037/a0037770.

Terry, M. L., Leary, M. R., & Metha, S. (2013). Self-compassion as a buffer against homesickness, depression, and dissatisfaction in the transition to college. *Self and Identity*, *12*(3), 278–290. http://dx.doi.org/10.1080/15298868.2012.667913.

Tomko, R. L., Solhan, M. B., Carpenter, R. W., Brown, W. C., Jahng, S., Wood, P. K., et al. (2014). Measuring impulsivity in daily life: The momentary impulsivity scale. *Psychological Assessment*, *26*(2), 339–349. http://dx.doi.org/10.1037/a0035083.

von Collani, G., & Herzberg, P. Y. (2003). Eine revidierte Fassung der deutschsprachigen Skala zum Selbstwertgefühl von Rosenberg. *Zeitschrift für Differentielle und Diagnostische Psychologie*, *24*, 3–7. http://dx.doi.org/10.1024//0170-1789.24.1.3.