



Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety

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ABSTRACT

The mediating effects of rumination (with brooding and reflection components) and worry were examined in the relation between self-compassion and depression and anxiety. Two hundred and seventy-one nonclinical undergraduates completed measures of self-compassion, rumination, worry, depression and anxiety. Results showed that for the relation between self-compassion and depression, only brooding (rumination) emerged as a significant mediator. For anxiety, both brooding and worrying emerged as significant mediators, but the mediating effect of worry was significantly greater than that of brooding. The present results suggest that one way via which self-compassion has buffering effects on depression and anxiety is through its positive effects on unproductive repetitive thinking.

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1. Introduction

Self-compassion is a relatively new concept in the field of personality psychology (Neff, *in press*; also see Gilbert, 2005; Leary, Tate, Adams, Batts Allen, & Hancock, 2007). Neff (2003a, p. 224) describes self-compassion as “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”.

According to Neff (2003a, b), self-compassion consists of three interacting components: self-kindness (the tendency to treat oneself with understanding and care rather than with harsh self-judgment), a sense of common humanity (the ability to recognize that all humans fail at times, rather than feeling cut off from others by one’s own failures), and mindfulness (being aware of present moment experience in a balanced way rather than overidentifying with one’s emotions).

Growing evidence suggests that self-compassion is related to psychological well-being and it is considered a potentially important protective factor, promoting emotional resilience. A particularly robust finding in this respect is that greater self-compassion is associated with less depression and anxiety (e.g., Leary et al., 2007; Neff, 2003a; Neff, Rude, & Kirkpatrick, 2007). For example, higher scores on the Self-Compassion Scale (SCS; Neff, 2003a) are consistently related to lower scores on various kinds of depression

and anxiety self-report scales (e.g., Neff, 2003a). Additionally, recent research shows that self-compassion moderates people’s emotional reactivity to negative events. So it has been shown that self-compassion – both trait-based and experimentally induced – attenuates people’s sad and anxious reactions to naturally occurring, hypothetical, and experimentally induced negative events (Leary et al., 2007; Neff, Hsieh, & Dejitterat, 2005).

Whereas the literature is clear that self-compassion is related to positive psychological outcomes such as less depression and anxiety, far less is known about the mechanisms involved. What potential mediating processes can explain the buffering/beneficial effects of self-compassion on depression and anxiety? Although some ideas have been put forward in the literature (Allen & Knight, 2005; Leary et al., 2007; Neff, *in press*), very little research has tested this key question empirically. Nevertheless, the importance of such research cannot be overstated, as knowledge of underlying mechanisms can further our understanding of the construct of self-compassion and can improve applied efforts to implement self-compassion interventions (e.g., Germer, 2009; Gilbert & Proctor, 2006). Leary et al. (2007), for example, concluded that the current base of research findings suggest that “self-compassion holds promise as an important and interesting construct that facilitates resilience and coping, but with only a few previous studies on the topic, many key questions have not been addressed” (p. 888). One such outstanding key question is, thus, which potential processes account for the relationship between self-compassion and depression/anxiety?

A likely candidate to mediate the relationship between self-compassion and depression is depressive rumination. Depressive

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rumination can be generally described as a repetitive form of thinking, in which one repeatedly and in an abstract-evaluative way ponders about oneself, and about the possible causes, meaning, and implications of one's sad and depressed feelings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Watkins, 2008). First of all, it is a robust finding that such ruminative thinking prolongs and deepens sad and depressed mood, as observed in experimental studies, and predicts the maintenance of clinical depression and the onset of new episodes of depression, as observed in naturalistic prospective studies (for recent reviews, see Nolen-Hoeksema et al., 2008; Watkins, 2008). Second, Neff (2003a, Study 2; Neff & Vonk, 2009) provided first evidence that greater self-compassion is related to less rumination. The combined observations of rumination's relation with both self-compassion and depression support the idea that rumination might mediate the relation between self-compassion and depression. In fact, Leary et al. (2007) recently suggested that self-compassionate people may experience less negative (i.e. depressed and anxious) affect following a negative event because they ruminate less or not about possible negative implications of such an event. Along the same line, Allen and Knight (2005), in discussing mechanisms by which self-compassion may alleviate or protect against depression, proposed that self-compassion may reduce ruminative thinking. Furthermore, it should be mentioned that rumination has been found to mediate the relationship between depression and a series of other protective, vulnerability or risk factors (e.g., Raes et al., 2006; Spasojevic & Alloy, 2001).

In a similar way, worry might be hypothesized to mediate the relationship between self-compassion and anxiety. Anxious worrying can be described as repeatedly thinking about potential future threats, risks, uncertainties, and imagined catastrophes (Watkins, 2008; also see Borkovec, Robinson, Pruzinsky, & Depree, 1983). On the one hand, worry has been found to predict anxiety, both concurrently and prospectively (e.g., Hong, 2007; for a review, see Watkins, 2008) and it is a central feature of generalized anxiety disorder (APA, 1994). On the other hand, self-compassion can be reasonably expected to be inversely related to worrying, given that prior research has shown that both concepts are moderately to highly associated with anxiety. However, only one study to date has directly examined the relationship between self-compassion and worry, reporting a moderate correlation between higher levels of self-compassion and lower levels of (academic related) worry in undergraduates (Williams, Stark, & Foster, 2008). Related to that observation, Leary et al. (2007) reported that self-compassionate people react to hypothetical negative scenarios with thoughts that reflect less catastrophizing, the latter being a typical component of anxious/worrisome thoughts (Vasey & Borkovec, 1992).

Although worry and rumination very clearly share common aspects, in that they are both forms of unproductive repetitive thinking focused on negative events, both cognitive processes also have specific aspects (for a review, see Watkins, 2008). For example, whereas ruminative thinking is typically associated with sad/depressed feelings over past events (e.g., failures), worrisome thoughts are intimately associated with anxiety about potential future events (Papageorgiou & Wells, 1999).

Notwithstanding the frequent observation that rumination is indeed related to depressed affect and worry to anxious affect, it remains unclear whether rumination and worry – given their many commonalities – are really differentially and specifically related to depression and anxiety, respectively, when all constructs involved are simultaneously considered, that is, controlled for (see Hong, 2007). First of all, there are not many studies around considering both worry and rumination in one and the same study, examining their associations with both depression and anxiety. Second, those studies that did explore the associations between worry, rumination, anxiety and depression, paint a mixed picture. Whereas some

studies did find that worry and/or rumination had unique associations with anxiety and depression (e.g., Hong, 2007; Muris, Roelofs, Meesters, & Boomsma, 2004), others report more undifferentiated patterns of associations (e.g., Calmes & Roberts, 2007; Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Muris, Roelofs, Rassin, Franken, & Mayer, 2005).

In conclusion, there seem to be indications in the literature suggesting that repetitive thinking might mediate the relationship between self-compassion and depression/anxiety (Hypothesis 1). However, this hypothesis has not yet been directly tested, and was the central aim of the present study. The second aim was to study the uniqueness of the mediating status of two specific forms of repetitive thinking, namely rumination and worry, as results of previous studies were mixed as regards the specificity of their associations with depression and anxiety. In light of the mixed findings, the present study also tested whether there are specific relationships between rumination and depression, and between worry and anxiety. However, consistent with, for example, Hong (2007), it is hypothesized that rumination rather than, or to a greater extent than, worry would mediate the relationship between self-compassion and depression, whereas worry rather than, or to a greater extent than, rumination would mediate self-compassion's relation with anxiety (Hypothesis 2).

Finally, two forms of ruminative thinking were distinguished and examined in the present study. Treynor, Gonzalez, and Nolen-Hoeksema (2003) identified two distinct rumination components, labeled *brooding* (referring to self-critical moody pondering) and *reflection* (capturing emotionally neutral pondering). Recent studies suggest that brooding represents the more maladaptive component of rumination; reflection, on the other hand, appears a more adaptive form of rumination (e.g., Burwell & Shirk, 2007; Treynor et al., 2003). These subtypes of rumination have not been studied in relation to self-compassion previously. It is predicted that if rumination is found to mediate the relation between self-compassion and depression (and possibly anxiety), it will be the brooding rather than the reflection subtype emerging as a significant mediator (Hypothesis 3; cf. O'Connor and Noyce, 2008; Raes & Hermans, 2008; Roelofs, Huibers, Peeters, Arntz, & van Os, 2008).

2. Method

2.1. Participants

Respondents were 271 first-year psychology undergraduates at the University of Leuven (214 women); all participated in return for course credit. The sample's mean age was 18.14 years ($SD = 1.25$).

2.2. Measures

2.2.1. Self-compassion scale (SCS)

The SCS (Neff, 2003a) consists of 26 items assessing six different aspects of self-compassion: self-kindness (e.g., "When I'm going through a very hard time, I give myself the caring and tenderness I need"), self-judgment (e.g., "I'm intolerant and impatient toward those aspects of my personality I don't like"), common humanity (e.g., "When things are going badly for me, I see the difficulties as part of life that everyone goes through"), isolation (e.g., "When I'm feeling down, I tend to feel like most other people are probably happier than I am"), mindfulness (e.g., "When I'm feeling down I try to approach my feelings with curiosity and openness"), and over-identification (e.g., "When I fail at something important to me I become consumed by feelings of inadequacy"). Adequate validity and reliability is reported (Neff, 2003a). The Dutch version

Table 1
Descriptive statistics and zero-order correlations for all measures.

Measure	M (SD)	1	2	3	4	5
1. SCS	82.80 (20.09)	–				
2. BDI-II	8.91 (6.94)	–.55***	–			
3. STAI-T	40.71 (9.71)	–.75***	.70***	–		
4. RRS-Reflection	8.66 (2.91)	–.19**	.26***	.26***	–	
5. RRS-Brooding	10.10 (3.17)	–.55***	.57***	.62***	.44***	–
6. PSWQ	49.03 (13.22)	–.62***	.47***	.68**	.20***	.53***

Note. SCS, self-compassion scale; BDI, beck depression inventory; STAI-T, state-trait anxiety inventory, trait version; RRS, ruminative response scale; PSWQ, Penn state worry questionnaire.

** $p < .01$.

*** $p < .001$.

was used (Neff & Vonk, 2009). Cronbach's alpha in the present study was .90.

2.2.2. Beck depression inventory-II (BDI-II)

The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item self-report measure for severity of depressive symptomatology. The Dutch version by Van der Does (2002) was used, for which adequate reliability is reported. Cronbach's alpha in the present study was .88.

2.2.3. State-trait anxiety inventory, trait version (STAI-T)

The STAI-T is a 20-item self-report scale assessing trait anxiety (Spielberger, 1983). The Dutch version by Van der Ploeg (2000) was used, which has good validity and reliability. Cronbach's alpha in the present study was .92.

2.2.4. Ruminative response scale (RRS)

The RRS (Nolen-Hoeksema, Larson, & Grayson, 1999) consists of 22 items measuring ruminative responses to depressed mood. The Dutch translation by Raes et al. (2009) was used, for which adequate reliability and good validity is reported. The brooding and reflection subscales consist of five items each. Sample items are "Why do I always react this way?" (brooding) and "I analyze recent events to try to understand why I am depressed" (reflection). Cronbach's alphas for the brooding and reflection subscale in the present study were .78 and .75, respectively.

2.2.5. Penn state worry questionnaire (PSWQ)

The PSWQ (Meyer, Miller, Metzger, & Borkovec, 1990) consists of 16 items measuring pathological worry. The Dutch version by van Rijsoort, Emmelkamp, and Vervaeke (1999) was used, for which adequate reliability is reported. Cronbach's alpha in the present study was .90.

2.3. Procedure

Following informed consent, participants completed all questionnaires in mass testing.

3. Results

Descriptive statistics and intercorrelations for all variables included are presented in Table 1. All variables were significantly correlated in the predicted directions. Self-compassion was negatively associated with anxiety (STAI-T) and depression (BDI-II), as well as with both forms of repetitive thinking, that is rumination (RRS; both reflection and brooding) and worry (PSWQ).

Independent samples t -tests did not reveal significant sex differences for reflection and brooding (both t s < 1), and depression ($p = .19$). Men, however, did obtain significantly lower anxiety and worry scores, and higher self-compassion scores than women, $t(269) = 2.35$, $p < .05$, $t(269) = 3.51$, $p < .001$, and $t(269) = 3.63$,

$p < .001$, respectively. And, as such, sex was included as a covariate in all mediational analyses.

Next, mediational analyses were performed (see Table 2). To test mediation, we used a bootstrapping method with 1000 bootstrap resamples to test the indirect effects of self-compassion via the potential mediating variables on anxiety and depression (Preacher & Hayes, 2008). Bootstrapping is a nonparametric method that generates an estimate of the indirect effect, including a 95% confidence interval. When zero is not in the 95% confidence interval, one can conclude that the indirect effect is significantly different from zero at $p < .05$ (two-tailed) and, thus, that the effect of the independent variable (in this case self-compassion) on the dependent variable (depression or anxiety) is (partially) mediated by the proposed mediating variable (reflection, brooding, or worrying). In the first analysis depression was the dependent variable, self-compassion the independent variable, and reflection, brooding and worrying the three potential mediators. The true indirect effects for reflection, brooding, and worrying were estimated to lie between $-.0142$ and $.0018$, $-.100$ and $-.0387$, and $-.0510$ and $.0056$, respectively. Because zero is not in the 95% confidence interval for brooding only, we can conclude that the indirect effect is significantly different from zero at $p < .05$, and that brooding (partially) mediates the relationship between self-compassion and depression, whereas reflection and worrying do not.

In the second analysis anxiety was the dependent variable, self-compassion the independent variable, and reflection, brooding and worrying the three potential mediators. The true indirect effects for reflection, brooding, and worrying were estimated to lie between $-.0141$ and $.0035$, $-.0909$ and $-.0291$, and $-.1161$ and $-.0470$, respectively. Because zero is not in the 95% confidence interval for both brooding and worrying, we can conclude that these indirect effects are significantly different from zero at $p < .05$, and that both brooding and worrying (partially) mediate the relationship between self-compassion and anxiety, whereas reflection does not. The indirect effects of brooding and worrying did not significantly differ in magnitude.

In line with Hong (2007) and Roelofs et al. (2008) these analyses were re-run with depression as an extra covariate when anxiety is the dependent variable and with anxiety as an extra covariate when depression is the dependent variable, since both variables are typically highly correlated. The results remained largely the same. Brooding was found to be the only significant mediator of the relationship between self-compassion and depression, and both worrying and brooding were found to be significant mediators of the relationship between self-compassion and anxiety. Importantly, however, now the indirect effect of worrying was significantly greater than the indirect effect of brooding (the macro provided by Preacher & Hayes, 2008, conducts all possible pairwise contrasts between indirect effects in multiple mediator models; for more details, see Preacher & Hayes, 2008). This suggests that worrying plays a larger mediating role in the relationship between self-compassion and anxiety than brooding (rumination) does.

4. Discussion

The results obtained were largely consistent with the hypotheses. First, it was observed that brooding was a unique mediator of the relationship between self-compassion and depression. Neither the reflective form of rumination nor worry was a significant mediator in this respect. As for self-compassion's relation with anxiety, both worry and brooding (and not reflection) were significant mediators, but the magnitude of the indirect effect of self-compassion via worry was significantly greater than that of brooding. The latter finding suggests that worrying plays a greater mediational

Table 2
Summary of mediation results for depression and anxiety with self-compassion as independent variable.

DV	M	Effect of IV on M	Effect of M on DV	Direct effects	Indirect effect	Total effects
Depression	Reflection	-.03**	.10	-.10**	-.00	-.19***
	Brooding	-.09***	.74***		-.07 ^a	
	Worrying	-.40***	.06		-.02	
Anxiety	Reflection	-.03**	.11	-.23***	-.00	-.37***
	Brooding	-.09***	.63***		-.06 ^a	
	Worrying	-.40***	.20***		-.08 ^a	

Note. DV, dependent variable; M, mediating variable; IV, independent variable (=self-compassion).

^a Significant point estimate ($p < .05$).

** $p < .01$.

*** $p < .001$.

role in the protective effects of self-compassion on anxiety than brooding (rumination), which is as predicted.

This study is the first to directly test and provide evidence for the hypothesis that unproductive repetitive thinking mediates the relation between self-compassion and depression/anxiety. Furthermore, the present findings show that it is especially the worry-type of repetitive thinking which mediates the relation self-compassion–anxiety, whereas the ruminative type of repetitive thinking was found to mediate the relation between self-compassion and depression. This differentiated pattern, suggesting a unique association between rumination and depression and between worry and anxiety, is in line with, for example, Hong (2007) who found that worry is uniquely associated with anxiety and rumination with depression, both concurrently and prospectively. The fact that rumination, although to a lesser extent than worry, also mediates the relationship between self-compassion and anxiety in the present study fits with earlier reports that rumination also predicts anxiety (e.g., Roelofs et al., 2008).

Another important observation, as predicted (Hypothesis 3), is that the brooding subtype of rumination, rather than reflection is a significant mediator of the relationship between self-compassion and depression (and anxiety). This finding further underscores the importance of discerning different subtypes of rumination, and adds to the growing corpus of research which highlights that brooding reflects the more maladaptive type of ruminative repetitive thinking (Burwell & Shirk, 2007; O'Connor and Noyce, 2008; Raes & Hermans, 2008; Roelofs et al., 2008; Surrence, Miranda, Marroquín, & Chan, 2009; Treynor et al., 2003). To my knowledge the present study represents the first exploration of distinct types of rumination in relation to self-compassion, which was found to be associated with (general or undifferentiated) rumination previously (Neff, 2003a, Study 2; Neff & Vonk, 2009).

It is important to stress that the present findings do not imply that rumination and worry are the only mediators of the relationship between self-compassion and depression/anxiety. Brooding and worry were only partial mediators, leaving ample room for other constructs to (partially) explain the central relationship (see Allen & Knight, 2005; Leary et al., 2007; Neff, in press, for a list of other candidates in that respect). For example, self-compassion may increase people's sense of mastery and self-esteem (Allen & Knight, 2005) and via that way alleviate or protect against depression. Or, the fact that self-compassionate individuals appear to judge their own performances more objectively than low self-compassionate people who tend to evaluate their performances more harshly and negatively (Leary et al., 2007) may represent another mediating process. Neff (in press) points to yet another possible process, namely the fact that self-compassionate people entertain relatively more mastery goals than performance goals. Prior research has shown that mastery goals are more adaptive and are linked to less anxiety, for example, than performance goals (Elliot & Church, 1997). In short, the current findings, though consistent

with the idea that repetitive thinking processes mediate the relation between self-compassion and depression/anxiety, clearly do not rule out these other mechanisms that may jointly contribute to self-compassion's impact on depressed and anxious feelings.

It may be important to point to one more noteworthy finding of the present study that requires further comment. Women reported having significantly less self-compassion than men, which confirms the results of earlier studies on sex differences (Neff, 2003a). This recurrent finding suggests that self-compassion might play a role in explaining the sex difference in emotional disorders, with twice as many women suffering from depression and anxiety than men.

The current study has at least two important limitations that require attention. A first limitation is the study's correlational cross-sectional nature, limiting the degree to which causal relationships can be inferred. Interpretation of the results of mediational analyses on cross-sectional data must always proceed with caution. However, the presence of a clear model grounded in the theoretical literature, and partially supported by previous empirical investigations, provides a sufficiently compelling case for the mediational modelling that was conducted. Nevertheless, future studies should employ a longitudinal design to assure that the direction of causation is as hypothesized (see Maxwell & Cole, 2007). For example, longitudinal studies should additionally examine alternative mediation models in which the impact of symptomatology on self-compassion is mediated by repetitive thought, or in which the impact of symptomatology on repetitive thought is mediated through self-compassion.

Second, participants were nonclinical, mainly female, undergraduates. Further research should examine to what extent the relationships reported here also generalize to a clinical sample of patients suffering from mood and/or anxiety disorders. Another aspect future studies should investigate is how self-compassion relates to positive, rather than negative personal features. Research so far, including the present study, has almost exclusively focused on self-compassion's relationship with 'negative' variables or constructs such as depression/anxiety, rumination and thought suppression.

In conclusion, and notwithstanding the above limitations, the present study extends previous research by offering first evidence for the mediating role of repetitive thinking in the relation between self-compassion, which is attracting increasing attention, and depression/anxiety. Given that no one has tried to determine through research the factors involved in the buffering aspect of self-compassion, this study potentially makes an important contribution.

Moreover, a differentiated pattern emerged, suggesting a unique association between rumination and depression on the one hand, and between worry and anxiety on the other hand. The current findings suggest that self-compassion may act as an antidote to unproductive repetitive thinking, like depressive ruminating

and anxious worrying. In terms of potential clinical implications, then, these findings suggest that self-compassion-based interventions (Germer, 2009; Gilbert & Proctor, 2006) may represent a parsimonious alternative to interventions that selectively target either worry or rumination in treating either anxiety or depression. Given that self-compassion appears to underlie both the negative impact of rumination on depression and that of worry on anxiety, promoting self-compassion may be a promising approach as a cognitive “immunization strategy” against the development and/or maintenance of depressive and anxious symptoms and associated clinical disorders.

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