



Testing the Cognitive Catalyst Model with Idiographic Content: Rumination Moderates the Association between Self-Discrepancies and Depressive Symptoms

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Abstract

Depressive rumination, which involves repetitive thinking directed at one's depressive symptoms and the perceived causes and consequences of those symptoms, plays an important role in the onset and maintenance of depression. Recently, Ciesla, and Roberts (2002, 2007; Ciesla, Felton, & Roberts, 2011) proposed the cognitive catalyst model of depression, which posits that rumination intensifies the impact of already existing negative cognitions. Previous studies examining rumination as a moderator of cognitive content have used nomothetic conceptualizations of cognitive content. The current research replicated and extended these past studies using an idiographic conceptualization of negative cognitive content, specifically self-discrepancy theory (SDT). SDT suggests that idiographic self-guides serve to direct behavior and govern self-regulation (Higgins, 1987). Two studies based on college student samples ($N = 102$ and $N = 107$) tested the interaction between rumination and self-discrepancies in the prediction of depressive symptoms. In line with the cognitive catalyst model, Study 1 found that rumination moderated the association between actual:ideal self-discrepancies and depressive symptoms, such that self-discrepancies predicted depression more strongly among high compared to low ruminators. Study 2 found that the interaction between rumination and actual:ideal self-discrepancies was specific to predicting dysphoric mood and insomnia versus other dimensions of depressive symptoms, such as lassitude, appetite change and suicidality, and that these effects were limited to males. Results from the two studies provide further support for the cognitive catalyst model by demonstrating that rumination amplifies the association between self-discrepancies and depression and suggests that these effects may be specific to dysphoric mood and insomnia (at least for males) as opposed to other forms of depressive symptomatology.

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Keywords: rumination; repetitive thought; cognitive vulnerability; depression; self-discrepancies; cognitive catalyst model

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Introduction

Nearly 25 years ago Susan Nolen-Hoeksema (1990) suggested that one of the key processes in the development of prolonged and persistent depression involved how individuals respond to feelings of sadness and dysphoria. Based on her review and synthesis of theory and research on gender differences in depression, Susan posited that females are at greater risk for depression due, in part, to their tendency to engage in self-focused passive and repetitive thinking about their feelings of sadness, and in the meaning and potential consequences of these feelings. This response style became known as depressive rumination, and an extensive body of research has since demonstrated that this form of thinking plays an important role in the onset and maintenance of depression (see Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008 and Smith & Alloy, 2009 for reviews). Although Susan made a number of highly influential contributions to the literature during the course of her too brief career, her work on rumination is perhaps the most significant; depressive rumination has become one of the best established psychological processes involved in depression and its investigation has helped launch the careers of numerous clinical scientists across the globe, including that of one of the present authors (J.E.R.). Her insightful and integrative thinking, clever methodological approaches, and prolific output will surely live on and influence future generations of clinical scientists.

One of Susan's early ideas was that there would be interplay between the process of ruminating and negative cognitive content, such as negative attributions (Lyubomirsky & Nolen-Hoeksema, 1995) and autobiographical memories (Lyubomirsky, Caldwell & Nolen-Hoeksema, 1998). Consistent with the possibility of such interplay, studies have suggested that rumination intensifies the impact of already existing negative cognitions, such as beliefs about worthlessness, and thereby exacerbates depression (Ciesla & Roberts, 2002, 2007; Robinson & Alloy, 2003). Indeed, this is the premise of the cognitive catalyst model of depression, which posits that response style (i.e., rumination) and cognitive content interact to amplify each other's impact on depression (Ciesla et al., 2011). This body of work suggests that negative cognitive content (typically operationalized as low self-worth and dysfunctional attitudes) is more strongly predictive of dysphoric mood states (Ciesla & Roberts, 2007), persistence of depressive episodes during treatment (Ciesla & Roberts, 2002), the onset of depressive episodes (Robinson & Alloy, 2003), and reactivity to life stressors (Ciesla et al., 2011) in the presence of ruminative thinking. In sum, although past research has established that both rumination and negative cognitive content (e.g., beliefs about self-

worth) play an important role in the etiology of depression, recent evidence (e.g., Ciesla et al., 2011) suggests that their interactive effects may be especially toxic.

It is notable that studies examining the interactive effects of rumination and cognitive content have used nomothetic conceptualizations of cognitive content. Nomothetic approaches to the assessment of cognitive content usually entail the administration of self-report questionnaires in which participants rate their degree of agreement with specific dysfunctional attitudes and beliefs about worthlessness (e.g., Rosenberg Self-Esteem Scale; Rosenberg, 1979; Dysfunctional Attitudes Scale; Weissman & Beck, 1978). While this assessment strategy can provide relevant information on specific negative cognitions, it presumes that individuals prone to depression hold the same content of negative cognitions. In contrast, idiographic approaches allow for the systematic study of individual variation in the content of the cognitions associated with depression. In other words, idiographic approaches enable assessing each individual's unique attitudes and beliefs.

Self-discrepancy theory (SDT) is a prime example of an idiographic approach to measuring cognitive content. SDT focuses on the specific beliefs that individuals hold in terms of their actual self and various self-guides, which guide behavior and govern self-regulation (Higgins, 1987). According to SDT, the actual self is compared to two distinct types of self-guides: the *ideal self* and the *ought self*. *Ideal self-guides* are representations of the attributes one would like to possess, whereas *ought self-guides* are representations of the attributes one believes one should possess. In addition to ideal and ought self-guides, Markus and Nurius (1986) proposed that individuals form *feared self-guides*, which are representations of attributes one wants to avoid. According to this idiographic model, individuals differ from one another in the nature and meaning of the characteristics identified as representing the actual self and self-guides. Of most relevance to the present research, SDT suggests that emotional distress is generated from the degree to which ideal and ought self-guides are discrepant from one's actual self (Higgins, 1987), or from the degree to which feared self-guides are congruent to the actual self. Empirical evidence supports the idea that greater mismatch between the actual self and ideal self-guides is associated with feelings of dejection and negative affect (e.g., Boldero & Francis, 2000; Carver, Lawrence, & Scheier, 1999), and a recent study found evidence that individuals with past episodes of depression tend to show greater levels of congruence between their actual self and feared self-guides compared to never depressed individuals (Vergara-Lopez & Roberts, 2012).

Although it seems plausible to posit that self-directed attention on discrepancies from ideal and ought self-guides or congruence with feared self-guides would amplify their impact on emotional distress, we are aware of only one past study examining the combined roles of rumination and these forms of cognitive content. Consistent with the cognitive catalyst model, Papadakis, Prince, Jones, and Strauman (2006) found that actual:ideal self-discrepancies predicted depressive symptoms in a sample of female high school students, but only among those who also displayed high levels of rumination. In other words, the authors found evidence of an interaction between rumination and cognitive content involving actual:ideal discrepancies, such that discrepancies were stronger predictors of depressive symptoms among high compared to low ruminators. Unfortunately, this study did not measure actual:ought self-discrepancies or actual:feared self-discrepancies, and so it is unclear whether rumination amplifies the impact of these self-guides on depressive symptoms. Furthermore, given the female sample, it is unclear whether these findings generalize across genders. Finally, in addition to examining discrepancies (or congruence), it may be worthwhile to examine how individuals' expectations of achieving their self-guides may affect depressive symptomatology. Previous research has found that individuals with high depressive symptoms tend to make negative predictions about the future and view negative outcomes as more likely to occur (Dickson & MacLeod 2004; Miranda & Mennin, 2007). It may be that the degree to which individuals hold lower expectations for achieving ideal and ought self-guides (or for avoiding feared self-guides) are associated with depressive symptoms, particularly among those who are prone to high levels of rumination.

The present research was designed to replicate and extend previous support for the cognitive catalyst model of depression using an idiographic conceptualization of negative cognitive content, specifically SDT, in two studies. Study 1 attempted to replicate Papadakis et al.'s (2006) findings using a mixed gender college student sample, as well as employing different measures of key variables such as depressive symptoms, rumination, and self-discrepancies. Based on this past research, we hypothesized that rumination would moderate the association between actual:ideal self-discrepancies and depressive symptoms, such that discrepancies would predict depression more strongly among high, as compared to low, ruminators, and we expected the interactions that

included actual:ought and actual:feared to function similarly. In addition, we hypothesized that rumination would moderate the association between negative expectations for attaining self-guides and depressive symptoms, such that negative expectations would predict depression more strongly among high relative to low ruminators. Finally, we tested whether effects generalize to males by testing gender as a potential moderator. Study 2 further investigated whether interactions between rumination and self-discrepancies were specific to predicting certain dimensions/facets of depression (i.e., dysphoric mood versus other dimensions of depressive symptoms such as lassitude, sleep disturbance, appetite change and suicidality).

Study 1

Participants

Participants were 102 (42 male) undergraduate students from a large northeastern university in the United States with ages ranging from 18 to 27 ($M = 19.7$, $SD = 2$). The majority (53%) of participants self-identified as Caucasian, 19.6% as Asian, 14.7% as African American, 6.8% as bi-racial, and 5.8% as Hispanic. Other aspects of these data have been examined in previous papers (Vergara & Roberts, 2011, 2012).

Measures

Depression.

The Beck Depression Inventory-II (BDI-II) was administered to assess current depressive symptomatology (Beck, Steer, & Brown, 1996). The BDI-II is a self-report measure containing 21 items which has good convergent and discriminant validity and high internal consistency ($\alpha = .92$) (Beck et al., 1996). In the present sample, internal consistency was $\alpha = .91$.

Rumination.

The Rumination on Sadness Scale (RSS) was administered to assess rumination on sadness (Conway, Csank, Holm, & Blake, 2000). The RSS is a 13-item self-report measure in which participants rate the extent to which the items reflect their responses to sadness on a 5-point Likert scale (1 being *not at all* and 5 being *very much*). The measure has good internal consistency ($\alpha = .91$) and evidence for convergent and discriminant validity (Conway et al., 2000). The internal consistency in the present sample was $\alpha = .92$.

Self-Discrepancies.

The Revised Selves Questionnaire (Carver et al., 1999) was administered to assess idiosyncratic self-discrepancies by requesting participants to list their own self-guides (i.e., characteristics they wish to attain or avoid) and then to rate the degree to which each characteristic is similar to themselves and likely to be achieved in the future. Participants were asked to generate seven of their own self-guides for each of the three types (specifically ideal, ought, and feared self-guides), resulting in a total of 21 self-guides. This measure provides clear definitions for what constitutes the ideal, ought, and feared self-guides and offers examples to ensure the participant fully understands each of the self-guides. Below are the instructions for the ought self-guides to demonstrate the detail provided to ensure clear understanding:

“Your ‘ought self’ is the kind of person you believe you have a duty or obligation to be or that you believe other people think you should be. It’s defined by the personality characteristics you think you ought to possess, or feel obligated to possess. It’s not necessary that you actually have these characteristics now, only that you believe you ought to have them. Please list seven characteristics that describe how you think you ought to be.

Examples of self-guides generated by participants include: Ideal self-guide: “To be successful,” Ought self-guide: “To be a hard worker,” Feared self-guide: “To be friendless.” For each self-guide, two ratings were given by the participants: 1) perceived discrepancy/congruence with the actual self, specifically “how well each characteristic describes you at present ” and; 2) the expectation of obtaining the self-guide in the future, specifically “how likely

you think it is you will have this characteristic in the future." Perceived discrepancy was rated on a scale from 1 (*Presently I am the opposite of this characteristic*) to 7 (*Presently I am exactly like this characteristic*). Thus, high scores reflect less discrepancy (more congruence) because individuals are reporting that they view themselves as similar to that characteristic and low scores reflect greater discrepancy because individuals are reporting that they view themselves as dissimilar to that specific characteristic. The expectations of achieving each self-guide in the future were also completed on 7-point Likert scales from 1 (*It is unlikely I will have this characteristic in the future*) to 7 (*It is very likely I will have this characteristic in the future*). Discrepancy and expectation scores were calculated separately for ideal, ought, and feared self-guides by aggregating responses from the 7 self-generated self-guides.

Some of the reported feared self-guides closely corresponded to symptoms of depression, such as "worthless," which could create a confound between this self-guide and having a history of depression. In other words, participants who endured a previous depressive episode of depression might report fearing having symptoms such as worthlessness, sleep disturbance, or fatigue as their feared self-guides. Therefore, we coded whether feared self-guides met criteria for symptoms of DSM-IV Major Depressive Disorder and these self-guides were removed from analyses to control for this potential confound. In such cases (as well as any other situations in which the participant had fewer than 7 self-generated self-guides), prorated scores were calculated based on the available data.

Procedure

Participants were recruited from the undergraduate Introductory Psychology class subject pool and received course credit for their participation. Once potential participants agreed to voluntarily participate in the study, they were scheduled for a group session to complete self-report measures.

Data Analytic Plan

To test our hypotheses we used ordinary least squares regression analyses. Self-guide variables and rumination were entered into the regression model in the first step, their cross-product interaction terms were entered in the second step, and lastly the 3-way interaction among self-guide variables, rumination and gender were entered as the third step. The dependent variable for all of our analyses was depressive symptoms. Simple slope tests of significant interactions were conditioned on 1 standard deviation above and below the sample mean to represent high and low levels of the moderator, respectively.

Results

Preliminary analyses revealed that rumination and self-discrepancies were weakly to moderately associated (r 's $-.07$ to $.29$). Ethnicity/race (Caucasians compared to all other groups) was not associated with any of the study's variables, all p 's $> .05$. Likewise, gender and age were not associated with any of the study's variables, all p 's $> .05$. Consequently, all subsequent data analyses collapsed across ethnicity and age. Because one of the aims of the current investigation was to test the moderating role of gender, all gender related interactions were tested. See Table 1 for a summary of the sample's basic descriptive information.

Table 1: Sample Characteristics

Variable	Study 1	Study 2
N	102	107
Age (Mean and SD)	19.7 (2.0)	19.9 (2.3)
Gender ratio (Male/Female)	42/60	52/55
Depressive Symptoms (Mean and SD)	BDI = 14.0 (9.7)	IDAS:GD = 47.6 (14.8)
Depressive Symptoms (Range)	BDI = 1-43	IDAS:GD = 25-81

Note: BDI = Beck Depression Inventory; IDAS:GD = General Depression subscale from the Inventory of Depression and Anxiety Symptoms

As shown in Table 2, we found a significant interaction between actual:ideal discrepancies and rumination, such that ideal discrepancies predicted depressive symptoms (as measured by the BDI-II) for high ruminators ($\beta = -0.66, p = .00$), but not for low ruminators ($\beta = -0.29, p = .23$). Thus, it appears that rumination amplifies the effect of actual:ideal discrepancies on depressive symptoms. Likewise, we found a significant interaction between ideal expectations and rumination, such that lower expectations predicted greater symptoms of depression for high ruminators ($\beta = -0.95, p = .00$), but not low ruminators ($\beta = -.28, p = .22$). Similarly, we found a significant interaction between ought expectations and rumination, such that lower expectations predicted greater symptoms of depression more strongly for high ruminators ($\beta = -0.91, p = .00$), relative to low ruminators ($\beta = -.55, p = .05$). Thus, pessimistic expectations regarding one's ability to attain ideal and ought self-guides in the future predicted depressive symptoms more strongly for individuals with a high tendency to ruminate compared to low ruminators. We also found a significant rumination by gender interaction predicting depressive symptoms such that rumination predicted depressive symptoms more strongly among females ($\beta = 0.69, p = .00$), than among males ($\beta = 0.39, p = .00$). Finally, the three-way interactions between self-guides, rumination, and gender were non-significant.

Table 2: Study 1 Step-wise Regression Results (DV= BDI)

Regression Model	Ideal Discrepancy β (SE)	Ought Discrepancy β (SE)	Feared Discrepancy β (SE)	Ideal Expectations β (SE)	Ought Expectations β (SE)	Feared Expectations β (SE)
Step 1	$R^2 = .51$	$R^2 = .46$	$R^2 = .42$	$R^2 = .47$	$R^2 = .47$	$R^2 = .41$
Self-Guide	-.35 (.07)***	-.26 (.07)***	.15 (.08)	-.28 (.08)***	-.28 (.07)***	.09 (.08)
Rumination	.56 (.07)***	.61 (.07)***	.58 (.08)***	.57 (.08)***	.58 (.07)***	.60 (.08)***
Gender	.21 (.14)	.25 (.15)	.19 (.16)	.28 (.15)	.24 (.15)	.21 (.16)
Step 2	$R^2 = .56$	$R^2 = .49$	$R^2 = .44$	$R^2 = .60$	$R^2 = .55$	$R^2 = .43$
Self-Guide X Rumination	-.18 (.07)**	-.09 (.07)	-.02 (.08)	-.34 (.07)***	-.18 (.08)**	.09 (.09)
Self-Guide X Gender	.09 (.14)	.11 (.15)	-.12 (.16)	.30 (.13)	-.14 (.15)	-.11 (.16)
Rumination X Gender	.30 (.14)**	.28 (.15)	.29 (.16)	.51 (.14)***	.43 (.15)***	.29 (.16)
Step 3	$R^2 = .57$	$R^2 = .49$	$R^2 = .44$	$R^2 = .61$	$R^2 = .56$	$R^2 = .43$
Self-Guide X Rumination X Gender	0.08 (.15)	-.02 (.16)	-.13 (.17)	.23 (.14)	.22 (.16)	-.04 (.17)

Note: Ideal and Ought discrepancies were reverse scored such that higher scores reflect greater discrepancy/less congruence, BDI= Beck Depression Inventory, ** = $p < .05$. *** = $p < .01$.

Study 1 Conclusions

Results from Study 1 expand upon previous findings suggesting that the degree to which self-discrepancies are associated with depression varies depending on the extent to which individuals tend to ruminate (Papadakis et al., 2006). Importantly, it appears that rumination not only amplifies the impact of ideal discrepancies on depressive symptoms, but it also amplifies the impact of low expectations for attaining ideal and ought self-guides in the future on depressive symptoms. The findings do not support the hypotheses that perceived congruence to feared self-guides or feared self-guide expectations interact with rumination to predict depressive symptoms. Although there was no evidence that the combination of self-discrepancies and elevated rumination was more strongly associated with depression among females compared to males, data from Study 1 suggested that rumination is more strongly related to depressive symptoms among females relative to males, which is consistent with some past studies (e.g., Nolen-Hoeksema, 1990, 1994).

Study 2

Nolen-Hoeksema et al. (2008) posit that rumination contributes to individuals "crossing the line" from dysphoria into a Major Depressive Episode. Thus, it can be hypothesized that the effects of rumination on dysphoric mood may be strongest relative to other facets of depressive symptomatology, and this may be particularly true when examining the interactive effects of self-discrepancies and rumination. According to self-regulation theories, self-focused attention on one's failure or lack of progress towards goals (i.e., self-discrepancies) results in negative mood (Martin & Tesser, 1989). It may be that ruminating on unattained goals (i.e., self-discrepancies) increases

vulnerability to depression via negative mood. Study 1 tested the cognitive catalyst model in the context of diverse depressive symptomatology measured by the BDI-II rather than specific dimensions of depressive symptomatology, which was the focus of Study 2.

Method

Participants included 187 undergraduate students from a large northeastern university in the United States. Analyses were based on 107 individuals (52 male) with complete data. Ages ranged from 18 to 31 ($M = 20$, $SD = 2.3$) and the majority self-identified as Caucasian (62.0%), 21.5% as Asian, 6.5% as Other (e.g., multiracial), 4.7% as African American, and 4.7% as Hispanic. Participants were compensated with partial credit for Introductory Psychology course requirements.

Measures

Depression and Anxiety.

The Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007) is a 64-item instrument with 12 subscales measuring symptoms of anxiety and depression. The IDAS was designed to assess broad, as well as narrow, constructs related to anxiety and depression and to assess key dimensions of anxiety and depression separately. The present study focused on the depression subscales, specifically General Depression (20 items), Dysphoria (10 items), Lassitude (6 items), Insomnia (6 items), Suicidality (6 items), Appetite Loss (3 items), and Appetite Gain (3 items). The General Depression subscale is akin to traditional measures of depressive symptoms (such as the BDI-II) and includes items that assess the full spectrum of depressive symptomatology, with items overlapping with other IDAS scales. More specifically, it includes all of the 10 Dysphoria subscale items, as well as two items each from the Lassitude, Insomnia, Suicidality, Appetite loss, and Well-being subscales (see Watson et al., 2007 for a detailed description on the construction and validity of these subscales). The Dysphoria subscale, on the other hand, assesses only emotional and cognitive symptoms, such as items reflecting depressed mood, anhedonia, worthlessness, and guilt. It does not include items pertaining to fatigue, death, self-harm, or sleep or appetite disturbance. Unlike the General Depression subscale, the Dysphoria subscale does not have overlapping items with the other subscales. Participants rated how well each statement described themselves on a scale from 1 (*Not at all*) to 5 (*Extremely*). The depression subscales correlate highly (from .97 - .99) with their matching DSM-IV symptoms (Watson et al., 2007). Many of the subscales including the General Depression ($r = .83$), Dysphoria ($r = .81$), Suicidality ($r = .63$), and Lassitude ($r = .62$) subscales have adequate to good convergent validity with the BDI-II (Watson et al., 2007). In the present study the internal consistencies were $\alpha = .91$ for General Depression, $\alpha = .92$ for Dysphoria, $\alpha = .81$ for Lassitude, $\alpha = .82$ for Insomnia, $\alpha = .93$ for Appetite Loss, $\alpha = .84$ for Appetite Gain, and $\alpha = .84$ for Suicidality.

Rumination.

Rumination was assessed using the Rumination on Sadness Scale (RSS; Conway et al., 2000). In the present study the internal consistency was $\alpha = .95$.

Self-discrepancies.

Self-discrepancies were assessed using the Revised Selves Questionnaire (Carver et al., 1999) in the same manner as in Study 1.

Procedure and Data Analytic Plan:

The procedure and data analytic plan were identical to those of Study 1, with the exception that seven separate regressions were run for each of the depression-related IDAS subscales. More specifically, there were individual regressions in which General Depression, Dysphoria, Lassitude, Insomnia, Suicidality, Appetite Loss, and Appetite Gain were treated as the dependent variables.

Results

Preliminary analyses revealed that rumination and the various forms of self-discrepancy were moderately associated (r 's = $-.29$ to $.36$). Ethnicity/race (Caucasians compared to all other groups) was not associated with any of the study's variables, all p 's $> .05$. Likewise, gender was not associated with any of the study's variables, all p 's $> .05$, except for rumination, $t(105) = 2.74$, $p = .01$, such that females reported higher rumination compared to males (mean 39.3 versus 32.0), as well as actual:ought discrepancies, $t(104) = 2.29$, $p = .02$, such that males reported larger discrepancies between their actual self and ought self-guides than females (mean 34.9 versus 31.4). Although age was correlated with appetite gain ($r = .20$, $p = .03$), actual:ought discrepancies ($r = -.19$, $p = .05$), and ideal self-guide expectations ($r = -.25$, $p = .01$), it was not associated with any other measured variable. In line with Study 1 analyses, we first ran all models collapsing across ethnicity and age, and tested the moderating role of gender. Due to the age related differences found in some of the key variables, we ran follow-up analyses for all the models including age as a covariate (see Footnote 1). See Table 1 for a summary of the sample's basic descriptive information.

Table 3: Study 2 step-wise regression results (DV= IDAS; General Depression Scale)

Regression Model	Ideal Discrepancy β (SE)	Ought Discrepancy β (SE)	Feared Discrepancy β (SE)	Ideal Expectations β (SE)	Ought Expectations β (SE)	Feared Expectations β (SE)
Step 1	$R^2 = .52$	$R^2 = .50$	$R^2 = .47$	$R^2 = .48$	$R^2 = .48$	$R^2 = .45$
Self-Guide	$-.30 (.07)^{***}$	$-.26 (.07)^{***}$	$.24 (.08)^{**}$	$-.26 (.08)^{***}$	$-.23 (.08)^{**}$	$.16 (.08)^{**}$
Rumination	$.58 (.08)^{***}$	$.60 (.08)^{***}$	$.57 (.08)^{***}$	$.58 (.08)^{***}$	$.60 (.08)^{***}$	$.59 (.08)^{***}$
Gender	$-.07 (.14)$	$-.13 (.15)$	$-.13 (.15)$	$-.07 (.15)$	$-.08 (.15)$	$-.10 (.15)$
Step 2	$R^2 = .56$	$R^2 = .53$	$R^2 = .50$	$R^2 = .52$	$R^2 = .52$	$R^2 = .48$
Self-Guide X Rumination	$-.14 (.06)^{**}$	$-.13 (.07)$	$.12 (.08)$	$-.16 (.09)^*$	$-.15 (.07)^{**}$	$.13 (.08)$
Self-Guide X Gender	$.17 (.15)$	$.01 (.15)$	$-.21 (.17)$	$.17 (.15)$	$.17 (.15)$	$-.21 (.16)$
Rumination X Gender	$.23 (.16)$	$.15 (.16)$	$.27 (.17)$	$.32 (.17)^*$	$.23 (.16)$	$.30 (.17)$
Step 3	$R^2 = .58$	$R^2 = .54$	$R^2 = .53$	$R^2 = .53$	$R^2 = .53$	$R^2 = .48$
Self-Guide X Rumination X Gender	$0.39 (.16)^{**}$	$.21 (.15)$	$-.39 (.17)^{**}$	$.20 (.19)$	$.25 (.16)$	$-.07 (.16)$

Note: Ideal and Ought discrepancies were reverse scored such that higher scores reflect greater discrepancy/less congruence, IDAS = Inventory of depression and anxiety symptoms, * = $p < .06$, ** = $p < .05$, *** = $p < .01$.

As shown in Table 3, we found a significant interaction between actual:ideal discrepancies and rumination, such that discrepancies predicted depressive symptoms (as measured by the IDAS General Depression subscale) more strongly for high ruminators ($\beta = -.74$, $p = .00$) than for low ruminators ($\beta = -.45$, $p = .06$). Likewise, there was a statistically significant interaction between ideal expectations and rumination, such that lower expectations predicted greater depressive symptoms for high ruminators ($\beta = -0.64$, $p = .01$), but not for low ruminators ($\beta = -.31$, $p = .21$). Similarly, we found a significant interaction between ought expectations and rumination, such that lower expectations predicted greater depressive symptoms more strongly for high ruminators ($\beta = -0.56$, $p = .02$), relative to low ruminators ($\beta = -.26$, $p = .29$). Lastly, we found a significant rumination by gender interaction predicting depressive symptoms such that rumination predicted depressive symptoms more strongly among females ($\beta = 0.70$, $p = .00$), than among males ($\beta = 0.38$, $p = .00$). In contrast to Study 1, there were two statistically significant triple interactions involving gender. Specifically, the actual:ideal discrepancy \times rumination \times gender, ($\beta = .39$, $p = .02$), and the actual:feared congruence \times rumination \times gender triple interactions, ($\beta = -.39$, $p = .03$), were significant. Follow-up analyses found that the actual:ideal discrepancies by rumination interaction significantly predicted general depression for males, ($\beta = -.46$, $p = .00$), but not for females ($\beta = -.07$, $p = .33$). Similarly, we found that the actual:feared congruence \times rumination interaction predicted general depression among males ($\beta = .42$, $p = .01$), but not among females ($\beta = .03$, $p = .76$).

The final set of analyses focused on specific dimensions of depressive symptomatology. The rumination \times actual:ideal discrepancy interaction was statistically significant in predicting the IDAS dysphoria subscale ($\beta = -.15$, $p = .03$). When this interaction was probed, actual:ideal discrepancies predicted dysphoria more strongly at high (β

= $-.80$, $p = .00$) than at low levels of rumination ($\beta = -0.51$, $p = .04$). Furthermore, the rumination \times actual:ideal discrepancy \times gender triple interaction was a statistically significant predictor of dysphoria, ($\beta = -.39$, $p = .02$), such that the actual:ideal discrepancies by rumination interaction was significant for males ($\beta = -.46$, $p = .00$) but not for females ($\beta = -.07$, $p = .33$). Similarly, there was an actual:ideal discrepancy \times rumination \times gender triple interaction ($\beta = .47$, $p = .03$) predicting insomnia, such that the actual:ideal discrepancies by rumination interaction was predicted insomnia among males ($\beta = -.48$, $p = .02$), but not for females ($\beta = .01$, $p = .89$). In contrast, the interactions between rumination and each of the different forms of self-discrepancies were not statistically significant predictors of lassitude, insomnia, suicidality, appetite loss, or appetite gain, all p 's $>.05$. Further, none of the triple interactions involving gender were statistically significant predictors of these variables, all p 's $>.05$ (with the exception of the above mentioned associations)¹.

Study 2 Conclusions

For the most part, the results of Study 2 replicated the findings from Study 1. These results suggest that rumination may not only amplify the effect of ideal discrepancies, but also ideal and ought expectations. In contrast to Study 1, results also suggested that congruence between actual selves and feared selves was more strongly associated with depression among individuals, particularly males, who were high in rumination. The analyses that focused on examining specific dimensions of depressive symptomatology suggest that the interactive effect of ideal self-discrepancies and rumination on "global" depression symptomatology found in Study 1 (as assessed by the BDI-II) and the first set of analyses in Study 2 (as assessed by the IDAS general depression subscale) may be specific to dysphoric affect and insomnia compared to other facets of depression (e.g., lassitude, appetite change, suicidal ideation) and that these relationships may be specific to males relative to females.

General Discussion

Consistent with a wealth of previous research, both Studies 1 and 2 found first-order effects of rumination and negative content on depression. More interestingly, in line with nomothetic conceptualizations of content (e.g., Ciesla & Roberts, 2002; 2007) and the one previous idiographic conceptualization of content (Papadakis et al., 2006), we found a significant interaction between rumination and actual:ideal self-guides in both studies, such that actual:ideal discrepancies were a stronger predictor of depressive symptoms among those with greater rumination tendencies. Of note, we were able to replicate Papadakis and colleagues' (2006) results utilizing different measures of key variables. Our findings provide further support for the cognitive catalyst model by demonstrating that rumination amplifies the association between idiographic cognitive content (i.e., self-discrepancies) and depression. Importantly, the current findings are in line with past research that utilized nomothetic approaches to conceptualize cognitive content, showing convergent validity for the cognitive catalyst model. In other words, both idiographic and nomothetic approaches to defining cognitive content interact with rumination to predict depressive symptoms, suggesting that this may be a robust effect observed across different conceptualizations of depressogenic cognitive content. Furthermore, the current findings suggest that these effects generalize to beliefs about attaining ideal and ought self-guides in the future and, that this effect may be specific to dysphoric mood and insomnia as opposed to other forms of depressive symptomatology, such as lassitude, appetite change, and suicidality, at least among males in non-clinical samples.

The cognitive catalyst model posits that cognitive vulnerabilities to depression, such as negative beliefs about self-worth, are activated and become potent contributors to dysphoric mood and depressive symptoms when ignited by

¹ All analyses in Study 2 were re-run including age as an additional covariate. The direction of effects were all the same as those reported for the models that excluded age as a covariate except that the ideal expectation by rumination and the ought expectation by rumination interactions predicting general depressive symptoms fell short of conventional significance; however the direction of the simple slopes remained statistically significant in the expected direction. More specifically, there was a marginally statistically significant interaction between ideal expectations and rumination ($\beta = -.15$, $p = .07$) such that lower expectations predicted greater depressive symptoms for high ruminators ($\beta = -.62$, $p = .01$) relative to low ruminators ($\beta = -.31$, $p = .21$). Similarly, there was a marginally statistically significant interaction between ought expectations and rumination ($\beta = -.14$, $p = .06$) such that lower expectations predicted greater depressive symptoms more strongly for high ruminators ($\beta = -.55$, $p = .03$) relative to low ruminators ($\beta = -.27$, $p = .27$).

rumination. In other words, the impact of rumination on depression will vary depending on the degree to which an individual possesses various cognitive vulnerabilities. Whereas past research has largely examined cognitive content in the form of self-esteem, dysfunctional attitudes, and attributional style, the present research establishes that rumination also interacts with idiosyncratic self-discrepancies in predicting depressive symptoms. More specifically, Study 1 found that actual:ideal discrepancies and rumination interacted to predict higher depressive symptoms. Similarly, rumination moderated the association between expectations for attaining ideal and ought self-guides in the future and depressive symptoms. We were able to replicate these findings in Study 2, which further showed that the interactive effect of rumination and negative content is specific to dysphoric mood and insomnia, particularly among males, and does not predict other dimensions of depressive symptomatology.

Overall Studies 1 and 2 complemented each other and provided evidence supporting the cognitive catalyst model. However, results of these two studies differed in two important ways. First, Study 2 found that rumination interacted with self-discrepancies for males, but not females, whereas Study 1 did not show evidence of such gender differences in these interactions. Assuming that future studies establish that these gender differences are reliable, it may be that self-discrepancies provide a better assessment of males' cognitive content relative to the traditional nomothetic assessments. In other words, it is possible that males conceptualize their internal thoughts differently than females and that traditional assessments of cognitive content are better designed to assess females' cognitions. On the other hand, it may be that females are sensitive to the effects of rumination regardless of levels of negative cognitive content, whereas males are more sensitive to such effects when they also exhibit negative cognitive content. Second, Study 1 did not show any significant results involving feared self-guides, whereas Study 2 found that males who perceived themselves as congruent to their feared self-guides and ruminated had more depressive symptoms. In contrast this effect was not statistically significant for females. It may be that perseverative focus on goal failure either through attending to unattained ideal goals (discrepancies from ideal self-guides) or to attained unwanted outcomes (congruence with feared self-guides) may be a particular cognitive vulnerability for males.

Given that these gender effects were not predicted a-priori and were not consistent between the two studies, it will be important for future studies to establish their reliability. Furthermore, the present research was based on non-clinical samples of college students, and it is therefore unclear whether or not findings would generalize to clinically significant forms of depression. On the other hand, it is possible that findings would have been more robust in clinical samples. It may be that the interactions between cognitive content and rumination did not predict somatic symptoms of depression, lassitude or suicidality in the present non-clinical samples because of limited variability on these types of symptoms. Finally, because the two studies used cross-sectional correlational designs, we cannot infer that symptoms of depression were caused by either self-discrepancies or rumination. Instead, it is possible that depression leads to the development of self-discrepancies and rumination. It remains for future studies to use prospective designs or experimental manipulations of rumination and/or the activation of self-discrepancies to clarify causal direction.

Nolen-Hoeksema (1991) posited that rumination has detrimental effects because it hinders effective problem-solving and magnifies pessimistic and fatalistic thinking. Martin and Tesser (1989; 1996; see Martin, Shrira, & Startup, 2004 for a review) expanded on this role of rumination and developed a goal progress theory of rumination. According to this goal progress view, rumination places an attentional "spotlight" on specific goals and the perceived progress towards those goals. Thus, rumination would fuel individuals getting cognitively stuck and fixated on unaccomplished goals. Self-discrepancies are a cognitive assessment of goal progress that focus on the "distance" between one's actual self and specific self-guides or goals. From a goal progress view, rumination would focus the spotlight on the level of discrepancies, magnifying the fact that these self-guides are both currently unaccomplished and there has been a lack of progress towards these guides, which in turn would likely bring goal pursuit to a halt and start a vicious cycle between a focus on the lack of goal attainment and negative affect. In sum, the goal progress theory of rumination provides a theoretically rich context for understanding how rumination amplifies the effect of self-discrepancies on depression.

Based on the above model and our findings, clinical interventions for depression could target a number of key processes. Specifically, interventions could interrupt perseverative cycles of ruminative thought, bolster the individual's appraisal of their actual self, and/or decrease inflated or difficult to attain ideal and ought self-guides.

Behavioral Activation (BA) protocols (e.g., Martell, Dimidjian, & Herman-Dunn, 2010) treat ruminative thinking as an obstacle in attaining one's goals. Within such treatments, the role of the clinician to teach the patient that: 1) rumination results in worsening mood and inhibits goal progress; and 2) rumination should signal that behavioral action is needed. In essence, BA protocols help patients develop better goal striving strategies, which ultimately would decrease self-discrepancies. In other words, patients would be guided in strategies that would bring their actual selves into closer alignment with their self-identified goals, as well as interrupt rumination. Relatedly, for some depressed individuals self-discrepancies may be driven by unrealistic negatively distorted appraisals of the actual self and/or unrealistic and difficult to attain ideal and ought self-guides, both of which might be addressed by cognitive interventions. Nonetheless, the current research was based on non-clinical samples, and therefore, these clinical implications need to be treated with caution.

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