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Do gender differences in the role of dysfunctional attitudes in depressive symptoms depend on depression history?

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Abstract

Gender differences in the moderating role of dysfunctional attitudes in the relationship between life stress and depressive symptoms were examined with and without controlling for the presence of lifetime history of depression. When lifetime history of depression was controlled, dysfunctional attitudes played a moderating role in the relationship between life stress and depressive symptoms for both men and women. However, when lifetime history of depression was not controlled, dysfunctional attitudes moderated the relationship of life stress and depressive symptoms for women only. The results suggest gender differences in the moderating role of dysfunctional attitudes may be contingent on lifetime history of depression and that past depression may exert differing effects for men and women.

Keywords

gender differences; depressive symptoms; dysfunctional attitudes; life stress; lifetime history of depression

1. Introduction

Epidemiological data consistently support higher rates of depression among women than men (Eaton, Shao, Nestadt, Lee, Bienvenu, & Zandi, 2008; Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993; Kuehner, 2003), fueling the hypothesis of gender differences in the development and maintenance of depression (see Hankin & Abramson, 2001; Nolen-Hoeksema, 1987; Piccinelli & Wilkinson, 2000 for review). The current study was based on Beck's cognitive theory of depression (Beck, 1967, 1987), which postulates that maladaptive self-schemata including dysfunctional attitudes increases a vulnerability to depression in the face of stressful life events. Beck's theory has been widely influential in clinical research and

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treatment of depressive disorders. Yet, the question of whether this theory is equally applicable to men and women remains unanswered.

The Dysfunctional Attitudes Scale (DAS; Weissman, 1979; Weissman & Beck, 1978) has been used to test Beck's theory of depression, including whether women, as compared to men, have a greater predisposing cognitive diathesis for major depression. Among samples of undergraduates, some studies found no significant gender differences in DAS total scores (Barnett & Gotlib, 1990; Dobson & Breiter, 1983; Dykman & Johll, 1998; Wong & Whitaker, 1993), while others found significantly higher DAS total scores for men as compared to women (Gotlib, 1984; Haefel et al., 2003). No gender differences in overall levels of dysfunctional attitudes have been found among clinical samples (Spangler, Simons, Monroe, & Thase, 1996; Wise & Barnes, 1986; Zlotnick, Shea, Pilkonis, Elkin, & Ryan, 1996), adults (Oliver & Baumgart, 1985) and adolescents (Lewinsohn, Gotlib, & Seeley, 1997).

One explanation for the weak support for a gender difference in a cognitive diathesis is that direct comparisons of dysfunctional attitudes between men and women failed to consider the interrelationship of dysfunctional attitudes with other tenets of Beck's theory. In particular, Beck hypothesizes a cognitive diathesis-stress interaction in explaining the etiology of depression such that dysfunctional attitudes are proposed to function as a moderator between life stress and depression. Data examining this hypothesis are few and the findings are mixed (Barnett & Gotlib, 1990; Dykman & Johll, 1998; Spangler, Simons, Monroe, and Thase, 1996). Prospective studies using nonclinical, college samples provided converging evidence for no moderating effect of dysfunctional attitudes, life stress related to depressive symptoms for men, and mixed findings for women (Barnett & Gotlib, 1990; Dykman & Johll, 1998). A cross-sectional investigation of outpatients (Spangler, Simons, Monroe, & Thase, 1996) found more frequent matches between dysfunctional attitudes and stressful life events among depressed women versus depressed men. Although these findings suggest roles of dysfunctional attitudes in the face of life stress differ by gender, the paucity of data and inconsistency among findings highlight the need for additional research.

It is possible a third factor may affect the relationships among gender, life stress, dysfunctional attitudes, and depression. For example, Post's (1992) kindling hypothesis posits that the impact of external factors such as stressful life events declines with increasing number of depressive episodes (Kendler, Thornton, & Gardner, 2000; Monroe & Harkness, 2005). Kindling may be due to the augmented role of internal factors with repeated episodes, consequently requiring less stress to trigger subsequent depressive episodes. Supporters of this hypothesis have suggested that the role of negative cognition or dysfunctional attitudes in the development of subsequent depressive episodes increases with the number of episodes (Segal, Williams, Teasdale, & Gemar, 1996).

Informed by the diathesis-stress model and the kindling hypothesis, the present study examined gender differences in the moderating role of dysfunctional attitudes for depressive symptoms in the context of life stress and lifetime history of depression. We predicted that female and male college undergraduates would not differ on their overall level of dysfunctional attitudes, but would differ in the moderating role of dysfunctional attitudes for the relationship between life stress and depressive symptoms. Specifically, we predicted that dysfunctional attitudes would moderate the relationship between life stress and women's depressive symptoms, while life stress alone (not moderated by dysfunctional attitudes) would be associated with men's depressive symptoms. We tested whether such gender differences in the moderating role differ by lifetime history of depression.

2. Method

2.1. Participants

A total of 306 participants (171 men and 135 women) were recruited from Introductory Psychology classes at Purdue University. Self-report research questionnaires were administered to groups of student volunteers receiving research participation credit. The study was approved by the University IRB. The mean age was 19.1 years ($SD = 2.0$); most students were freshmen, a time associated with increased depression among college students (Wong & Whitaker, 1994). The majority of the participants self-identified as European Americans (73.5%); others identified themselves as Asian/Pacific Islanders (9.8%), Hispanics (2.6%), African Americans (2.0%), and Native Americans (0.3%). No significant gender differences were found for mean age, $t(304) = 1.19, p = .24$, or ethnicity, $\chi^2(7) = 5.72, p = .57$.

2.2. Measures

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996)—The BDI-II, a 21-item self-report scale, uses a 4-point (0–3) rating scale. It is psychometrically sound in measuring the severity of depressive symptoms in clinical and nonclinical samples, including college students (Beck, Steer, & Brown, 1996; Dozois, Dobson, & Ahnberg, 1998; Osman et al., 1997; Storch, Roberti, & Roth, 2004). The internal consistency in the present sample was .91.

Inventory to Diagnose Depression, Lifetime Version (IDDL; Zimmerman & Coryell, 1987)—The IDDL is a 22-item self-report measure assessing a lifetime history of Major Depressive Disorder (MDD). For each item, participants choose one statement among five (0–4 rating scale), with a score of 2 or more indicating a clinical symptom. Respondents are asked to select the statement best describing the way they felt during the week in their life when they were most depressed, and answer whether or not the symptoms were present for more or less than two weeks. The presence of a lifetime history of depression was determined by the presence of symptoms listed in the DSM-IV (APA, 1994)'s criteria for MDD for more than two weeks in their lifetime. The IDDL has demonstrated high internal consistency and good reliability (Sato et al., 1996; Zimmerman & Coryell, 1987). The internal consistency estimate in the present sample was .92.

Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978)—The LES is a 60-item self-report measure assessing the number of stressful life events and their positive and negative impact on people's lives. Participants were asked to check the life events they experienced within the past year and rate the impact of these events using a 7-point Likert scale (−3 = extremely negative; 0 = no impact; 3 = extremely positive). The current study, because of its focus on Beck's theory of depression, considered the *negative* life events classified by participants but did not evaluate the frequency or nature of positive life events. Good test-retest reliability has been found in classifying negative life events via the LES (Sarason et al., 1978). In the current study, negative life events were summed for each participant and this summary score was used as a measure of life stress.

Dysfunctional Attitudes (DAS; Weissman, 1979; Weissman & Beck, 1978)—The DAS Form A is a 40-item self-report inventory measuring cognitive schema containing dysfunctional attitudes and beliefs that may place individuals at risk for depression. Items are rated on a 7-point Likert scale ranging from 1 (totally agree) to 7 (totally disagree). The DAS Form A has high internal consistency and test-retest reliability (Dobson & Breiter, 1983; Weissman & Beck, 1978). Internal consistency of the DAS Form A in the study sample was .90 and an average score was used in analyses.

2.3. Data analyses

Because the predictor (life stress), moderator (dysfunctional attitudes), and criterion (depressive symptoms) variables were all continuous, hierarchical multiple regression procedures were adopted in testing the hypothesized moderation models (Aiken & West, 1991). The interaction effects of life stress and dysfunctional attitudes were tested after the main effects of these variables were tested. All interaction terms were formed after centering continuous predictor and moderator variables (Aiken & West, 1991; Holmbeck, 2002). All regression analyses were stratified by gender to test whether the hypothesized model fit for both genders. The influence of lifetime history of depression on the gender difference in the diathesis-stress model was examined by conducting regression analyses, first, without controlling for lifetime history and, then, after controlling for lifetime history. Following recommendations of Aiken and West (1991) and Holmbeck (2002), post hoc probing was conducted for significant interactions in which the slopes of the simple regression lines of life stress on depressive symptoms were significantly different from zero among high and low DAS groups. The values of one standard deviation above and below the mean of the DAS were used as cut-off scores to represent two comparison groups in post hoc tests.

3. Results

3.1 Preliminary Analyses

Descriptive statistics for the BDI-II, LES, DAS, and IDDL for the total sample, men, and women are presented in Table 1 and show that women had significantly higher BDI-II scores than men. In the total sample, 19.3% endorsed IDDL items suggesting the presence of a lifetime history of depression, a finding similar to those of other researchers evaluating depression among college students (e.g. Wong & Whitaker, 1994). A significantly higher proportion of women reported the presence of a lifetime history of depression compared to men and women reported significantly higher scores than men on LES scores. No significant gender difference was found in the overall mean scores on the DAS.

3.2 Tests of the DAS Moderation Model without Controlling for Lifetime History of Depression

Hierarchical multiple regression procedures were used to test the moderating effect of dysfunctional attitudes (DAS). As seen in Table 2, the initial main-effect-only model accounted for 30% of the variance in scores of the BDI-II for the total sample. Both the DAS and the LES demonstrated significant main effects for the BDI-II. The addition of the interaction term in the second step significantly improved the predictability of the model. The results indicated that dysfunctional attitudes moderated the relationship between life stress and depressive symptoms. Post hoc testing revealed that the regression slopes of the high DAS group, $t(1) = 8.37, p < .001$, and the low DAS group, $t(1) = 5.0, p < .001$, were significantly different from zero, indicating positive associations between life stress and depressive symptoms for both groups, but with different magnitude in the association. The association between life stress and depressive symptoms was stronger among the high DAS group than for the low DAS group.

Hierarchical multiple regressions were conducted separately by gender. The initial main-effect model accounted for 25% and 38% of the variances of the BDI-II among men and women, respectively. The addition of the interaction term of the DAS and the LES in the second step significantly increased the accountability of the BDI-II for women, but not for men. Among women, post hoc tests of simple regression lines for the high and low DAS groups revealed significant positive associations between the LES and the BDI-II for both the high DAS group, $t(1) = 6.44, p < .001$, and the low DAS group, $t(1) = 3.67, p < .001$, although a stronger association was obtained for the high DAS group than the low DAS group. The interaction slopes for women is depicted in Figure 1. Such interaction effects were not obtained for men.

3.3 Tests of the DAS Moderation Model after Controlling for Lifetime History of Depression

The hypothesized moderation models were retested after controlling for lifetime history of depression using the IDDL (see Table 3). The IDDL significantly accounted for the BDI-II for the total sample, men, and women, respectively, suggesting the strong role of past depression in current depressive symptom severity in both genders. After controlling for the IDDL, both the DAS and the LES had significant main effects for the BDI-II, and the interaction between the DAS and the LES remained significant. Among men, after controlling for the IDDL, the interaction between the DAS and the LES significantly improved the predictability of the BDI-II; however, this finding was not present when the IDDL was not controlled. Interestingly, controlling for the IDDL did not affect the results for women, suggesting that understanding potential gender differences in depression may be associated with differential roles of past depression in women and men.

Post hoc tests for the significant interactions found that the regression slopes for the high DAS group, $t(1) = 6.15$, $p < .001$, and the low DAS group, $t(1) = 2.94$, $p < .01$, were significantly positive for women. For men, the simple regression slope for the high DAS group, $t(1) = 5.12$, $p < .001$, was significantly positive, but the one for the low DAS group was not, $t(1) = 1.41$, $p = .16$. These analyses indicate that when a lifetime history of depression was controlled, the association between life stress and depressive symptoms remains only for men with high (but not low) levels of dysfunctional attitudes. For women, however, a lifetime history of depression does not appear to affect the moderating role of dysfunctional attitudes on life stress and depressive symptoms. Interactions between dysfunctional attitudes and life stress for depressive symptoms among women and men are depicted in Figure 2.

Discussion

The current study examined the effect of gender and lifetime history of depression on the moderating role of dysfunctional attitudes in the relationship between life stress and depressive symptoms. Our primary finding was that the moderating effect of dysfunctional attitudes on the association between life stress and depressive symptoms is contingent upon both gender and a lifetime history of depression.

When a lifetime history of depression was not controlled, men's depressive symptoms were not associated with the interaction between life stress and dysfunctional attitudes. However, women's depressive symptoms were associated with this interaction predicted by Beck's (1967, 1987) cognitive theory of depression, supporting our prediction of gender differences in the moderating role of dysfunctional attitudes for the relationship between life stress and depressive symptoms. Yet, when a lifetime history of depression was taken into account, dysfunctional attitudes functioned as a moderator in the relationship between life stress and depressive symptoms for both genders. These findings suggest that the applicability of Beck's cognitive diathesis-stress model to men's depression may be contingent upon prior depression. Dysfunctional attitudes served as a moderator in the relation between life stress and depressive symptoms among women regardless of the presence or absence of a lifetime history.

Dysfunctional attitudes moderated the magnitude of the positive association between life stress and current depressive symptoms for women. Life stress had a more pronounced effect upon depressive symptoms for women with higher, rather than lower, dysfunctional attitudes. In contrast, among men with lower dysfunctional attitudes, life stress did not account for their current depressive symptoms. This suggests that decreasing levels of dysfunctional attitudes can be a stronger protective factor for men as compared to women. The steep slope of life stress and depressive symptoms among women with high dysfunctional attitudes suggests that higher levels of dysfunctional attitudes put women at greater risk for depressive symptoms, in the face of life stress, compared to men.

Women and men in our study did not differ in their overall levels of dysfunctional attitudes. This result is contradictory to a hypothesis that greater cognitive diatheses among women would explain their higher vulnerability to depression (Hankin & Abramson, 2001), but supportive of research obtaining no gender differences in overall level of dysfunctional attitudes (e.g. Dykman & Johll, 1998; Spangler, Simons, Monroe, & Thase, 1996). The absolute level of dysfunctional attitudes does not appear to account for gender differences in depression, and our findings suggest that gender differences in depression may not be accounted for by the absolute level of life stress. The interactive role of life stress with cognitions and a depression history appear to differ as a function of gender, suggesting the need for gender-informed investigations of the kindling hypothesis and the diathesis-stress component of depression.

It is important to note that the observed gender difference in the diathesis-stress model was no longer present when a lifetime history of depression was controlled. This is congruent with epidemiological findings in which women are twice as likely as men to have the first onset of depression but the genders are equivalent when considering the prevalence of depression for recurrent episodes (Coryell, Endicott, & Keller, 1991; Kovacs, Obrosky, & Sherrill, 2003).

Beck's cognitive diathesis-stress theory of depression may better account for women's depression than men's. The results of the present study highlight the need for further research examining gender-specific roles of depressogenic cognitions in response to life stress on the onset, maintenance, and recurrence of depression, and for examining gender differences in kindling. Depressogenic effects of life stress may differ as a function of negative cognition, past depression, and/or gender.

Our results are not congruent with the gender findings in Hankin, Abramson, and Siler (2001)'s study that was based on the hopelessness theory (Abramson, Metalsky, & Alloy, 1989) in which the interaction of attributional style and stress predicted depressive symptoms in adolescent boys but not girls. However, dysfunctional attitudes and attributional styles are relatively distinct, though related, constructs (Haefel, et al., 2003). Moreover, Hankin and Abramson (2002) suggest that poor reliability (low internal consistency) of the cognitive vulnerability measure used in Hankin et al.'s (2001) study may account for this study's unexpected findings. Thus, it is yet unclear whether the incongruent results between our study and the Hankin et al.'s study are due to methodological issues, different constructs of cognitive vulnerability, or sample differences.

Limitations of our study should be noted. Our sample was comprised of undergraduates, most of who were non-depressed, with unclear generalization to other populations including treated patients. Additionally, the use of retrospective self-reports of stressful life events in the study of depression, also based on self-report, is vulnerable to bias because individuals reporting depressive symptoms may also be more likely to report negative events and/or rate them as more severe due to a general response style, in a search for meaning of their symptoms, and/or due to the effects of depressed mood state on recall (Mazure, 1998). It should also be noted that the data were collected at one time point, so the causal relationships among the variables of interest cannot be assumed. Finally, we did not screen for other mental health conditions so the potential impact of comorbid disorders was not controlled. Research of the diathesis-stress model of depression including evaluation of the impact of comorbid disorders upon gender difference would advance the field.

Despite such limitations, the current investigation provides preliminary evidence for the impact of a lifetime history of depression in the gender difference in the role of cognition in depressive symptoms. Recently, Hyde, Mezulis, and Abramson (2008) have called for research integrating cognitive vulnerability with affective and biological factors in the stress-vulnerability model to explain the gender difference in depression. Replication studies using longitudinal designs

and clinical interviews and the expansion of Beck's theory in the context of positive psychology are still needed. For example, it is possible that positive life events undo or buffer the impact of negative life events (Fredrickson, 2001) or individual differences in resilience affect one's experience of depression in the face of trauma or life stressors (Bonanno, Galea, Bucciarelli, & Vlahov, 2007).

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Figure 1.
Plot of interaction between dysfunctional attitude and life stress for depressive mood among women without controlling for lifetime history of depression

Figure 2. Plot of interaction between dysfunctional attitude and life stress for depressive mood among men and women after controlling for lifetime history of depression

Table 1

Descriptive Statistics of Measures by Gender

Measures	Total N = 306		Men N = 171		Women N = 135		t	p
	M	SD	M	SD	M	SD		
BDI-II	10.73	8.53	8.87	7.72	13.07	8.94	-4.41	<.001
LES	9.93	8.12	8.73	7.70	11.45	8.50	2.91	<.01
DAS	3.19	.69	3.25	.70	3.11	.67	1.81	n.s.
	f	%	f	%	f	%	χ^2	p
IDDL	59	19.3%	24	14.0%	35	25.9%	$\chi^2=6.85$	<.01

Note. BDI-II = The Beck Depression Inventory-II, IDDL = The Inventory to Diagnose Depression, Lifetime Version, LES = The Life Experiences Survey, DAS = The Dysfunctional Attitudes Scale.

Table 2

Hierarchical Multiple Regression on the BDI-II: Tests of the DAS Moderation Model without Controlling for Lifetime History of Depression

Step	β	ΔR^2	ΔF	p
Total (<i>N</i> = 306)				
Step 1	.	.30	64.58	<.001
DAS	.31***			
LES	.43***			
Step 2		.02	7.17	<.01
DAS $\times$ LES	.13**			
Men (<i>N</i> = 171)				
Step 1	.	.25	28.52	<.001
DAS	.27***			
LES	.38***			
Step 2		.02	3.62	n.s.
DAS $\times$ LES	.14			
Women (<i>N</i> = 135)				
Step 1	.	.38	40.07	<.001
DAS	.44***			
LES	.46***			
Step 2		.03	7.46	<.01
DAS $\times$ LES	.20**			

Note. BDI-II = The Beck Depression Inventory-II, DAS = The Dysfunctional Attitudes Scale, LES = The Life Experiences Survey;

**
 $p < .01$,

 $p < .001$

Table 3

Hierarchical Multiple Regression on the BDI-II: Tests of the DAS Moderation Model after Controlling for Lifetime History of Depression

Step	β	ΔR^2	ΔF	p
Total (<i>N</i> = 306)				
Step 1		.15	55.28	<.001
IDDL	.39***			
Step 2		.21	48.76	<.001
DAS	.30***			
LES	.36***			
Step 3		.02	10.29	<.01
DAS $\times$ LES	.15**			
Men (<i>N</i> = 171)				
Step 1		.15	28.63	<.001
IDDL	.38***			
Step 2		.19	24.07	<.001
DAS	.27***			
LES	.31***			
Step 3		.02	4.06	<.05
DAS $\times$ LES	.14*			
Women (<i>N</i> = 135)				
Step 1		.13	20.21	<.001
IDDL positive ^a	.36***			
Step 2		.29	29.31	<.001
DAS	.41***			
LES	.41***			
Step 3		.05	10.08	<.01
DAS $\times$ LES	.23**			

Note. BDI-II = The Beck Depression Inventory-II, IDDL = The Inventory to Diagnose Depression, Lifetime Version, DAS = The Dysfunctional Attitudes Scale, LES = The Life Experiences Survey;

* $p < .05$,

** $p < .01$,

*** $p < .001$.