Responses to Depressed Mood and Suicide Attempt in Young Adults With a History of Childhood-Onset Mood Disorder

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Objective: Although individuals' responses to their depressed mood are hypothesized to play an important role in the development and maintenance of depression, how these responses might impact the likelihood of suicidal behavior in mood disorders remains largely unexplored. The goal of the current study was to examine whether maladaptive responses to depressed mood are associated with suicide attempts in adults with a history of childhood-onset mood disorder (COMD).

Method: Participants included 223 young adult probands with COMD meeting DSM-III or DSM-IV criteria for major depressive disorder or bipolar disorder and 112 controls without a history of psychiatric disorders. All participants were recruited between 1996 and 2004. Probands were followed for 6 to 99 months (median = 32 months). The Responses Styles Questionnaire was used to assess 2 adaptive (distraction and problem solving) and 2 maladaptive (dangerous activity and rumination) ways of coping with depressed mood.

Results: Compared to controls, COMD probands scored significantly higher on maladaptive response styles and lower on adaptive styles. Compared to their COMD peers, probands with a history of suicide attempt were less likely to report using distracting activities to manage their depressed mood. However, COMD probands who engaged in dangerous activities in response to depressed mood were more likely to attempt suicide during the follow-up period (hazard ratio = 1.8, 95% CI = 1.2 to 2.8).

Conclusion: One of the pathways to suicide attempt in mood disorders may involve maladaptive responses to depressed mood. The assessment of how depressed individuals manage their dysphoric moods, therefore, should be considered an important aspect of treatment and prevention of suicidal behavior.

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Mood disorders are the most common psychiatric disorders that are associated with suicide attempt and completed suicide.[1] A number of demographic, psychological, biologic, and clinical factors have been identified as risk factors for suicidal behavior among patients with mood disorders.[2–7] However, suicidal behavior remains difficult to predict from previously identified factors.[7,8] Identification of risk factors that predict suicide attempts and are potentially modifiable is essential for the intervention and prevention of suicidal behavior.

Depressed mood is a core symptom of mood disorders. Maladaptive responses to depressed mood have been hypothesized to play an important role in the development or maintenance of depression.[9–11] How individuals respond to their depressed mood may also be associated with suicidal behavior. Individuals who lack effective mood regulation responses or employ maladaptive response strategies may be more likely to attempt suicide.[12,13] For example, ruminative responses in dysphoric individuals have shown to be related to higher levels of negative self-evaluations and hopelessness,[14] which are key components of depression and suicide.[2] In contrast, individuals who employ adaptive response strategies may effectively attenuate their negative emotions and be less likely to attempt suicide.

Four main response styles to depressed mood have been posited: rumination, problem solving, distraction, and dangerous activities.[15] According to Nolen-Hoeksema,[15] ruminative responses involve behaviors and

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- Evaluation of the ways in which depressed patients manage their dysphoric mood may be important for suicidal intervention.
- Psychosocial intervention to improve patients' maladaptive ways of coping with their dysphoric mood may reduce risk of suicidal behavior.

thoughts that focus one's attention on one's depressed mood and on the potential causes and consequences of the negative mood. Problem-solving responses involve actively attempting to change one's depressed mood or to resolve problems that cause negative mood. Distracting responses are defined as engaging in active and positive activities to turn one's attention away from one's depressed mood. Dangerous activities involve reckless or risk-taking behaviors with high potential for negative consequences.

According to Lam and Wong,[16] the 4 response styles can be grouped into 2 broad categories: adaptive (distraction and problem solving) and maladaptive (rumination and dangerous activity). Rumination has been shown to increase risk for depression and prolong and worsen depressed and anxious mood,[10,17] whereas problem solving and distraction have been proposed to decrease the severity and duration of a depressive episode.[9] Furthermore, different response styles could also influence each other. For example, ruminating is thought to worsen mood and impair problem solving, while distraction is thought to alleviate mood and assist problem solving.[18]

Several studies have examined the association between response styles and suicidal behavior. In a study of bipolar disorders,[19] ruminative responses predicted severity of suicidal behavior. In a sample of depressed youth in Hungary, we found that young patients with a history of suicidal behavior were more likely to use maladaptive emotion regulation strategies and less likely to use adaptive strategies, even when controlling for depression severity.[20] However, Rotheram-Borus et al.[21] found that suicide attempters were more focused on their problems and were more likely to report a wishful thinking style of coping (i.e., hoping to be magically rescued from the situation or wishing the situation were radically different) than normal controls.

Suicidal individuals also exhibit problem-solving deficits. For example, within a sample of suicidal inpatients, rational problem solving was associated with decreased suicide risk.[22] Suicidal patients have been found to have fewer problem-solving skills than nonsuicidal patients.[19,23–25] However, Spirito et al.[26] did not find any differences in coping skills between suicidal and nonsuicidal inpatients. In addition, in a large prospective study of adolescent psychiatric patients followed for up to 6.9 years, Goldston and colleagues[27] did not find that social problem-solving deficits predicted later suicidal behavior.

Although cross-sectional studies have found that suicidal individuals were more likely to use maladaptive response styles than nonsuicidal counterparts,[19–22] the causal relationships remain unclear. Maladaptive response styles may lead to suicidal behavior but may also be a consequence of suicidal behavior. Another important limitation of most prior studies is that the potential effects of depressive status have not been taken into account. Depression can impair individuals' social, interpersonal, and/or cognitive functioning and affect their adaptive responses to negative emotions.[16,28,29] Also, as mentioned, maladaptive coping strategies (e.g., rumination) have been shown to worsen mood. As a result, severity of depression could mediate the relationship between response strategies and suicidal behavior, and, thus, the association would be attenuated when current level of depression is partialed out.[30] In addition, because sociodemographic variables may be related to both response strategies and suicidal behavior, they should be controlled for potential confounding effects. Discrepancies in previous findings may be attributed, at least in part, to different covariates included when statistical modeling was performed.

In this study, we aimed to examine the association between responses to depressed mood and suicide attempt in a sample of young adults with a history of childhood-onset mood disorder (COMD) enrolled in a multidisciplinary program project with a longitudinal component.[31,32] Participants were followed at least 6 months after the assessment of response styles. On the basis of previous studies,[10,17,19,23,24] we hypothesized that COMD subjects with a history of suicide attempt would report more maladaptive responses but fewer adaptive responses to depressed mood than either COMD nonattempters or normal controls after controlling for sociodemographics. We also hypothesized that the differences in response styles across past suicide attempters, nonattempters, and controls would be partially attributed to the current level of depression because the association between depressive status and coping responses may be bidirectional, and both of them may be associated with suicidal behavior.[4,6,13] Finally, we expected that maladaptive responses to depressed mood could predict future suicide attempt.[33]

METHOD

Participants and Procedure

The sample consisted of 223 young adults with a history of COMDs and 112 control subjects without a history of psychiatric disorders. All participants were recruited through prior research studies or community advertisements between 1996 and 2004 for a longitudinal, multidisciplinary program project examining risk factors for COMDs.[31,32] Probands were required to be at least 18 years old and meet DSM-III or DSM-IV diagnostic criteria for major depressive disorder, dysthymic disorder, or bipolar disorder: *childhood onset* was operationally defined as first episode of depression by age 14.9 years or first bipolar episode by age 17.9 years. We defined *early onset* for unipolar depression as by age 14.9 years because we aimed to focus mostly on depression developed during the childhood rather than the late adolescent years. We defined *early onset* for bipolar depression as later than unipolar (by age 17.9 years) because prior studies have suggested that bipolar disorder is less common in prepubertal children and has an early peak in late adolescence.[34] Control subjects were required to be at least 18 years old and have no lifetime history of major psychiatric disorders. Participants were excluded if they had major systemic medical disorders or mental retardation.

The study was approved by the institutional review board of the University of Pittsburgh. All subjects completed written informed consent forms before baseline interview and clinical evaluations. All COMD participants were assessed via semistructured clinical interviews, including a modified version of the Structured Clinical Interview for DSM-IV Axis I disorders, Patient Edition[35] and had clinical or research records supporting the presence of childhood-onset depressive or bipolar disorder. All diagnostic interviews were carried out by professional-level clinical evaluators and were verified by independent best-estimate procedures.[36] All participants received an extensive baseline psychosocial assessment and were then followed and psychiatrically evaluated approximately yearly for varying time periods, depending on the research protocol in which they were enrolled. The median number of follow-up evaluations was 2 (range = 1–8), and the median interval between evaluations was 14 months.

Study Variables

Suicide attempt. Information about history of suicidal behavior was collected as part of the psychiatric evaluations, using semistructured interview methods. Suicide attempt was defined as an executed act with the intent of trying to kill oneself (regardless of the extent of medical consequence). Participants who had a history of suicide attempt were asked about the date of their first attempt and if they had multiple attempts. At each follow-up assessment, the same questions about suicide attempt were asked over the period since the last assessment. Again, the date of each attempt was recorded if the event happened.

Responses Styles Questionnaire (RSQ). The RSQ is a 38-item self-report inventory designed to assess cognitive and behavioral coping responses to feelings of sadness or downcast mood.[37] The measure is composed of 4 scales: 2 concern adaptive responses—namely, Distraction (11 items) and Problem Solving (4 items)—and 2 concern maladaptive responses—namely, Rumination (19 items) and Dangerous Activity (4 items). Each item is rated on a 4-point scale from 1 ("almost never") to 4 ("almost always"). A score is generated by summing the ratings on each item of the corresponding scale. The RSQ Rumination and Distraction scales have shown good psychometric properties in previous studies.[37] In the current study, the RSQ had satisfactory reliability as measured by Cronbach α as follows: Distraction (.86), Problem Solving (.73), Rumination (.94), and Dangerous Activity (.69). The RSQ was administered to both COMD probands and control subjects when they entered the program project or during follow-up.

Covariates. Covariates considered in this report included sociodemographic variables (age, sex, race, marital status, educational attainment, and employment status), current level of depression at the assessment of response styles, and clinical characteristics (e.g., unipolar vs. bipolar diagnosis, age at onset, number of past depressive episodes, current episode of mood disorder, and history of comorbid anxiety, substance use, and conduct disorders). These variables were considered covariates because they relate to suicidal behavior.[2–7]

Sociodemographic variables were derived from the general information sheet developed for the program project.[31,32] Severity of depressive symptomatology was assessed with the Beck Depression Inventory (BDI),[38] which is the most widely used self-rated depressive scale with an emphasis on cognitive depressive symptoms. The BDI consists of 21 items, each rated on a scale of 0 to 3. The total BDI score ranges from 0 to 63, with a high score representing more depressive symptoms. The BDI was administered when participants entered our psychophysiology study or during follow-up. The BDI completed within 1 month of the RSQ administration was selected for each participant to represent concurrent depression severity. Information about diagnosis was derived from the best-estimate consensus.[36]

Statistical Analysis

Demographic characteristics for COMD probands and the comparison group were compared using t or χ^2 tests, as appropriate. Demographic and clinical characteristics of COMD suicide attempters and nonattempters at intake were then compared in the same statistical methods.

A series of general linear model analyses was conducted to determine whether there were significant differences in mean RSQ scale scores across the 3 groups (COMD suicide attempters, COMD nonattempters, and the comparison group). First, univariate analyses were conducted for each RSQ scale, followed by post hoc tests. Second, demographic variables were entered into the model for each RSQ scale to examine whether the differences remained significant after controlling for social demographic variables. Third, BDI scores were then added to determine the effect of current level of depression on each RSQ scale. Partial eta squared (η^2) was used to estimate the effect size accounted for by the 3 groups with or without adjustment for different covariates.[39]

Survival analysis was used to examine which response style could predict suicide attempt in the follow-up period. The interval for each subject who had a suicide attempt during follow-up was defined as the time elapsed from the entry RSQ assessment until the date of the first attempt after RSQ assessment. The interval for subjects who did not attempt suicide by the end of the follow-up period was censored, meaning that the observation period ended before the event (i.e., suicide attempt) occurred. A proportional hazards model was performed, in which the change in hazard per standard deviation change in each RSQ scale score was estimated. Univariate analyses were first conducted to examine individual RSQ scales, demographics, clinical variables, and future suicide attempt. Multiple Cox regression analysis was then performed to examine the predictive effect of each RSQ scale after controlling for the potential confounding effects of demographic and clinical variables, such as sex, past suicide attempt, and number of depressive episodes.

RESULTS

Demographic and Clinical Characteristics

Among 223 COMD probands, 139 had a history of major depressive disorder and 84 had a history of bipolar disorder. Of the 84 probands with bipolar disorder, 47 had a history of manic episode, 41 had a history of hypomanic episode, and 9 had a history of mixed-manic and depressive episode. A total of 112 COMD probands (50.2%) had attempted suicide in the past. None of the control subjects had a history of suicide attempt.

Intake sample characteristics of COMD probands who had or had no history of suicide attempt and non-COMD comparison group are presented in Table 1. Childhood-onset mood disorder probands were more likely to be unmarried, about 2 years younger, attained a lower level of education (a difference that remained significant after adjusting for age; $F = 17.87$, $p < .001$), and scored much higher on BDI than the non-COMD comparison group. Compared with COMD nonattempters, past attempters were more likely to be female, less educated, currently unemployed, and to have comorbid substance use disorders. Furthermore, COMD attempters had more depressive episodes in the past and were more likely to be currently depressed at the assessment of response styles. However, more than half of past attempters were not currently depressed, indicating that most attempts happened before the assessment of response styles.

Mean RSQ Scale Score Differences

Figure 1 presents means and standard deviations of 4 RSQ scale scores among COMD past attempters, COMD nonattempters, and non-COMD control group. Past attempters scored highest on Dangerous Activity and Rumination, followed by nonattempters and the control group. In contrast, past attempters scored lowest on Distraction and Problem Solving, followed by nonattempters and the control group. General linear model analysis showed that the 4 RSQ scale scores differed significantly by group (see Model 1 in Table 2). Post hoc tests indicated that the control group scored significantly higher than COMD attempters or nonattempters on the 2 adaptive response styles but lower on the 2 maladaptive styles ($p < .05$). Compared to COMD nonattempters, COMD attempters scored significantly higher on Rumination but lower on Distraction ($p < .05$).

General linear model analyses were then performed to examine whether the RSQ scale score differences across the 3 groups remained significant and the extent to which the group effect changed after controlling for various demographics and current level of depression. As shown in Table 2, group differences on the RSQ scales were attenuated but still significant after controlling for the effects of age, sex, marital status, educational attainment, and employment status (Model 2). After current level of depression was further statistically controlled in Model 3, group differences were markedly decreased, and Dangerous Activity and Distraction were no longer significant. For example, the group effect size (η^2) decreased by 33% (from .24 to .16) after adjustment for social/demographic variables and decreased by 87% (from .24 to .03) after additional adjustment for current depressive status.

Similarly, general linear model analyses were performed to examine the effects of clinical characteristics (age at onset, type of mood disorders, number of past episodes, and current episode) on the differences in RSQ Distraction and Rumination because the 2 response styles were significantly different between COMD attempters and nonattempters in the univariate analysis. Distraction remained significantly different between attempters and nonattempters ($F = 6.59$, $p = .011$). However, Rumination was no longer significant ($F = 1.75$, $p > .05$). When individual clinical variables were examined, we found that current episode of mood disorder significantly contributed to Rumination ($F = 35.49$, $p < .001$, $\eta^2 = .17$) and Distraction ($F = 4.20$, $p = .042$, $\eta^2 = .02$). Other clinical

Table 1. Demographic and Clinical Characteristics of Childhood-Onset Mood Disorder (COMD) Subjects Who Had or Had Not Attempted Suicide and Controls at the Assessment of Response Styles to Depressed Mood

	Suicide Attempters (N = 112)		Suicide Nonattempters (N = 111)		Controls (N = 112)		χ^2/t Test	
Characteristic	N	%	N	%	N	%	COMD vs Controls	COMD Suicide Attempters vs COMD Suicide Nonattempters
Sex							0.50	7.20**
Male	24	21.4	42	37.8	29	25.9		
Female	88	78.6	69	62.2	83	74.1		
Race							3.53	2.94
White	87	77.7	96	86.5	82	73.2		
Nonwhite	25	22.3	15	13.5	30	26.8		
Marital status							16.62**	4.36
Married	21	18.9	23	20.7	45	40.2		
Living with partner	25	22.5	15	13.5	17	15.2		
Separated/divorced/ widowed	7	6.3	4	3.6	6	5.4		
Single	58	51.8	69	62.2	44	39.3		
Education attainment							24.55***	8.21*
< High school	18	16.1	10	9.0	4	3.6		
High school	51	45.5	48	43.2	28	25.0		
Some college	38	33.9	38	34.2	61	54.5		
College or above	5	4.5	16	14.4	19	17.0		
Employment status							0.66	5.50*
Unemployed	64	57.1	46	41.4	50	44.6		
Employed	48	42.9	65	58.6	62	55.4		
Mood disorder							NA	1.77
Unipolar	65	58.0	74	66.7	NA	NA		
Bipolar	47	42.0	37	33.3	NA	NA		
Current episode of mood disorder							NA	7.94**
Yes	55	49.1	34	30.6	NA	NA		
No	57	50.9	77	69.4	NA	NA		
History of comorbid anxiety disorders							NA	0.46
Yes	74	66.1	78	70.3	NA	NA		
No	38	33.9	33	29.7	NA	NA		
History of comorbid conduct disorder							NA	2.02
Yes	55	49.1	44	39.6	NA	NA		
No	57	50.9	67	60.4	NA	NA		
History of comorbid substance use disorders							NA	7.87**
Yes	33	29.5	53	47.8	NA	NA		
No	79	70.5	58	52.3	NA	NA		
	Mean (SD)		Mean (SD)		Mean (SD)			
Age, y	24.5 (4.0)		25.2 (4.4)		27.5 (5.9)		4.30***	1.11
Age at onset of mood disorder, y	10.6 (2.7)		10.9 (2.8)		NA		NA	0.78
No. of depressive episodes	4.0 (2.4)		2.5 (2.1)		NA		NA	4.59***
BDI score[a]	18.2 (11.9)[b]		15.0 (11.4)[c]		2.0 (3.1)[d]		13.13***	1.53

[a]Assessed within 1 month of point when the response styles were assessed.
[b]N = 70.
[c]N = 58.
[d]N = 54.
*p < .05, **p < .01, ***p < .001.
Abbreviations: BDI = Beck Depression Inventory, NA = not applicable.

variables, including the type of depression (unipolar vs. bipolar), were not significantly associated with response styles (p > .05).

RSQ Scales Predicting Suicide Attempt

Among 223 COMD probands who returned completed RSQs at intake, 205 (91.9%) were followed for time intervals from 6.6 to 98.8 months (median = 32.2); cases with and without follow-up did not significantly differ in terms of any of the demographic variables or in mean age at first episode of mood disorder and past suicide attempt (all p values > .05). During the follow-up period, 15 probands (7.3%) attempted suicide.

Table 3 presents results from Cox regression models estimating the associations between response styles to depressed mood, demographics, clinical factors, and suicide attempt during the follow-up period. In univariate models, Dangerous Activity was associated with elevated risk for

Figure 1. Mean (SD) Subscale Scores on the Response Styles Questionnaire Among Childhood-Onset Mood Disorder (COMD) Subjects Who Had or Had Not Attempted Suicide and Non-COMD Controls

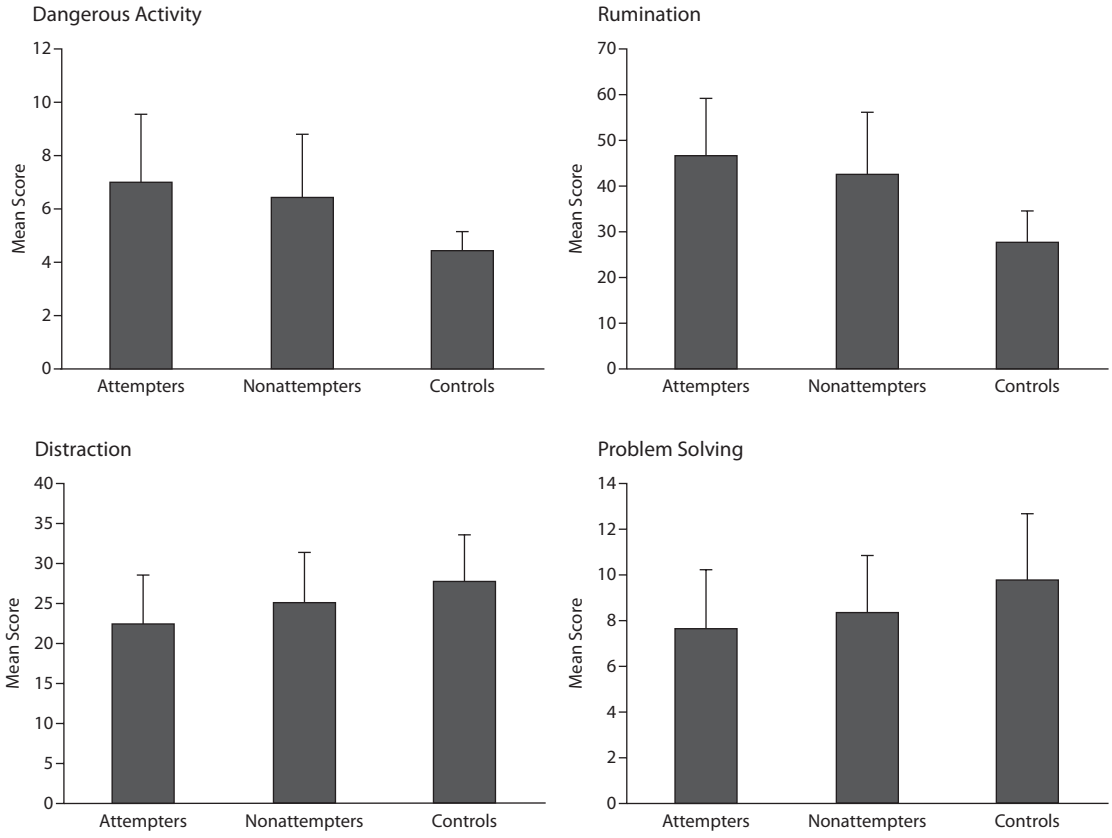


Table 2. Comparison of Response Styles Questionnaire Scale Scores Among Childhood-Onset Mood Disorder (COMD) Subjects Who Had or Had Not Attempted Suicide and Non-COMD Controls[a]

	Model 1 (N = 335)[b,c]			Model 2 (N = 335)[d,c]			Model 3 (N = 182)[e,c]		
Scale	F	p	η^2	F	p	η^2	F	p	η^2
Dangerous Activity	51.57	< .001	.24	31.96	< .001	.16	2.82	.063	.03
Distraction	20.79	< .001	.11	11.34	< .001	.07	3.02	.052	.03
Problem Solving	17.86	< .001	.10	11.79	< .001	.07	4.35	.014	.05
Rumination	92.30	< .001	.36	70.98	< .001	.30	14.89	< .001	.15

[a]A general linear model was used for statistical analysis.
[b]Without adjustment for covariates.
[c]η^2 = partial eta squared, an estimate of effect size. A η^2 = .01 is small, η^2 = .06 is medium, and η^2 = .14 is considered a large effect size.[39]
[d]Adjusted for age, sex, marital status, educational attainment, and unemployment status.
[e]Additional adjustment for current level of depression assessed by the Beck Depression Inventory within 1 month of when the Responses Styles Questionnaire was administered.

prospective suicide attempt (HR = 1.83, p = .007). Other variables were not significantly related to future suicide attempt (all p values > .05). The multiple Cox regression model was then performed with the 4 response styles, sex, type of mood disorder, number of past depressive episodes, history of suicide attempt, and current episode of mood disorder to determine if dangerous activity predicted suicide attempt independently from other response styles and potential demographic and clinical confounding variables. Results showed that Dangerous Activity remained significant (HR = 1.97, 95% CI = 1.12 to 3.46, p = .019). The finding indicated that every standard deviation increase in this scale was associated with about 2-fold increased risk of attempting suicide during the follow-up period (6–99 months).

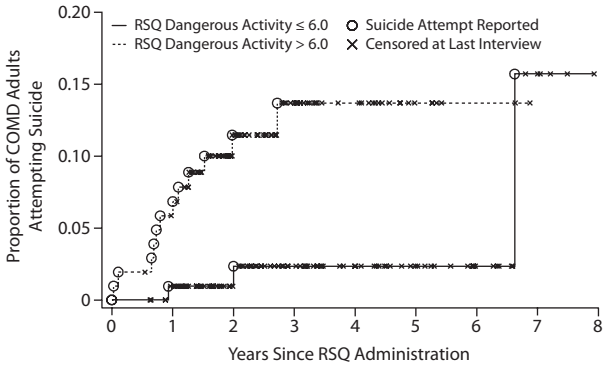
Figure 2 shows the hazard function when probands scored above or below the median on the Dangerous Activity scale. Risk for suicide attempt was markedly

Table 3. Predicting Variables of Suicide Attempts During the Follow-Up Period (6–99 months): Cox Regression

Variable	Hazard Ratio	95% CI	p
RSQ Dangerous Activity[a]	1.83	1.18 to 2.84	.007
RSQ Distraction[a]	0.58	0.32 to 1.06	.078
RSQ Problem Solving[a]	0.55	0.29 to 1.03	.062
RSQ Rumination[a]	1.20	0.71 to 2.03	.504
BDI score	1.46	0.76 to 2.81	.255
Female	2.27	0.51 to 10.08	.281
Age, y	0.98	0.86 to 1.12	.760
Nonwhite	0.95	0.26 to 3.44	.943
Marital status	0.27	0.04 to 2.08	.210
Educational attainment	0.55	0.28 to 1.10	.089
Unemployed	1.28	0.46 to 3.53	.640
Bipolar disorder	1.10	0.39 to 3.08	.862
No. of past depressive episodes	1.18	0.97 to 1.44	.089
Age at COMD onset, y	0.86	0.72 to 1.03	.111
Current episode of mood disorder	2.27	0.80 to 6.43	.122
History of comorbid anxiety disorders	0.78	0.28 to 2.21	.646
History of comorbid conduct disorder	2.47	0.70 to 8.76	.161
History of comorbid substance use disorders	1.79	0.63 to 5.06	.272
Past suicide attempt	2.60	0.83 to 8.18	.101

[a]Raw score divided by standard deviation.
Abbreviations: BDI = Beck Depression Inventory, COMD = childhood-onset mood disorder, RSQ = Response Styles Questionnaire.

Figure 2. Cumulative Proportion of Suicide Attempt During Follow-Up Among Childhood-Onset Mood Disorder (COMD) Probands Who Scored Above or Below the Median on the Response Styles Questionnaire (RSQ) Dangerous Activity Scale



increased during the first 2.5 years of follow-up for COMD probands who scored above the median (6.0) compared to those scoring below the median (Wilcoxon $\chi^2 = 8.24$, $p = .004$).

DISCUSSION

This study aimed to examine the association between various ways of responding to depressed mood and suicide attempt in young adults with a history of COMD. This study uncovered several major findings. First, probands, irrespective of history of suicide attempt, were more likely than normal controls to report responding to depressed mood in maladaptive ways (rumination and dangerous activity engagement) and less likely to respond in adaptive ways (distraction and problem solving). However, these differences were largely attenuated when current level of depression was taken into account. Second, COMD subjects with past suicide attempts were less likely than those without a past attempt to use distraction strategies to respond to depressive mood. Finally, those COMD probands who tended to engage in dangerous activities when faced with depressed mood were at increased risk for suicide attempt in the follow-up period.

Consistent with previous studies,[9,18,40] we found that COMD probands were more likely than non-COMD controls to ruminate and engage in dangerous activities and less likely to use adaptive responses when faced with depressed mood. The relationship between response strategies and COMD may be bidirectional. Maladaptive response strategies may be a cause of depression, as demonstrated in several studies.[9,10,17,40] In contrast, maladaptive response strategies could be a consequence of COMD, because depression may impair individuals' social, interpersonal, or cognitive functioning, which may in turn affect their response strategies when experiencing a depressed mood.[16,28,29,41] Although our findings cannot address the causal relationship between response strategies and COMD, our finding that the group differences in the response styles between COMD probands and controls were largely attenuated when current level of depression was statistically controlled suggests that self-reported responses to depression are largely affected by respondents' current mood-state.

Our longitudinal analysis showed that people who tended to engage in dangerous activities were more likely to have a suicide attempt in the follow-up period. Although no studies have used the RSQ Dangerous Activity scale to predict suicidal behavior, our finding is consistent with those of previous studies in which high-risk behaviors, such as drinking, drug use, or aggression, were found to increase the odds of suicidal behavior.[3,5–7,42] Dangerous activities as a means to regulate depressed mood may have an immediate short-term effect by initially reducing emotional arousal; however, these activities may have additional negative repercussions that could increase stress and worsen negative feelings and thus lead to suicidal behavior. In addition, dangerous activities may be a proxy for impulsive, aggressive, or hostile tendencies, which have been demonstrated to be associated with suicidal

behavior.[4,42] Further prospective studies are warranted to investigate the role of individual dangerous activities in predicting suicidal behavior.

Greater use of dangerous activities significantly predicted suicide attempt during the follow-up period, whereas less use of distraction to cope with depressed mood characterized COMD probands with a history of suicide attempt. Although we were not expecting a discrepancy between cross-sectional and longitudinal results, the pattern of findings deserves consideration. We speculated that dangerous activities, such as "do something reckless or dangerous," may be a direct and proximal factor that predicts future suicide attempt. It may also be that some response styles change in response to previous suicide attempts and thus that less use of distraction may be a consequence of rather than a cause of previous suicide attempts. Longitudinal studies with multiple assessments of response styles may help clarify the causal relationships and mediating factors between response styles and suicide attempt.

This study has several strengths, including longitudinal design, standardized instruments, and statistical adjustment for the potential effects of demographic and clinical variables. However, the following 2 limitations should also be noted when interpreting our findings. First, the number of suicide attempts during the follow-up period was rather small and the follow-up period was relatively short, so our prospective analysis may have insufficient statistical power and the risk for type II errors is relatively high. For instance, those with history of a suicide attempt were more likely to attempt again in the future (HR = 2.6), consistent with many previous studies.[1–3] However, this association between prior suicide attempt and future attempt did not reach statistical significance with the small group. Second, although we have controlled for the confounding effects of demographic and clinical variables, there remains the possibility that we did not control for some other key confounding variables. Future prospective studies with larger samples are needed to clarify the relative contribution of adaptive and maladaptive responses to depressed mood to suicide risk in individuals with mood disorder. Third, different age cutoffs for unipolar and bipolar depression may bias the association between coping styles and suicide attempts, since coping strategies may be more impaired in earlier disorders. However, there were no significant differences in coping styles between unipolar and bipolar disorders, and the type of depression (unipolar vs. bipolar) was not a significant predictor of suicide attempt. Therefore, the association between coping styles and suicide attempt may be less likely to be biased by the 3-year difference in age cutoffs for unipolar and bipolar disorder.

Despite the limitations described above, our results suggest that one of the pathways to suicidal behavior in mood disorders may involve maladaptive response strategies to depressed mood. One implication of these findings is that the assessment of depressed patients should include evaluation of the ways in which they manage their dysphoric mood. Quite possibly, treatment aimed at improving how patients cope with their dysphoria may lower the risk of suicidal behavior.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside US Food and Drug Administration–approved labeling has been presented in this article.

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