

Summary

This study evaluated total stress and stress reactivity to minor stressors as predictors of depressed mood in traditional and nontraditional college women ($n = 146$). Stress reactivity, which was conceptualized as mean stress per stressor, accounted more strongly than number of potentially stressful encounters for total stress, and was a stronger predictor than total stress of symptoms of depressed mood, after controlling for initial depressed mood and neuroticism. Reactivity was associated with greater use of avoidance coping and higher levels of neuroticism, which suggest that it may represent a stable individual difference and be a good predictor of depressed mood, especially in response to minor stressors.

Introduction

Studies relating stress to physical and psychological disorder are generally based on the assumption that stress accumulates over time to precipitate episodes of disorder.¹ Early studies used “life events” inventories, such as the Social Readjustment Rating Scale,² to measure total stress from exposure to (mostly) major events requiring adaptive responses. Researchers proposed that individuals could accumulate sufficient stress to trigger disorder by exposure to one or more very stressful events or a greater number of less stressful events. Many studies provided support for this model by showing life events stress was a reliable, albeit modest predictor of negative physical and psychological health outcomes.³

Researchers seeking explanations for typically weak associations between stress and disorder began to study individual differences in vulnerabilities and psychosocial resources such as personality, coping, and social support. Others considered the nature of the commonly used measures of stress and proposed that major stressors occurred too infrequently to account for most stress experienced by most people most of the time, and consequently, would not account well for stress-related disorder. An alternative approach of measuring stress from common, minor annoyances called “daily hassles,” “minor negative events,” or “microstressors” proved successful, and many studies found cumulative stress from minor stressors was a better predictor of physical and psychological disorder than stress from major life events, even when both measures of stress were used in the same study.⁴⁻⁶

Researchers also found that self-ratings of the perceived stressfulness of events provided better measures of stress than scores obtained from normative samples. This is consistent with the concept of appraisal in the cognitive-transactional model of stress proposed by Lazarus and Folkman.⁷ In that model, individuals evaluate the relevance of an encounter in terms of actual or potential harm,

loss, or challenge, and also consider their options for coping with the encounter. This process determines the perceived stressfulness of an event as it occurs and influences the stress rating an individual provides for an event on a stress inventory, although not without the effects of memory and changes in affect. Although the concepts of appraisal and coping are conceptually separate in the cognitive-transactional model, the processes are inseparable within the individual. Moreover, both are strongly influenced by such psychosocial variables as personality, personal and social resources, world-view, and self-esteem, and by environmental characteristics, including culture, constraints, and opportunities.⁸

When studies use daily stress inventories, individuals' total stress scores accumulate from small or large stress ratings for few to many minor events. But unlike some items in life events inventories (e.g., death of a loved), which are viewed by most people as very stressful, none of the events in daily stress inventories stands out as an especially salient stressor. Individuals who rate minor stressors as very stressful may be dispositionally or temporarily more vulnerable to stressors and less able to cope.⁹ Individuals who are highly reactive to minor stressors are likely to differ from less reactive individuals on other important correlates of appraisal and coping, and also on measures of physical and psychological disorder.

One may also question a strict interpretation of the cumulative nature of stress as it applies to minor stressors. If an encounter is perceived to be only slightly stressful, and its practical and affective consequences are resolved before the next minor encounter, it may not contribute to cumulative stress. In contrast, if an encounter is perceived to be more stressful, and its practical and affective consequences linger, it would be more likely to contribute to cumulative stress. Consequently, total stress scores may exaggerate the actual cumulative stress experienced,

especially in people who are less reactive. When adding responses on a daily stress inventory, the researcher cannot know the degree to which stress actually accumulated.

The present study compared total stress and stress reactivity measured with a daily stress inventory as predictors of symptoms of depressed mood in female college students. Daily stress has been found to predict depressed mood in adolescents and adults,¹⁰⁻¹² and depressed mood has been found to have an impact far beyond the discomfort of its symptoms. It predicted reduced immune function in diverse samples of people,¹³ and delayed hospital discharge in medical patients and disability and absentee days in workers.¹⁴ Depressed mood was among the stronger predictors of suicide in adolescents,¹⁵ and serious suicide attempts in suicidal patients.¹⁶

The present study of stress and depressed mood was prospective and controlled for initial depressed mood. I hypothesized that stress reactivity would be a stronger predictor than total stress of depressed mood. I also evaluated how strongly each of these measures of stress was associated with neuroticism, a personality measure found to be a strong predictor of stress, coping, and depression,^{17,18} and tested whether coping moderated the associations between stress and symptoms of depressed mood.

Materials and Methods

Participants

Undergraduate women ($n = 165$) at a small campus of a public university in the Midwest participated in this study. Almost all were white and many were nontraditional students with jobs, spouses, and children. Mean age was 23.2 years ($SD = 8.0$) and 22.0% were between 25 and 54 years old. Most were single, but 20.6% were married and 5.5% were divorced. The majority worked full-time or part-time. All provided informed consent and received research credit in psychology courses. Data from 19 women were excluded from analyses because of incorrect completion of the stress inventory.

Instruments

Daily Stress Inventory.⁹ The DSI is a valid, self-report instrument used to assess the frequency and impact of common, minor stressors. Items include events from five domains: interpersonal, personal competency, cognitive, environmental, and varied. Participants rated the stressfulness of situations encountered on a 7-point scale, ranging from "not stressful" to "caused me to panic." Students completed the inventory at one sitting with instructions to rate all events experienced in the previous two-week period. The DSI provides three measures of stress: number of events experienced, total perceived impact of those events, and ratio of total impact to number of events, which is a measure of stress reactivity. In this study, events experienced without stress were counted in the number of events, but given a score of zero for computing total stress and stress reactivity.

Beck Depression Inventory – II.¹⁹ The BDI-II is a 21-item, self-report inventory used to assess the severity of cognitive, affective, somatic, and behavioral symptoms of depression according to DSM-IV criteria. The BDI-II assesses symptoms experienced in the previous two-week period using a 4-point scale.

Coping Strategy Indicator.²⁰ The CSI is a self-report inventory with 11-item scales for each of three coping strategies, problem solving, social support seeking, and avoidance. The instrument is psychometrically sound and has nearly independent scales²¹ that were able to predict coping styles used by students in laboratory and educational settings and clients in substance abuse treatment programs.²² Although intended to measure situation-specific coping responses, the CSI may also tap more stable coping styles.²¹ Participants rated items on a 3-point scale.

NEO Five-Factor Inventory.²³ The NEO-FFI is a 60-item, self-report inventory that assesses domains of personality in the five-factor model: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Students completed the entire inventory, but only neuroticism was used in the analyses.

Procedure

Participants provided demographic information and completed the BDI-II, NEO-FFI, and CSI in groups at one sitting. Approximately six weeks later, participants completed the DSI and the BDI-II a second time.

Results

Table 1 shows descriptive statistics for and correlations between neuroticism, coping, stress measures, and symptoms of depressed mood. Means for neuroticism and the coping measures were within normal ranges. Although most women were not depressed, Time 2 depressed mood was classified¹⁹ as mild for 18.5%, moderate for 6.2%, and severe for 4.8% of the women.

Insert Table 1 about here

Correlations showed Time 1 depressed mood, neuroticism, avoidance coping, total stress, and stress reactivity were the strongest predictors of Time 2 depressed mood. Neuroticism was also a moderately strong predictor of avoidance coping, total stress, and stress reactivity. Although this analysis showed small differences between neuroticism and the two stress measures as predictors of symptoms of depressed mood, partial correlations provided a very different picture. Controlling for Time 1 depressed mood, the correlation between neuroticism and Time 2 symptoms was .17, $p < .05$. If stress reactivity was also controlled, the correlation fell to -.01. The correlation between total stress and Time 2 depressed mood with Time 1 symptoms controlled was .40, $p < .001$, but only .09 if stress reactivity was also controlled. In contrast, the correlation between stress reactivity and Time 2 symptoms of depressed mood with Time 1 symptoms controlled was .46, $p < .001$, and was reduced to .27, $p < .001$ if total stress and neuroticism were also controlled.

Figure 1 is a scatter plot showing total stress and Time 2 depressed mood for women split on the dimension of stress reactivity into three nearly equal-sized groups. Women in the lowest reactivity group had the lowest total stress, women in the highest reactivity group had the highest total stress, and women in the moderate reactivity group had intermediate levels of stress that overlapped the

scores of the other two groups. One-way ANOVA showed these differences to be significant, but found no differences between the groups in the number of stressors encountered. This confirmed

Insert Figure 1 about here

that reactivity was primarily responsible for differences in total stress. One-way ANOVA and contrasts also showed the more stress reactive women had greater Time 1 and Time 2 symptoms of

Insert Table 2 about here

depressed mood and higher scores on neuroticism and avoidance coping, which are correlates of depression. Mean neuroticism scores were average, borderline high, and high for women in the low, moderate, and high reactivity groups, respectively.²³ Women in the three groups did not differ in age, problem solving, or social support seeking. These data are shown in Table 2.

Hierarchical regression analysis was used to test if coping also predicted Time 2 symptoms of depressed mood, either directly or by moderating the relationship between stress reactivity and depressed mood. I controlled for Time 1 symptoms and neuroticism by entering them in the first step. Stress reactivity and coping strategies (problem solving, support seeking, and avoidance) were entered in the second step, and their interactions in the third step. Results are shown in Table 3.

Time 1 depressed mood and neuroticism accounted for 48.5% of the variance in Time 2 symptoms, $F(2, 143) = 67.2, p < .001$. Stress reactivity and coping added 10.2% to the variance, $F(4, 139) = 8.6, p < .001$, but only stress reactivity was significant. Step 3 did not contribute significantly to the variance in Time 2 depressed mood, but included a significant interaction between stress reactivity

and social support seeking. Greater support seeking was associated with reduced symptoms of depressed mood at higher levels of stress reactivity. When the analysis was repeated with only the

Insert Table 3 about here

support x reactivity interaction in the third step, it added 1.4% to the variance in Time 2 symptoms of depressed mood, $F(1, 138) = 4.9, p < .05$.

Discussion

As predicted, when stress was measured for minor stressors, reactivity was a stronger predictor than total stress of symptoms of depressed mood in college women. Highly reactive and less reactive women did not differ in the number of stressors encountered, indicating that stress reactivity accounted primarily for total stress. In fact, almost all of the women with the highest stress scores and almost all of the women with depressed mood scores in the moderate to severe range were in the highest reactivity group.

Reactivity was operationalized as average perceived stress per stressor. In the cognitive-transactional model,⁷ perceived stress is determined by cognitive appraisal, the process whereby individuals evaluate encounters with the environment in terms of potential harm, loss, or challenge in the context of the individual's perceived psychosocial resources for coping. Individuals who were more reactive were likely to perceive their coping resources to be less effective and to expect less favorable outcomes from their encounters with the environment. Given that all the stressors on the Daily Stress Inventory are minor, it is likely that characteristics of the individual were the main determinants of appraisals as more stressful. Consistent with this, higher reactivity was associated with higher scores on neuroticism, a stable and pervasive dimension of personality that has been linked to ineffective coping, vulnerability to stress, poor adjustment, and negative affect.²³ Although individuals may be temporarily more reactive, depending on situational demands and resources, the finding that the most reactive women had neuroticism scores in the high range suggested that their reactivity, like their neuroticism may be stable. In the present study, reactivity was not only a stronger predictor than neuroticism of depressed mood, it could also be viewed as a mediator of the effects of neuroticism on depressed mood according to guidelines reported by Baron and Kenny.²⁴

Because women divided into low, moderate, and high reactivity groups did not differ in the number of stressors reported, it appears those with the lowest reactivity experienced a pattern of low stress encounters with the environment along with lesser symptoms of depressed mood, whereas those with the highest reactivity experienced a pattern of more stressful encounters with the environment and greater symptoms of depressed mood. This is not only consistent with the observed link between stress reactivity and neuroticism, but also suggestive of cognitive explanations for depression. People with consistently greater stress reactivity likely view the environment as more threatening and their coping resources as less effective. They may have a more pessimistic explanatory style, which is strong predictor of depression.²⁵ Although the present study did not assess explanatory style, Dykema, Bergbower, and Peterson²⁶ found pessimistic explanatory style correlated with reports of hassles and health problems.

More reactive women used more avoidance coping, but did not differ from less reactive women in the use of problem solving or social support seeking. Note that the three scales of the Coping Strategy Indicator²⁰ are nearly independent, so greater use of avoidance need not predict lesser use of other coping strategies. It was not surprising that women who used more avoidance were more reactive to stressors because stress appraisals depend on perceived coping abilities. In the CSI, avoidance is conceptualized as behavioral, mental, and interpersonal disengagement, each of which may prevent successful resolution of stressful encounters. Avoidance coping is a generally ineffective strategy that has been found to predict depression.^{27 - 29}

One limitation of the present study was that the participants were all college women. They were, nevertheless, a somewhat diverse group, with a wide range of ages. Most worked for pay and many were married. Another limitation was that most participants had fairly low scores on symptoms of depression. Despite this, scores extended into the moderate and severe ranges and research has

shown that depression falls on a continuum and depressed mood has consequences on physical and psychological well-being.

In summary, the present study found stress reactivity was a stronger predictor than total stress of depressed mood in college women. Associations between reactivity, avoidance coping, and neuroticism suggest that reactivity may more than another measure of stress; it may be a stable indicator of vulnerability to stress, especially from minor daily stressors.

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Table 1

Descriptive statistics and correlations

	N	PS	SS	AV	STR-N	STR-T	STR-R	DEP1	DEP2
Neuroticism (N)	--	-.36***	-.14	.63***	.30***	.58***	.59***	.70***	.57***
Problem Solving (PS)		--	.18*	-.29**	-.22**	-.14	-.06	-.24**	-.19*
Support Seeking (SS)			--	-.24**	-.09	-.04	-.06	-.11	-.09
Avoidance (AV)				--	.27**	.44***	.43***	.54***	.44***
Stressors (STR-N)					--	.58***	.08	.15	.15
Total Stress (STR-T)						--	.81***	.48***	.58***
Stress Reactivity (STR-R)							--	.51***	.64***
Time 1 Depressed Mood (DEP1)								--	.69***
<u>M</u>	24.6	26.1	26.8	20.1	29.5	55.0	1.8	12.3	10.0
<u>SD</u>	8.3	4.8	5.3	4.3	10.3	36.6	1.0	7.8	8.4

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2One-way analysis of variance for low, moderate, and high stress reactive women

	<u>Stress Reactivity</u>						Omnibus F	
	Low		Moderate		High			
	(n = 50)		(n = 47)		(n = 49)		$F(2, 143)$	$p <$
Total Stress	21.5	14.6	58.3	19.3	86.0	36.2	81.8	.001
Stressors	28.2	10.8	31.5	8.9	29.0	10.9	1.4	ns
Time 1 Depressed Mood	7.8	4.7	11.5	6.1	17.5	8.9	25.7	.000
Time 2 Depressed Mood	4.6	3.9	8.6	5.4	17.0	9.5	43.8	.000
Neuroticism	18.8	7.3	24.9	7.3	30.3	6.0	35.0	.001
Problem Solving	26.4	4.8	26.5	4.6	25.3	4.9	.9	ns
Support Seeking	27.5	5.1	26.2	6.1	26.8	4.8	.7	ns
Avoidance	18.1	4.1	20.2	3.8	22.1	4.0	12.3	.001
Age	22.7	7.7	23.1	9.2	24.6	7.9	.7	ns

Note. When the omnibus F -test was significant, all contrasts were significant at $p < .05$.

Table 3Hierarchical regression of time 2 depressed mood onto predictor variables

Step	Predictor	R ²	ΔR ²	F Change	β
1	Time 1 Depressed Mood	.485	.485	67.21***	.565 ***
	Neuroticism				.171*
2	Stress Reactivity	.587	.102	8.61***	.411***
	Problem Solving (PS)				-.068
	Support Seeking (SS)				-.008
	Avoidance (AV)				.006
3	Stress Reactivity x PS	.601	.014	1.67	.139
	Stress Reactivity x SS				-.752*
	Stress Reactivity x AV				-.006

Note: *p<.05; **p<.01; ***p<.001

Figure Caption

Figure 1. Total stress and symptoms of depressed mood in women divided into low, moderate, and high stress reactivity groups.