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DOI: 10.1177/0146167298242002

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>> Version of Record - Feb 1, 1998
What is This?
Emotional Reactivity to Everyday Problems, Affective Inertia, and Neuroticism

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A naturalistic diary recording study was conducted to assess affective responses to everyday stress. Community-residing male participants made diary recordings regarding problem occurrence and mood several times a day for 8 days. In addition to reporting more frequent daily problems, persons scoring high in neuroticism were more reactive to stressors and were more distressed by recurrent problems than were persons scoring low in neuroticism. New problems affected everyone comparably. There was also evidence of affective inertia, such that bad mood was more likely to carry over to the next assessment. This lag effect tended to be stronger among more neurotic individuals.

A famous psychotherapist, John Weakland, was fond of saying, "When you have a problem, life is the same damn thing over and over. When you no longer have a problem, life is one damn thing after another" (McG. Thomas, 1995, p. A16). Some individuals, however, seem to experience more problems and to be more affected by them than are other people. There is substantial evidence that some people are either exposed to or create more stressors for themselves. This tendency has been has been referred to as "person-environmental covariance" (Depue & Monroe, 1986; see also Smith & Anderson, 1986; Suls & Rittenhouse, 1990). Further, the basic premise of the diathesis-stress model is that some persons, by virtue of circumstances or temperament, are more vulnerable to the effects of stressful life events (Monroe & Simons, 1991). In this article, we investigated the role of temperament in the susceptibility to everyday negative events. In particular, our focus was on neuroticism, the predisposition to feel chronically dissatisfied and unhappy (Costa & McCrae, 1980, 1985; Eysenck, 1967; Watson & Clark, 1984). Persons scoring high on this dimension report a high frequency of problems, intense negative mood states—such as anxiety, fear, depression, and irritability—and physical symptoms.

Discussions of neuroticism have presumed that individuals who report frequent and high levels of negative affect are especially distressed when problems arise. But whether such individuals respond more negatively to life problems than do persons low in neuroticism, after adjusting for baseline differences in negative affect, is unresolved on an empirical basis. On a conceptual level, Costa and McCrae (1980) and Watson and Clark (1984) posited that neuroticism represents an inherent susceptibility to negative emotional states. Larsen and Ketelaar (1991) described several theoretical models, including Eysenck's (1967), Gray's (1981), and Strelau's (1987), which provide a basis for such a relationship. Although the models differ in their particulars, they agree that persons scoring high in neuroticism have a stronger sensitivity to signals of punishment or negative events. Despite the intuitive plausibility of differential reactivity, Watson and Clark, in their review of the empirical literature, found little consistent evidence for differential emotional reactivity to negative events on the part of neurotic persons. These reviewers also noted, however, that the available empirical studies at the time suffered from several limitations. For example, because neurotic persons report more distress at baseline (no stress), this means they "must... report (in order to exhibit differential reactivity)... a greater increase in discomfort under stress. There are... a variety of statistical factors.

**Authors' Note:** This research was supported by a grant from the National Institutes of Health (Grant 46448). We wish to thank René Martin and Stephen West for their helpful advice during the conduct and analysis of this research and two anonymous reviewers for their suggestions about an earlier version of this article. Address correspondence to Jerry Suls, Department of Psychology, E-11 Seashore Hall, University of Iowa, Iowa City, IA 52242, e-mail jsuls@blue. weeg.uiowa.edu.

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that operate against such a differential change when the groups differ initially” (Watson & Clark, 1984, pp. 475-476).

Recent evidence is suggestive of differential emotional reactivity. Two studies conducted by Larsen and Ketelaar (1989, 1991) exposed persons high versus low in neuroticism to negative emotional induction tasks. Neurotic individuals were more affected by negative manipulations than were the less neurotic persons. These studies are limited, however, by not measuring state affect prior to the manipulations (see Billings & Revelle, 1995). Consequently, the investigators did not really demonstrate that reactivity to the inductions was greater in one group than the other. Studies of naturalistic stress provide somewhat stronger evidence for differential susceptibility. In a study of major life events, Ormel and Wohlfarth (1991) found that occurrence of life stressors was related to more subsequent distress in persons scoring higher in neuroticism even after adjusting for initial levels of distress. In a study of reactions to taking an important examination, Bolger (1990) found that students scoring high in neuroticism reported more distress than did students low in neuroticism even after controlling for prior mood. In two other studies, one with married adults (Bolger & Schilling, 1991) and another with college students (Bolger & Zuckerman, 1995), respondents kept diaries about interpersonal conflicts across several days or weeks. Both studies showed that more neurotic respondents were more upset by conflicts. Marco and Suls (1993) had community residents participate in an experience-sampling study in which problems and mood were assessed several times during the day for several successive days. Persons high in neuroticism exhibited greater emotional reactivity to problem events even after controlling for prior mood (see also Suls, Martin, & David, in press).

Not all studies have found differential reactivity on the part of neurotic individuals, however. Affleck, Tennen, Urrows, and Higgins (1994) in a daily study of arthritis patients found no evidence of differential susceptibility to minor daily stressors. Whether the failure to find emotional hyperreactivity was due to Affleck et al.’s use of a chronically ill sample, living under highly stressful circumstances most of the time and, thereby, creating a ceiling effect or some other factor, is unclear. David, Green, Martin, and Suls (1997) also conducted a diary study of stress and mood and found no evidence that neurotic persons were more reactive to daily stressors. However, their design was limited to only nightly accounts of daily events and employed a statistical approach that may not have been powerful enough to detect differential reactivity. In a series of laboratory studies similar to Larsen and Ketelaar’s (1989), Billings and Revelle (1995) did not find differential sensitivity to negative mood inductions in neurotic participants when baseline differences in affect were controlled for in statistical analysis. The authors argued that adjusting for baseline affect in their studies may have contributed to the discrepancy with Larsen and Ketelaar’s findings. It is also possible, however, that laboratory inductions of mood are not as effective in eliciting consistent differences in emotional reactivity as are real-life stressors.

Some in situ studies have found differential reactivity to daily stressors in more neurotic individuals using either nightly or multiple assessments across the day (Bolger, 1990; Bolger & Schilling, 1991; Bolger & Zuckerman, 1995; Marco & Suls, 1993). No single study has, however, involved both multiple, within-day assessments of events and mood and optimal statistical analysis. Nightly reports of the day’s experiences improve on global recollections of stress and mood across weeks or months (Stone, Neale, & Schiffman, 1993) but still may be subject to errors about events occurring several hours earlier in the day (Stone & Schiffman, 1994). By assessing event occurrence and mood several times during the day, we reduce further the possibility of recall problems and memory bias. Although Marco and Suls (1993) measured stress and mood several times a day, they used a statistical approach with some limitations (see below). The present study provides a new test of the differential emotional reactivity hypothesis with a sample consisting of nominally healthy community-residing adults who responded to diaries both several times a day and across days. Furthermore, we evaluated the relation among stress, mood, and personality using multilevel analysis (Bryk & Raudenbush, 1992; Goldstein, 1987), a statistical approach that is better suited to diary data than past approaches.

The investigation also examined the role of other processes, in addition to emotional reactivity, that may contribute to the negative affect reported by neurotic persons. There is evidence that neurotics are exposed to or create more stressors (Bolger & Schilling, 1991; Bolger & Zuckerman, 1995; Magnus, Diener, Fujita, & Pavot, 1993; Ormel & Wohlfarth, 1991). Indeed, some models proposed to account for the relationship between personality and psychological distress or physical disease have posited that differential exposure to stressors may be as critical as physiological hyperreactivity (Smith & Anderson, 1986; Suls & Sanders, 1989).

Still other processes may also be operating that contribute to the high level of distress reported by neurotic individuals. Prior mood tends to carry over to subsequent time periods, especially if the interval is relatively short, such as within the same day (Larsen, 1991; Marco & Suls, 1993; Stone, Neale, & Schiffman, 1993; Williams, Suls, Alliger, Learner, & Wan, 1991) this is sometimes referred to as a lag effect. Neurotic individuals may exhibit the most marked affective inertia, which
might be the result of the use of inappropriate or maladaptive coping efforts to handle problems or repair mood (Isen, 1987). One aim of the present investigation was to determine whether individuals scoring high in neuroticism exhibit stronger affective inertia (i.e., lag effect) for negative mood.

An additional process contributing to negative mood may be greater susceptibility to recurrent problems. Neurotics are often described as being unable to stop ruminating or brooding about bad things that happened to them in the past. Although there is no intrinsic reason why novel problems should be any more or less aversive than old problems, we speculated that neurotic individuals would be more distressed by old problems than would nonneurotic persons. For neurotics, the inability to avoid the recurrence of problems may be further validation of their negative self-concept and expectations (Swann, 1983).

Our main focus, consistent with past theories about personality and negative emotions (e.g., Eysenck, 1967; Tellegen, 1985; Watson & Clark, 1984), was on the role of neuroticism (see David et al., 1997). However, neuroticism is only one dimension of the five-factor model (otherwise known as the Big Five) of personality, which also consists of extraversion, agreeableness, conscientiousness, and openness to experience (Costa & McCrae, 1985; Goldberg, 1992). Some authors have proposed that neuroticism and extraversion may interact to influence emotional experience. Persons who are both neurotic and low in extraversion (i.e., high in introversion) are proposed to exhibit the strongest negative affect (whereas persons who are neurotic and extraverted are proposed to show the strongest positive affect) (see Derryberry & Reed, 1994; McFatter, 1994). According to this account, neuroticism acts as an amplifier of arousal to negative or positive events (Derryberry & Reed, 1994; McFatter, 1994; Newman, 1987; Wallace, Newman, & Bachorowski, 1991). The present study design provided the opportunity to examine whether there is an interactive effect of neuroticism and extraversion on emotional reactivity to everyday problems. In addition, we evaluated the degree to which other dimensions of the Big Five might contribute or confound any obtained relationships between neuroticism and reactivity to stressful everyday events.

In summary, the present study examined four related questions: whether persons scoring high in neuroticism (a) are more emotionally reactive to stressful events, (b) report more stressors, (c) show greater carryover of negative mood to subsequent occasions, and (d) are more bothered by recurrent problems than are persons scoring low in neuroticism. In addition, we examined the degree to which other dimensions of the five-factor model contribute to emotional reactivity. These empirical questions were examined using an idiographic/nomothetic approach (Epstein, 1985) with a within- and across-day diary recording methodology (Larsen, 1991; Suls & Martin, 1993; Tennen, Suls, & Affleck, 1991; Wheeler & Reis, 1991). A version of multilevel analysis—hierarchical linear modeling (HLM) (Bryk & Raudenbush, 1992)—was used to analyze the diary data. This statistical approach is receiving increasing use in the behavioral sciences. Because HLM is able to simultaneously evaluate between- and within-subjects sources of variation, it is well suited to daily diary data in which unequal numbers of problem events occur across individuals.

METHOD

Overview

Participants made recordings about problem occurrence and mood in pocket diaries six times a day for 8 successive days during waking hours. These same individuals had filled out a personality battery in a prior laboratory session, so that scores on the Big Five dimensions of personality—neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience—were also available.

Subjects

A total of 48 healthy male community residents, 25 to 42 years of age, were recruited after telephone screening of respondents who responded to an advertisement placed in a local newspaper. These participants were recruited as part of a larger sample to study psychosocial risk factors for coronary disease in a nominally healthy adult male population. Participants suffering from chronic diseases were screened and excluded. Six participants failed to fill out their diaries correctly and were dropped from subsequent analysis. Participants received $50 compensation for their participation.

Materials and Procedure

All participants completed the NEO Personality Inventory (NEO-PI) (Costa & McCrae, 1985) at an initial appointment. The NEO-PI (Form S) consists of 181 items answered in a 5-point scale format. It is a well-validated and widely used measure of the five-factor model of personality. At the next appointment, each participant received a packet of diaries for the next 8 days and extensive instructions about how and when to make diary entries. Instruction included responding to a practice diary to clarify any questions or ambiguities concerning the procedure. Participants were also given a written set of instructions in case a question arose during the diary-recording phase. In addition, a wristwatch with a preprogrammed alarm (Seiko RC-1000 Wrist Terminal) was
provided to each subject to remind them when to complete a diary entry. To encourage compliance and to minimize the number of lost diaries, participants returned diaries every 2 days in postage-paid envelopes.

**Daily events and mood.** Daily events were recorded in a diary that contained a checklist of items. Participants were requested to make a diary recording six times a day, every 3 hours from 9 a.m. to 9 p.m., and then before bed. First, participants responded to a series of negative mood adjectives—**tense/jittery, irritable, and angry/hostile**—taken from Watson and Clark’s (1984) measure of state negative affectivity. Subjects were asked to rate how each word described their feelings “since they woke up” or “since the last diary entry” on a 7-point scale ranging from 0 (not at all) to 6 (very much). Another question asked whether any problems had occurred this morning (if it was the first diary of the day) or since the last diary entry (if later in the day). If the participant responded yes, they also indicated whether it was a new problem or a recurrence or continuation of a previous problem. Responses to the mood items were highly intercorrelated (r = .82 to .83) and were consequently aggregated into one index labeled **negative mood** for the analyses.

**RESULTS**

**Descriptive Analyses**

The response rate to the diaries was high: Of the 2,016 maximum possible observations (6 recordings per day × 8 days × 42 participants), there were only 26 missing observations. Thus, participants responded 99% of the time. Maximum likelihood estimation in HLM uses all available information and computes weighted estimates of slopes and intercepts based on the amount of data provided by each participant. In cases, however, when there was no variation in the predictor variables for a given participant (e.g., a few reported only new or only old problems), the HLM program dropped them from the analysis.

The sample mean for the NEO-Neuroticism scale was 81.0 (SD = 21.3), which falls in the midrange of the NEO norms (Costa & McCrae, 1985). The means and standard deviations for the extraversion, agreeableness, conscientiousness, and openness to experience dimensions were 111.40 (SD = 15.33), 46.81 (SD = 6.18), 46.67 (SD = 8.74), and 39.10 (SD = 5.31), respectively. Although the five factors are considered to be theoretically distinct, some factors are typically correlated, sometimes moderately to highly (see Costa & McCrae, 1985). In the present sample, extraversion was correlated significantly with agreeableness (r = .42, p < .007) and conscientiousness (r = .40, p < .009). Neuroticism was correlated inversely with agreeableness (r = -.53, p < .001), an association that will be important later for interpreting a portion of the results.

Problem occurrence was reported in 27.6% of the diary recordings. New problems were reported on 10.8% (217 cases) of the occasions, and old problems were reported in 16.9% (340 cases) of the occasions.

**Aggregated Analysis**

To evaluate whether more neurotic individuals report more daily problems and to compare our results concerning mood, daily stress, and neuroticism with previous studies (Watson, 1988), between-subject correlations were computed between mood ratings and problem occurrences aggregated across the entire diary series. The correlation between negative mood ratings and number of problems was .55 (df = 40), p < .001. Neuroticism was associated significantly with problem occurrence, r = .33, p = .05, and also with aggregated negative mood, r = .35, p = .02. The correlations between problem occurrence and mood and between problem occurrence and neuroticism were consistent with past reports (Magnus et al., 1993; Watson, 1988).

**Daily Diary Analysis Plan**

The diary data have a multilevel structure because each diary recording can be considered a lower level observation nested under the upper level unit—persons. Earlier statistical approaches with diary data typically aggregated across repeated measurements, which obscures between- and within-subject effects (for a discussion of the limitations of this analytic strategy, see Jaccard & Wan, 1993; Michela, 1990; Suls, Wan, & Blanchard, 1994; West & Hepworth, 1991). In another approach, some researchers have ignored the upper level (person) units and simply treated each diary entry as an independent unit. This approach is also suboptimal because the Type I error rate is inflated as the amount of independent information from the data decreases, so tests of significance are likely to be too liberal. A third approach, using ordinary least squares regression with subject dummy vectors, avoids some of the above problems (Bolger, DeLongis, Kessler, & Schilling, 1989; Marco & Suls, 1993) but adjusts only for differences in intercept (e.g., each participant’s average negative mood across the time series) and not for differences in the relationship (slopes) between stress and mood among participants.

In the present study, we used HLM, which treats both lower and upper level (persons) units as sampling units so that inferences can be made to observations and persons and takes into account differences in slopes across persons (Bryk & Raudenbush, 1992). Using HLM, an estimation of the effects of problem occurrence and prior mood is initially computed separately for each participant. In a second stage, the variability of the
estimated parameters (e.g., slopes and intercepts) of the individual change curves is modeled with individual attributes (i.e., neuroticism). This approach uses maximum likelihood estimation and does not require an equal number of observations or common spacing of observations. This is important for our purposes because the frequency and number of daily problems varied across participants. Multilevel analysis can accommodate unequal number and spacing of observations because it includes a random term that represents the effect of diary clustering under participants on the outcome variable. In short, the HLM model allows us to obtain separate estimates of the relationship between problem occurrence and mood for each participant and then to evaluate the degree to which personality accounts for differences in the relationship among persons.

Role of Problem Occurrence and Prior Mood

In the first-level (within-person) model, we posited that each participant’s current mood would be effected by occurrence of a current problem and negative mood intensity on the prior occasion. Lagged effects of mood are common in diary data, usually at a lag of 1(t − 1) particularly within the same day. As recommended by Kreft, de Leeuw, and Aiken (1995), the Level 1 variables were centered using the group mean (see Bryk & Raudenbush, 1992, pp. 26-28). The model was as follows:

\[ \text{Mood}_t = a_0 + a_1 \text{Mood}_{t-1} + a_2 P_t + e_t, \]

where \( \text{Mood}_t \) is negative mood intensity at time \( t \); \( \text{Mood}_{t-1} \) is negative mood on the preceding occasion; \( P_t \) indicates whether a problem occurred at time \( t \) or not (0 if no problem; 1 if a problem was reported); \( a_0 \) is the intercept, representing (because of centering) the average outcome; \( a_1 \) is the slope for prior negative mood; \( a_2 \) is the slope for problems, or the reactivity effect; and \( e_t \) is a random component of mood at time \( t \).

The second, between-subject, level of the model has two parts, one that refers to the effects of prior mood and the other that refers to the effect of problem occurrence (or reactivity):

\[ a_{ij} = b_0 + b_1 N_i + s_i. \]

In this model, it is proposed that each participant’s reactivity slope is a function of an intercept, a neuroticism component, and a random component. Personality scores were centered on the grand mean (see Bryk & Raudenbush, 1992, pp. 26-28). The intercept \( b_0 \) represents the expected change in negative mood associated with the occurrence of a problem at \( t \) for a person whose neuroticism level is average. The significance of \( b_1 \) indicates whether differences in neuroticism account for some significant portion of the variation in mood in response to problem occurrence.

The second level of the effects of prior mood is as follows:

\[ a_{ij} = h_0 + h_2 N_i + s_i. \]

In this equation, \( h_0 \) represents the expected change in negative mood associated with higher levels of prior negative mood at \( t \) for a person whose neuroticism level is average. \( h_2 \) refers to the slope of the effects of neuroticism on the effect of prior mood.

Model testing. We wished to establish the unique effects of neuroticism while minimizing the number of parameters to be estimated (as the number of parameters increases, so does the difficulty in obtaining convergence in maximum likelihood estimation). To reduce the number of parameters to be estimated in the final model, separate models, like those described above, were initially calculated except that extraversion, agreeableness, conscientiousness, and openness to experience were substituted for neuroticism. Only agreeableness emerged as a significant predictor of negative mood; specifically, agreeableness was inversely related to strength of the lag effect of prior negative mood, \( b = -0.08, t = 2.05, p < .05 \). The other personality dimensions were unrelated (\( ps > .15 \)) to negative mood. Consequently, extraversion, conscientiousness, and openness to experience were not included in the final model.

In the final model, prior mood and problem occurrence were entered; in addition, neuroticism was included as a moderator of the effect of problem occurrence, and both neuroticism and agreeableness were included as moderators of the effect of prior mood. The intercept was significant, \( b = 2.60, t = 9.78, p < .0001 \), indicating there were differences in average mood across the sample. Neuroticism was related to the differences among individual intercepts, such that higher overall mood scores were associated with higher neuroticism, \( b = .04, t = 2.45, p < .02 \). In other words, baseline mood of neurotic persons was higher than that of nonneurotic individuals. Problem occurrence was also related to poorer mood, \( b = 2.12, t = 10.43, p < .0001 \). This effect was moderated by neuroticism, \( b = .02, t = 2.10, p < .05 \), such that persons higher in neuroticism were more bothered by occurrence of a current problem than were persons lower in neuroticism. Thus, in addition to baseline differences in negative mood, neurotic individuals were also more reactive to stressful problems. To illustrate this interaction, separate slopes were computed at one standard deviation above and below the mean of neuroticism scores (Aiken & West, 1991). Figure 1 depicts the relationship between problem occurrence and mood for persons high versus low in neuroticism.
Being in a bad mood during the immediately preceding interval was also related to the current intensity of negative mood, $b = .25$, $t = 8.96$, $p < .0001$. Neither neuroticism nor agreeableness moderated the lag effect, at a conventional level of statistical significance, $b = .001$, $p < .14$ and $-.005$, $p < .23$, when they were simultaneously entered into the model. However, neuroticism and agreeableness were related to the strength of the lag effect when they were entered in separate models. Neuroticism was positively related to the lag effect ($b = .003$, $t = 2.39$, $p < .03$)—that is, more neurotic persons were likely to continue to be in a poor mood if they were in a poor mood during the immediately preceding time period. More agreeable persons were less likely to be affected by a previously bad mood (see above). A plausible explanation for why these two personality dimensions were not significantly related to mood when entered simultaneously is suggested by the inverse correlation between neuroticism and agreeableness scores in our sample (see above). Because they shared predicted variance, neither emerged as significant contributors of negative mood in the combined model. The results of the separate models suggest, however, that persons high in neuroticism or low in agreeableness tend to exhibit a stronger lag effect of prior mood.

For some diary measurements, measures of prior mood represented affect experienced before the participant retired for the evening. Lag or carryover effects of mood from the previous day have not been found consistently by prior investigations (Stone et al., 1993). Thus, the question is whether mood during the previous evening predicted mood the next morning. An analysis similar to the one described above was conducted except that a dummy-coded variable, indicating whether the prior mood report was from the previous day or the same day, was included in the model. This analysis yielded the same results as above; however, there was no effect associated with mood ratings from the preceding night. Thus, there was no carryover of mood from the last entry of the evening to the next morning. This means that the prior mood effects reported earlier represented a mood residue earlier in the day but not across days.

**Old Versus New Problems**

We also examined whether new versus old problems have a differential effect on negative mood and whether individuals high in neuroticism were more reactive to recurrence of old problems. A model was created similar to the upper level model specified earlier, except that instead of including a dummy-coded variable for current problem occurrence, we created two dummy-coded variables—one to represent whether a new problem occurred or not and the other to represent whether an old or familiar problem occurred during time $t$ (the reference value was, therefore, no problem). The second-level model was exactly the same as before, except that neuroticism was used to model both the effects of new problem and old problem occurrence. A series of preliminary models indicated that none of the other Big Five dimensions moderated the relationship between new versus old problem and mood ($p > .15$), so only the results for neuroticism will be reported here. (Agreeableness and neuroticism were entered together to model the effect of prior mood because of the results reported above.)

Occurrence of new problems was associated with an increase in negative mood, $b = 2.03$, $t = 6.67$, $p < .0001$. Neuroticism did not, however, significantly moderate the effect of problem occurrence, $t = 1.12$, $ns$. Occurrence of old problems also affected mood, $b = 2.13$, $t = 8.67$, $p < .001$. In this case, however, neuroticism moderated the relationship between new problems and mood, such that persons higher in neuroticism were more affected by old problems, $b = 0.025$, $t = 2.24$, $p < .03$. Thus, as predicted, old problems were more distressing to neurotic persons. Figure 2 illustrates this moderation effect; the slopes for individuals one standard deviation above and below the mean on neuroticism were calculated. (Given earlier results, an effect of prior negative mood was expected and obtained, $b = .26$, $t = 11.8$, $p < .0001$. As before, neither neuroticism nor agreeableness...
ness moderated this relationship significantly when both were in the model but were significant when entered singly.

To determine whether new or old problems had a stronger effect, a statistical contrast, in the form of a chi-square test, was conducted. The chi-square value for the contrast was nonsignificant, $\chi^2 < 1$ ($df = 1$), indicating that, overall, occurrence of old and new problems had comparable effects on mood. However, the notable difference was, as shown above, that old problems were more strongly related to negative mood in individuals higher in neuroticism.

**Neuroticism x Extraversion Interactions**

A final set of analyses considered the hypothesis that the effect of neuroticism on emotional reactivity would be moderated by extraversion—that is, persons high in neuroticism and introversion (i.e., low extraversion) would show the most intense reactions to stress (McFatter, 1994). HLM models similar to those described above were tested with the addition of a Neuroticism x Extraversion product term as a moderator. None of these models showed a significant contribution of the interaction (all $p_s > .20$).

**DISCUSSION**

The present results indicate that, for most people, current everyday problems and negative mood in the preceding hours contribute to a poorer mood. Of greater interest, three additional dynamics—emotional hyperreactivity, heightened susceptibility to the recurrence of the same problems, and more exposure to problems—were exhibited in persons with a neurotic disposition.

The pattern of emotional hyperreactivity to minor daily problems shown by neurotic individuals is notable because it was demonstrated even after statistically adjusting for prior mood. This is important because in most past research linking personality and affect, baseline (or mean-level) differences in affect across persons have not been typically distinguished from greater reactivity. Participants who have higher neuroticism scores also have higher baseline negative affect. In addition, neuroticism was related to greater reactivity (i.e., bigger changes from baseline) as a function of daily stressors. The magnitude of the effect is modest but should be considered in light of the higher baseline affect levels exhibited by neurotic individuals. In light of the evidence of their higher emotional reactivity to minor daily problems, future research needs to examine mechanisms underlying reactivity in persons predisposed to experience frequent and intense episodes of negative affect. Gray (1981), for example, argued that there are brain mecha-

![Figure 2](image)

**Figure 2 Interaction between old problem occurrence and neuroticism (illuminating slopes of participants 1 SD above and below the mean of neuroticism scores).**

NOTE: Neur = neuroticism.

isms responsible for this difference. On the other hand, others have proposed that neurotic individuals are more inclined to use maladaptive coping strategies (Bolger, 1990). These explanations are, of course, not mutually exclusive.

The tendency of neurotic individuals to be more affected by old problems has the effect of maintaining a state of dysphoria, irritation, and tenseness. In contrast, new problems had comparable effects on persons differing in neuroticism. Research on the different strategies used to cope with the reoccurrence of problems by persons high versus low in neuroticism seems indicated. Available evidence suggests that neurotics tend to engage in more wish-fulfilling fantasy and other avoidant tactics to cope with problems (e.g., Watson & Hubbard, 1996), but these strategies are associated with more, rather than less, subsequent distress (Aldwin, 1994; Bolger, 1990; Stanton & Snider, 1993; Suls & Fletcher, 1985). We speculate that when problems recur for neurotics, they may try to wish them away. The return of the same problems may also reinforce their long-standing feeling that something is wrong with them that makes them deserve bad fortune (see Swann, 1983).

We had hypothesized that neurotic individuals would show a larger lag effect of prior mood. The results are not clear-cut on this question. Entered by itself in the analysis, neuroticism was significantly related to a stronger lag effect, but when entered with agreeableness, the significant effect was lost. Because agreeableness,
entered separately, also moderated the lag effect and was highly inversely correlated with neuroticism, we speculate that their shared variance was responsible for obscuring the effect. We should add that the (inverse) correlation between agreeableness and neuroticism scores found in our sample has been reported by other researchers (Costa & McCrae, 1985). This association may be the result of common measurement variance; both dimensions were assessed with the same inventory. More likely, there is true overlap in the constructs. The more important point for present purposes is that a predisposition to be unhappy or dissatisfied and/or an interpersonal disposition to be disagreeable with other people were related to a longer lasting effect of prior negative experience. Recently, Moskowitz and Coté (1994) also found an association between daily negative affect and agreeableness. The separate and combined roles of neuroticism and agreeableness in negative affective experience need further empirical attention. These kinds of "emotional residues" may make it difficult for such individuals to regulate their moods. Whether neurotic, disagreeable persons lack the means to repair their mood, use inadequate coping strategies, or have some biological mechanism that creates a negative emotional inertia needs empirical study.

In addition to these three processes, neurotic persons also reported more stressful events. This replicates a result reported by Magnus et al. (1993), who measured stressful events objectively. Thus, there appear to be several distinct, although related, processes that contribute to the negative emotions reported by persons high in neuroticism.

We found no evidence that neuroticism and extraversion interact to influence affective reactions to stressful events. The reason for the discrepancy with McFatter’s (1994) results is unclear. McFatter was interested in the association between neuroticism and extraversion in global affective experience (i.e., "how often in the past few weeks" participants felt each particular mood); the present study was concerned with affective reactions to stressful events over a shorter time frame. McFatter also employed a very large sample of almost 400 participants, and the interaction effect was small (b = .094). We may have had insufficient statistical power to detect such a moderator effect. The present study also found, with the exception of agreeableness (see also Moskowitz & Coté, 1994), that none of the other Big Five personality dimensions were associated with negative emotional reactivity or lag effects. These results are consistent with independent evidence that conscientiousness, openness to experience, and extraversion tend to be unrelated to negative emotional experience (Watson & Clark, 1992).

The study had some limitations deserving mention. Participants were asked to report negative stressors in daily life. Hence, the results bear on reactivity to negative events; whether neuroticism reflects a general reactivity could not be determined here. As noted earlier, some researchers maintain that neuroticism is an amplifier of both positive and negative events (Derryberry & Reed, 1994; McFatter, 1994; Newman, 1987; Wallace et al., 1991). This remains an important question for future research.

The sample was restricted to community-residing middle-age males because it was conducted as part of a larger project on middle-age males and coronary risk. Others have, however, found neuroticism moderating emotional reactivity in adult women (Bolger & Schilling, 1991) and female undergraduates (Bolger & Zuckerman, 1995). Hence, the emotional reactivity associated with neuroticism does not seem to be limited to one gender.

We relied on participants’ reports about mood and problem occurrence in situ. The questions arise whether neurotic individuals are exposed to more veridically stressful situations or appraise benign situations as stressful. As noted earlier, Magnus et al. (1993), who examined the occurrence of negative life events in neurotic individuals using objective indicators, found evidence of greater exposure. More generally, other researchers have found that significant others’ reports of daily stress show reasonable agreement with participant reports (Bolger & Schilling, 1991; Hedges, Krantz, Contrada, & Rozanski, 1990; Stone, 1981). Nonetheless, validation of the present findings with significant other or informant reports would be desirable in future research.

Bolger and Zuckerman (1995) identified exposure and reactivity as major mechanisms by which negative affect is maintained in neurotic individuals. We identified two additional processes—differential sensitivity to certain types of problems and, with somewhat less confidence, negative affective inertia. An interesting question is whether differential emotional reactivity translates into differential physiological reactivity. This is especially critical for models positing that physiological reactivity to stressors contributes to physical disease processes (Krantz & Manuck, 1984; Smith & Anderson, 1986; Suls & Wan, 1993). Future research should also consider the possibility of not just differential physiological reactivity but also slower recovery (lag effects) that could contribute to pathogenic processes.

The general methodology and statistical approach outlined above can be readily adapted to the study of other individual differences. Whether the four affective phenomena found here also apply to the emotional dynamics of persons with predispositions toward depression or anxiety disorders, for example, is worthy of empirical examination. There has been considerable interest devoted to the study of anger and hostility as risk
factors for disease (see Smith, 1992; Suls, Wan, & Costa, 1995). Laboratory studies indicate that antagonistic persons are more physiologically reactive to laboratory stressors, particularly those involving interpersonal conflict (Smith, 1992; Suls & Wan, 1993), but it remains to be determined whether such reactivity is exhibited in everyday life. The present approach provides a framework for examining relations between stress and reactivity both within and between subjects. This methodology and statistical approach affords the opportunity for researchers to bridge the gap between nonomothetic and idiographic perspectives in the study of stress, emotion, and personality (see also Larsen, 1991).

REFERENCES


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Received June 12, 1996
Revision accepted June 18, 1997