
Stress and Adaptational Outcomes

The Problem of Confounded Measures

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ABSTRACT: *Confounding is a major source of uneasiness among many who do research on the relationship between stress and adaptational outcomes such as psychological symptoms and somatic health. A commonly proposed solution, illustrated by a recent article by Dohrenwend, Dohrenwend, Dodson, and Shrout, is to purify the independent variable, stress, by focusing on its environmental aspects and by making it independent of psychological response variables such as perceptions or appraisals. Such a solution, however, is neither possible nor desirable, and it obviates relational, cognitive theories of psychological stress such as our own. In this article, we closely examine the problem of confounding and circularity in stress research and provide new data. We argue that the appraisal process should not and cannot be removed in the measurement of psychological stress, and therefore some confounding is inevitable. Like emotion, stress is best regarded as a complex rubric consisting of many interrelated variables and processes rather than as a simple variable that can be readily measured and correlated with adaptational outcomes.*

No issue in the psychology of health is of greater interest and importance than whether and how stress influences adaptational outcomes such as well-being, social functioning, and somatic health. This issue has fueled extensive research on stressful life events (see Thoits, 1983, for a recent review) and more recently on an alternative type of stress variously referred to by the terms *microstressors* (McLean, 1976; Monroe, 1983), *chronic role strains* (Pearlin, 1983), and *daily hassles* (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner, Coyne, Schaefer, & Lazarus, 1981; Lazarus, 1984, in press; Lazarus & DeLongis, 1983).

This article was prompted by an article by Dohrenwend, Dohrenwend, Dodson, and Shrout (1984) that dealt with the issue of confounding between measures of stress and health outcomes. We address the issues posed by these authors and, based on their findings, provide some reanalyses of data that bear importantly on them. However, the issue of confounding raises questions that go far

beyond parochial concerns, and it warrants a broad and searching examination. In this article we explore these questions and respond in terms of our theory of psychological stress and our measurements of daily hassles.

In the critique and research reported by Dohrenwend et al. (1984), clinical psychologists evaluated the items on Holmes and Rahe's Life Events Scale (1967), Lin, Dean, and Ensel's Instrumental-Expressive Social Support Scale (1981), and the Berkeley Stress and Coping Project's Daily Hassles Scale (DeLongis et al., 1982; Kanner et al., 1981) with respect to the likelihood that, in addition to what they were supposed to measure, their contents also reflected symptoms of psychological disorder. Their ratings indicated that the scales contained substantial though varying amounts of psychopathology, thus producing a confounding between what these scales were supposed to measure and what they were often used to predict, namely, psychological problems. The authors concluded that more care should be given to how stressful life events, social supports, and hassles are conceptualized and used in the study of psychological stress and health. They emphasized the positive value of treating stressors as environmental inputs that are independent of the reaction or state of mind of the person.

In contrast, our view is that stress lies not in the environmental input but in the person's appraisal of the *relationship* between that input and its demands and the person's agendas (e.g., beliefs, commitments, goals) and capabilities to meet, mitigate, or alter these demands in the interests of well-being (Folkman & Lazarus, 1984; Lazarus, 1981; Lazarus & Folkman, 1984; Lazarus, Kanner, & Folkman, 1980; Lazarus & Launier, 1978).

The searching question that guides this article is whether and how relational, cognitive approaches to psychological stress such as ours, which draw on subjectively defined assessments of stress, can overcome the dangers of confounding and circularity.

The Problem of Confounded Measures

That confounding is a major source of uneasiness among those who do research on stress and adap-

tational outcomes is indicated by the following comment by Kasl (1978):

Unfortunately, this convergence of theoretical formulations [about the role of individual differences in appraisal] has led to a self-serving methodological trap which has tended to trivialize a good deal of the research on work stress or role stress: the measurement of the "independent" variable (e.g., role ambiguity, role conflict, quantitative overload, etc.) and the measurement of the "dependent" variable (work strain, distress, dissatisfaction) are sometimes so close operationally that they appear to be simply two similar measures of a single concept. (p. 13)

Dohrenwend et al. (1984) and Kasl (1978; see also Dohrenwend, 1978, and Thoits, in press) posed an issue that must be confronted by those who define stress in relational and cognitive terms. If the relationship being studied is entirely circular, that is, the same process is being measured in the independent and dependent variables, then we would have to agree that probably nothing of importance will be learned about the functional connection between stress as a condition of life and the health outcome.

That circularity or confounding is a problem in present-day research is illustrated by an article by Cohen, Kamarck, and Mermelstein (1983). The authors presented what they called a "global measure of perceived stress" (p. 385). Cohen et al. (1983) reported that their global measure correlates well with outcome measures of symptomatology. However, an examination of the 14 items of this scale, which assess general, negative feelings and reactions over the last month, suggests that it is yet another measure of psychopathology or distress. These items deal with reactions such as being upset, having or lacking control over things, feeling nervous and stressed, feeling or not feeling effective, and being overwhelmed by difficulties. In this strategy of stress measurement, the antecedent and consequent measures seem to overlap entirely, making it questionable whether the correlation provides any gains in knowledge.

Confounding or circularity refers to redundancy among variables: "The causes contain all that is contained in the effect; the effect contains nothing that is not contained in the causes" (Oxford English Dictionary, 1970, Vol. 11, p. 116). It can occur for a variety of reasons. For example, the components

making up the variables themselves can be redundant or identical, as when there are duplicated or similar items. This is the problem with the research of Cohen et al. (1983) cited above. Perhaps it would be even better to speak of overlapping measures (see Nicholls, Licht, & Pearl, 1982, for an analysis of overlapping item content in personality questionnaires). Alternatively, the variables as measured can reflect some third, underlying variable in common, even though there is no explicit redundancy in the form of duplicated or similar items.

Psychologists have been debating the problems inherent in circular or tautological reasoning for a long time. Some would argue that circularity is inevitable in any scientific explanation. For example, Pratt (1939) said:

The aversion to circular arguments is the last stronghold of that faith which believes that science can furnish for any given array of well-established facts a *why* which is more than a mere statement of how the facts go together. In certain quarters the faith still lingers on that the laws of nature are something more than the events in nature themselves. The events *obey* the laws, which can not be the same as saying that the events obey themselves. If the statement that nature is subject to law really means that nature is subject to nature, then the so-called laws of science explain nothing. They are pompous tautologies, vicious circles.

The majority of present-day scientists, particularly the correlationists, have indeed come to realize that a scientific *why* can be no more than an exact *how*; but the corollary is frequently overlooked, namely, that all arguments in support of any given hypothesis must of necessity be circular. (pp. 149-150)

Pratt went on to give a historical example of how circular concepts can lead to gain. Shortly after the planet Uranus was found, it became evident that its orbit could not be accounted for by the known motions of Jupiter and Saturn. After it was realized that inaccurate observations were not involved, it was suggested that the deviations in orbit must be due to the action of a still more distant, as yet undiscovered, planet. Calculations were made of the orbit such a new planet would have to have to produce the positions observed for Uranus, and this hypothesized planet was regarded as a reasonable explanation for the perplexing behavior of Uranus. Such an explanation, noted Pratt, is a perfect illustration of circularity, in which "the formal properties of the calculated planet were derived from the material properties, that is, the observed positions of Uranus, and then these same formal properties were used to explain the behavior of Uranus" (Pratt, 1939, p. 153). This circular reasoning led to the discovery of a material object, now called Neptune. The concept of instinct has had a similar history. Countless patterns of behavior among all forms of

Work on this article was supported in part by grants from the MacArthur Foundation and grant 1R01 DAO2976 from the National Institute on Drug Abuse.

We would like to thank Philip E. Tetlock, Seth Roberts, and Guy Swanson for their helpful comments and suggestions on an earlier draft of this article.

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animal life were attributed to wired-in mechanisms called instinct. Instinct, in turn, was used to explain these behaviors. By itself, the concept was of little value; however, it motivated important work on the role of environmental and hormonal variables in the ring dove's reproductive behavior (cf. Lehrman, 1964).

What this history should tell us is that circularity in the sense discussed by Pratt is not only inevitable in exploratory research, but that it can also prove ultimately valuable in advancing knowledge and understanding (see also formulations by Carnap, 1936; Kant, 1956; Quine, 1950). The value can come from a concept's capacity to point to hitherto only suspected material objects and characteristics, as in the case of Uranus, or organize a search for more complete descriptive knowledge, as in the case of the transformation of the vague concept of instinct into a rich understanding of the internal (e.g., hormonal) and external (e.g., behavior of a ring dove's mate) conditions that shape an animal's behavior. As we shall try to show below, these points are relevant to criticisms of the Hassles Scale and the relational, cognitive conceptions of stress on which the scale is based.

Confounding in the Hassles Scale

In commenting on the Hassles Scale, Dohrenwend et al. (1984, p. 223) wrote:

Monroe (1983) has observed, for example, that "while at face value the hassles scale developed by Kanner et al. (1981) appears to contain relatively minor everyday difficulties (e.g., traffic noise, preparing meals, having to wait, etc.), closer inspection of the scale reveals numerous items that may be more directly related to psychological problems or symptoms." (p. 191)

As noted above, the study reported by Dohrenwend et al. assessed confounding in the Hassles Scale and two other measures, the Life Events Scale (Holmes & Rahe, 1967) and the Instrumental-Expressive Social Support Scale (Lin, Dean, & Ensel, 1981) by having clinical psychologists rate each item on a scale ranging from 1 ("almost certainly a symptom of psychological disorder") to 5 ("almost certainly not a symptom of psychological disorder"). Ratings on all three tests varied from a low value of 1.8 to a high value of 4.6. For the Hassles Scale the average rating was 3.17, whereas for the Holmes and Rahe life events measure it was 3.52, and for the Instrumental-Expressive Social Support Scale it was 2.72. The verbal designation of 3 on the rating scale was that the item was "about as likely as not to be a symptom of psychological disorder" (Dohrenwend et al., 1984, p. 224).¹

¹ In the Dohrenwend et al. (1984) study, the Hassles Scale items were reworded, though usually in minor ways. Nonetheless,

On the basis of their findings, Dohrenwend et al. concluded:

The use of measures such as these almost guarantees positive correlations between "stress" and illness outcomes, but contributes little but confusion to our understanding of the role of environmentally induced stress in psychological stress and disorder. Nor is this problem of confounding measures of stress with measures of psychological symptoms limited to studies of psychopathology. It interferes as well with our understanding of the role of environmentally induced stress and physical illnesses which tend to be strongly related to psychological distress and disorders. (p. 228)

There are serious problems with this conclusion, especially with regard to daily hassles. Our rebuttal will be presented in three parts. In the first part we argue that Dohrenwend et al. have not shown that the items of our Hassles Scale and outcome measure are actually redundant, but only that the correlation could be explained—we think inadequately—on the basis of a third variable, common to both the independent variable (where it is implicit) and the dependent variable (where it is explicit), namely, what they called psychopathology. In the second part we provide a reanalysis of our data, using the clinical ratings obtained by Dohrenwend et al. (1984) and a factor analysis of the Hassles Scale, and show clearly that the so-called confounding does not affect the stress-symptoms relationship. Finally, the solution to the problem of confounding that is usually proposed—and was proposed by Dohrenwend et al.—is to eliminate any subjective elements, such as appraisal or distress, from the environmental sources of stress. This solution returns us to an older, stimulus definition of stress that must eventually be rejected if we are to make progress toward an understanding of psychological stress, emotion, and adaptational outcomes. In the third section we ad-

such changes might well have affected the ratings of items with respect to psychopathology. For example, an item that appears in our version of the scale as "gossip" was rewritten as "You have been concerned about gossip." "Unexpected company" was changed to "You have had unexpected company." All the items in our original scale were changed in similar ways, and it is difficult to ascertain whether and how such changes might have affected the ratings of clinicians, although, if they did have an effect, they would have added to any confounding with psychopathological content, because being "concerned" is now explicitly rather than implicitly stated in the item. Ironically, Dohrenwend et al. pointed out that "some hassles such as 'having unexpected company' or 'having to care for a pet' are highly unlikely to be confounded with symptoms, and others could probably be made so by avoiding the use of terms like 'concerned with' in their description" (pp. 228-229). Our view of the psychodynamics of hassles (cf. Lazarus, 1984) is that the mere endorsement of an item implies both "concern" and a negative reaction to a previous experience. Nevertheless, it is not clear to what extent the findings of Dohrenwend et al. are specific to *their* version of the Hassles Scale.

dress this issue, elaborate our theoretical position, and present stress as a complex rubric rather than a simple antecedent variable.

Psychopathology as the Source of Confounding

Although some common measurement terms were originally present in the Hassles Scale and the outcome variable, the Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974a, 1974b), they were deleted in the analyses reported by Kanner et al. (1981). Thus, there was no explicit redundancy in the terms. This deletion leaves as a possibility only the second kind of confounding, which is based on the premise that to some extent the items on the Hassles Scale measure psychopathology, which accounts for the relationship between hassles and symptoms.

Is this a sound premise? The answer depends, of course, on what is meant by psychopathology, which is typically a vague concept. The clinical psychologists used by Dohrenwend et al. were not told what criteria to use in judging psychopathological content, and we do not know the concept they employed individually or collectively to assess this property. Indeed, the considerable variability in the ratings for each Hassles Scale item suggests that there may have been many such concepts.

Thoits (in press) has argued that affective criteria are at the core of most assessments of psychopathology. She stated that

an examination of the criteria for mental disorders in the most recent Diagnostic and Statistical Manual of Mental Disorders, DSM-III (American Psychiatric Association, 1980), indicates that excessive or inappropriate affect and affect displays are important indicators for several types of disorder. My informal analyses of the diagnostic criteria in DSM-III reveal that inappropriate, usually negative, emotional states or emotional displays are an essential defining feature of 81 out of a total of 228 disorders (35.5%) and an "associated feature" of 64.9% of these disorders. These percentages would be even higher if disorders due to genetic or organic causes (e.g., mental retardation, substance abuse, organic disorder) were excluded. These observations suggest that socially inappropriate or undesirable feelings and feeling displays play an important part in the recognition and labelling of disturbance. Psychological disturbance might usefully be conceptualized as, then, persistent or recurrent *emotional deviance*. (emphasis added)

Thoits is by no means the only writer to view psychopathology in terms of manifestations of emotional distress. Stimulated by the great interest in depression, Gotlib (1984) too has pointed out that "self-report measures of a number of types of maladaptive functioning may all essentially assess one construct, which might best be labeled *dysphoria*, *malaise*, or *general psychological distress*" (p. 26, emphasis added). He noted that previously Welsh

and Dahlstrom (1956) had identified two main dimensions of the Minnesota Multiphasic Personality Inventory (MMPI) scales by factor analysis, with the first factor seeming to represent general psychiatric distress or disturbance. Gotlib and others provided further evidence that a wide variety of measures of depression, dysfunctional attitudes, anxiety, nonassertiveness, and the Hopkins Symptom Checklist (the SCL-90) are highly intercorrelated, suggesting that they tap, at least with subclinical samples, some kind of general psychopathology that involves the endorsement of multiple forms of emotional distress.

We quarrel with the idea, however, that distress per se should be regarded as tantamount to psychopathology (cf. Lazarus, in press). A person who experiences anxiety or fear is not necessarily disturbed or neurotic. We must know the type of distress, the circumstances under which it is manifested, and the processes that explain it. Furthermore, still other concepts of psychopathology are possible, such as the rigidly self-defeating cognitions described by Beck (1976) and Ellis (1962) or the ego psychology formulations of defensive processes (e.g., Haan, 1977; Loevinger, 1976; Menninger, 1963; Vaillant, 1977), which all hinge on a failure of reality testing and inflexible, inner-determined, and developmentally primitive defensive styles.

To return now to the findings of Dohrenwend et al., if we examine the hassles items rated highest and lowest in psychopathology, we can see that the link between hassles and psychopathology is highly inferential. The hassles item rated as having the most psychopathological content was, "You have had sexual problems other than those resulting from physical problems," which had the lowest score of 1.8. The following items were also rated as having high psychopathological content: "You are concerned about your use of alcohol" (1.9), "You have had trouble making decisions" (2.0), and "You have had a fear of rejection" (2.0). In contrast, the four hassles items rated as having the least psychopathological content were "You have had unexpected company" (4.6), "You have had to care for a pet" (4.6), "You have been financing your children's education" (4.4), and "You have had to plan meals" (4.4). Given Thoits and Gotlib's argument, it is noteworthy that, of the items considered to be most confounded, only one explicitly refers to emotional distress, in this case fear, whereas the others have to do with using alcohol or drugs, experiencing sexual problems, and making decisions.

Clinicians who view these items from the standpoint of psychopathology probably assume that the items represent people's chronic concerns, although in the Hassles Scale the items are endorsed only for a specific period such as the past month, week, or day. Nevertheless, by what reasoning are concerns

with sexual problems, use of alcohol or drugs, making decisions, and rejection signs of mental illness or disturbance? Why is concern over such matters more psychopathological than being bothered over having to care for a pet, having had to plan meals, or having had unexpected company? What concept of mental illness do the former hassles reflect?

Fear of rejection, for example, is the basis of most advertisements of soap, shampoo, and mouthwash, and therefore it can be a mundane fear indeed. The unstated question, of course, is when is such fear a sign of illness? Drinking is common among perfectly well-functioning people, and unless drinking in our society is per se psychopathological, it might be an indication of considerable wisdom that a person is concerned about whether he or she is drinking too much. Furthermore, worrying about such matters might be far less deviant than worrying about unexpected company and planning meals; one could argue that anyone who gets upset about such routine matters is the more troubled person. In any case, without reference to the actual context of a person's life, hassles such as these tell little about the psychological soundness of the person who endorses them. For example, it could be quite appropriate for a recently divorced man or woman in our society to be concerned about fear of rejection. Even though no reputable clinician would offer a diagnosis of psychopathology without understanding the context of a difficulty, this is exactly what the clinicians in the Dohrenwend et al. study were asked to do.

Reanalysis of Our Data in Light of the Dohrenwend et al. Findings

What follows is an empirical examination of the hypothesis that the strong relationships observed between hassles and symptoms in prior studies (Kanner et al., 1981) resulted from the inclusion of a confounded variable, psychological symptoms, in the Hassles score. We took two approaches, both involving a reanalysis of the original data set. First, we used the item ratings obtained from the study by Dohrenwend et al. (1984) to compare the relationships to psychological symptoms of hassles that were found to be more confounded and those found to be less so. If the Dohrenwend et al. specific confound hypothesis is correct, hassles items rated high on psychopathology or psychological difficulty should show a stronger correlation with symptoms than items rated low.

Second, we factor analyzed the Hassles Scale to determine whether differences existed in the relationships between various empirically derived Hassles subscales and symptoms. If our previously reported findings were due to either a direct or con-

ceptual overlap between the Hassles Scale and symptom measures, then those subscales tapping "intrapsychic" hassles should show a stronger relationship to symptom measures than purely "environmental" hassles.

The sample consisted of 100 community-residing adults (52 women and 48 men) aged 45 to 64 years who participated in a 12-month study of stress processes.² Subjects were predominantly married (86%), were well educated (the mean was 13.7 years of education), and had high incomes (the median was \$20,000 and above in 1978).

The Hassles Scale (DeLongis et al., 1982; Kanner et al., 1981) had been completed by subjects monthly for nine consecutive months. The questionnaire consisted of 117 items, and subjects endorsed items that "hassled" them during the past month. Subjects rated each hassle on a 3-point scale as having been "somewhat," "moderately," or "extremely" severe. For the reanalysis of the findings of Dohrenwend et al., we used a frequency score, a simple count of the number of items checked, in order to maintain comparability with prior reports.

In order to factor analyze the Hassles Scale, severity ratings for each item were summed over the nine administrations of the questionnaire, yielding scores on each item ranging from 0 to 27. Forty-five items that were endorsed during the nine-month period by less than 50% of the sample were excluded from the factor analysis. An additional eight items were ultimately dropped from the factor analysis because they had low or unstable factor pattern loadings.

The remaining items of the Hassles Scale were submitted to principal factor analysis with oblique rotation, with an eight-factor solution yielding a conceptually meaningful set of factors. The factors can be characterized as follows:

Household hassles (11 items): for example, "preparing meals," "shopping," and "home maintenance";

Health hassles (10 items): for example, "physical illness," "concerns about medical treatment," and "side effects of medication";

Time pressure hassles (9 items): for example, "too many things to do," "not enough time to do the things you need to do," and "too many responsibilities";

Inner concern hassles (9 items): for example, "being lonely," "concerns about inner conflicts," and "fear of confrontation";

Environmental hassles (8 items): for example, "neighborhood deterioration," "noise," and "crime";

² A more detailed description of the sample, procedures, and instruments used in this study can be found in Kanner et al. (1981) and DeLongis et al. (1982).

Financial responsibility hassles (7 items): for example, "financial responsibility," "concerns about owing money," and "financial responsibility for someone who doesn't live with you";

Work hassles (6 items): for example, "job dissatisfaction," "don't like current work duties," and "problems getting along with fellow workers"; and

Future security hassles (4 items): for example, "concerns about job security," "concerns about retirement," and "property, investments, or taxes." Scale reliabilities were high, with alphas ranging from .79 to .91.

The Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974a, 1974b) is a measure of psychological symptomatology that has been shown to have substantial validity and reliability. The scale is particularly appropriate for use in this study because of its demonstrated sensitivity to low levels of symptoms in normal populations (Rickels, Lipman, Garcia, & Fisher, 1972; Uhlenhuth, Lipman, Balter, & Stern, 1974). Subjects completed the symptom checklist twice, once in the second month of the study (Time 1) and once at the end of the study (Time 2).

To perform the reanalysis of the original data using the first approach, hassles items were placed into one of three groups, according to the ratings given them by the clinical psychologists in the Dohrenwend et al. study. Those items with a mean rating below 3.0, indicating a high likelihood of being a "symptom of psychological disorder," were placed in the confounded group (37 items). Those items with a mean rating above 3.5, indicating a low likelihood of being a "symptom of psychological disorder," were placed in the unconfounded group (35 items). Forty-three items with ratings between 3.0 and 3.5 fell in the middle group.

Pearson product-moment correlation coefficients among each of the three groups of hassles with Hopkins Symptom Checklist scores are presented in Table 1.

Correlations for the three groups of hassles with psychological symptoms did not differ signifi-

Table 1
Pearson Correlation Coefficients for Hassles With Psychological Symptoms

Hassles	Psychological symptoms	
	Time 1	Time 2
Unconfounded group frequency	.59	.50
Middle group frequency	.63	.49
Confounded group frequency	.68	.56

Note. All correlations are significant beyond the $p = .001$ level.

Table 2
Pearson Correlation Coefficients Among Hassles Factors and Hopkins Symptom Checklist Scores

Hassles factors	Psychological symptoms	
	Time 1	Time 2
Future Security	.49	.40
Time pressures:		
Males ^a	.17*	-.08*
Females	.60	.42
Work	.40	.34
Household	.57	.44
Health	.63	.57
Inner concern	.59	.50
Financial responsibility	.38	.36
Environment	.59	.46

Note. All correlations are significant beyond the $p = .001$ level unless otherwise noted.

^a Correlation coefficients differed significantly by gender (z for Time 1 = 2.54; z for Time 2 = 2.88; $p < .01$).

* $p > .10$

cantly. In fact, they were remarkably similar. For example, the correlation between confounded hassles and psychological symptoms measured at Time 2 was .56, whereas the relationship for unconfounded hassles was .50. Clearly, the Dohrenwend et al. (1984) confound hypothesis does not account for the strong relationship between hassles and psychological symptoms that we reported (Kanner et al., 1981). Nor does it explain our earlier findings of a stronger relationship between hassles and symptoms than between life events and symptoms. The present analysis suggests that hassles are strongly related to psychological symptoms, whether or not they appear to clinicians to indicate psychopathology.

The second approach depends on the factor analysis of the Hassles Scale. Because there were no significant differences among the relationships of the hassles factors to the various subscales of the Hopkins Symptom Checklist, the relationships reported here will be for total symptom checklist scores. As shown in Table 2, seven of the eight hassles factors were significantly correlated with total Hopkins Symptom Checklist scores. Pearson correlation coefficients ranged from a low of .34 for work hassles with Time 2 psychological symptoms to a high of .63 for health hassles with Time 1 psychological symptoms.

Although the inner concerns hassles factor shows the strongest relationship to psychological symptoms, the difference in the strength of the relationship of this potentially confounded scale to symptoms and that of the scales considered unconfounded is not significant. For example, environmental hassles such as "noise," "crime," and "neighborhood deteriora-

tion," which we would expect to be least susceptible to confounding, are correlated .46 with psychological symptoms (Time 2), whereas inner concerns such as "being lonely," "concerns about inner conflicts," and "fear of confrontation" are correlated .50.

What we have shown in the two data reanalyses can be summed up as follows. First, the degree of confounding in Hassles Scale items as evaluated by the Dohrenwend et al. (1984) clinical raters has no significant effect on the correlation between hassles and psychological symptoms. Hence, such "confounding" cannot provide an explanation of this correlation.

Second, it makes little difference whether one correlates hassles items that appear to describe purely environmental hassles with psychological symptoms, or with items that deal with inner concerns. That these categories of hassles do not differentially predict psychological symptoms is exactly what our theory of hassles suggests: The guiding feature of an endorsement of *any* item as a hassle is the mediating process of appraisal in which the experience is evaluated by the person as negative and salient. It does not matter whether the hassles item refers to a condition of the environment or a reaction or state—what is important is how the person appraises the condition, reaction, or state with respect to its significance for his or her well-being. To make this point clear and to further examine the issues of confounding and circularity in the study of stress and distress, we shall discuss the implications of relational conceptualizations of stress and elaborate the theory underlying the methodological problem.

Stress Theory and the Catch-22

In the name of scientific rigor, Dohrenwend et al. and others urged researchers to measure stress by means of pure environmental events, uncontaminated by perceptions, appraisals, or reactions. To eliminate possible redundancy, they opted, in effect, for abandoning the hard-won insight that there are no environmental stressors without vulnerable people whose agendas and resources influence whether they will experience stress, the form it will take, and its short- and long-run outcomes. Those who press the demand for purely objective measures of stress present those of us who accept the premise of individuals' vulnerability with a classic catch-22: No environmental event can be identified as a stressor independently of its appraisal by the person.

It is difficult to see how social scientists can argue against a relational approach to stress, considering the widespread acceptance of a relational view of disease itself, as argued forcefully, for example, by Dubos (1959). Disease is no longer thought of as caused solely by environmental agents such as bacteria and viruses but by multiple factors. The rela-

tional view of disease is illustrated by the concept of "host resistance" (Cassel, 1976; Syme, 1984), which postulates that many of the conditions that affect whether infection occurs lie in the organism itself. Stress, similarly, is not definable as an environmental stimulus or agent but as a relationship between a stimulus and a vulnerable person.

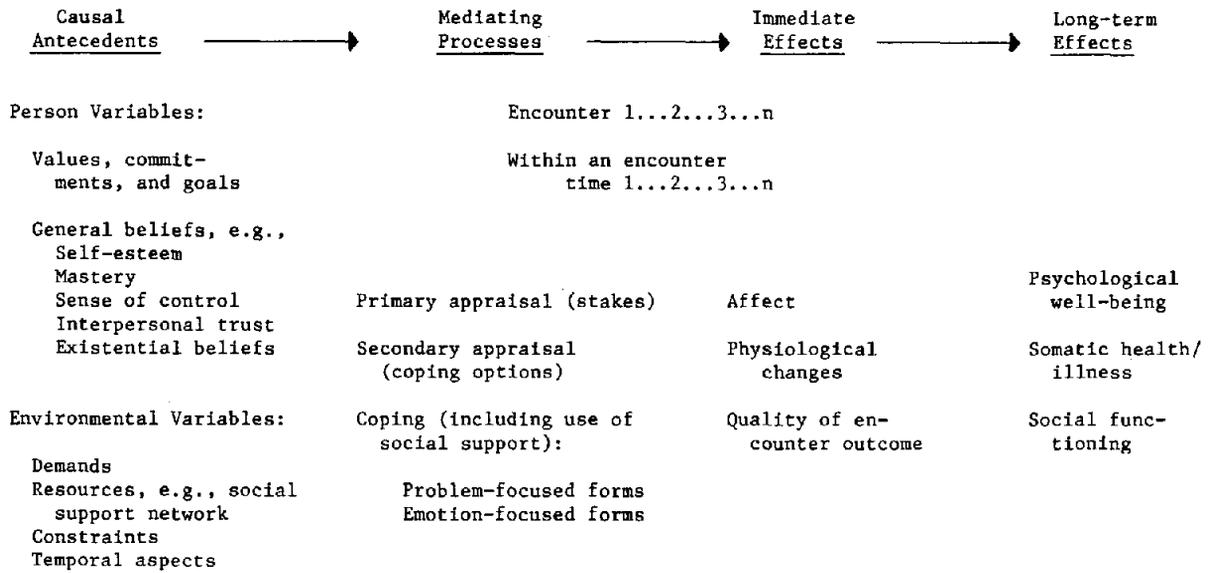
Cognitive theories of emotion state, for example, that fear is a consequence of an individual's appraisal that he or she is not able to neutralize danger. Although this appraisal is an essential component of fear in a specific context, it is not the same as fear. In effect, the overlap between appraisal and fear is not total. Similarly, stress (viewed relationally) and distress overlap, but they are not the same. Whatever reservations one might have about the value of such a conceptualization, it is redundant only to a degree. If we were to follow the recommendations of those who worry about confounding due to a common appraisal term, Bandura's research on self-efficacy and fear (e.g., Bandura, Adams, Hardy, & Howells, 1980) would be regarded as tautological. One would have to argue that to expect to be inefficacious is the same as to be actually fearful. Efficacy expectations and appraisals refer to cognitions; fear and distress refer to emotional states that include cognitions. These are part-whole relationships. What we must be careful to avoid are whole-whole relationships, where the independent and dependent variables are mutually and totally inclusive.

With respect to the definition of psychological stress within this formulation, we have consistently argued (cf. Lazarus, 1966; Lazarus & Folkman, 1984) that stress is best regarded as a complex *rubric*, like emotion, motivation, or cognition, rather than as a simple variable. The meaning sphere of stress is defined by many variables and processes that are reflected in the person's appraisal of a relationship with the environment as relevant to well-being and taxing or exceeding his or her resources. Changes in the relationship and how it is appraised by the person explain the flux we observe in the short-term emotional reactions and behavior that flow from any person-environment encounter (Folkman & Lazarus, 1984).

We can limit the circularity that is inevitable with relational definitions of stress by asking what it is about the person, in interaction with a given environmental situation, that generates appraisals of harm/loss, threat, or challenge, the three major variants of psychological stress in our model. Figure 1 provides a set of variables that, from our theoretical standpoint, are involved in stressful encounters and are fruitful to study.

Person and environment antecedent variables interact to produce divergent appraisals that reflect

Figure 1
Illustrative System Variables for the Stress Rubric



Note. Although not shown here, the model is recursive. Also, note the parallelism between short- and long-term effects.

whether the encounter is irrelevant, benign, or stressful, and if stressful, what might be done to cope. The concept of appraisal integrates person variables, such as values and commitments, with the environmental conditions being faced, and provides the bases of individual differences in reaction. Appraisal shapes the coping process, which in turn affects the immediate outcome of the encounter and probably also the long-term adaptational outcomes of multiple encounters. Although it is not shown in Figure 1, the system is dynamic in that appraisal and coping processes continuously change, and it is recursive in that outcomes can influence antecedent variables, depending on where in the flow of psychological events one chooses to begin and end the analysis (Coyne & Lazarus, 1980). For example, psychological symptoms or distress can themselves be sources of stress. The point applies also to health concerns such as headaches or not getting enough sleep; for many people sleeplessness and health problems are a source of stress in daily living as well as a reaction. Thoits (1983) has recognized this dilemma of recursive conceptualizations of stress and symptoms in her review of research connecting life events with psychological distress.

With such a multivariate, multiprocess system, one can easily see that no single variable—whether in the environment or within the person or whether a structural, causal antecedent variable; a process; or an outcome—can stand for stress. All the variables

in the system contribute potentially to the immediate appraisal of stress and emotional effects and perhaps to long-term effects also if a given process is stable or recurrent over time or across encounters. By considering the system as a whole, one can see what it means to speak of stress as a rubric rather than as a variable and can recognize that none of the variables individually is capable of explaining the emotional response. From this perspective, stress is just a handy term to refer to the operation of many variables and processes in situations in which the demands tax or exceed the person's resources, and the person appraises the encounter as relevant to well-being, engages in coping processes, and responds cognitively, affectively, and behaviorally to feedback about what is happening.

Once the relational approach that this model describes is well understood, the term *environmentally induced stress*, or *environmental stress*, loses its usefulness, because it is the person-environment relationship that is stressful or emotionally arousing. To one person a traffic jam is simply a condition of life to be managed philosophically or negotiated with minimum stress and distress; such a person may not report the traffic jam on the Hassles Scale. To another, however, a traffic jam may be an additional pressure in an already pressured existence, or may represent a personal affront by the social system. Such a person is very likely to remember the traffic jam and to endorse it as a severe hassle.

Let us further test the traditional environmental stressor concept. Is an insult a stressor? Often, but not always. An insult may not be perceived as such if it is subtle or if it is directed at a person who regards it as having no potential for doing damage. Even major events, such as the death of a loved one, divorce, loss of job, illness, incapacitation, and so on, elicit wide individual variation in the degree to which they are experienced as stressful. What about stressful conditions that are characterized by the absence of an identifiable stimulus, such as when a person who needs approval from a loved one is ignored and reacts with great distress? It would take a considerable expansion and distortion to regard the absence of a response by another—a nonevent—as a stimulus at all. But more to the point, there is simply no way to define an event as a stressor without referring to the properties of persons that make their well-being in some way vulnerable to that event. If one accepts this reasoning, it is counterproductive to keep trying to reify the environmental input as a stressor, and it is essential to find principles for predicting the stress response from the person–environment relationship.

We should be asking, instead, what it is about the person and the situational context that produce appraisals of harm and threat or appraisals that some benefit is possible or probable. The discovery of these antecedents of appraisal would be of greater informational and research value than merely comparing people in terms of the amount of stress they experience as identified by the frequency and/or the intensity of daily hassles. To take this important further step requires examination of individual differences in the content patterns of hassles over time for both individuals and groups of people chosen on the basis of vulnerabilities they share (Lazarus, 1984). These differences could be the result both of stable factors in the individual's environment such as a continuing marriage, secure neighborhood, or nonfluctuating conditions of work, and of stable personal agendas such as patterns of commitment (e.g., Type A behavior, perfectionism, ambition, insatiable needs for approval, etc.), the individual's beliefs about his or her capabilities or lack of them, and the individual's skill or lack thereof in coping with important ongoing sources of stress. The ability to predict the nature and type of response on the basis of these or other antecedent variables would do much to overcome any problems of circularity in the study of stress processes.

Conclusions

One must conclude that stress is an "unclean" variable in that as a concept it depends on the interaction of two complex systems, the environment and the person. There is no way to separate them

without destroying the concept of stress as a relational and cognitively mediated phenomenon. To suggest that the independent variable be cleaned up, so to speak, is not useful, because stress does not exist in the absence of the person–environment relationship and the processes that explain this relationship. The environment affects the person, and the person affects the environment. This recursive arrangement goes on in all adaptational encounters, in a fashion implied by Bandura's (1978) term "reciprocal determinism." The only way these interlocking variables or systems can be separated is by studying their temporal relations cross-sectionally in slices of time, as first one variable and then another takes on the role of antecedent (see also Coyne & Lazarus, 1980; Lazarus, Coyne, & Folkman, 1982; Phillips & Orton, 1983).

Thus, some of the confounding that we have been discussing reflects the fusion of variables in nature rather than being merely the result of measurement errors of researchers. If we try to delete the overlap in variables of genuine importance, we will be distorting nature to fit a simpler, mythical metatheory of separable antecedent and consequent variables. We urge researchers to be very wary of throwing out the baby with the bath water in their efforts to objectify stress as an event in the environment. The positivist position has, over the past 15 years, repeatedly failed to demonstrate its usefulness in stress and coping research.

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