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CONCEPTUALIZING AND MEASURING LIFE STRESS: PROBLEMS, PRINCIPLES, PROCEDURES, PROGRESS

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SUMMARY

Life stress has long been a popular explanation for physical and mental disorders. Despite the intuitive appeal of the premise that adverse circumstances predispose to disease, stress research has been hindered by problems in defining and measuring the construct. In the present article these shortcomings are outlined and examples are provided to illustrate many of the basic principles involved. It is suggested that the complexity of human lives and the multifaceted nature of life stress pose ambitious demands in the assessment of life stress. Advantages and disadvantages of currently available procedures are discussed. Finally, recent advances in theory and practice based upon these procedures are outlined. Through such approaches, the assessment of life stress may more closely approximate the complexity inherent in the ongoing lives of people, without sacrificing the rigor required for a scientific understanding of the concept and its consequences.

KEY WORDS—Life events, stress measurement.

The impression that life's adversities cause not only unhappiness but also illness and madness has been a belief common to ages of old as well as to our own. Terms reflecting such notions as stress, distress, or strain have been in the English vocabulary for centuries.[1-3] Most commonly, these expressions conveyed the sense that, for the unfortunate souls destined to endure them, difficult social circumstances had a myriad of deleterious consequences. Added to the personal hardships faced by different men and women of any era, the advancing complexity of modern civilization led to speculation that people are subject to even greater societal pressures for which they are unprepared. Once again, this is a view not unique to our times but has been proposed previously. John Hawkes noted in 1857:[4]

> It seems, indeed, as if the world was moving at an advanced rate of speed proportionate to its approaching end; as though, in this rapid race of time, increasing with each revolving century, a higher pressure is engendered on the minds of men and with this; there appears a tendency among all classes constantly to demand higher standards of intellectual attainment, a faster speed of intellectual travelling, greater fancies, greater forces, larger means than are commensurate with health. (See also ref. 3)

In a broad sense, then, stress is inherent in life and transcends specific times and circumstances. Moreover, people appear prone to perceive stress in a variety of situations, and to see it as contributing to many forms of dysfunction. The omnipresence of stress in the lives and minds of the populace constitutes a subjectively compelling mandate for understanding the construct in a more rigorous scientific sense. Yet this pervasiveness of stress, combined with its alluring explanatory appeal for all sorts of ills, also presents formidable problems to meaningful measurement and understanding of the concept and its potential consequences. Despite the proliferation of research over the past 20 years studying stressful life events and a variety of maladaptive outcomes, many problems have undermined the measurement of stress. The purpose of this article is to (a) delineate problems inherent in procedures for assessing life stress; (b) outline principles necessary to improve upon these procedures; and (c) discuss issues of importance for further

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developments in conceptualizing and measuring life stress.

PROBLEMS

Despite considerable effort and debate, no uniformity of opinion has emerged on the definition of stress.[1,5-8] This perhaps is not so surprising when one contemplates the magnitude of the task: to abstract and operationalize commonalities in experiences across different individuals, all of whom lead very different lives and face very different complexes of environment and experience, all of which is subject to constant change over time. Since stress infiltrates all aspects of one's life, the objective becomes one of developing an approach for comparing people across virtually all facets of their existence.

Interactional definitions

Although there is little consensus on these definitional concerns, there are certain points of accord. Typically stress is viewed as an interaction between the individual and his or her environment. That is, stress is a composite of environmental exigencies and the perception of these exigencies.[6] Two related facets of the interactional perspective on stress have proven problematic for stress research. At the level of theory, an obvious point of contention concerns the degree to which stress is determined by either of the two constituent components of the interaction — factors external to the person (i.e. the 'objective' environment) *versus* factors within the person (i.e. the 'subjective' perception). Individuals within very different environments and with very different perceptual tendencies can attain virtually indistinguishable stress scores within such a system. For example, a person who loses his home and belongings through natural catastrophe, yet strives to remain stoic about the incident, attains a comparable stress rating to someone who receives a minor traffic ticket, yet is greatly distressed by the incident. Conversely, individuals with essentially identical social circumstances can attain very discrepant stress scores.

At the present state of knowledge we do not know if one component (i.e. the circumstance or perception) is relatively more important for producing susceptibility to subsequent breakdown. Without a clear characterization of the two components, no progress can be made in distinguishing between the relative importance of individual differences in social circumstances *versus* individual differences in perception.

Stressful life events

One approach to resolving this difficulty has attempted to focus more exclusively upon the external environment. This has been apparent in the vast research literature on stressful life events.[9-11] By specifying relatively discrete events that lead to changes in one's life (e.g. marriage, divorce, loss of job), it is implicitly assumed that one maximizes the environmental aspect of the stress score and minimizes the perceptual input. Although in theory this approach has the virtue of segregating environmental input and perception, important problems remain.

First, the realm of information tapped by the individual's perception of the social circumstances is essentially lost. Yet, in developing an understanding of stress, this aspect may not be so crucial initially. It could be argued that individual differences in perception are only meaningful when they are grounded in a reliable system for delineating individual differences in that which is perceived: the social environment. Thus, while perception is undoubtedly an integral part of the stress process, one can only begin to understand variability in this dimension in light of its relationship to the actual social circumstances.

Second, and most relevant for the present discussion, is that in actual practice this separation of environment and perception is at best incomplete, at worst misleading. The vast majority of studies on life stress have been based upon self-report checklists of life events. These measures typically have been modeled after the original innovative scale of Holmes and Rahe, the Schedule of Recent Experiences (SRE).[12] In light of 20 years of experience, investigators have become increasingly aware of the limitations of the SRE and its derivative instruments. Early criticisms of these measures were compelling and were addressed in the development of new self-report checklists.[13] Yet many investigators now believe that perhaps the entire checklist approach rests upon a faulty foundation.[14] This view is based upon the opinion that self-report procedures are inadequate for developing a satisfactory system of measurement for life stress.

Beneath the surface appearance of simplicity lies obscured complexity, if not confusion, concerning what is actually being measured by life-event

assessments. Left to their own devices, subjects are quite variable in their approach to, and interpretation of, questionnaires such as the SRE. The items included in self-report checklists virtually all leave considerable judgement up to each individual. For example, 'serious illness of close family member' requires the person to evaluate what constitutes both 'serious' and 'close'. Left to their own interpretation, subjects will have substantial variability in what they define as events, owing to often highly idiosyncratic impressions.[15,16] With respect to the particular item concerning 'serious illness of close family member', one person may consider an acute but short-lived illness of a child (e.g. the flu) as very stressful and therefore endorse it. Another individual may consider a mild heart attack — where the crisis is past and the prognosis good — to be not quite serious enough. Consequently, the measure again becomes an uninterpretable blend of external stressors and subjective perception of the individual. (This example portrays one of the more obvious shortcomings of the self-report approach; more elaborate problems are addressed as examples in the next section as we discuss principles required for developing better procedures.)

In summary, prevailing procedures for assessing life stress, most notably self-report life-event checklists, have fallen short of the requirements imposed by the task. In the enthusiastic pursuit of exploring the associations between stress and a variety of disturbances, investigators have overlooked or ignored basic issues in definition and measurement. The problems of self-report checklists for assessing stressful life events stem from the complexity of the requirements unwittingly imposed on the respondent. What is lacking is a standard reference base for ensuring commonality of events across individuals. Without such a common reference point, measurement becomes meaningless. For something as multidetermined and complex as life stress, the reference base requires a system of principles and procedures to ensure standardization of measurement across individuals. In the next section we outline such guidelines and illustrate procedures that are useful for developing a standardized system of measurement.

PRINCIPLES

The goal of measurement is to provide a standardized system to operationalize life stress that is reliable over time and replicable in the hands of other investigators. One wishes to ensure that different people assessing the same phenomenon arrive at similar conclusions concerning the categories defined and the scores on the dimensions assessed. Given the complexity of any individual's life and the multifaceted nature of stress, this means that principles — explicit guidelines and operational criteria — are essential for making certain that experiences in the lives of different individuals are treated in a similar manner within the system and that the ratings of stress dimensions are anchored within a standardized reference base. The work of Brown and Harris[17] has been instrumental in delineating many of the basic considerations involved in the assessment of life stress.

Threshold considerations

Intuitively it may seem that life events are self-evident. Yet life is a continuous flow of experiences and transactions. Determining at what point ongoing experience becomes an event can be problematic. For any system of measuring life stress, there should be uniformity of procedures in addressing this basic issue. Otherwise, once again, it becomes impossible to meaningfully compare events across individuals. To illustrate this concern, we depict problems associated with three types of life experiences that require criteria and guidelines for systematic treatment.

The most basic concern is the threshold at which an experience constitutes an event. For many events there is a gradient of experience such that the incident may or may not be sufficient to qualify as an event. For example, arguments with family, friends, or work associates constitute a large class of events. Yet there is ambiguity in terms of what defines an argument, and therefore much latitude for variability in response. For instance, one individual who is extremely sensitive to conflict situations may characterize a furrowed brow and a mild disagreement as an argument, whereas someone who is characteristically more aggressive in interpersonal encounters may require a good deal of heated exchange before defining the experience as an argument. What is required is a set of criteria to establish the threshold value for defining the event and thereby anchor the definition of the event within a common framework of experiences across individuals. For example, the investigator might require particular characteristics of the interchange (e.g. raised voices), implications of the interchange

(e.g. threat to employment or continuation of the relationship), and duration (e.g. more than a momentary irritable exchange). There are many other classes of events that can be construed along a gradient of experience and that are subject to idiosyncratic interpretations (e.g. illnesses, work and school stressors, legal incidents, problems with children). Without initially imposing criteria to designate what qualifies as an event, the researcher risks having subjects with different thresholds for reporting life stress producing considerable distortion in the resulting measure.[15]

Other kinds of life events may appear to stand out more clearly from the ongoing experiences of the individual. Yet, upon closer scrutiny, it is also apparent that the definition of such events is unacceptably vague for the purpose of a reliable stress assessment. For instance, deaths appear to be relatively straightforward events, are commonly conferred a high level of stress, and are routinely included in life-event inventories. Yet, during any extended period of time, most individuals know of one or more people within their sphere of contacts who has passed away. The problem is that deaths that may be truly stressful (close family or friends) may be indiscriminately merged with deaths that are less meaningful to the person (e.g. distant work associate). Interestingly, in a probabilistic sense, the majority of deaths reported will most likely be from the broader network of more distant associates (as opposed to close affiliates). Once again, to reliably make such determinations guidelines are required to specify which individuals constitute the close interpersonal network of the individual. For example, criteria concerning how often they saw each other or communicated, their past history of interaction and mutual support, and so forth, would be developed.

Finally, many subjects interpret the items on self-report checklists quite broadly and report events for which they are not the primary person involved. For example, a subject may indicate the event 'Fired from work', yet upon probing indicate that it was her spouse or child who was actually dismissed. Although, again, one can suggest that this, too, is stressful, such counterargument simply betrays the looseness with which the term stress is used. In developing an understanding of the consequences of stress, the focus of the event — to whom it actually occurs — should be taken into account.[17] While there may be commonalities of stress that are imposed as a result of one's own loss of job or one's spouse's firing (e.g. economic consequences), there are a variety of other implications that are clearly not equivalent (e.g. personal failure and loss of valued activity; day-to-day unemployment, search for employment, or underemployment; etc.). Once again, such information is too easily lost with the self-report checklist format.

In summary, operational criteria are essential for specifying the components of the ongoing experiences of the individual that qualify as life events in a system of assessment for life stress. The respondent, trying as he or she will to be a good informant when completing such materials, understandably attempts to supply the investigator with a comprehensive depiction of his or her life. The serious and the not so serious, the important and the mundane, may be collapsed haphazardly, with only a remote bearing upon what the investigator intends to have measured. The complexity of the experience, and the requisite sophistication of the measurement process, cannot be summed up simply in a 'yes or no' response by the subject. It is up to the investigator to adopt a system based on operational criteria to ensure comparability of endorsed events across individuals.[15]

Definitional issues: Distinguishing events

Once one moves beyond the basic issues in defining what constitutes an event, other complex considerations arise when attempting to understand the occurrence of multiple events in the context of an individual's life. Most stressful life events are not isolated experiences. In tangled ways, they are often the consequences, correlates, or causes of several reported events; not infrequently, they are also simply redundant with other specified events. Several examples of these concerns illustrate the need for further guidelines and criteria to ensure systematic treatment of people's basic experiences for the measurement of stress.

Many major life events are not adequately encapsulated by any single item on a checklist but frequently are spread across multiple items. For instance, the event 'divorce' can also signify 'separation', 'change of residence', 'loss of income', or even 'arguments with spouse', 'troubles with in-laws', and a variety of other possible events. The event 'fired' could entail 'loss of income', 'change of work' or 'unemployment', 'changed residence', and so on. There are many instances in which an event on a checklist is merely one element in the structure of a broader life calamity. Subjects, of

course, are unaware of whether such complexes should be represented by one major superordinate event or whether all possible elements of life that are touched upon by the experience should be documented. Consequently, there is considerable variability in how each respondent treats such issues. Under these conditions, some people endorse only major events while others endorse all events that could conceivably bear on the issue — often to the point of marking down several events that simply reflect the same underlying experience. Once again, it is apparent that to entrust these decisions to the idiosyncratic interpretations of the respondent is an imprudent approach to measurement.[15,16]

At the present stage of knowledge, it is perhaps less important exactly how the investigator treats these concerns than it is that the concerns are treated in a consistent manner. For example, should one count a separation due to a violent argument as one event or two? Should daily arguments over a week period be counted as seven events or one? Should 'suffered a financial loss' consequent to being 'laid off' be one event or two? Explicit guidelines must be developed to handle such complicated, yet not at all uncommon, life situations. For instance, one might adopt a time frame to distinguish events (e.g. if two highly related events occur within one week they are treated as one). The major concern at the present stage is to derive a consistent set of guidelines in which to anchor the assessment procedures. Any practice will be admittedly somewhat arbitrary, yet not capricious: such procedures are the initial and necessary cost of standardization. With progressive research, these practices can be refined to better approximate a meaningful representation of the stress in the individual's life.

PROCEDURES AND PROGRESS

A comprehensive system for assessing life stress should address the complexity of life's adversities and the possible multifaceted nature of stress. As we have emphasized, such a system must first be standardized. Second, the procedures should allow for expansion beyond the assessment of individual events. Specifically, such a system would permit the investigator to (a) track not only the incidence of specific life events, but also how the events interact over time; and (b) assess specific dimensions of stress which may be characterized by particular kinds of events or stressors. In order to handle such complex information, interview procedures appear to be essential.

Promising procedures

Several investigators have developed alternative stress-measurement systems based on semistructured interviews.[16–18] Of these, the most elaborately documented and empirically investigated is the Bedford College Life Events and Difficulties Schedule (LEDS) developed by Brown and Harris.[17] There are several attractive features of this approach. First, the LEDS system yields clear, standardized definitions for determining which events qualify for inclusion. Predetermined criteria for each type of event have been developed to ensure that only distinctive types of experiences are recorded as events. Second, events are rated in terms of the focus of the experience (i.e. the person for whom the event is of primary significance).

Third, based on the information gleaned during the interview, more individualized ratings of life stress can be performed with the LEDS. For example, an innovative feature is the development of contextual ratings for life stress (e.g. threat or unpleasantness associated with the event). This rating incorporates specific information concerning the life circumstances of the individual in developing the stress rating. That is, the rating attempts to address the degree of stress that may be associated with an event given the life context of the particular person involved. The ratings, then, are more sensitive to the likely meaning of the event for that person, yet still are anchored in externally verifiable circumstances. Furthermore, there is an extensive catalogue of examples available to anchor these ratings, again in a standard format. Such procedures help to bridge the gap between the objective and subjective perspectives without resorting to the problems entailed with subjective perception.

A fourth virtue of this system is that it provides the basis for rating life events with respect to specific dimensions or characteristics. For example, some stressful events may be associated with experiences of loss (e.g. deaths, separations), whereas others may be associated more with danger of future adversities (e.g. serious illness). A variety of different dimensions may be part of the more global concept of stress and have distinct implications for subsequent functioning. Interestingly, Finlay-Jones and Brown found that events of loss typically predicted cases of depressive disorders, whereas events of danger typically predicted cases

of anxiety disorder.[19] The LEDS provides a flexible format wherein other dimensions of hypothesized importance for particular types of illness may be readily included.[20]

Finally, much of what is referred to as life stress may not only be the result of temporally discrete life events but also of ongoing chronic adversities. Theoretically, this distinction is potentially important. Certain types of disorders with acute forms of onset may be associated with the occurrence of major life events (e.g. acute clinical depression). Other types of disorders, with a more insidious and prolonged onset, may be related to more enduring forms of stress (e.g. cardiovascular disease). A comprehensive assessment system should be capable of addressing this aspect of stress as well. The LEDS is designed to include ratings for ongoing difficulties of the subject's life.

Progress: Recent developments

Many life events appear to be in part attributable to the behavior of the person upon whose life the stress falls. Other events appear to be meaningfully related over time, or to be importantly associated with ongoing difficulties. Recent developments in stress assessment have been directed towards a better understanding of the complex interrelations between the person and the stressors he or she experiences. A firm foundation for establishing the basic events and difficulties is necessary to achieve such objectives; most of the developments have been accomplished employing the LEDS.

Not all events are random occurrences. In fact, the majority of stressful experiences are often in part attributable to actions of the subject. For studies of particular types of disorders (e.g. psychopathology), it is important to understand the degree to which the subject may have brought the event about. Two concerns are most relevant. First, it may be that, as a consequence of disturbed behavior, stressful events occur. Obviously such forms of stress are not those of interest to investigators studying etiology, for they are confounded with preexisting disorder. Yet with questioning and attention to dating the event's occurrence and the disorder's onset, the researcher can discern whether or not, for example, a break-up of an important relationship was a possible contributor to, or consequence of, the depressive episode.

More generally, however, it is of interest to know the various ways in which individuals become subject to life's adversities. That is, do they bring them about directly (e.g. purposefully change jobs), do they indirectly contribute to their occurrence (e.g. lifestyle or socioeconomic considerations), or are they true victims of fate (e.g. natural disasters)? Such ratings help to develop insight into the larger forces that may dictate or influence the more proximal stress factors.

Life events and difficulties obviously do not occur in a vacuum, but rather take place in the context of the individual's life. Recent trends in the measurement of stress in a sense are directed towards putting the 'life' back into events and difficulties through a better representation of their interrelations. Two developments exemplify this issue. First, not all life events are necessarily cumulative in their effects (as assumed with the checklist approach). Rather, some events may nullify, or neutralize, the stress of previous experiences.[20,21] For example, an individual who is laid off could shortly thereafter regain employment. The latter event could offset many of the adversities of the original incident. Since life is a process of adaptation, it is not surprising that many life events reflect attempts to deal with previous problems.

The second area of recent development concerns another way of thinking about the interrelations between events. That is, instead of nullifying the negative consequences of previous experiences, new events may exacerbate the persistent stressful conditions. In particular, it is likely that ongoing difficulties — the chronic stressors of people's lives — may set the stage for major negative life events. For example, ongoing relationship problems are highly correlated with major events such as break-up, divorce, infidelity, and so on. It may be that the matching of specific types of events with ongoing difficulties to which the events may be related proves to be synergistically stressful.[20]

In a sense, these recent areas of development represent attempts to put the 'life' back into the standardized skeleton of experiences. The potential is that one may gain a more complete representation of individual differences in life stress, replicable across individuals and investigators. It is upon such a foundation that an understanding of individual differences' susceptibility to disorder may be built.

CONCLUDING REMARKS

Stress is a concept that virtually everyone knows yet no one can define precisely. Since stress is so

apparent, prevalent, and straightforward in a subjective sense — to lay person and scientist alike — investigators thought it reasonable that people from all walks of life could reliably report on the degree of stress in their private lives. Our premise has been that the forcefulness of this personal knowledge has impeded progress in conceptualizing and measuring the dimensions of life stress. This initial stance, embodied in self-report checklists of life events, obscures the complexity of the task, both theoretically and operationally. In closing, we wish to briefly discuss conflicting points of view, as well as other social factors potentially involved in the genesis of stress-related disorders.

Other investigators of life stress suggest that with appropriate improvements in self-report measures subjects may be able to better report on the stress in their lives.[22,23] That is, with more explicit instructions, better wording, and so on, study participants can more effectively structure their responses to such questionnaires and thereby provide more valid information. Although improvements could clearly come from such efforts, it is most likely that the procedures will continue to fall short of the requirements for developing a sound scientific body of information on stress. Measurement is built upon the standardization of procedures. The examples we have provided impart insight into the underlying intricacy of standardizing stress in the inevitably complicated lives of people. Over 20 years of experience accrued since the SRE was deployed suggest that, if nothing else, experts continue to disagree on what constitutes stress and how to most adequately measure it. Placing these problems at the feet of naive study participants will not magically put order or consistency into the chaos of concepts and measures. Only through the development of routine procedures, comprising explicit guidelines and operational criteria, can an informative body of evidence be developed.[15,24]

It is not surprising that, given the problems with stress measurement, reported associations between stress and different disturbances have frequently been of low magnitude.[11] It is likely that with refined concepts of the dimensions of stress and improved measurement the predictive importance of the construct will be enhanced.[20] Yet a complementary approach to studying the effects of stress has gained popularity in recent years, and often has been regarded as the direction through which the relationship of stress to disorder will be elucidated. Instead of a more intensive inquiry into what constitutes stress, this area of study focuses upon the ambient factors that modify the impact of stress.

A range of social, psychological, and biological considerations has been proposed that moderate stress impact.[10,24] For example, social support has been found to influence health and well-being.[25] It is noteworthy that many of the conceptual and measurement issues involving life stress are equally applicable to this area of research as well.[26] The development of such broad-based conceptual models could assist in clarifying the conditions under which stress may or may not lead to adverse consequences. However, progress can only be made with adequate attention to theory and measurement of the construct so central to these expanded frameworks: stress. Through such simultaneously expanded and intensive approaches, the age-old impression that life's adversities lead to illness and madness may be more rigorously reformulated to specify under what circumstances, and for whom, which particular dimensions of life stress may lead to distinctive forms of disorder.

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