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Psychoanalytic Theory *See:* Psychoanalysis.

Psychological Stressors, Overview

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Glossary

Catecholamines	Neurotransmitters, including epinephrine, norepinephrine, and dopamine, that promote sympathetic nervous system activity. They may be released in substantial quantities during stressful times.
Corticosteroids	Complex chemical compounds produced in the outer layer of the adrenal gland, which include both mineralocorticoids and glucocorticoids. Mineralocorticoids maintain salt and fluid balance in the body, while glucocorticoids have metabolic and anti-inflammatory effects and are important mediators of the stress response.
Neuroendocrine	Relating to the nervous and endocrine system, which produces endocrine secretions that help to control bodily metabolic activity.
Stress sensitization	The enhanced and progressive sensitivity of an organism to stress given repeated exposure to stressors.

Historical and General Considerations

Historical Matters

It is frequently assumed that psychological stressors are a concern of especially modern origins, or at least that they have become more prominent with recent advances in society and technology. It is also commonly assumed that with the accelerating progress of civilization, more and more people are afflicted with mental and physical disorders. Historical accounts, however, suggest that such ideas about stressors, civilization, and disease have been common for quite some time. Sir Clifford Albutt (1895: 217) expressed such sentiments quite clearly well over 100 years ago:

> To turn now... to nervous disability, to hysteria... to the frightfulness, the melancholy, the unrest due to living at a high pressure, the world of the railway, the pelting of telegrams, the strife of business ... surely, at any rate, these maladies or the causes of these maladies are more rife than they were in the days of our fathers?

The tendency to view life in stressful terms may be even more basic to human cognition than is readily

apparent. The Greek myth of Sisyphus is enlightening in this regard. The perpetual work of pushing a boulder up a mountain – only to have gravity bring it back down after each and every effort – captures some of the qualities and characteristics linked to modern views of psychological stressors. Perhaps there is something fundamental about the human condition and psyche that fosters a perception of the world as a place rife with unrelenting demands that can never be fully met, resulting in subjective states of fatigue and distress and eventually leading to ill health. Each era may bring its unique colorations to such perceptions and its own attributions regarding their origins.

It is against this psychological backdrop of belief and possible bias in thinking that modern work on psychological stressors must be examined. Psychological stressors and related concepts have been popular explanatory constructs throughout recent, and perhaps not so recent, history. As a result of their subjective allure and apparent explanatory power, these ideas have often been loosely formulated. Owing to conceptual fuzziness and ambiguity, not only has progress in science been slowed, but nonscientific issues, ideas, and biases have been permitted to masquerade as scientific truths.

The concept of psychological stressors is rich with possibilities for shedding light on important matters in adaptation, dysfunction, and disease. The concept is paralleled, though, by the potential pitfalls that accompany its intuitive appeal. The challenge is to translate the fertile ideas about psychological stressors into more precise concepts, definitions, and operational procedures. With more sound definitional and methodological procedures in place, the utility of stress concepts for understanding adaptation and maladaptation, mental and physical disorder and disease, will be better understood.

Early Ideas and Research

A broad foundation for understanding the organism's reactions to challenging environmental circumstances was laid down by Claude Bernard and Charles Darwin during the nineteenth century. Each of these two influential individuals in his own way touched on issues deriving from the tension resulting from ongoing adaptation to changing and challenging environmental circumstances. Yet it was not until the early to mid-twentieth century that such generality and complexity began to be translated into more specific terminology and technology. These efforts can be traced to at least three different lines of thought and research.

The early work of Walter Cannon dealt with ideas about common emotions and their physiological consequences, particularly with respect to the body's maintenance of homeostasis. This line of study was complemented shortly thereafter by the animal laboratory studies of Hans Selye, wherein acute and severe stressors were systematically investigated. It was in Selye's work that the concept of stress most forcefully emerged. Stress was defined as "the nonspecific response of the body to any demand" (Selye, 1976: 74). Stressors, in turn, were defined as "that which produces stress" (Selye, 1976: 78). Finally, from another vantage point, Adolph Meyer popularized the life chart methodology. This approach emphasized the importance of the dynamic interplay between biological, psychological, and social factors, such that important events within the person's biography became foci of attention for studying health and disease. Collectively, these activities, and the multiple lines of research they generated, served to initiate specific awareness of, and interest in, psychological stressors.

Arising outside of the more purposeful activities of science was another influential development that contributed to the emerging idea that psychological stressors cause both mental and physical disorders. Prior to World War II, psychopathology was commonly attributed to genetic factors or acquired biological propensities; so-called normal people devoid of such taints were thought to be largely invulnerable to mental illness. The experiences during and after World War II dramatically shifted thinking in medical and psychiatric circles to incorporate the idea that severe stress could precipitate breakdown in a previously healthy individual. Once this conceptual shift began, it underscored the multiplicity of health consequences that could be caused by severe stressors. It also opened the door for enlarging conceptual perspectives on psychological stressors by considering how less severe, yet still noxious, aspects of the social and physical environment could contribute to, or precipitate, pathology.

Conceptual Progress

Upon the foundations of stress research and theory laid down by Selye, Cannon, and Meyer, along with the influences of experiences of World War II, modern inquiry into the effects of psychological stressors became a topic of increasing interest and, eventually, of extensive empirical inquiry. Two general themes may be discerned that have underpinned advances in theory: (1) characteristics of psychological stressors and (2) individual differences in response to psychological stressors.

Stressor Characteristics

Despite general agreement about the importance of psychological stressors for health and well-being,

determining exactly what it is about stressful circumstances that is deleterious has proven challenging. An initial question of considerable theoretical importance involved the basic nature of psychological stressors: are they best viewed in a unitary manner as nonspecific demands on the organism (as postulated by Selye), or are psychological stressors more effectively viewed as a class of conditions harboring specific component characteristics of importance? Investigators from two traditions – animal and human research – have addressed this issue, with parallel and sometimes intersecting developments. Although considerable progress has been made, the general topic of elaborating stressor characteristics remains one of central importance in current thinking on psychological stressors.

Animal Laboratory Research

A great deal of work in the 1960s and 1970s was performed to determine whether specific psychological characteristics of stressors possess qualitatively distinct implications for the organism. Initially this work revealed how particular features associated with the environmental stressors might be important for predicting adverse outcomes (as opposed to the more psychologically neutral notion proposed by Selye of general or nonspecific adaptive demands). Such research went on to probe the types of psychological stressors and their effects. It became of central interest to understand in a more differentiated way the effects of diverse psychological stressors.

Animal laboratory studies adopted ingenious designs to differentiate psychological components associated with environmental stressors, with the findings from these studies demonstrating that distinctive psychological characteristics were responsible for many immediate behavioral or physiological responses. For example, specific psychological characteristics of stressors, such as undesirability or controllability, were particularly pertinent for the development of various disorders. It became clear, too, that other characteristics of stressors were important. For example, different parameters of shock administration (acute, intermittent, or chronic) produced different physiological effects in animals. Further, such differences might increase, decrease, or not influence the development of particular diseases. Finally, psychological stressors not only could influence immediate psychobiological functioning, but also could have long-term ramifications through permanent alteration of the organism.

As the importance of specificity of stressor characteristics became more apparent and accepted, questions about the specificity of stress responses also arose. What were the implications of specific stressor characteristics for different facets of psychological and physiological functioning? Such theoretical developments greatly extended the framework for inquiry, requiring attention to multiple characteristics of stressors in relation to multiple psychological and biological processes and outcomes. Relatively simple, singular response indices (e.g., corticosteroids, catecholamines) were replaced by patterns of behavioral and biological effects or profiles of neuroendocrine responses. More recently, other levels of conceptualization have been proposed. For example, psychological stressors may promote fundamental disruptions in oscillatory regulation of basic biological functions or reversions to earlier modes of functioning.

Overall, research on psychological stressors from animal research has moved beyond unidimensional and linear concepts of stressors and their effects. More recent thinking has adopted a larger framework for understanding the diverse characteristics of stressors that influence particular and varied response systems of the organism. The response systems of interest have expanded from single systems to patterns or profiles of response across multiple indices.

Human Experimental and Field Studies

Investigators of psychological stressors in humans also conducted innovative and insightful studies, both in the laboratory and in the field. Early work tended to focus on the aversive subjective attributes, particularly perception or appraisal, of psychological stressors as evaluated in an experimental setting. Yet at about this same time research on stressful life events began. It is in this area of stress research that activity on psychological stressors perhaps reached its pinnacle, in terms of both productivity and popular interest.

Extrapolating from animal laboratory studies on the one hand, and integrating with Meyer's life chart procedures on the other, Thomas Holmes and Richard Rahe first formulated the idea that distinctive changes in one's life circumstances – specific and documentable life events – could be defined and assessed in an objective manner. The work was initially based on case histories of some 5000 tuberculosis patients, from which they derived a list of 43 life events "empirically observed to occur just prior to the time of onset of disease, including, for example, marriage, trouble with the boss, jail term, death of spouse, change in sleeping habits, retirement, death in the family, and vacation" (Holmes, 1978: 46). The Schedule of Recent Experiences (SRE) was developed and published, and by 1978 more than 1000 publications had utilized this convenient method for

probing a vast range of questions pertaining to stress and illness.

The common feature associated with these disparate life changes – the stressor characteristic of primary concern – was thought to be the degree of social readjustment entailed by the event: "The relative importance of each item is determined not by the item's desirability, by the emotions associated with the item, nor by the meaning of the item for the individual; it is the amount of change that we are studying and the relationship of the amount of change to the onset of illness" (Holmes, 1978: 47). This viewpoint is consonant with Selye's ideas about stressors and stress. Hence, the psychologically neutral notion of the readjustment required of life changes was conceptualized as the characteristic responsible vulnerability to a wide variety of psychological and physical maladies.

Much as the emphasis in animal laboratory studies shifted from psychological neutral concepts of any demand, viewpoints within the stressful life events literature began to shift away from the concept of readjustment and toward emphasizing the undesirable characteristics of events. Human studies of life events consequently began to focus on the particular characteristics of psychological stressors and their potentially unique effects. The principle of specificity also was extended from the characteristics of stressors to the specific consequences of such experiences, elaborating theory about the importance of specific psychological stressors for specific responses and eventually for specific types of disorder or disease. A vast literature on this topic has appeared over the past two decades, with diverse conceptualizations of psychological stressors and myriad methods designed to measure them.

The issue of desirability of events, however, along with the more general issue involving stressor characteristics, brought into focus another important subject in the study of psychological stressors: individual differences. What might be viewed or experienced as undesirable by one person could be viewed or experienced as desirable by another. As discussed next, a variety of considerations are invoked to explain variability in effects and outcomes in relation to psychological stressors.

Individual Differences

Despite progress in conceptualizing the component characteristics of psychological stressors, and despite progress in prediction afforded by such work, considerable variability in response to psychological stressors occurs. Even under the most dire of stressful conditions, all animals or individuals do not necessarily break down. Although a refined understanding of stressor characteristics still may account for some variability in outcomes, other factors may be useful to effectively model effects of psychological stressors. Progress in understanding this issue has again come from both the basic laboratory and human studies of psychological stressors.

Animal Laboratory Research

Although there were characteristic features of physiological responses to the stressors employed in the early paradigm adopted by Selye, not all animals responded to stress in an identical manner. Further, individual differences in response were even more pronounced when the less severe types of stressors were used.

Such variables as prior experience, availability of coping responses, and other aspects of the social and experimental context were found to moderate the influence of psychological stressors. For example, when rats are exposed to electric shock, animals that cannot predict shock occurrence (via warning tones) develop a sixfold increase in gastric ulceration compared to their yoked counterparts (who receive the warning tones). Work along these lines demonstrated the delicate and often subtle interplay among stressor, social context, and resources available to the organism in determining response outcomes. These lines of study, too, suggested that individual differences in susceptibility to psychological stress could be viewed within a developmental perspective in terms of stress sensitization. Laboratory animals repeatedly exposed to severe psychological stressors can become neurobiologically sensitized to the stressors, such that relatively minor degrees of stress eventually acquire the capability of triggering pathogenic responses.

Human Life Stress Research

The importance of individual differences was perhaps more apparent in studies of human life stress and its consequences. A consistent criticism of life events research was the relatively weak association between psychological stressors and disorder. It was assumed that other considerations moderated stress effects, and the elucidation of such factors would increase the predictive capability of disorder following stressful events. Again, there were a number of factors that were believed to moderate the impact of psychological stressors, ranging from environmental factors such as social support to more individual factors such as prior experience and coping. Developmental considerations have also been important in recent theorizing about individual differences in responsivity to

psychological stressors, with the idea that prior exposure to severe psychological stressors renders the individual more susceptible to increasingly lower levels of psychological stress.

A major arena for understanding individual differences in stress susceptibility has been perception. The early and elegant laboratory studies of human stress had indicated the importance of such individual differences in perception, or appraisal, of stressors, and such thinking was readily incorporated into theory and method. Studies of life events, for example, used subjective weights of events experienced by the study participants. Once this avenue of inquiry was opened, it also brought to the forefront a variety of influences on perception, along with other factors that might influence stress responsivity. Thus, research began to focus not only on appraisal of stressors, but also on coping, social support, personality, and other considerations that in theory could moderate the effects of psychological stressors.

As research progressed along these lines, it became clear that making some of these distinctions was easier to do in theory than in method. For example, while it made good sense theoretically to consider an individual's subjective perception of psychological stressors, it was more difficult to employ such information in a scientifically sound manner. When it came to operationalization, serious problems became apparent. For example, owing to depression-based perceptual biases, a depressed person might have a skewed perception of events and rate them as particularly negative (irrespective of the objectively stressful qualities *per se*). Generally, such concerns raised an important paradox for investigations of psychological stressors. Namely, although a large part of the desired knowledge pertained to the individual's idiosyncratic appraisal of psychological stressors, methodological concerns cautioned against direct assessment of such information. Instead, alternative approaches were developed to avoid the pitfalls of using subjective reports in research on psychological stressors, as well as to avoid other problems with these methods that eventually came to light.

Methodological Considerations and Recent Developments

While concepts and methods often intertwine and, united, nurture progress, at times one or the other component may unduly influence development (for good or for bad). This situation appears applicable to research on psychological stressors, in which the methods adopted in animal laboratory research have constrained theory and methods adopted in human life stress research have misled theory on psychological stressors.

Animal Laboratory Research

The original work of Selye typically employed situations that were overpowering or unavoidable for the animal. Such conditions did not permit an evaluation of behavioral responses or other moderating influences that could influence an animal's adaptation to stressors. Further, it was realized that this methodological paradigm was not informative about psychological stressors that might be of greater ecological and evolutionary relevance (i.e., more typical with respect to the animal's natural environment and evolutionary history). Thus, such an approach readily masked the implications of less severe psychological stressors on physiology and behavior, which in turn might represent a more fertile area of inquiry into stressor effects. Finally, the nature of the stressor employed in the early stress laboratory studies also contributed to the aforementioned difficulty in differentiating physical from psychological effects, which inhibited progress in the arena of conceptual development.

Overall, the range of psychological stressors was constrained by the methods adopted. Theory, in turn, was constrained to account for the consequences of stressors under such restricted and relatively unnatural stressor conditions. More recent research has benefited from methods that encourage assessment of diverse characteristics of psychological stressors and their severities and incorporate the assessment of a wide variety of behavioral and biological response possibilities. Current perspectives based on these broader methodological approaches suggest that the organism's responses are often exquisitely specific nuances of stressors encountered.

Human Studies of Stressful Life Events

The bulk of empirical work on human life stress has been based on self-report checklist methods. The prototype of this approach is the SRE, the instrument that catalyzed research in this area. The popularity of the SRE was likely due to the combination of the intuitive appeal of the stress concept, the apparent objectivity of the method, and the overall impression of scientific legitimacy.

The methodological paradigm launched by the SRE, however, embodied several problems. It became clear that subjects did not report life events in a reliable manner over time and that investigators did not adequately control for the directionality of effects in research designs (e.g., being depressed initially could bring about life events such as trouble at work,

difficulties with spouse, and so on). Indeed, many of the initial items on the SRE were direct indicators of disorder or illness. For example, some of the key criteria for defining clinical depression were represented in the original SRE (e.g., major change in eating habits, major change in sleeping habits). If measures of life events were directly confounded with the presence of disorder or were contaminated by the effects of pre- or coexisting disorder, then clearly general theory about psychological stressors, as well as theory about the characteristics of psychological stressors, rested on flawed information.

In response to these methodological concerns, other investigators designed semistructured interview protocols and developed explicit guidelines, decision rules, and operational criteria for defining and rating life events. These developments further highlighted serious problems with self-report checklist methods. For example, there was too much subjective leeway permitted in defining what constitutes an event with self-report procedures, resulting in considerable variability of content within ostensibly uniform categories of events. In order to have a more firm methodological foundation, the more elaborate and extensive interview and rater-based procedures were employed, which helped to standardize measurement across individuals.

In general, such interview and rater-based approaches have been found to enhance the reliability of life event assessments and to provide stronger predictions of particular kinds of disorders following the occurrence of psychological stressors. Procedures such as these also provide a solid foundation upon which to build in terms of developing taxonomies of psychological stressors and their effects. Although such approaches are more time- and labor-intensive to implement, they represent the current-day gold standard for assessing psychological stressors.

Human Studies Employing Other Measures of Psychological Stressors

There have been other methods in which psychological stressors have been defined and studied. None of these approaches has received the degree of attention devoted to the work on life events, yet each may have useful properties for the study of psychological stressors. Two lines of investigation are noteworthy.

Many investigations have targeted people who experience a specific life event and compared these individuals with controls who do not experience the event. For example, individuals who become unemployed are compared to individuals who do not experience this event in relation to a variety of psychological and physical processes and outcomes. Such work is useful for examining a potentially more homogenous process with more readily identifiable outcomes. On the other hand, such studies may oversimplify the psychological stressors associated with an event and not specifically articulate the different components within the general event that are most pernicious for health and well-being. For example, the effects can be partitioned into a variety of stressful themes that, although often intercorrelated, may not have uniform effects. Thus, although people who become unemployed in general may experience a loss of self-esteem, loss of income, loss of daily schedule, and so on, each particular situation may pull more or less for heightened responses along these different dimensions. Work sensitive to such variability in the component characteristics will be most useful for research on psychological stressors.

Finally, there also have been efforts to measure psychological stressors through questionnaire or diary methods, inquiring about minor but common daily events, chronic conditions, appraisal processes, and other indicators or correlates of psychological stressors. A promising recent avenue of research involves ecological momentary assessment, where subjects can be prompted throughout the day to respond to queries about their circumstances and psychological states. Such procedures help minimize problems with standard retrospective methods.

In closing, it is appropriate to return to the concerns and caveat with which the article began. The specter of possible biases in the measurement of psychological stressors must be consistently borne in mind, and methods employed must be rigorously attentive to such concerns, to provide a solid empirical foundation upon which theory and research can build for this important area of investigation.

See Also the Following Articles

Affective Disorders; Animal Models (Nonprimate) for Human Stress; Cardiovascular System and Stress; Cognition and Stress; Control and Stress; Coping Skills; Corticosteroids and Stress; Depression Models; Environmental Factors; Immune Suppression; Life Events Scale; Psychosocial Factors and Stress; Selye, Hans; Social Support; Stress, Definitions and Concepts of; Stress Generation.

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Psychoneuroimmunology

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Glossary

Cytokines	Secreted regulatory proteins in response to external insults that control the survival, growth, differentiation, and effector function of tissue cells.
Immune system	A complex network of specialized cells and organs (lymphoid organs) that distinguishes between self and nonself and defends the body against infections from agents such as bacteria, viruses, fungi, and parasites.

Immune System

Immunology deals with understanding how the body distinguishes between what is self and what is nonself. The classic hallmark of the immune system is its ability to recognize and kill foreign substances and at the same time recognize but not destroy normal host tissues. To protect against potentially pathogenic microorganisms that are foreign to the body (antigens), the host uses white blood cells, or leukocytes, that originate from precursors in the bone narrow. These cells circulate through the blood and lymph system or, for some of them, are fixed in specific tissues. Innate immunity represents the first line of defense against antigens and involves phagocytic cells that are mononuclear (e.g., macrophages) and polymorphonuclear (e.g., neutrophils). These cells capture microbes and digest them, and the mononuclear macrophages also present antigen fragments to lymphocytes. Lymphocytes have highly diverse specific receptors, which allow them to recognize antigens. Adaptive immunity is based on the proliferation and differentiation of antigen-specific lymphocytes into effector cells. The T lymphocytes, so designated because they differentiate and mature in the thymus gland before traveling to the spleen and lymph nodes, are the first of the lymphocytes to be activated. Following contact with antigen-presenting cells such as macrophages, lymphocytes proliferate and destroy the infected cells, in which case they are called cytotoxic T lymphocytes, or they help other lymphocytes to intervene.

There are many different subclasses of T cells that can be distinguished from each other by specialized cell surface molecules. For instance, cytotoxic T lymphocytes are called CD8 positive T cells because they express a glycoprotein known as CD8. CD4 positive T cells, which are markedly depressed in patients suffering from acquired immunodeficiency syndrome, are essential for the activation of macrophages and