The “Stress Analogy” in the Context of Psychoneuroimmunology

by Francesco Chiappelli

Abstract

The “stress analogy” is examined from the perspective of psychoneuroimmunology. Arguments are presented that do not support a linear and mathematical conception of psychosocial stress, as defended by the “stress analogy” concept. Implications for the study of schizophrenia are discussed.

Smith (1987) recently discussed “stress” as proportional to the ratio of the load, or force, applied to the stressed object, over the cross-area of the object itself, and “strain” as the extent to which the object is affected, or changed, by the stress applied upon it. This author extrapolated these concepts to animal and human stress research, relying on Selye’s generalized adaptation syndrome and on Holmes and Rahe’s perspective on life event and psychosocial stress.

Contrary to Selye’s original proposition, the physiological response to stressful stimuli is very specific. It is typically dependent on the nature of the stress applied, its intensity, and frequency (Terman et al. 1984); it is finely and specifically modulated by hormones and neuropeptides (Axelrod and Reisine 1984); and it is species-specific (Gibbs 1986). It also involves the immune system to an extent specific to the intrinsic characteristics of the stress applied (Ader 1981; Shavit et al. 1985; Tecoma and Huey 1985).

In addition, we now know that Holmes and Rahe’s perspective on psychosocial stress as a function of major stressful life events (e.g., divorce, bereavement) may not be viewed as the sole or the optimal conceptualization of stress. Alternative conceptions suggest that stress may result (1) from the individual’s cognitive appraisal of minor daily events or situations as hassles, (2) as the lack or loss of balance between actual or perceived environmental demands and the person’s actual or perceived abilities and resources, or (3) as the perception of lack of fit within a given sociocultural environment at a given time (Chiappelli 1985, 1986).

As a “perception,” the third model is plastic to individual specificity. That is, two individuals experiencing the same stressful condition may experience different levels of psychosocial stress depending on how each one perceives the environmental event. If psychosocial stress is viewed as an outcome of the person’s specific cognitive processes associated with the perception of a given event, instead of the nature of the event per se, by modifying the subject’s perception, his/her actual experience of psychosocial stress can be modulated as well. This notion relates to the context of psychological control and to the body of research which indicates that the beneficial effects of potential or perceived control are often similar or equal to those obtained by...
actual control (for review, see Mineka and Hendersen 1985).

As a "perception of lack of fit," this model of psychosocial stress allows for the acquisition of whatever it takes to attain (actual or perceived) fit. The fit between the individual and the environment is the end-product of a complex interactive process involving both the subjective (i.e., perceived) and objective (i.e., real) characteristics of the person and the sociocultural context (Chiappelli 1985, 1986). From a psychotherapeutic viewpoint, the objective reality of the environment may be improved by providing the client with informational material and social support, which in turn might contribute to changing the individual's set of perceptions. Common stress-coping programs, such as those discussed by Olson (1987), enhance either the objective reality of the person (e.g., behavior modification) or the subjective reality of the environment (e.g., systematic desensitization) and of the client (e.g., cognitive therapy), or both.

When psychosocial stress is conceived as the perception of lack of fit within a given environmental milieu at a given time, emphasis is also given to the specificity of both stress and response. Indeed, the complexity of everyday life situations often obscures the high degree of specificity of single stress responses because of the contemporaneous responses to a myriad of events.

Recent developments in our understanding of how the psychological system interacts with the neuroendocrine and the immunobiocellular systems of the body are the foundations of the emerging science of "psychoneuroimmunology" (Ader 1981; Solomon 1981; Mineka and Hendersen 1985; Krantz et al. 1985; Ader et al. 1987), which also has profound implications in a number of physical and mental science areas, including schizophrenia. In this context, Solomon (1981) has stressed the complexity of this psychiatric condition, and has concluded that the etiology of the behavioral and immunological dysfunctions often associated with schizophrenia and other mental illnesses is most likely associated with environmental, genetic, functional, and organic factors.

Smith (1987) suggests that stress might be operationalized as the simple product between the load imposed upon the organism and the inverse of the organism's resistance. From a psychoneuroimmunological viewpoint, the "load" is a complex function including not only life events (Smith 1987) but inadequate person-environment fit, precarious neuroimmunological status, lack of support network, and other factors. Similarly, the organism's "resistance" to load is a complex function of not only our inborn resistance (Smith 1987), but adequate person-environment fit, effective neuroimmunological status, available support, and other factors. The developmental nature of animals and human beings—their continual psychological and physiological growth, development, and maturation process—further implies that both the load and the resistance functions are in constant flux.

In sum, the issue of stress in people and in animals is clearly more complex than Smith (1987) suggests. In fact, if stress is expressed as a ratio as outlined by Smith (1987), neither the numerator nor denominator can be fully determined at our present level of knowledge. In the context of schizophrenia, moreover, Smith's (1987) proposal may also be inappropriate considering the complex nature of this condition.

References


The Author

Francesco Chiappelli, Ph.D., is Postdoctoral Scholar, Psychoneuroimmunology Program, University of California, Los Angeles, CA.

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5600 Fishers Lane, Rm. 1OC-06
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