scale reflects not only the information supplied by the reliable variation in the corresponding subtest score, but also the information in all other scales which is predictive of that subtest score (typically all such scales are appreciably intercorrelated). The authors are conscious that this is a somewhat novel proposal and point out the advantages which lie in the error suppression inherent in the regression technique and the resulting tightening of the confidence bounds on the universe score for each scale. They also concede that the procedure tends to yield "flatter" profiles than do unregressed scores and that, in retaining the identity of the original scales, it does not provide the possible reduction in dimensionality which can be obtained, for example, by a factor-score approach. Where the latter is desirable, the authors recommend the methods of Bock or Abelson which in effect redefine the variables to obtain universe scores of maximum generalizability and minimal dimensionality.

Although the book includes exercises at the ends of chapters and can serve as a text for an advanced course in psychometric theory, it is perhaps more pointedly directed at the established specialists in educational and psychological testing who continue to labor in a quagmire of conflicting concepts of test reliability and true score. By formulating the well-defined and readily operationalized alternative concepts of generalizability and universe score, the authors have put this work on firmer ground and have given classical test theory a new lease on life.

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Aversive Stimuli

Urban Stress. Experiments on Noise and Social Stressors. DAVID C. GLASS and JEROME E. SINGER. Academic Press, New York, 1972. xiv, 182 pp., illus. $8.75. Social Psychology.

This volume reports on a series of experiments concerned with the influence of cognitive factors on reactions to noise and social stress stimuli. Thus, stress is conceived of in psychological terms, that is, not as the direct impact of aversive stimuli on the person but in terms of the "associated cues that signify the implications and consequences of these stimuli" (p. 6). Three types of problems are considered: the direct psychophysiological and behavioral consequences of the stress stimulation, that is during exposure to it; its effects on subsequent behavior; and the behavioral consequences of the adaptation process itself. Adaptation is equated with habituation or "the organism's decreased sensitivity following repeated exposure to aversive stimulation" (p. 8). The urban dweller clearly adapts or becomes habituated to the stress of modern city life but, Glass and Singer ask, does the adjustment cost him anything in terms of his subsequent behavior and experience?

The empirical locus of these investigations was the laboratory setting of the experimental social psychologist. It is easy to understand why the study of noise dominated the experiments; it is a form of urban stress that is far easier to subject to experimental controls and measurement than are others. However, the other experiments, on the behavioral aftereffects of electric shock and on the social stresses of bureaucratic red tape and personal discrimination, reflect the authors' desire to provide more general statements of the role of cognitive factors in urban stress.

The findings reported are based on more than 20 experiments carried out primarily by Glass and Singer and their graduate students. Although these studies varied in the details of their purpose and design, the general research paradigm was the same for all: the setting was the academic laboratory, and college students were employed as subjects; there was precise preparation, presentation, and measurement of the physical stress stimuli; experimental instructions were used to create social stress variables and related cognitive influences; and the efficacy of experimental variations and the expression of hypothesized effects were determined by means of psychophysiological measures, objective measures of performance on cognitive tasks, and responses to postexperimental questionnaires.

For example: physiological reaction to city noise was studied by measuring galvanic skin response, finger vasoconstriction, and muscle action potentials in response to fixed or random 108-dba broad band noise presented by specially prepared tape recordings. Tolerance of frustration in postnoise tasks was measured by the subject's persistence in trying to solve insoluble puzzles, and the quality of his performance by the number of errors he made in a proofreading task. For observing the effect of "perceived direct control" over aversive physical stimulation, the subject was told he could use a nearby switch to stop the noise; for "indirect control," that he could signal someone else to switch the noise off. "Bureaucratic stress" was induced by asking students who came expecting to participate in a psychological study to fill out administrative forms first and harassing them in various ways as they attempted to do so; "discrimination" was effected by apparent capriciousness concerning payment for participating in the study.

Insofar as direct exposure to noise is concerned, Glass and Singer found, as have other investigators, that the individual quickly adapts. This is true for simple tasks both in terms of his psychophysiological reactions and in his performance even if he is unable to predict or control the noise. For more complex tasks of the information-processing or vigilance type, the effects of noise are mitigated by ability to predict or control it. What happens to task performance after the noise is gone? Here the mediation of reactions by cognitive factors is even more pronounced. Unpredictable noise—whether loud or soft, with older as well as college-age subjects, in a variety of experimental conditions, and in replications by several experimenters—resulted in poorer performance on subsequent tasks measuring frustration tolerance, ability to resolve cognitive conflict, and skill in proofreading. But these negative aftereffects were themselves subject to sharp change by appropriate cognitive structuring of the unpredictable noise. If the individual believed he could switch the noise off, or that another person would turn it off for him on request, or that he could avoid or prevent such noise by his task performance, then these negative aftereffects of unpredictable noise were greatly reduced.

The authors also studied the effects of noise in relation to relative deprivation, expectancy, necessity and choice, and cognitive dissonance. Persons who saw themselves as "deprived" because they perceived that others were being exposed to less intense noise experienced greater stress, as evidenced in subsequent task performance. Expectations with respect to the intensity of

noise had little effect on stress reactions, and necessity (is the noise gratuitous or is there good reason for it?) produced equivocal findings.

Glass and Singer place great emphasis on the absence of perceived control as a factor in aversive reactions to unpredictable noxious stimuli. Drawing on the conceptions of other investigators more generally concerned with the nature and meaning of psychological stress, they invoke the concept of "helplessness." Lacking or believing he lacks control over such stimuli, the person experiences "a state of helplessness in which there is an absence of incentives for initiating strategies designed to avoid or escape from the aversive stimuli" (p. 88). The general utility of this kind of explanation will depend in part on whether the effects of other forms of aversive stimulation are related to perceived control in the same manner as in the case of noise. This clearly turned out to be so in the experiments with electric shock. But the studies of social stress stimulation (bureaucratic harassment and personal discrimination) although cleverly designed and executed provide only very indirect evidence that perceived control, predictability, and similar cognitive factors play the same role in this kind of urban stress. What we do learn is that, at least in these experiments, administrative harassment, either in the form of impersonally presented, tedious regulations or of a capricious bureaucratic assistant who makes sure the regulations are enforced, impairs subsequent task performance; and that of the two forms of harassment the latter provokes more negativistic and less compliant behavior than the former. In other words, subjects confronted simply with the set of regulations rather than by a person severely administering them tended to give up the fight. Adverse discrimination in the payment of fees, whether it appeared to be "arbitrary" or "chance," led to poorer task performance, but both kinds of discrimination were less detrimental among subjects who could choose their tasks—and thereby had some control—than among those who not only were discriminated against in payment but had no choice of task. With respect to attitudinal measures, that is "satisfaction" with the experiment and willingness to volunteer for additional research, only those who experienced arbitrary discrimination (in contrast to those who could attribute it to chance) showed significant negative reactions, particularly if they had no choice of tasks.

What of the adaptation process itself? Glass and Singer ask whether the negative behavioral aftereffects of aversive noise occur "because of stress adaptation or in spite of it." By controlling physiological adaptation in a series of studies, they were able to demonstrate quite clearly that the adverse effects of the noise were the result not of the adaptive process but of the cumulative exposure to such stimulation in spite of adaptation.

In the context of laboratory research, it is not difficult to see why this volume was awarded the AAAS Sociopsychological Prize for 1971. The research itself is innovative in its paradigms of urban stress and was carefully and strategically carried out, and its findings are presented and interpreted in careful and parsimonious terms. It stands well above the usual laboratory studies of its kind because it was programmatic, it considered and tested alternative explanations, and perhaps most important was sensitive to some degree to problems of experimenter bias.

Of course one may seriously question how far the representations of such phenomena as frustration by bureaucracy or arbitrary discrimination resembled these phenomena in the outside world. These and similar issues that can be raised reflect the limitations that beset all laboratory studies of complex social behavior. It is easy enough to criticize the experimenter's translation of real-life human interactions, but difficult to suggest something better. But there are two serious limitations of quite another kind in Glass and Singer's research that must be noted:

First, because laboratory research tends to preclude the involvement of just such a critical variable, we would ask whether urban stress in the form of noise (or any other form) can be studied profitably without a consideration of the variable of *time*. There are many questions one can ask. What happens to initial adaptation if exposure is for three hours rather than for the half-hour periods reported in these studies? The reported negative aftereffects of unpredictable noise were found immediately following exposure to noise; what would have happened if there had been longer intervals between the stressful noise and the task activity? Even for the negative aftereffects immediately following the noise exposure, there is the fundamental question of how long they last. Would performance improve say a half hour or an hour later? Finally, it would not be too difficult to demonstrate that cognitive factors as influences on reactions to stressful stimulation are themselves related to time.

The second limitation in the research that must be noted is less patent. It is easy enough to see that the study of complex social behavior in the laboratory is necessarily restricted. One accepts this limitation when undertaking such research. But, are we really any better off in this sense when we study noise in the laboratory? Did the use of the noise tape by Glass and Singer to study the influence of this form of urban stress approximate reality sufficiently well? True, it consisted of a real concatenation of sounds often present in the urban setting; but there is the simple fact that "real noise" in most urban settings does not have the stability of patterning and quality that the sounds presented by means of their noise tape had. We respond not only to intensity but to contextual and qualitative variations in noise as well. Thus, one is left with the uneasy feeling that even for a mechanical stimulus like noise, laboratory manipulations may in the end create a highly specialized phenomenon whose behavioral and psychological principles have limited applicability in the real world.

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Pueblo Studies

New Perspectives on the Pueblos. A seminar, Santa Fe, N.M., Nov. 1969. ALFONSO ORTIZ, Ed. University of New Mexico Press, Albuquerque, 1972. xx, 340 pp., illus. $11. School of American Research Advanced Seminar Series.

The study of Pueblo Indian cultures has been a long-standing focus of interest for American and European anthropologists. This interest stems not from preoccupation with primitive cultures, but rather from other central concerns in anthropology. The Pueblos —like the Jews, the ancient Hellenes, the medieval Celts, the Gypsies, the 20th-century Arabs, and many others —have, in maintaining their own way