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VULNERABILITY AND COMPETENCE: A Review of Research on Resilience in Childhood

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Abstract

The developmental psychopathology literature addressing issues of children's resilience and vulnerability in dealing with life stresses is reviewed. The contribution and methodological limitations of research on stress and competence are examined, theoretical concepts of resilience are discussed, and findings with respect to protective mechanisms, as well as data from longitudinal studies, are presented. Directions for further research are outlined.

In the face of life stresses, many children develop behavioral and psychological difficulties. Other children, referred to as “resilient” or “stress-resistant,” defy expectation by developing into well-adapted individuals in spite of serious stressors in their lives. In recent years, a great deal of empirical work has focused on resilience and vulnerability. This paper reviews the literature on resilience within the field of developmental psychopathology. In the first of the paper's five sections, approaches to defining the two central constructs in resilience research – stress and competence—are examined. Methodological issues associated with the various operational definitions are considered in some detail. Theoretical models of stress-resistance are outlined in the second section of the paper. The third and fourth sections of the paper contain, respectively, empirical findings on factors that moderate the effects of stress, and data obtained from longitudinal studies. Implications for future research on resilience are discussed in the concluding part of the paper.

CENTRAL CONSTRUCTS IN RISK RESEARCH

Definitions of Stressors

Horowitz (1989) has delineated five types of risk literature: the high-risk infant literature, which includes research on infants born prematurely or following prenatal complications; the conduct disorder literature, focusing on behavioral disorders and the conditions that dispose toward them; “behavioral teratogenesis,” in which the focus is on infancy and the exposure to environmental agents such as lead and alcohol; research on sensitive or critical periods, conducted largely with nonhuman animals; and developmental psychopathology, focusing on emotional/social maladjustment and competence, and on factors that are

ameliorative against stress. This review is confined to studies within the developmental psycho-pathology literature.

Life events research—In studies on childhood stress resistance, a commonly used approach to operationalizing stress is the life events method. This technique uses self-report measures to obtain a count of stressful life events encountered by respondents. Typically, such measures (Coddington, 1972; Johnson & McCutcheon, 1980; Swearingen & Cohen, 1985) consist of a list of items judged to be experienced frequently by children and adolescents, and respondents are asked to indicate events experienced in the recent past. There is a large literature on the methodological issues associated with measures of life events (Cohen, 1988; Johnson, 1986; Johnson & Bradlyn, 1988; Monroe, 1982; Tausig, 1982; Thoits, 1983; Zimmerman, 1983). A brief overview of salient issues is presented here.

Many of the early life events measures (e.g., Coddington, 1972; Holmes & Rahe, 1967) contained a heterogeneous mix of events ranging from trivial to severe, desirable to undesirable, and subjectively judgmental to objectively descriptive (Dohrenwend & Dohrenwend, 1978; Garmezy & Rutter, 1985). Scales developed in recent years have addressed some of these limitations. In measures such as the Life Events Checklist (Johnson & McCutcheon, 1980), the Junior High Life Experiences Survey (Swearingen & Cohen, 1985), and the Adolescent Perceived Events Scale (Compas, Davis, Forsythe, & Wagner, 1987), respondents are asked not just whether they have experienced a particular event, but also whether they perceived that event as being desirable or undesirable, and the extent to which it has affected their lives.

The life events measures cited above have been found to have acceptable psychometric properties in terms of both reliability and validity (Cohen, 1988; Johnson & Bradlyn, 1988). Research employing measures such as these can be strictly empirical, controlled, and precise (Anthony, 1987). Additional advantages in using this method lie in its pragmatic value in terms of ease of data collection, and the built-in provision of control group data: since stress scores are on a continuous scale, comparisons between high and low stress groups are possible without the need to locate specific high-risk and control samples.

Notwithstanding the improved empirical rigor and pragmatic value of the more recent scales, the life events method has been criticized on conceptual and theoretical grounds. A major problem has to do with the difficulty in making inferences regarding causality. Although life stress measures typically correlate significantly with adjustment, there is potentially a problem of confounded measurement, since many items on life events measures (e.g., failing a grade at school) may themselves be manifestations of maladjustment.

In attempts to address the issue of causality, several studies have examined correlations with adjustment of two types of life events: those over which the individual could not have had any control (and which could not be realistically viewed as consequences of maladjustment), and those over which respondents had some degree of control. Results of these investigations indicate significant relationships between stress and adjustment in children, even when only those events beyond the respondent's control were considered (Gersten,

Langner, Eisenberg, & Simcha-Fagan, 1977; Sandler & Block, 1979). Such findings on uncontrollable events suggest that while correlations between life events scores and adjustment may sometimes be inflated due to the inclusion of events which might be manifestations of maladjustment, these correlations are not simply artifactual (Thoits, 1983).

Another approach to examining issues of cause-and-effect has been to use the cross-lagged correlation method, which involves examining the extent to which life events at Time 1 might predict adjustment at Time 2, as opposed to the converse. The use of this technique has indicated that while stress can play an important role in maladjustment, the presence of adjustment problems can also lead to experiences of negative life events (Cohen, Burt, & Bjorck, 1987; Compas & Wagner, 1985; Compas, Howell, Phares, Williams, & Giunta, 1989; Compas, Wagner, Slavin, & Vannatta, 1986; Swearingen & Cohen, 1985). Further, the apparent bidirectional relationship between life stress and adjustment may, in some cases, result from the common influence of a third variable (Johnson & Bradlyn, 1988).

A final concern with life stress measures is the fact that although significant correlations have generally been found between stress and adjustment, the magnitude of these correlations is typically between .30 and .40. The low values of the correlations have sometimes been seen as reflecting deficits in measures of life events (Johnson & Bradlyn, 1988). However, the correlational values obtained may reflect the actual magnitude of the stress-adjustment relationship. Simple linear models of development are now widely viewed as being less adequate in predicting development than are transactional models, which posit that there is a reciprocal influence between the organism and the environment, and that development proceeds out of these mutual influences (Bronfenbrenner, 1986; Horowitz, 1989; Sameroff & Chandler, 1975). In risk research, studies that have explored the impact on adjustment of child attributes and environmental factors, in addition to life stress, have yielded multiple correlation coefficients between .60 and .80 (Garmezzy, Masten, & Tellegen, 1984; Luthar, in press; Seifer & Sameroff, 1987; Wertlieb, Weigel, Springer, & Feldstein, 1989), accounting for a considerably greater proportion of the variance in adjustment as compared to that predicted by life stress alone.

In conclusion, research using the life events method has yielded some promising results. While existing life events measures retain several conceptual and methodological limitations, studies employing rigorous research procedures – which allow for cause-effect interpretations – have been judged as providing strong evidence that life stress does play an important role in adjustment (Monroe & Peterman, 1988). Findings such as these support the continued use of life events questionnaires to assess stress in empirical research.

Small events or hassles—A second approach to operationalizing stress in studying resilience has been to assess relatively minor stresses that characterize everyday life. According to this viewpoint, hassles or the irritating, frustrating experiences that occur in everyday transactions with the environment – are a useful measure of life stress, and predictive of various adjustment outcomes. The use of hassles as an index of stress has grown largely from the efforts of Lazarus and his colleagues (Lazarus, 1980, 1984; Lazarus & Cohen, 1977).

Lazarus's group has strongly argued for the superiority of hassles over life events as indices of stress. This claim is based in part on commonly noted limitations of life events methodology, such as the failure to consider the individual significance of events, and the low power to predict adjustment and health (Lazarus, 1984). In addition, it has been argued that compared to major life events, small events are somewhat less heterogeneous in meaning, since they refer to smaller units of behavior. Small events or hassles are also better suited to prospective studies of causal relationships between stress and adjustment, given their relatively high frequency of occurrence over short time intervals. Similarly, such events can be experimentally manipulated far more easily than can major stressors (Zautra, Guarnaccia, Reich, & Dohrenwend, 1988). Finally, research on small events may provide information about the processes through time by which life events affect health and adjustment outcomes. Conceivably, major life events could operate by affecting the person's pattern of daily hassles, so that hassles might be critical mediators in the relationship between life events and health (Kanner, Coyne, Schaefer, & Lazarus, 1981; Zautra et al., 1988).

Empirical research suggests that, among adults, hassles scores may be more strongly related to various outcome variables than are major life event scores (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner et al., 1981). In predicting outcomes, a substantial relationship has been found to remain for hassles, even after the shared effect due to life events is removed. Conversely, the relationship between life events and outcomes, after partialling out the effects of hassles, has been found to be either weaker or nonsignificant (DeLongis et al., 1982; Kanner et al., 1981).

Methodological concerns require that findings of these studies be interpreted with caution. A major source of error in the relationships found between hassles and outcomes is confounded measurement between the predictor (event items) and the criterion (psychological health) (Dohrenwend, Dohrenwend, Dodson, & ShROUT, 1984; Dohrenwend & ShROUT, 1985). For example, even items such as "thoughts about death" or "fear of rejection" are similar to items commonly found on measures of psychological distress.

In response to comments about potential confounds between hassles and outcomes, Lazarus and colleagues have contended that stress lies not in the environmental input, but the person's appraisal of the relationship between that input and the person's resources to cope with the demands posed (Lazarus, DeLongis, Folkman, & Gruen, 1985). While supporting this statement from a theoretical viewpoint, other researchers have argued that what is needed is separate measurement of event occurrence and the individual's evaluation of that event (Cohen, 1988; Green, 1986).

Technology for assessing hassles among children is still in its earliest stages (Kanner, Harrison, & Wertlieb, 1985; Wertlieb et al., 1989). A recent study (Wertlieb et al., 1989) used maternal reports of daily hassles, in addition to a life events scale for children, as indices of stress. Results indicated that daily hassles and negative life events both made independent, statistically significant contributions to variation in children's behavior symptoms, indicating the usefulness of both major and minor events as measures of stress.

Specific life stresses—A third approach to operationalizing stress of high-risk conditions in research on resilience has been to use specific stressful life experiences. A variety of life events and family circumstances have been utilized within this approach, ranging from severe disasters such as war and floods (Garmezy & Rutter, 1985), to sociodemographic and familial stressors such as economic deprivation (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987; Werner & Smith, 1982), institutionalization (Rutter & Quinton, 1984), parental divorce (Wallerstein, 1983), and parental psychopathology (Garmezy, 1974).

A common limitation in earlier studies using specific life stressors is the absence of control groups (Fisher, Kokes, Cole, Perkins, & Wynne, 1987). While studies focusing exclusively on high-risk samples do offer some insights into predictors of adjustment, they leave unanswered the important question of whether levels of competence in children labeled resilient are comparable to competence levels among well-functioning children in the general population. There is evidence indicating that may not, in fact, be the case. For instance, a longitudinal study on the effects of compensatory education found clear-cut differences between economically disadvantaged children who received such intervention, and a comparison group who did not. At the same time, however, the educational intervention did not result in the disadvantaged children attaining the level of intellectual achievement displayed by children in nondisadvantaged groups (Abelson, Zigler, & DeBlasi, 1974).

A second difficulty in cross-sectional studies employing specific life stressors has to do with issues of causality. Most of these investigations do not provide data on children's levels of adjustment prior to the occurrence of a major stressor. Even with the presence of control groups, it is necessary to rule out the possibility that cohorts which differ in their exposure to major stresses (e.g., parental divorce or institutionalization) do not also differ in psychological functioning prior to this exposure. The need for such clarifications is clear from research on child abuse. Several investigators (Gelles, 1973; Parker & Collmer, 1976) have suggested that abused children can be particularly difficult to care for. Thus, it is not clear whether abuse is necessarily a stressor that results in maladjustment or, at least in some instances, whether having difficult temperaments causes children to be abused (Farber & Egeland, 1987).

On the surface, the use of single life circumstances as stressors may seem to circumvent a significant problem inherent in measures of major and minor life events, i.e., the combination of a heterogeneous mix of stressors. However, this is not necessarily the case. In their research on in-vulnerability, Seifer and Sameroff (1987) used what is often considered a straightforward risk factor: maternal mental illness. Two complications in the use of this variable were outlined by the authors. First, there was the need to identify which aspects of the global variable represented risk factors. Severity and chronicity of maternal mental illness were better predictors of clinical symptoms in children than was diagnosis. Second, a variable tapping subclinical aspects of mental health, i.e., maternal anxiety, was also strongly related to child competence. Based on these data, the authors concluded that even factors generally treated as simple indices of risk have their own complex internal structures which must be considered. Similar precautions have been noted with regard to

another widely studied life circumstance, parental divorce. It has been noted that divorce consists of a complex series of events and stressors, and the multiplicity of events, as well as the context in which they occur, are important correlates of outcome (Masten, 1989).

Socioeconomic status as an index of stress—Socioeconomic status (SES) is among the most commonly investigated indices of stress. Studies have pinpointed specific factors that characterize low-SES families and that operate as high risk factors. Apart from low status parental occupation, these include low maternal education, large family size, membership in a minority group, and absence of one parent (Rutter & Quinton, 1977; Sameroff et al., 1987; West & Farrington, 1977).

The widespread use of SES as an index of environmental influences appears to be based on two factors: the conceptual and operational simplicity of models using this variable, and the quickness and ease with which it can be assessed (Bronfenbrenner, 1986). However, several factors limit the scientific value of using socioeconomic status as a measure of life stress.

Knowledge of an individual's socioeconomic status in itself yields no information on the process through which this aspect of the environment might affect development. As Zigler, Lamb, and Child (1982) have noted, for psychologists, the discovery of a relationship between social class membership and a particular expression of behavior is a meaningless one, until the sociological variable is reduced to psychological terms. Similarly, Bronfenbrenner (1986) has noted the restricted scope of studies that focus simply on a “social address,” with no explicit consideration of intervening processes or structures through which environmental influences may operate. Consonant with these theoretical perspectives, there is evidence that children's competence levels are influenced more by what parents *do* in their interactions with them, than they are by the parents' status in terms of occupation, income, and other sociodemographic variables (Braithwaite & Gordon, in press; Wolf, 1966).

Another limitation of using low SES as a stressor is evident in findings that many economically deprived children are well able to adjust to this life circumstance and appear to be no different from their more advantaged peers (Garmezy, 1981; Garmezy & Nuechterlein, 1972). Further, variations in competence associated with SES are likely to be observed only within a certain range of socioeconomic levels. In other words, while high-SES children generally show adjustment superior to that of their low-SES peers, weak correlations between competence and SES are likely to be found both above and below certain “threshold” levels (Luthar, in press); within samples of either affluent or underprivileged children, therefore, SES is unlikely to be a very useful index of life stresses.

Multiple measures of stress or risk—In discussing difficulties in defining risk, Seifer and Sameroff (1987) noted that there is no definite criterion by which a particular variable is investigated as a risk factor, a protective factor, or merely a measure related to the outcome in question. For example, while in their own research they used low SES as a potential risk factor, other investigators (Masten 1989; Werner & Smith, 1982) have included high SES among variables investigated as potential protective factors. Seifer and Sameroff pointed out that this issue represents a logical dilemma. One might assume that any factor associated

with poor child outcomes was a risk factor; however, this would leave no room to identify variables that protect against stress, since such variables—being predictors of adjustment—would also constitute risk factors. At the other extreme, one might opt for a rigidly circumscribed, small set of measures as representing risk, e.g., parental mental illness (Seifer & Sameroff). An acceptable rationale for the selection of a few measures over several others, however, would be difficult to construct.

Given this dilemma, Seifer and Sameroff argued for the inclusion of variables at different levels of individual, family, or societal organization as potential risk factors, incorporating the different systems that affect developmental processes. Thus, in their own research, they examined maternal mental health, parental perspectives on child development, family stress (including negative life events and family size), and socioeconomic status as potential risk factors. Although in their study the amount of variance explained varied, there was no single risk factor that accounted for all the significant variance in the outcome variable (IQ). Put differently, when the effect of anyone risk factor was partialled out, the variance explained by the remaining risk variables was significant in all cases, attesting to the value of exploring multiple indices of risk from different areas.

The inclusion of multiple risk indices is being seen increasingly in research on resilience. Studies have used measures of life events as well as hassles (Dohrenwend, Zautra, Lennon, & Marbach, 1985; Gersten et al., 1977; Wertlieb, Weigel, & Feldstein, 1987; Wertlieb et al., 1989), and life event scales along with more specific stress indices such as low SES (Garmezy, Masten, & Tellegen, 1984; Luthar, in press). The simultaneous consideration of multiple indices of risk is invaluable in helping define more completely the concept of risk which, in turn, is a prerequisite to achieving a sound understanding of the concept of resilience.

Outcome Measures: Maladjustment vs Competence

Frequently, researchers have used the absence of psychopathology, or of maladaptive behavior, as an indicator of resilience against high-risk conditions (Mednick & Schulsinger, 1968; Rutter, 1982; Rutter & Quinton, 1984). Over the last two decades, developmental psychopathologists have increasingly explored the concept of “invulnerability,” rather than focusing predominantly on vulnerability and maladjustment. Recent investigations on risk and vulnerability have tended more frequently to use aspects of health and competence as outcome measures, correcting empirical psychologists’ traditional neglect of successful adaptation under adverse conditions (Garmezy & Tellegen, 1984).

Several researchers have argued for the use of social competence as the measure of choice in assessing levels of overall adjustment (Garmezy et al. 1984; Masterpasqua, 1989; Zigler & Trickett, 1978). With regard to definitions of social competence, two major criteria have been delineated, at least one of which should be reflected in measures of the construct: the success of the person in meeting societal expectations, and aspects of the individual's personal development or self-actualization (Zigler & Trickett).

Earlier studies on stress-resistance have frequently operationalized social competence levels on the basis of observable, behavioral criteria that represent success in meeting expectations

of society. Investigations with children, for example, have often used ratings by teachers, parents, or peers, as well as academic achievement scores, in assessing competence (Garmezy et al., 1984; Luthar, in press; Masten, Morison, Pellegrini, & Tellegen, in press; O'Grady & Metz, 1987; Parker, Cowen, Work, & Wyman, 1990). The assumption in using such indices is that manifest competence on such behavioral dimensions reflects good underlying coping skills (Garmezy & Masten, 1986). Further, "broad-band" assessments via the use of multiple measurement modalities (e.g., ratings by peers and teachers, and academic scores) have served to buttress the validity of the competence construct (Waters & Sroufe, 1983).

In research on stress resistance, the shift toward focusing on competence rather than on maladjustment is laudable, representing as it does a somewhat more positive outlook on development and adjustment. There is, however, a major caveat in endorsing this approach. It does not allow for the fact that, despite competence on behavioral indices, individuals may have a variety of other psychological difficulties, such as depression or anxiety. Various theoretical arguments indicate this possibility, and there is some empirical evidence in its support.

A distinction commonly made by developmental psychopathologists (Achenbach & Edelbrock, 1978) is between action-oriented, "externalizing" symptoms (e.g., acting out and aggressive behavior) and thought-oriented, "internalizing" ones (e.g., depression and anxiety). It is possible that so-called "resilient" children's reactions to their stressful experiences are primarily of an internalizing nature, expressed in more covert symptoms such as depression or anxiety. This argument rests on two empirically based findings. First, the literature in developmental psychopathology indicates that, at higher levels of development, pathology tends to be expressed more often in internalizing symptoms, rather than in externalizing, "undercontrolled" behavioral disturbances (Achenbach & Edelbrock, 1983; Cohen, Gotlib, Kershner, & Wehrspann, 1985; Cohen, Kershner, & Wehrspann, 1985; Zigler & Glick, 1986). Secondly, children identified as stress-resistant are generally at high developmental levels, as reflected, for instance, in their greater intellectual maturity (Masten, 1989; Masten et al., in press).

Given the above reasoning, the question at issue is whether profiles of resilient children on measures of depression would parallel their profiles on behavioral measures, showing them, again, to have superior adjustment levels. Addressing this issue, Luthar (in press) compared levels of internalizing symptoms among resilient adolescents (high stress, high competence) and two other groups: low stress/high competence and high stress/low competence. Results indicated that children identified as resilient had significantly higher scores on depression and anxiety as compared to those who were also high in competence but were from low stress backgrounds. Further, statistically comparable depression and anxiety levels were found among the so-called resilient children and those at the *lower extreme* in social competence (i.e., those in the high stress/low competence group). In spite of their impressive social competence, therefore, the "stress-resistant" adolescents were clearly not emotionally un-troubled.

Similar findings on internalizing symptoms were obtained in a study of urban elementary school children (Parker et al., 1990). Within this investigation, levels of depression and anxiety were compared among stress-resilient (SR) and stress-affected (SA) children. Despite the superior behavioral competence of SR as compared to SA children, the resilient group did not show similar advantages in self-rated levels of depression or anxiety.

Clinical studies of resilient individuals provide further support for the presence of underlying symptoms. In describing an “in-vulnerable” adult, Peck (1987) noted that this individual’s strong drive toward mastery, while invaluable in personal survival against odds, also periodically brought him into contact with high risk which he was unable to master, resulting in overwhelming anxiety or depression. Similar suggestions have been made in other clinical reports (Miller, 1979). Data such as these underscore the need for researchers to be cognizant of distinctions between adaptive behavior and emotional health in studying children who do well despite stress.

THEORETICAL MODELS OF VULNERABILITY AND RESILIENCE

Recent works have illustrated the importance of making conceptual distinctions between factors that are ameliorative against stress, based on the processes through which they influence adaptation. Garmezy et al. (1984) outlined three models describing the impact of personal attributes and stress on adjustment. The *compensatory* model is a simple additive one, wherein stressors tend to lower levels of competence, whereas various personal attributes help to improve adjustment levels. The operative mechanism, therefore, is a simple counteractive one. The *protective versus vulnerability* model implies an interactive relationship between stress and personal attributes in predicting adjustment. A protective function is implied if, for example, individuals with high levels of a trait are relatively unaffected by increasing stress, whereas those low on the trait show declines in competence with increasing stress levels. Conversely, in a vulnerability process, individuals with high levels of a certain attribute are more susceptible to increasing stress than are those low on the attribute. Finally, the *challenge* model hypothesizes a curvilinear relationship between stress and adjustment, so that stressors could actually enhance competence, providing that levels of stress are not too high.

Similar distinctions between compensatory and protective factors have been noted by other authors. Rutter (1987), for instance, pointed out the differences between “risk mechanisms” (which lead directly to disorder) and “vulnerability” or “protective” processes. The latter have an impact on adjustment by virtue of their *interactions with risk variables*, instead of (or in addition to) having direct effects on their own.

The identification of a statistically significant interaction effect is generally considered evidence of a buffering or moderating effect in the relationship between stress and adjustment (Kessler, 1983; Rutter, 1987). However, several difficulties arise in the search for interaction effects in resilience research, including the need for relatively large sample sizes, and the complexities of interpreting significant effects (Masten, 1989). Further, the predictive power of models involving interaction effects does not seem to be very impressive. Data provided by various studies (Garmezy et al., 1984; Luthar, in press;

Masten, Garmezy, Tellegen, Pellegrini, Larkin, & Larsen, 1988; Wertlieb et al., 1989) suggest that if models using only main effects were compared to those including significant interaction terms as well, the increase in variance accounted for would typically be small, yielding, for example, increments from 62% to 66% (Garmezy et al., 1984) or from 45% to 50% (Luthar, in press). The relatively small increase in variance explained with the inclusion of interaction effects has led some authors to suggest that, although these effects do provide evidence for moderators against the effects of stress, their failure to enhance the predictive power of the model significantly may indicate that the more parsimonious model of simple main effects (the compensatory model) is also useful to consider (Wertlieb et al., 1989).

While the literature contains a great deal of information on factors that directly promote positive or negative health, so far there is comparatively little understanding of protective or buffering processes. The mechanisms involved in interaction effects are still incompletely understood; empirical studies have only recently begun to investigate effects that involve not evasion of a risk, but successful engagement and coping with it (Rutter, 1987). Findings of some of these studies are presented below.

PROTECTIVE MECHANISMS

On the basis of previous research in the area, Garmezy (1985) has identified three categories of factors that protect against stress: 1) dispositional attributes of the child, 2) family cohesion and warmth, and 3) the availability and use of external support systems by parents and children.

In the context of *dispositional attributes of the child*, genetic and constitutional factors have frequently been found to serve protective functions. Antecedents of resilience are likely to be found in ways in which the infant responds to environmental change, can be comforted, equilibrates physiological responses, and modifies sleep-wakefulness states (Block & Block, 1980). Temperamental features have also been found to operate in protective and vulnerability processes. Wertlieb et al. (1989) found three aspects of temperament to moderate the effects of stress: distractibility, threshold (level of stimulation required to elicit a discernible response), and approach (nature of responses to novel stimuli). Children with adverse temperaments are more likely than are other children to be the target of parental irritability, criticism, and hostility (Rutter, 1978). Protective aspects of gender have been identified by research indicating that, in comparison to girls, boys are more vulnerable to out-of-home day care (Gamble & Zigler, 1986), and that they react to stressful family circumstances with greater emotional and behavioral disturbances (Rutter, 1982).

Intellectual ability is one of the most widely investigated moderator variables in resilience research. However, the ways in which intelligence interacts with stress in predicting adjustment are still incompletely understood. Some investigations have indicated that intellectual ability shows protective effects (Kandel et al., 1988; Masten et al., 1988; Werner & Smith, 1982). For instance, Garmezy et al. (1984) found that, when faced with increasing levels of stress, bright children did not show the declines in social competence that were demonstrated by less intelligent children. Other studies, however, have failed to find

significant interactions between intelligence and risk in predicting adjustment (White, Moffitt, & Silva, 1989). Still other investigations have yielded the somewhat counterintuitive finding that intelligence can sometimes operate as a vulnerability factor (Luthar, in press; Masten, 1982). In the Luthar study, intelligence was positively related to competence indices at low levels of stress. When stress levels were high, however, the intelligent children appeared to lose their advantage, and demonstrated competence levels more similar to those of less intelligent youngsters. Findings such as these have been interpreted via the argument that more intelligent children tend to have higher levels of sensitivity to their environments, which may heighten their susceptibility to stressors (Zigler & Farber, 1985). Given the widely differing findings across existing studies, however, it is clear that a great deal more research is required to understand the conditions under which intelligence operates as a protective factor, a vulnerability factor, or is simply uninvolved in interactions with stress.

The role of humor in resilience is suggested by exploratory analyses (Masten, 1982) showing that highly stressed, competent children had higher scores on humor generation than did children who were highly stressed but less competent. Protective aspects of social skills have been indicated by various investigations. Interaction effects obtained between interpersonal awareness and stress indicated that increasing stress was associated with decreasing competence, but only among children with low interpersonal awareness (Pellegrini, 1980). As compared to stress-affected elementary school children, those who are stress-resilient have been found to have higher levels of empathy, as well as more effective social problem solving skills and coping strategies (Parker et al., 1990). Finally, in a study involving adolescents, social expressiveness was found to be a protective factor (Luthar, in press).

An internal locus of control has been found to serve protective functions among children (Murphy & Moriarty, 1986; Parker et al., 1990), adolescents (Luthar, in press), and young adults (Werner, 1989). In their longitudinal study of stress-resistance, Werner and Smith (1982) found that resilient youngsters had high faith in their control over their environment (reflecting an internal locus of control), as opposed to believing that the external environment was random and immutable. In a somewhat similar vein, planning for marriage, a variable representing tendencies to exercise foresight and to take active steps to deal with environmental challenges, was protective for women who had been raised in institutions. Formerly institutionalized women who exercised planning were less likely to marry deviant men (criminals or men with a psychiatric disorder) than were those low in planning; among a group of controls, planning was not related to the choice of deviant versus nondeviant spouses (Rutter & Quinton, 1984).

The importance of *familial factors* in resilience has been indicated by several studies. Data on the development of egoresilience through childhood indicate that while ego-brittle children come from homes marked by discord and conflict, ego-resilient children have parents who are competent, integrated, loving, patient, and compatible, and who have shared values (Block, 1971). A good relationship with at least one parental figure can protect against the risks associated with family discord (Rutter, 1979) and child abuse (Hunter & Kilstrom, 1979). Another investigation revealed that maternal competence in parenting

served protective functions for girls in middle childhood (Masten et al., 1988). The significance of parental values and beliefs in resilience is indicated by the fact that among underprivileged families, parents' beliefs in opportunities through education can help children to attain considerable success and competence in their adult lives (Comer, 1988). The longitudinal study by Werner and Smith (1982) indicated various protective aspects of family functioning, which are considered in some detail in the following section.

The family has been found to serve important protective functions for individuals during adulthood as well. Among adult women who had been institutionalized as children, the presence of a supportive spouse exercised a protective function in influencing the quality of the women's parenting (Quinton, Rutter, & Liddle, 1984; Rutter & Quinton, 1984). Similar protective processes associated with the presence of intimate relationships or marital support have been found by other investigators (Brown & Harris, 1978; Parker & Hazdi-Pavlovic, 1984).

With regard to the *use of support systems*, the third category of protective factors outlined by Garmezy (1985), the literature indicates that positive outcomes tend to be associated with high use by high-risk children and their families. Resilient youngsters appear to be skillful at choosing and identifying with resilient models and sources of support (Murphy & Moriarty, 1976; Pines, 1979). Rather than seeking professional help, however, these youngsters more often tend to have a network of informal relationships that include friends of the same age, older friends, ministers, members of church youth organizations, and, in some cases, teachers (Werner & Smith, 1982; Braithwaite & Gordon, in press).

A study of high-risk adolescents (Cauce, Feiner, & Primavera, 1982) explored the protective functions of three dimensions of social support: family (parents, other relatives), formal (counselors, teachers, clergy), and informal (other adults, peers). The perceived helpfulness of these three support dimensions varied by sex, grade, and ethnic background. Interestingly, informal social support was related to better peer self-concept but was also associated with *lower* academic adjustment, indicating the potential protective as well as negative adaptive impact of different social support dimensions.

Studies have indicated that positive school experiences (academic or nonacademic) can serve protective functions. In an investigation by Rutter and colleagues, positive school experiences were found to be related to levels of planning for work and marriage among women who had been institutionalized as children, but were unrelated to planning among the control group (Rutter & Quinton, 1984).

The availability of supports for parents can strongly affect coping skills among high-risk families. For instance, the relationship between life stresses and illness has been found to be moderated by the presence of social supports from intrafamilial and extrafamilial sources (Wertlieb et al., 1987). A study of child neglect among low-income families revealed that treatment of the child was influenced by conditions such as the quality of housing and the presence or absence of a telephone, as well as factors such as the existence of a network of family and friends and church attendance (Giovannoni & Billingsley, 1970). Another study (Hunter & Kilstrom, 1979) revealed that the presence of social supports was among the

significant factors differentiating parents who repeated an intergenerational cycle of child abuse from parents who did not. Finally, there is an abundance of literature indicating that intervention programs that offer support services to high-risk children and their families can be of great benefit in terms of providing protective functions and promoting positive outcomes (see reviews by Berrueta-Clement, Schweinhart, Barnett, Epstein, & Weikart, 1984; Consortium for Longitudinal Studies, 1983; Copple, Cline, & Smith, 1987; Price, Cowen, Lorion, & Ramos-McKay, 1988; Seitz, in press).

LONGITUDINAL STUDIES OF RESILIENCE

Much of the extant research on resilience has utilized concurrent or retrospective designs. Although such studies can provide useful insights into factors that moderate the effects of stress, they preclude definitive conclusions regarding the causal relationships between stressors and developmental outcomes. The importance of longitudinal data is apparent in results of prospective studies indicating that phenomena associated with resilience show considerable variability over different points on the developmental continuum.

The 30-year study of resilient individuals conducted by Werner and colleagues (Werner, 1989; Werner & Smith, 1982) illustrates that the relative impact of different protective and risk factors changes at various life phases. For instance, males in their sample showed greater vulnerability than females during the first decade of life and less during the second, with another shift appearing at the beginning of the third decade. Similarly, different aspects of family functioning assumed varying levels of importance as protective factors over the course of childhood and adolescence. During childhood, for example, significant predictors of resilience included the presence of alternative caregivers in the household, the presence of the father (for boys) and the mother's long-term employment (for girls). During late adolescence, significant discriminators included the individual's perception of the quality of his or her relationship with the family, especially with the father, and the absence of maternal mental health problems in the case of girls (Werner & Smith, 1982).

Longitudinal studies also help to address the question of whether resilience shows continuity over time. In a study by Farber and Egeland (1987), levels of competence were assessed among abused and neglected children on five occasions between 12 and 42 months. Results indicated that, within the abused group, there was a subset of children who appeared competent at each stage of assessment. However, there was a decrease in the percentage of these children between 12 months and preschool. While 22 of 41 abused children were competent at 12 months, only 4 of 18 who were tested remained competent at preschool. In commenting on these findings, the authors predicted that if the home situation of these few survivors remained abusive, maladaptive behavior would be manifest during the early school years. In fact, a later study employing similar methods revealed that children who had been resilient during their first five years, and at the first grade level at elementary school, showed a substantial decline in functioning by the time they reached the third grade (Egeland & Kreutzer, in press).

Based on their longitudinal data on abused children, Farber and Egeland (1987) also made the important distinction between competent behavior and emotional health. They cited

observational data on individual “in-vulnerable” children, illustrating that, in spite of their apparently good coping strategies and adaptive behavior, these children may not be emotionally healthy. These data are consonant with findings of cross-sectional studies cited earlier (Luthar, in press; Parker et al., 1990) indicating that high behavioral competence is not necessarily paralleled by superior adjustment on measures of internalizing symptoms of psycho-pathology.

Similar questions are raised by data from Werner's sample. At the age of 30, 62 of the original sample of 72 resilient individuals were located for follow-up assessments. The 30-year interview data revealed that most of these individuals were coping successfully with their adult responsibilities, as they had coped well with demands during childhood and adolescence. However, not all of these individuals were happy or satisfied with their lives. At the same time, the proportion of self-reported health problems was significantly higher among the high-risk resilient individuals than among the low-risk comparison group. These health problems often appeared related to stress (e.g., back problems, dizziness, ulcers), particularly among men. In addition, some of the resilient males showed difficulties in establishing intimate, committed relationships in their adult years (Werner, 1989).

IMPLICATIONS FOR RESEARCH

Based on the review of extant research on childhood resilience, various directions for future research are apparent. Several important questions remain unanswered in the context of operational definitions of the central constructs, stress and competence. In addition, greater clarity is needed with regard to the processes via which the effects of stressors are moderated, and with regard to the continuity with which the effects of moderators are seen over time.

In operationalizing the pivotal construct of stress, research on childhood resilience has tended to rely heavily on life events measures. While the life events approach has several advantages, some methodological issues clearly require further exploration. For instance, additional research is needed on the issue of controllability of events. Some researchers have advocated the inclusion of only uncontrollable events in studies on resilience (Gersten et al., 1977; Masten et al., 1988). since these are relatively unlikely to be confounded with indices of maladjustment. However, the use of an approach of this kind can lead to its own set of problems. Existing life event measures contain a mix of both controllable and uncontrollable events. Scores based on a subset of uncontrollable events would not only be restricted in range (Luthar, in press), but would also have uncertain psychometric properties, since marked reduction of items on any scale can affect its reliability and validity (Carmines & Zeller, 1979).

The development of psychometrically sound measures of uncontrollable life events would constitute a considerable contribution to the field. In addition, it would be useful to have prospective data that compare, across the two types of life event scores, *a*) the magnitude of relations with indices of childhood adjustment, *b*) the stability of these correlations over time, and *c*) questions of cause and effect, i.e., the extent to which life event scores predict adjustment, as opposed to the other way around.

Another issue that warrants further empirical attention concerns the clarification of how small events may be linked to major life stresses. Significant correlations between the two types of stressors have been found in various studies (Dohrenwend et al., 1985; Sensenig, 1985). Even when spuriousness has been controlled for (through eliminating item redundancy), substantial correlations remain (Zautra et al. 1988). Such findings suggest the utility of exploring whether small events might, in fact, mediate in the relationships found between life events and various adjustment indices.

A final recommendation in the context of operationalizing stress has to do with the use of multifaceted definitions of the variable. The need to include different stress indices in resilience research is implied within current theoretical paradigms on development (Bronfenbrenner, 1986; Horowitz, 1989; Sameroff & Chandler, 1975), as well as in empirical findings indicating that a variety of stressors can correlate significantly and independently with a single aspect of adjustment (Seifer & Sameroff, 1987).

The operationalizing of competence, the second major construct involved in resilience research, gives rise to similar questions. There is a need to examine the merits, and the possible pitfalls, of the current tendency to define resilience based solely on behavioral indices of competence. Additional evidence is required to replicate (or refute) findings which suggest that, despite their manifest competence, apparently resilient children may be emotionally troubled.

As pointed out by Farber and Egeland (1987), there are ethical issues to consider when disseminating the view that certain children are invulnerable to severe life stresses. The reliance on one-time assessments which indicate behavioral competence despite stress is not just insufficient to label a child as being resilient. More seriously, it could affect intervention and prevention programming. Children most likely to receive mental health services are those whose symptoms present management problems for authority figures. High-achieving youngsters who suffer from emotional problems are unlikely to receive such services without conclusive empirical evidence demonstrating that they, too, might struggle with distress despite their adaptive behavior. Prospective studies are, therefore, vital in order to establish whether children who appear resilient continue to do well not only in terms of adaptive behavior, but also on indices of emotional health.

In the context of factors that moderate the effects of life stress, some variables, such as internal locus of control, have been consistently found to be involved in protective processes against life stress. One useful direction for future research would be to focus on designing intervention strategies aimed at fostering the development of such protective attributes among high-risk populations.

Results on some moderator variables explored have shown considerable variations across studies on resilience. In some instances, inconsistencies in results may reflect the effects of differing developmental or sociodemographic influences across investigations. For instance, although intelligence may serve protective functions among preadolescents facing high stress (e.g., Masten et al., 1988), inner-city adolescents—facing greater freedom from the home and school—may tend to use their talents in arenas other than educational achievement

(Luthar, in press). Additional research utilizing samples belonging to different age and SES groups can help to pinpoint developmental and environmental forces that may be associated with differential effects of moderator variables.

In conclusion, research on resilience in childhood has yielded several important insights over the last few decades. Building upon the existing knowledge base, future empirical endeavors can help to develop theoretical models that are increasingly complex, and that incorporate the effects of multiple forces operating at the levels of stress, competence, and the moderating processes involved in resilience. In future studies on resilience, the use of multifaceted approaches to assess stress and competence, the inclusion of developmental and socio-demographic factors in research paradigms, and the exploration of resilience in prospective designs can, together, be invaluable in terms of informing theory, as well as in yielding specific directions for future intervention programs and social policy initiatives.

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