
Ordinary Magic

Resilience Processes in Development

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The study of resilience in development has overturned many negative assumptions and deficit-focused models about children growing up under the threat of disadvantage and adversity. The most surprising conclusion emerging from studies of these children is the ordinariness of resilience. An examination of converging findings from variable-focused and person-focused investigations of these phenomena suggests that resilience is common and that it usually arises from the normative functions of human adaptational systems, with the greatest threats to human development being those that compromise these protective systems. The conclusion that resilience is made of ordinary rather than extraordinary processes offers a more positive outlook on human development and adaptation, as well as direction for policy and practice aimed at enhancing the development of children at risk for problems and psychopathology.

During the 1970s, a group of pioneering psychologists and psychiatrists began to draw the attention of scientists to the phenomenon of resilience in children at risk for psychopathology and problems in development due to genetic or experiential circumstances. These pioneers argued that research on children who developed well in the context of risk or adversity held the potential to inform theories of etiology in psychopathology and to learn what makes a difference in the lives of children at risk that could guide intervention and policy (Anthony, 1974; Garnezy, 1971, 1974; Murphy, 1974; Murphy & Moriarty, 1976; Rutter, 1979; Werner & Smith, 1982). Their calls to action inspired two decades of investigation that has yielded models, methods, and data about this family of phenomena, as well as controversies, criticisms, and media attention (Luthar, Cicchetti, & Becker, 2000; Masten, 1999b; Masten & Coatsworth, 1998).

The recognition and study of resilient children has overturned many negative assumptions and deficit-focused models about the development of children growing up under the threat of disadvantage and adversity. At the same time, the picture emerging from the systematic study of resilience suggests that some of the original assumptions about this class of phenomena were wrong, or at least misleading. Early images of resilience in both scholarly work and mass media implied that there was something remarkable or special about these children, often described

by words such as *invulnerable*, or *invincible*. One of the earliest news articles about resilience in American psychology was about “the invulnerables” in the *APA Monitor* (Pines, 1975). Similarly, a headline about this new research field in the *Washington Post* on March 7, 1976, read, “Trouble’s a Bubble to Some Kids.” The idea of resilient children as remarkable individuals possessing extraordinary strength or inner resiliency has lingered, even in scholarly work. In 1995, “Superkids of the Ghetto” appeared as the title for a book review on resilience in inner-city children published in *Contemporary Psychology* (Buggie, 1995).

The great surprise of resilience research is the ordinariness of the phenomena. Resilience appears to be a common phenomenon that results in most cases from the operation of basic human adaptational systems. If those systems are protected and in good working order, development is robust even in the face of severe adversity; if these major systems are impaired, antecedent or consequent to adversity, then the risk for developmental problems is much greater, particularly if the environmental hazards are prolonged. In this article, I highlight recent evidence accumulating from two major approaches to the study of resilience, one focused on variables and one focused on people. I also discuss the implications of resilience models and findings for research, practice, and policies aimed at understanding and changing the life course of children in developmental jeopardy.

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Defining Resilience

Resilience refers to a class of phenomena characterized by *good outcomes in spite of serious threats to adaptation or development*. Research on resilience aims to understand the processes that account for these good outcomes. Resilience is an inferential and contextual construct that requires two major kinds of judgments (Masten, 1999b; Masten & Coatsworth, 1998). The first judgment addresses the threat side of the inference. Individuals are not considered resilient if there has never been a significant threat to their development; there must be current or past hazards judged to have the potential to derail normative development. In other words, there must be demonstrable risk. In many cases, risks are actuarially based predictors of undesirable outcomes drawn from evidence that this status or condition is statistically associated with higher probability of a “bad” outcome in the future (Kraemer et al., 1997; Masten & Garnezy, 1985). Many risk factors, ranging from status variables such as biological child of a parent with schizophrenia or low socioeconomic status to direct measures of exposure to maltreatment or violence, are well-established statistical predictors of subsequent developmental problems, either specific problems or a broad spectrum of difficulties (Masten & Garnezy, 1985; Masten & Wright, 1998).

In studies of resilience, the risk side of the definition has been operationally defined in diverse ways, including socioeconomic status (SES) measures, tabulations of the number of life events that have occurred in recent months or a lifetime, massive community trauma, low birth weight, divorce, and cumulative risk calculations that combine these different kinds of risk factors. The diversity of the

risks studied in this literature presents a problem for comparing and interpreting results across studies (Kaufman, Cook, Arny, Jones, & Pittinsky, 1994; Luthar, 1999; Luthar et al., 2000). On the other hand, convergent findings in the context of such diversity are compelling (Luthar et al., 2000).

Investigators quickly realized that risks for specific or general problems in development often co-occur and that cumulation of these risks at one point in time or over time is strongly related to rising risk for poor outcomes on multiple indicators of development, including psychosocial competence, psychopathology, and health (Masten & Wright, 1998; Rutter, 1979, 1990; Seifer & Sameroff, 1987). Such risk gradients are pervasive, and the processes underlying them remain elusive, as evident in recent attempts to understand SES gradients for a wide variety of child and adult criteria of health (broadly defined) and well-being (Keating & Hertzman, 1999). Singular and aggregated risk indices often predict many kinds of undesirable outcomes. The lack of specificity observed in studies of risk (Coie et al., 1993) may reflect in part the tendency for measured and unmeasured risks to co-occur.

Furthermore, most risk gradients can be inverted to create an “asset” or “resource” gradient showing that high levels of assets are associated with better outcomes (Benson, Scales, Leffert, & Roehlkepartain, 1999; Sameroff, Seifer, & Bartko, 1997). This is because most risk indicators are arbitrarily labeled this way (Kraemer et al., 1997; Masten, 1994; Rutter, 1990; Sameroff et al., 1997; Stouthamer-Loeber et al., 1993). Pure risk factors undoubtedly exist (predicting negative outcomes when they occur), such as a car accident, and purely positive assets are conceivable, such as a talent or friend (or a fairy godmother). However, most risk factors actually index continuous, bipolar dimensions that have a positive end associated with positive outcomes (e.g., good parenting vs. poor parenting, high education vs. low education), as well as a negative end associated with negative outcomes. Thus, low risk on a risk gradient indicates high assets in many cases, because of the arbitrary naming of bipolar predictors. However, it is also possible for risks and assets to be inversely related for other reasons, such as a third causal factor, even when they are not opposite ends of the same dimensions (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). Competent parents (causal factor), for example, may produce fewer stressful family life events (risks), choose to live in neighborhoods with low crime rates (risks) and good community resources (assets), and be more likely to hire tutors for their children (assets).

The second judgment involved in an inference about resilience is the criteria by which the quality of adaptation or developmental outcome is assessed or evaluated as “good” or “OK.” There is little debate about whether such criteria exist, but much controversy remains about who should define resilience by what standards (Luthar et al., 2000; Masten, 1999b). This is a highly complex issue that is only beginning to be addressed empirically.

Many developmental investigators have defined resilience on the basis of an observable track record of meeting the major expectations of a given society or culture in historical context for the behavior of children of that age and situation. These expectations are termed *salient developmental tasks, competence criteria, or cultural age expectations* in developmental and life-span theory (Elder, 1998; Masten & Coatsworth, 1995, 1998; Waters & Sroufe, 1983). However, other investigators, particularly in fields concerned with prevention of substance abuse and psychopathology, have focused on the absence of psychopathology or a low level of symptoms and impairment as the criterion for resilience, rather than the presence of academic or social achievements (Conrad & Hammen, 1993; Tiet et al., 1998). Still others include both kinds of criteria (Dubow, Edwards, & Ippolito, 1997; Felner et al., 1995; Greenberg, Lengua, Coie, & Pinderhughes, 1999). A related issue is whether to define resilience on the basis of external adaptation criteria (such as academic achievement or the absence of delinquency) or internal criteria (psychological well-being or low levels of distress) or both (Luthar, 1999; Luthar et al., 2000; Masten, 1999b). Clearly, the choices made about the adaptation criteria defining resilience will influence who is included in studies and will reflect cultural norms, whether or not these are articulated in the study. Questions raised by efforts to define "good" development in resilience research warrant their own investigation, which has been rare to date (see Durbrow, 1999; Durbrow, Peña, Masten, Sesma, & Williamson, in press).

Models of Resilience

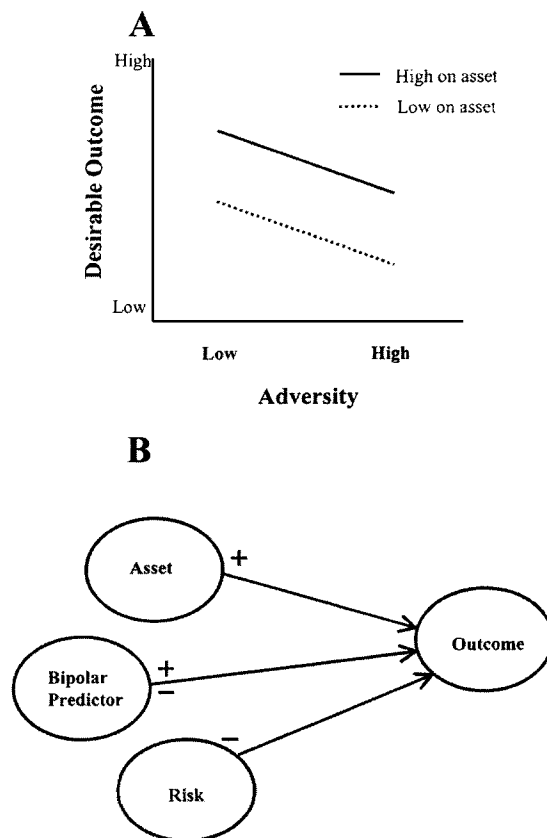
Two major approaches have characterized the designs of resilience studies aimed at explaining the variation in outcomes among high-risk children. *Variable-focused* approaches use multivariate statistics to test for linkages among measures of the degree of risk or adversity, outcome, and potential qualities of the individual or environment that may function to compensate for or protect the individual from the negative consequences of risk or adversity. *Person-focused* approaches compare people who have different profiles within or across time on sets of criteria to ascertain what differentiates resilient children from other groups of children. Each approach has advantages and disadvantages, leading some investigators to include both. The variable focus often maximizes statistical power and is well suited to searching for specific and differential links between predictors and outcomes that have implications for intervention. Yet this approach can fail to capture striking patterns in the lives of real people, losing a sense of the whole and overlooking distinctive regularities across dimensions that can indicate who is at greatest risk or needs a particular intervention. The person focus keeps variables assembled in naturally occurring configurations and is well suited to searching for common and uncommon patterns in lives through time that result from multiple processes and constraints on development (Bergman & Magnusson, 1997). On the other hand, person-

focused approaches can obscure specific linkages that provide valuable clues to explanatory processes (Shiner, Tellegen, & Masten, in press).

Variable-Focused Studies of Resilience

Main effects in variable-oriented models theoretically reflect the independent contribution of risks or assets or bipolar attributes to the course of the outcome criterion variable, although causality cannot be determined in these kind of correlational studies (Masten, 1999b). Figure 1 shows two common ways to illustrate a main effect found in multivariate, correlational analyses. In Figure 1A, regression lines are plotted for two values of an asset variable (representing high vs. low levels of a continuous asset or "present" vs. "absent" conditions for a dichotomous asset). The lines are parallel because the relation of this asset to

Figure 1
Examples of Main Effect Models Based on Multivariate Analyses in Resilience Research



Note. In A, regression lines are plotted for two values on an asset with a main effect on the criterion; the lines are parallel because this asset is an advantage regardless of adversity or risk level. Adversity also has a main effect in this example, so that the criterion falls as adversity increases. B shows a path diagram with the same main effects for an asset variable and an adversity-risk variable, plus an additional bipolar predictor with a main effect on this criterion.

the criterion of interest does not vary across risk–adversity levels. One is always better off with this asset, although the risk–adversity variable in this picture also has a main effect; scores on the criterion are falling as a function of rising risk. Figure 1B uses a path diagram to illustrate the same kind of main effects for an asset variable and a risk–adversity variable, along with the main effect of a bipolar predictor. The path model is more precise in showing the distinction between three kinds of predictors. Such main effect models can be extended through time by predicting positive and negative change in the criterion of interest over time. These prospective, longitudinal models control for the start point on the criterion variable and test for changes (residuals) over time that can be predicted by the asset or risk variables of interest.

Intervention strategies based explicitly or implicitly on such main effect models could focus on adding more assets; theoretically, if enough assets or resources were added to a child’s life, the outcome variable of interest could be maintained at normative levels, counterbalancing the negative effects of high adversity. The concept of *compensatory effects* (Garmezy, Masten, & Tellegen, 1984; Masten et al., 1988) refers to the idea that enough positive assets could offset the burden in a child’s life from one or many risk influences. Asset-building interventions are based on this assumption.

Interventions could also focus on altering the level of a particular asset or risk in a child’s life or in a population. Such strategies reflect models with mediated influence. The focus of intervention could be a mediating attribute within the child, such as when a tutoring program aims to teach a child new academic skills in order to improve the outcome of academic achievement. It is also possible to target asset–risk variables in the child’s life, such as parenting. Figure 2 illustrates a mediation model of how adversity or a positive asset in parents’ lives could undermine or enhance the adaptation of a child through their effects on the functioning of the parents. The effects of poverty (McLoyd,

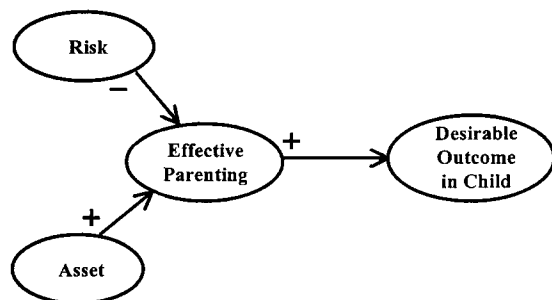
1998) appear to fit this model, in that economic hardship effects on children appear to be at least partially mediated through parenting. This model has been tested by Conger, Elder, and their colleagues in their studies of the farm crisis in the Midwest (Conger, Conger, & Elder, 1997; Conger et al., 1992). Their findings support an indirect pathway whereby the effects of the economic crisis on adolescents are mediated by effects on the mood and interaction of parents that undermine the effectiveness of parenting behavior.

Similar indirect effects suggested by the study of divorce (Hetherington, Bridges, & Glendessa, 1998) led to a randomized experimental prevention study by Forgatch and DeGarmo (1999). Their study was designed to test the hypothesized protective effect of improving or buffering parenting from the effects of divorce, using an intervention based on coercion theory (Patterson, Reid, & Dishion, 1992). Results supported the effectiveness of the intervention on parenting, which appeared to result in better outcomes among their children. Such intervention trials represent a powerful test of hypothesized protective processes emerging from the resilience literature (Cicchetti & Toth, 1992; Coie et al., 1993; Kellam & Rebok, 1992; Masten & Coatsworth, 1998).

It is also possible to prevent risk factors from occurring altogether, as when universal prenatal care is offered to a population as a preventive intervention for premature birth, a known risk factor for child development. Effective parents probably avert numerous risk factors for their offspring; thus, it is not surprising to find that children with competent parents are exposed to fewer adverse life events (Dubow et al., 1997; Gest, Neemann, Hubbard, Masten, & Tellegen, 1993; Masten et al., 1999). Total prevention of this kind (the risk factor is averted) could be difficult to detect in studies of naturally occurring resilience, given that one seeks to show something has not occurred. Thus, it is all the more important to develop and test risk-focused models of preventive intervention in randomized experimental designs.

Much also remains to be done to address the transactional dynamics of individual and environmental variables that may contribute to adaptation. Many of these variable-focused models do not accommodate the bidirectional nature of influence in living systems (Masten, 1999b). There is good reason to believe, for example, that children’s behavior influences the quality of parenting they receive (Patterson et al., 1992), and that parents influence the development of behavior in children that may be involved in moderating the impact of stress (Gunnar, 2001; Kochanska, 1993). Moreover, some personality characteristics in children and adolescents are associated with more risky behavior that could result in highly damaging life experiences (e.g., Caspi et al., 1997). Rarely examined as yet in resilience research is how the assets, risks, and protective factors in these resilience models may influence each other over time. One study that found parenting to predict child competence, resilience, and change in child competence over time, also found that child competence predicted

Figure 2
Example of an Indirect Model of Risk and Resilience



Note. Example of an indirect model of risk and resilience where a threat or asset for development works through its effects on a major adaptive system, in this case parenting. Effect of the asset or risk variable in this case is mediated by the parenting variable.

changes in parenting quality over time (Masten et al., 1999).

Results from variable-focused studies of resilience suggest that parenting qualities, intellectual functioning, SES, and positive self-perceptions have broad and pervasive correlations with multiple domains of adaptive behavior. Substantial main effects are often found for these variables for outcome criteria such as academic achievement, prosocial and antisocial behavior, psychopathology ratings, and peer acceptance (e.g., Cicchetti & Rogosch, 1997; Cicchetti, Rogosch, Lynch, & Holt, 1993; Conrad & Hammen, 1993; Dubow et al., 1997; Felner et al., 1995; Luthar, 1991; Masten et al., 1988, 1999; Tiet et al., 1998). Main effects for negative life experiences are also found in many of the same studies (e.g., Dubow et al., 1997; Felner et al., 1995; Luthar, 1991; Tiet et al., 1998). However, the explanatory power of negative life experiences is often relatively modest or negligible compared with parenting variables, IQ scores, or SES indicators, particularly when measures of life events exclude events that could be related to the child's behavior and the covariance associated with parenting or SES is controlled (e.g., Cicchetti et al., 1993; Masten et al., 1999).

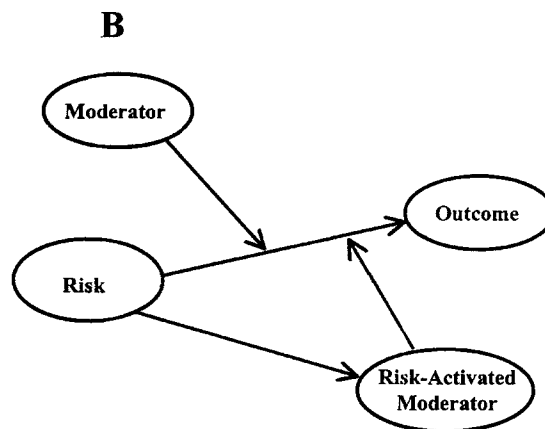
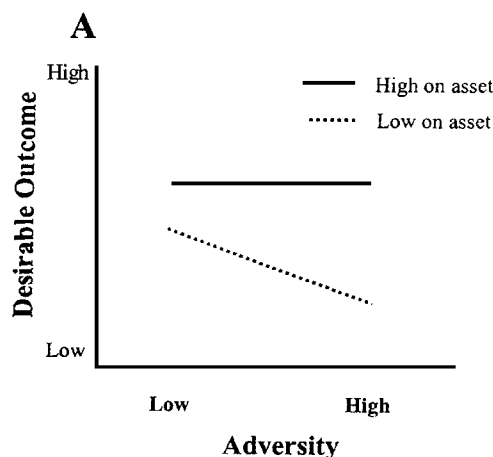
The possibility that the effects of adversity can be moderated by qualities of the individual or environment is represented and tested by interaction models in variable-focused analyses (Garmezy et al., 1984; Luthar et al., 2000; Masten et al., 1988). Figure 3A illustrates an interaction as often portrayed in regression analyses to illustrate the direction of effects after a statistically significant interaction has been found. Regression lines are plotted for two values of a presumed moderator. In this illustrative case, the contrasting slopes of the two lines suggest that the moderating variable is more important at high levels of adversity; either the individuals high on the variable are protected under high adversity conditions or those disadvantaged on this variable are more vulnerable, or both. It is not clear where the action is in such analyses of covariance.

Path diagram 3B illustrates two kinds of interaction with different implications for intervention. One is an enduring attribute unrelated to the risk factor or stressor that alters the impact of risk exposure (e.g., individuals may vary in stress reactivity). The second example is a risk-activated moderator that alters the impact of a hazard, akin to an airbag released in an automobile during a collision that serves to protect the driver (e.g., an adult comforts a child during a hurricane or a 911 call summons crisis intervention).

Interventions based on interaction models could attempt to add risk-activated protections, such as new crisis services. They could also focus on changing the quality of already present moderators, such as efforts to improve emergency social services or parental responses to the needs of children in crisis. Interventions aiming to change the coping behavior of individuals also could be based on such models (Compas, 1998).

Significant interaction effects have not been found very often across the variable-focused resilience literature

Figure 3
Examples of Interaction Models From Resilience Research



Note. The graph in A illustrates an interaction as typically portrayed in regression analyses in the case where adversity or risk appears to have differential predictive effects on the criterion depending on the level or presence of a protective or vulnerability factor. Path diagram B shows two kinds of moderator effects. One represents an attribute of child or environment that moderates the impact of a risk factor or stressor on the outcome of interest but has no relation to the risk-stressor itself. The other is a risk-activated moderator analogous to an automobile airbag or immune system response.

and results generally have not been consistent, perhaps because of the methodological variability across studies or the general difficulty of detecting interactions or both (Jessor et al., 1995; Luthar et al., 2000). The best evidence for interaction effects in the variable-focused resilience data has accrued for the hypothesis that intellectual functioning moderates the effects of adversity on the development of rule-governed behavior, as indicated by good conduct versus antisocial behavior. Better intellectual skills are generally associated with competence, particularly in school-

based domains; however, these capabilities appear to be particularly important protective factors against the development of conduct problems for children growing up in highly disadvantaged circumstances or with high exposure to adverse life events (Kolvin, Miller, Fleeting, & Kolvin, 1988; Masten et al., 1999; White, Moffitt, & Silva, 1989). It is not yet clear what exactly it is about intellectual aptitude variables that accounts for this effect. Tests of intellectual functioning are inherently complex and could be markers of motivation as well as a variety of cognitive abilities related to attention, memory, reasoning, and executive functioning.

Effective parenting (e.g., authoritative parenting, monitoring, support) also appears to be protective with respect to antisocial behavior (Dubow et al., 1997; Masten et al., 1999). Again, it is not clear what processes might be involved, including genetic covariance. However, experimental intervention designs that demonstrate a change in child behavior as a function of changes in parenting behavior (e.g., Forgatch & DeGarmo, 1999, described above) support the conclusion of resilience investigators that parenting quality has protective power, particularly against antisocial behavior in risky environments.

These findings hint at the possibility of some specificity for cognitive abilities and parenting as moderators of risk for antisocial or disruptive-aggressive behavior when rearing conditions are adverse, although each of these predictors also has extensive links to many other aspects of good and poor developmental outcome, as well as to each other. One might speculate that the development of effective self-regulation skills are involved in both cases. Clearly, there is empirical and theoretical work to be done before specific protective (or vulnerability) processes are likely to be delineated and adequately tested.

To date, results from variable-focused studies of resilience underscore the importance of well-established individual and family differences for the course of good development. Under conditions of severe adversity, poor cognitive skills and parenting appear to increase the risk of bad outcomes, particularly in the form of antisocial behavior; normative cognition and parenting appear to protect the development of competence under adverse conditions. Parenting appears to play a key mediating role linking major life stressors to child behavior. In low-threat environments, outcomes generally are good, unless the individual has significant handicaps. Very little evidence has emerged from these studies to indicate that severe adversity has major or lasting effects on adaptive behaviors in the environment *unless important adaptive systems, such as cognition and parenting, are compromised prior to or as a result of the adversity.*

Person-Focused Studies of Resilience

Resilience studies focused on whole individuals rather than variables corroborate these conclusions. Person-focused approaches attempt to capture the configural patterns of adaptation that naturally occur, in much the same way that classification systems for mental disorder organize symp-

toms into patterns that have been observed to occur together. Single case studies of resilience (e.g., Masten & O'Connor, 1989), which are person focused and can be compelling for heuristic purposes, have numerous shortcomings, particularly in terms of generalizability. Most person-focused approaches seek to identify groups of individuals with patterns of good versus poor adaptive functioning (judged on multiple criteria simultaneously) in a life context of high versus low risk or threat, in order to examine what might account for the differences in outcome.

The classic person-focused approach to resilience has been the comparison of two groups drawn from the same high-risk sample who have adaptive and maladaptive outcomes. The Kauai study by Werner and Smith (1982, 1992) has this design, as do the Rochester resilience studies of Cowen, Wyman, and colleagues (Cowen, Lotyczewski, & Weissberg, 1984; Cowen et al., 1997; Cowen, Wyman, Work, & Parker, 1990; Wyman et al., 1999). In the Kauai study, a high-risk group was identified from a birth cohort: the risk group had four or more cumulative risk factors by age two (e.g., perinatal problems, low maternal education, poverty). Then a resilient subgroup was identified on the basis of good competence and few behavior problems at ages 10 and 18. Attributes of these children and their lives were then compared with peers in the high-risk subgroup who developed significant adjustment problems by ages 10 and 18. Many differences were found that favored the resilient group. Resilient individuals had better parenting resources and were more appealing infants. As they grew older, they had better cognitive test scores, more positive self-perceptions, and greater conscientiousness than their maladaptive peers. The competence of the resilient group continued into adulthood, but it is also noteworthy that the investigators have reported a good deal of improvement for the majority of the maladaptive group in the adult years (Werner & Smith, 1992).

Other studies of the classic form base the group categories on a variety of adverse life experiences or conditions. The Rochester investigators formed "stress-affected" and "stress-resilient" groups on the basis of major life stressors (e.g., family violence, death, illness, divorce, poverty) and the pattern of scores on adjustment screening measures indexing behavioral competence and problems (Cowen et al., 1997; Wyman et al., 1999). Richters and Martinez (1993) studied children living in dangerous neighborhoods of Washington, DC, who were classified as adaptive successes or not on the basis of cutoff scores on the Child Behavior Checklist (total problems fell in the normal range) and teacher ratings of academic progress as average or better. Both of these studies found that parental competence and parenting quality were strongly associated with resilience, although their measures of risk, parenting, and outcome differed. Fergusson and Lynskey (1996) used a cutoff score on a family adversity index based on 39 family risk factors and classified adolescents as resilient on the basis of the absence of externalizing behavior problems, such as drug use, conduct disorders, delinquency, and

school problems. The resilient group had significantly lower adversity exposure and higher IQ scores in childhood, as well as less association with deviant peers and less novelty seeking.

What is missing from the classic design are low-risk groups, which could address the question of whether resilient children differ from children who are doing equally well but do not have high-risk profiles. Full classification models of resilience include low-risk groups. Investigators in two of the studies discussed previously with variable-focused analyses also analyzed their data from the person-focused perspective, using cutoff criteria to define four corner groups for analysis (Luthar, 1991; Masten et al., 1999), reflecting cutoff criteria for good versus poor competence as well as high-versus low-adversity-exposure or risk. Once the diagnostic groups were formed, resilient youth (high competence, high adversity) were then compared with both similarly competent peers with low adversity and a group of maladaptive peers who shared a history of high adversity. In both studies, the fourth corner, representing low risk, maladaptive children (who might be considered highly vulnerable, as in theory they do not fare well even with little adversity) were too few in number for analysis, an empty-cell phenomenon in these school-based samples (see Masten et al., 1999, discussion of the empty cell). Results reported by Masten et al. (1999) revealed that competent-low-adversity and resilient youth, who shared a profile of average or better competence across three salient domains (academic, conduct, social), had very similar psychosocial resources, including better intellectual functioning and parenting quality, and more positive self-concepts. Both competent groups differed markedly from their maladaptive peers on these attributes and resources, even though the resilient and maladaptive groups had similar lifetime histories of severe to catastrophic negative life experiences. Luthar's analysis was designed to assess the possibility that resilient youth suffer internal distress, in contrast to their external competence. Luthar's (1991) results supported this view, although this finding was not replicated by Masten et al. (1999), who found generally positive well-being among the resilient group.

It is possible to invert the classification in these person-focused studies and group individuals on the basis of adversity and resources, rather than competence. In such cases, children high on a combination of resources represented by scores on variables such as parenting quality, SES, and IQ appear to be well adjusted or competent, even with high-adversity exposure (Cowen et al., 1984; Masten et al., 1999); maladaptive profiles emerge when adversity is high and protective resources are weak.

Discriminant function analysis and cluster analysis also have been used to study resilient persons. Both of these strategies were used by Masten et al. (1999) to corroborate their findings. Maladaptive youth could be readily discriminated from the two competence groups by resources and well-being indicators, whereas the resilient and low-adversity competent groups could not be discriminated from each other. Cluster analysis yielded resilient,

maladaptive, and competent groups that were highly comparable with groups defined by cutoff scores, both in terms of who fell into the group and how they compared with each other on other variables.

The most complex person-oriented models of resilience discussed in the literature focus on healthy versus maladaptive pathways of development in lives through time and give special attention to turning points in people's lives (e.g., Bergman & Magnussen, 1997; Cairns & Cairns, 1994; Cicchetti & Rogosch, 1997; Egeland, Carlson, & Sroufe, 1993; Masten, 1994; Rutter, 1990; Sameroff, 1982; Werner & Smith, 1982). The concept of developmental pathways derives from developmental systems theory (Ford & Lerner, 1992), organizational theory (Cicchetti, 1984, 1990; Cicchetti & Schneider-Rosen, 1986; Sroufe, 1979, 1997), and life-course theory (Elder, 1998), all of which assume that patterns of development arise from many interactions of organisms embedded in larger systems and require longitudinal study. Bergman and Magnussen (1997) described this strategy as longitudinal classification analysis.

Most of the resilience investigators of the past decade have assumed that resilience arises from many dynamic interactions within and between organism and environment, but the systematic study of such patterns and pathways is in the nascent stage. To date, much of the discussion of resilient pathways has drawn upon case examples of individuals, often within longitudinal studies (e.g., Cairns & Cairns, 1994; Werner & Smith, 1982). These anecdotes suggest that opportunities and choices at crucial junctures play an important role in the life course of resilient individuals who find mentors, enter the military, find a new or deeper faith, marry healthy partners, leave deviant peer groups, or in other ways take action that has positive consequences for their life course. Resilient youth appear to place themselves in healthier contexts, generating opportunities for success or raising the odds of connecting with prosocial mentors in a manner consistent with the concept of niche seeking (Scarr & McCartney, 1983). Such behavior is quite difficult to study in the aggregate because of the variability in timing and situations.

The best recent evidence of resilience in the sense of recovery-to-normal trajectories of development can be found in the follow-up studies of children adopted away from institutional rearing characterized by extreme deprivation. Studies of Romanian adoptees provide dramatic documentation of developmental catch-up in many of the children, both physically and cognitively (Ames, 1997; Rutter & ERA Study Team, 1998): in the words of Rutter et al., "the degree of cognitive catch-up by the age of 4 years was spectacular" (p. 474). As observed in many other situations of extraordinary adversity, the capacity for developmental recovery when normative rearing conditions are restored is amazing (Garmezy, 1985; Masten, Best, & Garmezy, 1990; Wright, Masten, Northwood, & Hubbard, 1997). However, the impressive recovery trajectories of many children following dramatic improvements in rearing conditions do not mean that all children recover well.

Significant numbers of children from Romanian orphanages, as well as from other situations of extreme and long-term adversity, have serious and chronic problems that appear to be the residual of their experiences (Ames, 1997; Gunnar, 2001). Nonetheless, the frequency and degree of recovery of these children is compelling evidence of normative restorative processes at work, in response to the provision of good psychological and physical care by an adoptive family.

Pathway models of resilience also offer a conceptual framework for intervention. Several of the most comprehensive efforts to change the life course are conceptualized this way, including Head Start, Fast Track, and the Abecedarian Project (Conduct Problems Prevention Research Group, 1992, 1999; Ramey & Ramey, 1998; Zigler, Tausig, & Black, 1992). Theoretically, such interventions have a developmental systems perspective and they target multiple systems in their intervention. Practical considerations have necessitated simplification of their theoretical models for implementation and evaluation, but in each case, intervention results have been consistent with their models. These models differ, yet they all focus in developmentally sensitive ways on building competence and fostering healthy adaptive systems.

Conclusions From Research on Resilience Phenomena in the Lives of Children

The accumulating data on resilience in development suggest that this class of phenomena is more ordinary than one was led to expect by the extraordinary case histories that often inspired its study. Resilience appears to be a common phenomenon arising from ordinary human adaptive processes. The great threats to human development are those that jeopardize the systems underlying these adaptive processes, including brain development and cognition, caregiver-child relationships, regulation of emotion and behavior, and the motivation for learning and engaging in the environment. This does not mean that in specific instances, extraordinary talents or parenting or good fortune may not play a key role for an individual's positive development or recovery; rather, the data suggest that normative processes account for much of the resilience observed across a wide variety of situations. Ironically, expectations that special qualities were required to overcome adversity may have been influenced by prevailing deficit models of psychopathology that the early resilience investigators set out to overturn. In other words, expecting extraordinary qualities in resilient individuals implied that ordinary adaptive resources and systems were not enough.

Evidence from variable-oriented and person-oriented studies of resilience converge on a short list of attributes of child and environment that turn out to be well-established general correlates of competence and psychopathology. Despite all the flaws in the early studies of resilience pointed out by early and later reviewers, recent studies continue to corroborate the importance of a relatively small set of global factors associated with resilience. These in-

clude connections to competent and caring adults in the family and community, cognitive and self-regulation skills, positive views of self, and motivation to be effective in the environment (Garmezy, 1985; Luthar et al., 2000; Masten et al., 1990; Masten & Coatsworth, 1998; Masten & Reed, in press; Wyman, Sandler, Wolchik, & Nelson, 2000). Across different situations and research strategies, the consistent support for these resources suggests that basic human adaptational systems are at work, many of which have been studied in some depth under the rubric of constructs such as attachment, authoritative parenting, intelligence, self-regulation, self-efficacy, pleasure-in-mastery, or intrinsic motivation.

Reconceptualizing Intervention: Goals, Strategies, Assessment, and Classification

Research on resilience phenomena has changed the nature of the frameworks, goals, assessments, strategies, and evaluations in fields of prevention and treatment (Cicchetti, Rappaport, Sandler, & Weissberg, 2000; Cowen, 2000; Luthar et al., 2000; Masten, 1999a; Masten & Coatsworth, 1998; Masten & Reed, in press; Wyman et al., 2000). Goals now incorporate the promotion of competence as well as the prevention or amelioration of symptoms and problems. Strategies include the enhancement of assets as well as the reduction of risks or stressors, and the facilitation of protective processes as well as treatment of illness or reduction of harmful processes. Assessments include assets and potential resources as well as problems and risks, competence as well as symptoms and disorder. These changes together reflect a major transformation in the conceptualization of prevention and intervention. This change is evident in reports on interventions, such as one by Hawkins, Catalano, Kosterman, Abbot, and Hill (1999), titled "Preventing Adolescent Health-Risk Behaviors by Strengthening Protection During Childhood." These investigators concluded:

One explanation for the durability of these effects in contrast to those observed by others is that this intervention focused on increasing school bonding and achievement rather than on developing norms or skills specifically related to avoiding health-risk behaviors. (p. 233)

Similarly, Wyman et al. (2000), proposed the term *cumulative competence promotion and stress protection* to describe how interventions can be conceptualized in terms of resilience. It has also become evident that the classification systems for psychopathology need an overhaul to address more effectively the salient role of competence and adaptive functioning in defining and treating disorder (Masten & Curtis, 2000).

Advancing Research on Adaptive Systems

The roads taken to understand resilience have led investigators toward more integrative studies of adaptive systems in human development, how they work and how these systems develop and respond to variations in the environment. The new frontier for resilience research is understanding these processes at multiple levels, from genes to

relationships, and investigating how the individual as a complex living system interacts effectively and ineffectively over time with the systems in which it is embedded. Exciting new work on the linkages among adversity, brain development, and the quality of adaptation in terms of both competence and psychopathology, exemplify this frontier (Cicchetti & Cannon, 1999; Maier & Watkins, 1998; Nelson, 1999, 2000).

Research on resilience has underscored the importance of integrating studies of competence and psychopathology, of individual differences and normative patterns in development, and of how developmental processes unfold in normative compared with extremely deviant conditions. These goals are fundamental to the integrative science of developmental psychopathology, which rose to prominence during the same period as resilience (Cicchetti, 1984; Masten & Braswell, 1991; Sroufe & Rutter, 1984). Thus, it is not surprising to find that developmental psychopathologists often have a keen interest in resilience. We are moving toward an integrated science of human adaptation and development (Masten & Curtis, 2000).

Resilience and Positive Psychology

The message from three decades of research on resilience underscores central themes of the positive psychology movement (Seligman & Csikszentmihalyi, 2000; Snyder & Lopez, in press). Psychology has neglected important phenomena in human adaptation and development during periods of focus on risk, problems, pathology, and treatment. Attention to human capabilities and adaptive systems that promote healthy development and functioning have the potential to inform policy and programs that foster competence and human capital and aim to improve the health of communities and nations while also preventing problems. The study of resilience helped to rekindle positive psychology; now the new impetus for research on successful human functioning should serve to illuminate fundamental processes underlying resilience in development (Masten & Reed, in press). In addition, positive psychology poses important questions for resilience investigators about the differentiation of challenging experiences that undermine development versus those that promote development. Concomitantly, the study of resilience raises questions about the nature and development of optimal functioning: whether it arises from an unusual alignment of normative rather than extraordinary processes, what it means under conditions of severe adversity, and how it is scaffolded by the social context over the course of development.

The Power of the Ordinary

What began as a quest to understand the extraordinary has revealed the power of the ordinary. Resilience does not come from rare and special qualities, but from the everyday magic of ordinary, normative human resources in the minds, brains, and bodies of children, in their families and relationships, and in their communities. This has profound implications for promoting competence and human capital

in individuals and society. Even the most basic of human adaptational systems are not invulnerable and require nurturance. All too often, children who contend with the greatest adversities do not have the protections afforded by basic resources nor the opportunities and experiences that nurture the development of adaptive systems. If major threats to children are those adversities that undermine basic protective systems for development, it follows that efforts to promote competence and resilience in children at risk should focus on strategies that protect or restore the efficacy of these basic systems. Resilience models and findings also suggest that programs will be most effective when they tap into these basic but powerful systems.

The conclusion that resilience emerges from ordinary processes offers a far more optimistic outlook for action than the idea that rare and extraordinary processes are involved. The task before us now is to delineate how adaptive systems develop, how they operate under diverse conditions, how they work for or against success for a given child in his or her environmental and developmental context, and how they can be protected, restored, facilitated, and nurtured in the lives of children. Fortunately, we know more than we realized about resilience processes because a substantial knowledge base already exists about adaptive processes in human development. Our current knowledge justifies a more positive view of normative human capabilities, ordinary parents, and the self-righting power of development than either the gloom-and-doom or the rosy-resiliency perspectives could provide.

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