

PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE  
The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS

The Edinburgh Building, Cambridge CB2 2RU, UK  
40 West 20th Street, New York, NY 10011-4211, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

Ruiz de Alarcón 13, 28014 Madrid, Spain

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First published 2003

Printed in the United States of America

*Typeface* TTC New Baskerville 10/13 pt. *System* L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> [T<sub>B</sub>]

*A catalog record for this book is available from the British Library.*

*Library of Congress Cataloging in Publication Data*

Resilience and vulnerability : adaptation in the context of childhood adversities /  
edited by Suniya S. Luthar.

p. cm.

Includes bibliographical references and index.

ISBN 0-521-80701-8 (hbk) — ISBN 0-521-00161-7 (pbk.)

1. Resilience (Personality trait) in children. 2. Adaptability (Psychology) in children.

I. Luthar, Suniya S.

BF723.R46 R47 2003

155.4'1824—dc21

2002073614

ISBN 0 521 80701 8 hardback

ISBN 0 521 00161 7 paperback

# Resilience and Vulnerability

## *Adaptation in the Context of Childhood Adversities*

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 **CAMBRIDGE**  
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## Adaptation among Youth Facing Multiple Risks

### *Prospective Research Findings*

Arnold Sameroff, Leslie Morrison Guttman,  
and Stephen C. Peck

The high prevalence of mental health problems among children in the United States has continued to stimulate service-oriented professionals to seek targets for preventive intervention. In a 1999 survey of youth risk behavior during the previous year (Centers for Disease Control and Prevention, 2000), 28% of high school children felt blue or hopeless, 19% had considered suicide, and 8% had made an attempt. In terms of aggression, 36% had been in a physical fight. Academic problems were equally serious, with 30% of Hispanics dropping out before high school graduation compared to 14% of African Americans and 8% of whites. Although the majority of youth do not have such problems, the number who do is substantial.

Understanding the pathways that have led to such problem behavior is an important precursor of any successful intervention. Prevention is intimately connected to developmental concerns because there is an expected time course in which activities in the present will influence activities in the future. Where the problem seems to be in the family, school, or peer group, intuitively interventions should take place in those settings and should have immediate impact. Unfortunately, most interventions in single domains have not produced major reductions in problem behavior. It appears that children typically experience multiple risks in multiple social contexts; consequently, it is unlikely that a "magic bullet" for prevention or intervention will be found (Maslen & Coatsworth, 1998). Prevention and intervention efforts emerging from this realization utilize combinations of protective efforts to target multiple rather than single risk factors (Coie et al., 1993). Outcomes of lack of academic success or mental illness in the present or lack of financial independence

or marital problems in the future appear to have many determinants. Increasingly, attention must be given to the multiple social subsystems that play important roles in producing or reducing social and academic competence.

In this chapter, we will examine a model for predicting developmental competence based on an ecological analysis of the child's social surroundings as well as the child's capacities. Although it is important to understand the specific processes that lead to specific maladjustments, from an epidemiological standpoint the best predictors of problem behaviors seem to be a cumulative risk score that reflects statuses in the full range of ecological subsystems of the child. Moreover, the kind of risk appears to be secondary to the number of negative factors. When the strengths of the individual youth are added to the predictive model, they do not overcome the effects of high environmental risk.

### ASSESSING RISKS

Where scientists usually see their task as a search for causes, research on risk factors may appear to be a substitute for a more basic understanding of why individuals succeed or fail. Risks are probabilistic where causes are thought to be deterministic. However, the history of research into the etiology of biological disorders has demonstrated that there are no single sufficient causes. The term *risk factors* itself arose from epidemiological research seeking the cause of heart disease (Costello & Angold, 2000). In the most comprehensive of these efforts, the Framingham Study, it was found that no one factor was either necessary or sufficient (Dawber, 1980). Hypertension, obesity, lack of exercise, and smoking all made significant contributions to heart disease at the population level, but for any single affected individual there was a different combination of these factors. We shall discover a similar result in our search for the causes of developmental problems in children and adolescents. It is not a single factor that causes such difficulties, but an accumulation of adversity that reduces developmental competence.

The emerging field of prevention science (Coie et al., 1993; Mrazek & Haggerty, 1994) is much concerned with the universality of risk factors. Common findings are that the same risk factors affect multiple outcomes, such as depression, conduct disorder, or substance abuse, and that each disorder has multiple risk factors (Coie, Miller-Johnson, & Bagwell, 2000). In studies of single risks and single outcomes, this fact would be missed. The comprehensiveness and the unity of the developmental

process require studies of multiple risks and multiple outcomes to avoid a distorted view of the importance of any single risk.

#### REPRESENTATIVE RISK FACTORS

Let us turn for a moment to research aimed at identifying representative risk factors in the development of cognitive and social-emotional competence. Such child competencies have been found to be strongly related to family mental health and especially social class. In an investigation of a sample of families with a high level of maternal psychopathology, children were followed from birth through high school in the Rochester Longitudinal Study (RLS). When the effects of the mother's mental health and social status on the child's preschool intelligence and mental health were compared, socioeconomic status (SES) had a greater influence (Sameroff, Seifer, & Zax, 1982). However, to better understand the role of SES, more differentiated views of environmental influences were necessary. The measures of parents' educational and occupational achievement that constituted SES scores needed to be transformed into variables that would have a conceptually more direct influence on the child and would illuminate the differences in experiences of children raised in different socioeconomic environments.

Although SES was the best single variable for predicting children's cognitive competence, and an important predictor of social-emotional functioning, the circumstances of families within the same social class differed markedly; SES impacts parenting, parental attitudes and beliefs, family interactions, and the availability of institutions in the surrounding community. From the early data available in the RLS, a set of variables were chosen that were related to economic circumstance but were not the same as SES (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987). The 10 environmental risk variables identified were (1) a history of maternal mental illness, (2) high maternal anxiety, (3) parental perspectives that reflected rigidity in the attitudes, beliefs, and values that mothers had in regard to their child's development, (4) few positive maternal interactions with the child observed during infancy, (5) head of the household in an unskilled occupation, (6) minimal maternal education, (7) disadvantaged minority status, (8) single parenthood, (9) stressful life events, and (10) large family size. Each of these risk factors has a large literature documenting its potential for deleterious developmental effects (Gichetti & Cohen, 1995; Damon & Eisenberg, 1998; Sameroff, Lewis, & Miller, 2000; Zeanah, 2000).

Where there was no intuitive definition of risk, such as a single parent, the 25% of the sample with the worst scores were labeled as high risk. We then tested whether poor cognitive and social-emotional development was related to the risk factors associated with low socioeconomic circumstances. Each of these variables was a risk factor for preschool competence. For both cognitive and mental health outcomes, the high-risk group for each factor had worse scores than the low-risk group. However, these group differences were not large enough to provide the specificity necessary to identify specific individuals as needing intervention; most children with only a single risk factor did not have a major developmental problem.

#### CUMULATIVE RISK STUDIES

As children often experience many risks and recurring stressors, focusing on a single risk factor does not address the reality of most children's lives. To increase specificity, it is necessary to take a broader perspective when examining the factors that may be targeted for intervention efforts. Multiple settings and multiple systems must be examined simultaneously because risk factors tend to cluster in the same individuals (Bronfenbrenner, 1979, 1994). Conversely, indices of successful adaptation also tend to cluster (Carnegie Council, 1995). As children often experience many risks and recurring stressors, focusing on a single risk factor does not address the reality of most children's lives.

In improving predictive power, Rutter (1979) argued that it was no particular risk factor but the number of risk factors in a child's background that led to psychiatric disorder. Psychiatric risk for a sample of 10-year-olds rose from 2% in families with zero or one risk factors to 20% in families with four or more. The six risk factors considered included severe marital distress, low SES, large family size or overcrowding, paternal criminality, maternal psychiatric disorder, and placement of the child in foster care. Similarly, Williams, Anderson, McGee, and Silva (1990) related a cumulative disadvantage score to behavioral disorders in 11-year-olds, and Ferguson, Horwood, and Lynsky (1994) to adolescent mental health problems. In each study, the more risk factors, the more behavioral problems.

In the Rochester study, we created a multiple risk score that was the total number of risks for each family (Sameroff et al., 1987). Using this strategy, major differences were found on mental health and intelligence measures between those children with few risks and those with many

On the intelligence test, children with no environmental risks scored more than 30 points higher than children with eight or nine risks. No preschooler in the zero-risk group had an IQ below 85, whereas 26% of those in the high-risk group did. On average, each risk factor reduced the child's IQ score by 4 points. Four-year-olds in the high-risk group (five or more risk factors) were 12.3 times more likely to be rated as having clinical mental health symptoms.

Statistically, use of the multirisk strategy sacrifices some information on variability in risk indices (e.g., Burchinal, Roberts, Hooper, & Zeisel, 2000; Hooper, Burchinal, Roberts, Zeisel, & Neebe, 1998), yet at the same time it has the advantage of permitting simultaneous consideration of multiple risks in relatively small samples. In general, maximal explanatory power is attained when conducting regression analyses that consider the associations of each of multiple risk variables with a particular outcome. In situations where 20 or 30 risk indices are considered, however, it is often impractical to have this large number of predictor variables included in a single regression analysis. Particularly when sample sizes are limited, therefore, it is often preferable to dichotomize the continuum of scores on each adversity condition into two groups, representing the presence (1) or absence (0) of risk, and then adding all the resultant scores (Sameroff, Seifer, Baldwin, & Baldwin, 1993).

If the primary interest is in some developmental process relating single predictors and outcomes, then the multirisk score provides a good summary of background variables without sacrificing degrees of freedom. An example of this is the Ackerman, Izard, Schoff, Youngstrom, and Kogos (1999) study examining the relation between contextual risk and problem behaviors of 6- and 7-year-old children from economically disadvantaged families. Eleven indicators were used to index contextual risk, but they excluded proximal family variables of specific interest. The investigation found an interaction where more positive caregiver emotionality buffered the influence of higher cumulative risk.

#### Quality versus Quantity

Another question about the multirisk strategy is whether the negative effects on developmental outcomes are the result of the accumulation of risk factors or the action of a specific risk factor. We had examined this question in the analysis of the 4-year IQ data in the Rochester study (Sameroff et al., 1987). Data from the families that had a moderate multiple risk score (3 to 5 out of 10) were analyzed to determine which risk

factors occurred together and whether specific combinations had worse effects than others. The families fell into five groups with different combinations of high-risk conditions. Despite these differences, developmental competencies were the same for children in the five groups. If there were the same number of risk factors, it didn't matter which ones they were. As in the Framingham study of heart disease (Dawber, 1980), no single variable was either a necessary or a sufficient determinant of good or bad outcomes. It was not the quality of the risky environment but the number of risk factors that was affecting the development of children.

In another study contrasting regression and add-em-up strategies, Deater-Deckard, Dodge, Bates, and Pettit (1998) found that multirisk scores were successful outcome predictors, but they explained only about two-thirds of the variance predicted by regressions. In addition, they followed up on the quantity versus quality issue and found that different combinations of risks led to similar outcomes. This means that it is unlikely that the same intervention will work for all children. For every family situation, a unique combination of risk factors will require a unique set of intervention strategies embedded within a developmental model.

#### Multiple Outcomes and Multiple Risks

To measure the prevalence of risk factors and their association with developmental outcomes, a study is required with a large representative sample and a clearly conceptualized model of risk. Unfortunately, no such epidemiological study has been performed. Moreover, most studies of the effects of risk on development have not applied an ecological perspective in their conceptualization. Attention in the planning has not been given to family, school, peer, and community variables simultaneously. It is only after the fact that risk analyses have been considered.

An example is an analysis of the progress of several thousand young children from kindergarten to third grade using community samples from 30 sites (Peck, Sameroff, Ramey, & Ramey, 1999). From the data collected, 14 risk factors were chosen that tapped ecological levels ranging from parent behavior to neighborhood characteristics. The risk factors were summed, and the expected linear relations were found between the multiple environmental risk scores and school outcomes of academic achievement and social competence supporting the findings from the RLS. Although this study used a large sample at multiple sites, the children were not a representative sample of the community, and the risk factors were selected from available data rather than planned in advance.

Another set of data on the effects of multiple environmental risks on child development was provided by a study of adolescents in a group of Philadelphia families (Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999). Mothers, fathers, and offspring were interviewed in almost 500 families where there was a youth between the ages of 11 and 14. Although not a representative sample, the families varied widely in SES and racial composition.

An advantage of the Philadelphia project was that a more conceptual approach was taken to the design so that environmental measures were available at a number of ecological levels. For the analyses of environmental risk, variables were grouped and examined within subsystems that affected the adolescent, from microsystems (Bronfenbrenner, 1979) in which the child was an active participant to those more distal to the child, where any effect had to be mediated by more proximal variables.

To approximate an ecological model, six groupings of 20 environmental risk variables reflecting different relations to the adolescent were built into the design (Sameroff, Bartko, Baldwin, Baldwin, & Seifer, 1998) (see Table 15.1). The intention was to include multiple factors in each

TABLE 15.1. *Risk Variables in the Philadelphia Study*

| Domain                  | Variable                  |
|-------------------------|---------------------------|
| Family process          | Support for autonomy      |
|                         | Discipline effectiveness  |
|                         | Parental investment       |
|                         | Family climate            |
| Parent characteristics  | Education                 |
|                         | Efficacy                  |
|                         | Resourcefulness           |
|                         | Mental health             |
| Family structure        | Marital status            |
|                         | Household crowding        |
|                         | Welfare receipt           |
|                         | Institutional involvement |
| Management of community | Informal networks         |
|                         | Social resources          |
|                         | Economic adjustment       |
|                         | Prosocial                 |
| Peers                   | Antisocial                |
|                         | Neighborhood SES          |
|                         | Neighborhood problems     |
| Community               | Neighborhood problems     |
|                         | School climate            |

of the six ecological subsystems. Family process was the first grouping and included variables in the family microsystem that were directly experienced by the child and would fit into a category of parent-child interaction. These variables included support for autonomy, behavior control, parental involvement, and family climate. The second grouping was Parent Characteristics, which included mental health, sense of efficacy, resourcefulness, and level of education. The third grouping, Family Structure, included the parents' marital status, and socioeconomic indicators of household crowding and receiving welfare payments. The fourth grouping was Family Management of the Community, composed of institutional involvement, informal networks, social resources, and adjustments to economic pressure. The fifth grouping, Peers, included indicators of another microsystem of the youth, the extent to which the youth was associated with prosocial and antisocial peers. Community was the sixth grouping, representing the ecological level most distal to the youth and the family. It included a census tract variable reflecting the average income and educational level of the neighborhood the family lived in, a parental report of the number of problems in the neighborhood, and the climate of the adolescent's school.

In the Philadelphia study, in addition to the larger number of ecological variables, we had a wider array of youth assessments for interpreting developmental competence. The five outcomes used to characterize successful adolescence were Psychological Adjustment, Self-Competence, Problem Behaviors with drugs, delinquency, and early sexual behavior, Activity Involvement in sports, religious, extracurricular, and community projects, and Academic Performance, as reflected in grades.

To examine the effect of the accumulation of risks, scores were calculated for each adolescent. The result ranged from a minimum of 0 to a maximum of 13 out of a possible 20 risk factors. When the five normalized adolescent outcome scores were plotted against the number of risk factors a very large decline in outcome was found with increasing risk (see Figure 15.1) (Sameroff et al., 1998).

Whether cumulative risk scores meaningfully increase predictive efficiency can be demonstrated by an odds-ratio analyses, involving comparisons of the odds of having a bad outcome in a high-risk versus a low-risk environment. For the typical analysis of relative and attributable risk the outcome variable is usually discrete, either succumbing to a disease or disorder or not. For children, there are few discrete negative outcomes. They are generally too young to have many pregnancies or arrests, and the rate of academic failure is not particularly high. In the Philadelphia

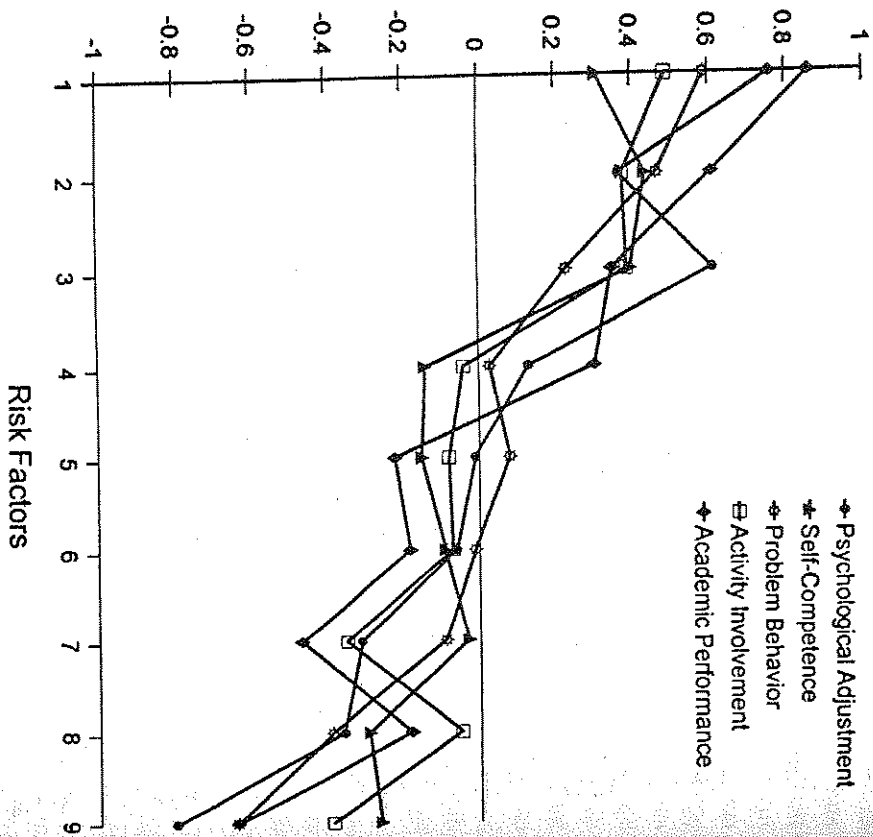


FIGURE 15.1 Relation of five youth outcomes to multiple-risk score in the Philadelphia study.

study, bad outcomes were artificially created by identifying the 25% of adolescents who were doing the most poorly in terms of mental health, self-competence, problem behavior, activity involvement, or academic performance.

The relative risk in the high-risk group (eight or more risks) for each of the bad outcomes was substantially higher than in the low-risk group (three or fewer risks). The strongest effects were for Academic Performance, where the relative risk for a bad outcome increased from 7% in the low-risk group to 45% in the high-risk group, an odds ratio of 6.7. The odds ratios for Psychological Adjustment, Problem Behavior, Self-Competence, and Activity Involvement were 5.7, 4.5, 3.4, and 2.7,

respectively. For the important cognitive and social-emotional outcomes of youth, powerful negative effects, seem to result from the accumulation of environmental risk factors.

Our assessments of both multiple risks and multiple outcomes have allowed us to examine another important issue: the degree to which some sets of risks are associated with some outcomes more than with others. Using data from a longitudinal study of African American and white adolescents in a large county in Maryland that included both urban and suburban neighborhoods (Eccles, Early, Fraser, Belansky, & McCarthy, 1997), we examined the pattern of contributions from different ecological subsystems to the mental health, problem behavior, and academic achievement during the eighth grade (Sameroff & Peck, 2001). Because many variables are correlated with each other (e.g., education and income), their contribution to multiple regression equations may not reflect their actual influence. To get around this problem, we entered the set of variables for each ecological subsystem first and last in a series of hierarchical multiple regressions. The variance explained when entered first represents the upper limit and when entered last represents the lower limit, with the truth somewhere in between (Figures 15.2, 15.3, and 15.4).

For each outcome we found a different pattern, with parental mental health being the largest contributor to youth mental health, peers being the largest contributor to problem behavior, and almost every variable contributing to academic achievement. Yet when we used multiple risk scores that equalized the influence of each contextual variable, there were similar relations to each outcome – the more risk factors, the worse the outcome.

Similarly, in the Philadelphia study, the pattern of relations between ecological variables chosen as risk factors and adolescent behavior was different in regression analyses for each outcome (Furstenberg et al., 1999). But again, the more risk factors, the worse the outcome.

#### RESILIENCE AND PROTECTIVE FACTORS

A major counterpoint to changing the social circumstances of children's lives is the idea of changing the characteristics of the children themselves. Resilience connotes positive adaptation by individuals despite severe adversity. Over the past three decades, studies of resilience have focused on individual variation in response to risky conditions such as stressful life events (Garmezy, Masten, & Tellegen, 1984; Luthar, 1991; Weist, Freedman, Paskewitz, Proescher, & Flaherty, 1995), exposure to



### Youth Mental Health

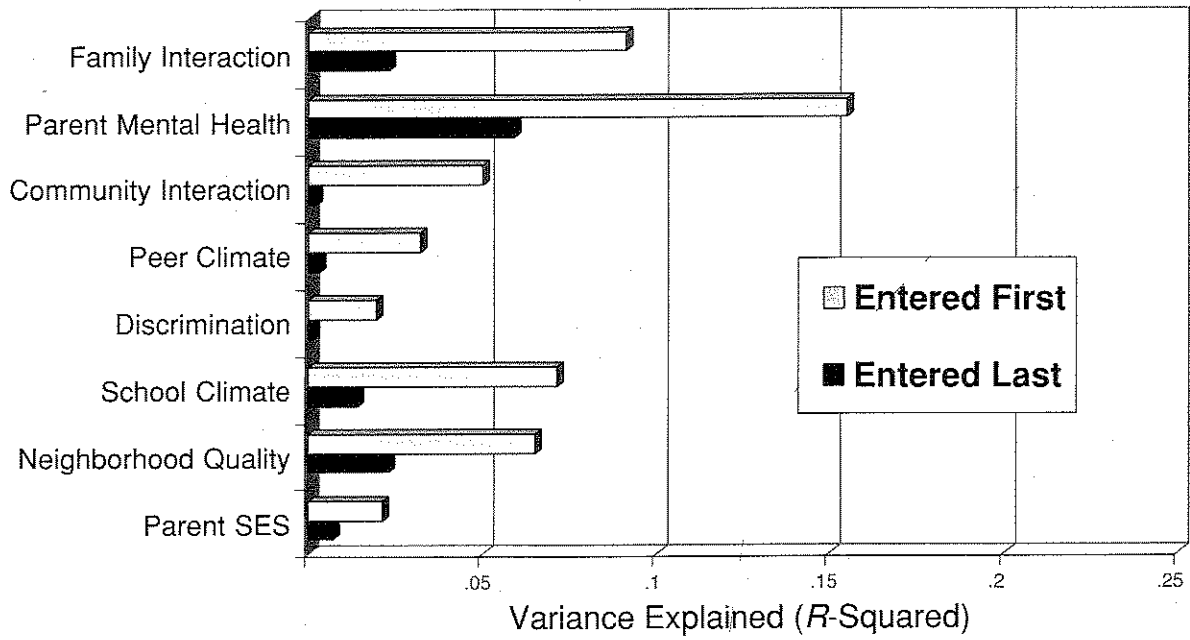


FIGURE 15.2 Proportion of variance explained when sets of variables from various ecological systems are entered first and last in hierarchical linear regression analyses predicting youth mental health, problem behavior, and academic achievement in the Maryland study.

### Youth Problem Behavior

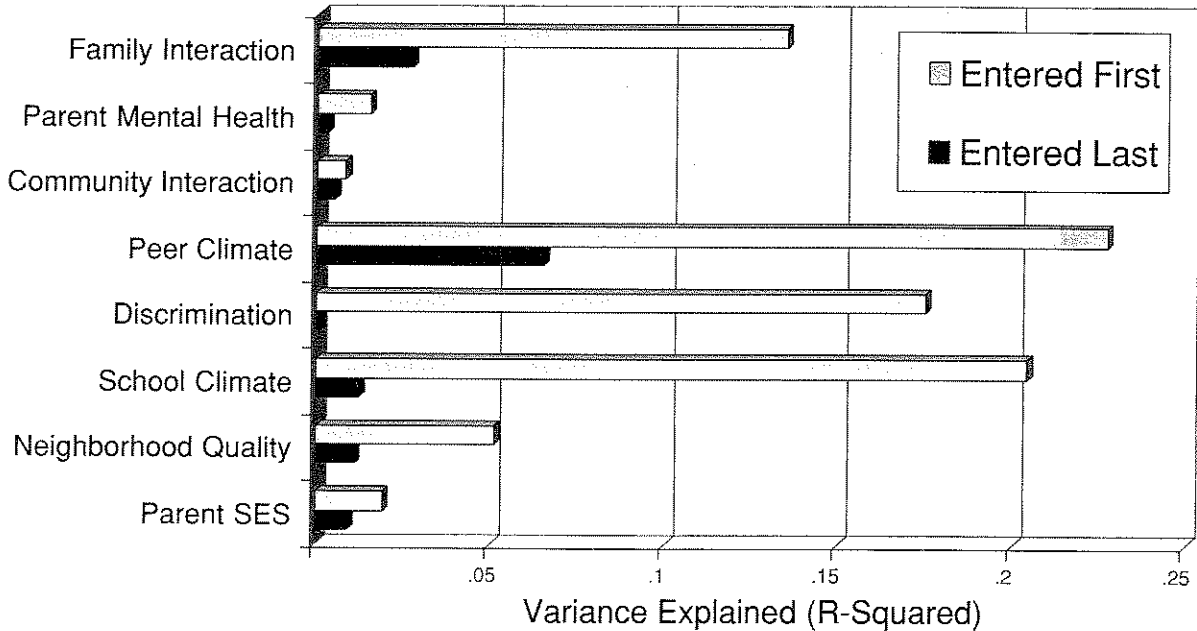


FIGURE 15.3 Caption same as Figure 15.2.



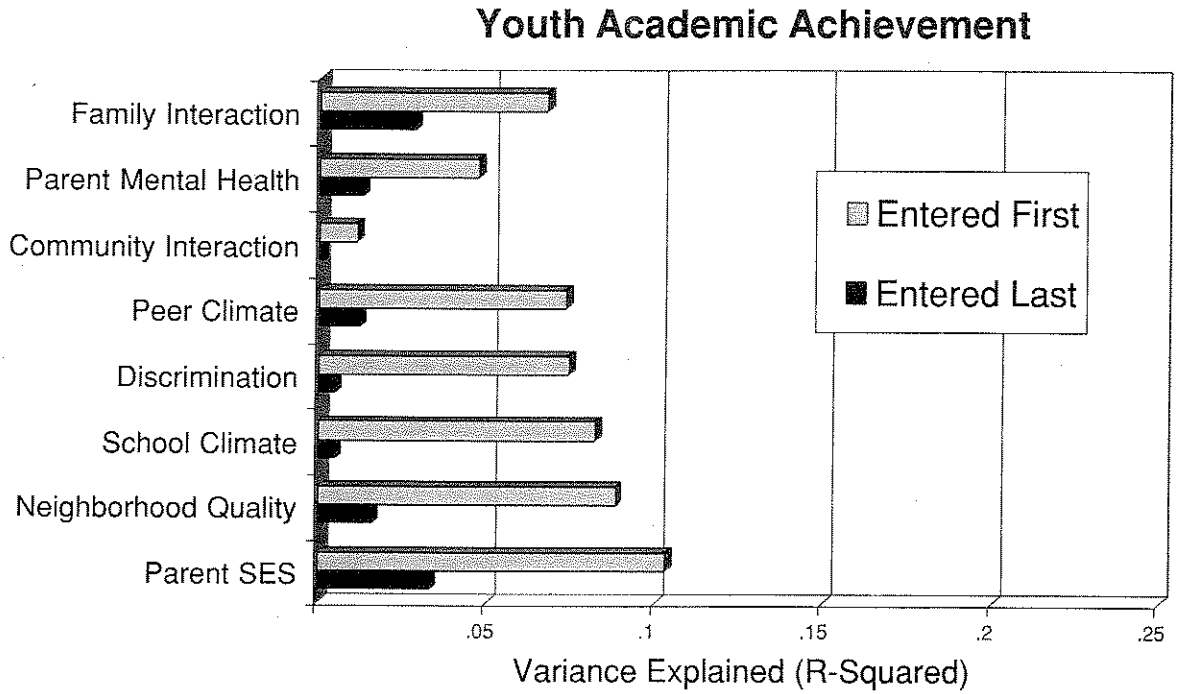


FIGURE 15.4 Caption same as Figure 15.2.

community violence (White, Bruce, Farrell, & Kliever, 1998) maltreatment (Moran & Eckenrode, 1992), urban poverty (Luthar, 1999), and maternal mental illness (Seifer et al., 1982).

These studies have brought sharper attention to the protective factors that influence stress resistance in children and adolescents. Whereas earlier studies focused primarily on personal attributes, such as high IQ that were associated with manifestations of competence in children despite exposure to stressful events (Garmezy et al., 1984), later research incorporated protective factors in the social context. For example, Garmezy (1993) identified three broad sets of variables that have been found to operate as protective factors in stress-resistant children: (1) characteristics of the child such as temperament, cognitive skills, and positive responsiveness to others, (2) families marked by warmth, cohesion, and structure, and (3) the availability of external support systems.

Recently, however, there has been sharp criticism concerning the construct of resilience and the methods used by resilience researchers (see Luthar, Cicchetti, & Becker, 2000). One of the main criticisms concerns the absence of a unifying conceptual framework that encompasses its integration across disciplines and specialized areas. A scientific basis for intervention research necessitates precise terminology to build upon earlier classifications and to ensure its continued vitality (Luthar et al., 2000). A consistent and systematic framework is essential to facilitate the work of researchers and practitioners who pursue work in this area, to integrate findings across diverse fields, and to provide guidance for the identification and implementation of age-appropriate, optimal targets for preventive interventions.

Many current research reports use the phrase *protective factors* as a synonym for *competence-enhancing factors*, but early pioneers of resilience research restricted the use of these terms to situations where there was an interaction with a risk variable. In this sense, the effect of a protective factor would be minimal in low-risk populations but would be magnified in the presence of one or more risk variables (Garmezy et al., 1984). Protective factors should have meaning only in the face of adversity (Rutter, 1987).

However, other researchers have been using the term *protective factors* to describe variables associated with desirable outcomes independent of the occurrence of social disadvantage or adverse circumstances (McFarlane, Bellissimo, & Norman, 1995; Resnick, et al., 1997). In other studies, protective factors were defined simply as the positive pole of risk factors (Stouthamer-Loeber et al., 1993). To counter the confusion, Sameroff (1999) proposed that a better term for the positive end of the

risk dimension would be *promotive factors* rather than *protective factors*. In this sense, a promotive factor would have a positive effect in both high- and low-risk populations.

#### PROMOTIVE FACTORS

To examine the different effects of risk and promotive influences, we created a set of promotive factors by cutting each of our risk dimensions at the top quartile rather than the bottom (Sameroff et al., 1998). For example, where a negative family climate had been a risk factor, a positive family climate now became a promotive factor; where a parent's poor mental health was a risk factor, her good mental health became promotive. We then summed these promotive factors and examined their relation to the five Philadelphia outcomes. There was a similar range of promotive factors, from families with none to families with 15 out of a possible 20. The effects of the multiple promotive factor score mirrored the effects of multiple risks. Families with many promotive factors did substantially better than families with few promotive factors. For the youth in the Philadelphia sample, there does not seem to be much difference between the influence of risk and promotive variables. The more risk factors, the worse the outcomes; the more promotive factors, the better the outcomes. In short, when taken as part of a constellation of environmental influences on child development, most contextual variables in the parents, the family, the neighborhood, and the culture at large seem to be dimensional, aiding in general child development at one end and inhibiting it at the other. For intervention purposes, increasing promotive factors has the same effect as reducing risks, because they are on the same dimensions for most children most of the time.

Although most family and social factors seem to have linear effects on child competence, for intervention purposes it is worthwhile to determine if there are some factors that would show an interactive effect. One approach is to determine if some environmental factor would buffer the effects of other risks. Another is to search for factors in the child that would serve such functions.

#### ENVIRONMENTAL PROTECTIVE FACTORS

##### Income and Marital Status

On the environmental side, we examined the effect of two risk factors in the Philadelphia study that economists and sociologists have been very

concerned about: low income level and single parenthood (Sameroff et al., 1998). Although one would think that these factors should have powerful effects on the fate of children, we did not find such differences when these single variables were put into a broader ecological framework. Differences in effects on child competence disappeared when we controlled for the number of other environmental risk factors in each family. To test the effects of different amounts of financial resources, we split our sample of families into those with high, middle, and low income levels. For the family structure comparison, we split the sample into groups of children living in two-parent versus single-parent families. In each case, there were no differences and no interactions in the relation to child competence when we compared groups of children with the same number of risk factors raised in rich or poor families or families with one or two parents (Sameroff et al., 1998). There are many successful adults who were raised in poverty and unsuccessful ones who were raised in affluence. There are many healthy and happy adults who come from broken homes, and there are many unhappy ones who were raised by two parents.

Again, what our analyses of these data reveal is that it is not single environmental factors that make a difference but rather the constellation of risks in each family's life. Income and marital status seem to make major differences in child development not because they are overarching variables in themselves, but because they are strongly associated with a combination of other risk factors. For example, whereas 39% of poor children lived in high-risk families with more than seven risk factors only 7% of affluent children did. Similarly, whereas 29% of single-parent families lived in high-risk social conditions, only 15% of two-parent families did.

##### Family Process

In a more recent study, Guttman, Sameroff, and Eccles (2002) did find interactions. We examined the effects of multiple risk and protective factors on the academic outcomes of African American adolescents in our Maryland sample (Eccles et al., 1997; Sameroff & Peck, 2001). Negative demographic and structural variables were defined as risk factors, and parent interaction and social support variables were defined as positive factors to emphasize the interplay between these two sets of influences on adolescent development. A multiple-risk score for each family was calculated based on many of the factors already shown to have deleterious effects on children and adolescents. These included maternal

depression, family income, highest occupation in the household, maternal education, marital status, number of children living in the household, family stressful events, percentage of neighborhood poverty, percentage of neighborhood female-headed households, and percentage of neighborhood welfare recipients.

We defined parenting behavior and social support as positive variables to determine whether they had promotive (i.e., direct) and/or protective (i.e., interactive) effects. For the most part, previous studies have focused on how positive factors influence the developmental outcomes of either low-risk or high-risk adolescents. But in many studies of resilience, there has been a confound between high-risk samples and ethnic differences (e.g., the high-risk groups have been primarily African American, whereas the low-risk groups have been primarily white) (Baldwin et al., 1998). Because our sample included African American families with a wide distribution of exposure to risk, both promotive and protective effects could be examined.

Consistent with past research (Rutter, 1979; Sameroff et al., 1987, 1993), we found that the more risk factors adolescents experienced, the worse their academic outcomes were (Gutman et al., 2002). As the number of risk factors increased, adolescents had lower grade point averages, more absences, and lower math achievement test scores. Different promotive and protective factors also emerged as significant contributors, depending on the nature of the achievement-related outcome that was assessed. Factors were identified that were promotive only, such as parental school involvement, and those that had both promotive and protective effects, such as consistent discipline. Both factors had a positive influence on all groups of children, regardless of risk status, but consistent discipline had an additional positive effect on high-risk youth.

There were also factors that were protective only, such as peer support. In particular, peer support was associated with higher math achievement test scores for higher-risk adolescents, but it did not affect the math achievement test scores of lower-risk adolescents. Although peer support for academic success may be limited for African American adolescents (Steinberg, Dornbusch, & Brown, 1992), African American adolescents exposed to multiple risks who perceive that they can depend on their peers for help with their personal and school difficulties may be more likely to experience higher academic outcomes than their counterparts who perceive their peers as less supportive.

A surprise were variables that were thought to be positive but showed negative effects instead, such as democratic decision making. We found

that fewer opportunities for adolescent democratic decision making were associated with higher grade point averages and math achievement test scores for African American adolescents with more risks, whereas democratic decision making had little or no effect on the grade point averages and math achievement test scores of adolescents with fewer risks. Although this finding was unexpected, it was less surprising when we considered the values and demands of the larger social context in which each family lives. Parenting practices that emphasize democratic decision making and foster a sense of autonomy may be more suitable for children from low-risk environments, whereas they may be inappropriate for, or even detrimental to, youth living in more risky environments. Children and adolescents who live in more dangerous environments may benefit from high levels of parental control, whereas children living in less risky neighborhoods may experience negative effects of such restrictive control (Baldwin, Baldwin, & Cole, 1990; Baumrind, 1972; Furstenberg et al., 1999; Gonzales, Caucé, Friedman, & Mason, 1996).

We have presented the details of such studies to demonstrate the complexity involved in determining the links between context and child. Comparing the positive and negative effects of social and individual factors is necessary to understand the processes that lead to more or less successful adolescent outcomes. For example, based on the results of the Maryland study, it appears that increasing parental school involvement is important for all African American students (a promotive effect), whereas African American youth exposed to multiple risks may benefit especially from efforts designed to enhance peer networks in early adolescence such as peer mentoring or tutoring programs (a protective effect).

#### PERSONAL PROTECTIVE FACTORS

##### Gender and Race

Personal characteristics should be important ingredients in each child's development and can be divided into demographic domains, like gender and race, and behavioral domains, like sense of efficacy. To give some perspective on the relation between individual contributions and the effects of social risk, some child characteristics were included in the Philadelphia study (Furstenberg et al., 1999). The correlations between risk scores and outcomes for separate groups of boys and girls and for blacks and whites were examined, and no differences were found (Sameroff, Seifer, & Bartko, 1997). When the relation between our summary competence

measure and risk factors was compared for gender and racial groups, the curves were essentially overlapping; the more risk factors, the worse the developmental outcomes.

### Resourcefulness

Like the SES variable on the environmental side, race and gender are not behavioral variables. Therefore, it would be of greater interest to investigate the influence of variables with psychological content. A personality variable that is given great importance in discussions of successful development is resourcefulness. Is it possible that despite social adversity, those children with high levels of *human capital* (Coleman, 1988) are able to overcome the problem of minimal resources at home and in the community to reach levels of achievement comparable to those of children from more highly advantaged social strata?

In the Philadelphia study, we measured this construct of resourcefulness with a set of questions asked of the parent and the child about the youth's capacity to solve problems, overcome difficulties, and bounce back from setbacks. We divided the sample into high- and low-efficacy groups and looked at their adolescent outcomes. High-efficacy youth were more competent than those with low efficacy on our measures of adolescent competence. A sense of personal resourcefulness did seem to pay off.

But what happens to this effect when we take environmental adversity into account? When we matched high- and low-efficacy children on the number of environmental risk factors, the difference in general competence between those in the high and low environmental risk conditions was far greater than that between the high-resourceful and low-resourceful groups (see figure 15.5). High-efficacy adolescents in high-risk conditions did worse than low-efficacy youth in low-risk conditions (Sameroff et al., 1998). For some, it may be a surprise to learn that the ineffective offspring of advantaged families may have a much easier developmental path than that of more resourceful multirisk children.

We did the same analysis using academic achievement as an indicator of competence and examined whether the good work of high-efficacy youth at school was related to better mental health, more engagement in positive community activities, and less involvement in delinquent problem behavior. Again, for every outcome, adolescents with high grades in high-risk conditions did worse than those with low grades in low-risk conditions.

### Mental Health

One of the weaknesses of the Philadelphia study is that the data are cross-sectional. Finding causal factors is impossible unless one has longitudinal developmental data, and it is difficult even then. The Rochester study did have a series of developmental assessments that permitted a longitudinal view of the contribution of individual factors to developmental success. We could see how infant competence affected preschool competence and then how preschool competence affected high school competence.

From the Rochester data collected during the first year of life, we created a multiple competence score for each child during infancy that included 12 factors. These were scores from newborn medical and behavioral tests, temperament assessments, and developmental scales. We then divided the sample into groups of high- and low-competent infants and examined as outcomes their 4-year IQ and social-emotional functioning scores. We found no relation between infant competence and 4-year IQ or social-emotional problems. We could not find infant protective factors (Sameroff et al., 1998).

However, infant developmental scales may be weak predictors because they assess different developmental functions than those captured by later cognitive and personality assessments. Perhaps if we move up the age scale, we may find that characteristics of these children at 4 years of age may be protective for later achievement. We divided the 4-year-olds into high and low mental health groups and high and low IQ groups. We then compared these groups on how they did at 18 years on mental health and measures of school achievement. More resourceful children did better on average than less resourceful children, but as in the Philadelphia study, when we controlled for environmental risk, the differences in performance between children with high and low levels of early competence were much less than those between children in high- and low-risk social environments. In each case, we found again that high-competent children in high-risk environments did worse than low-competent children in low-risk environments.

The situation was much the same at 13 years of age. We divided the adolescents into high and low mental health groups and high and low intelligence groups and examined their 18-year behavior. Again, in each case, 13-year-old youths with better mental health and intelligence did better within the same social risk conditions, but competent youths living in high-risk conditions did worse than competent youths in low-risk conditions. However more to our point, they did worse than low-competent

children in low-risk environments (Sameroff et al., 1998). The negative effects of a disadvantaged environment seem to be more powerful contributors to child achievement at every age than the personality characteristics of the child.

#### DEVELOPMENTAL TRAJECTORIES

Although several studies have examined the impact of risk and protective factors on the academic outcomes of children and adolescents, most have either examined a single point in time or change across two time points. Interactive processes between risk and protective factors, however, often rely on chains of connections over time rather than on a multiplicative effect at any single time point (Rutter, 1987). Understanding the factors that influence students' academic trajectories over many time points may help explain why high-risk students either catch up or fall further behind their more advantaged peers as they progress through school.

In the Rochester study, we examined school records and obtained grades and attendance records for the participants from 1st to 12th grades (Gutman, Sameroff, & Cole, submitted). Hierarchical linear modeling (HLM) was used to examine the trajectories of the children throughout their school careers (Bryk & Raudenbush, 1992). We then determined how the growth curves were influenced by early environmental risk, that is, their 4-year multirisk scores. We also determined the degree to which their early mental health and intelligence interacted with environmental risk in a two-level hierarchical linear model where the time points were conceptualizing as nested within children. In other words, in addition to measuring multiple risk factors, we examined the promotive (i.e., direct) and protective (i.e., interactive) effects of intelligence and mental health on grade point average and number of absences using the 12 time points from 1st to 12th grades. We expected that (1) multiple risks would have negative effects on students' academic trajectories; (2) child factors would act as either promotive and/or protective factors, depending on the outcome being assessed; and (3) protective factors would be identified whose effects were magnified in the presence of multiple risks.

Amplifying other studies that examined either one or two points in time, we found that early risk had an adverse effect on academic trajectories from 1st to 12th grades (Gutman et al., submitted). Although high-risk students started out with academic achievement similar to that of average students in first grade, their school grades became lower and

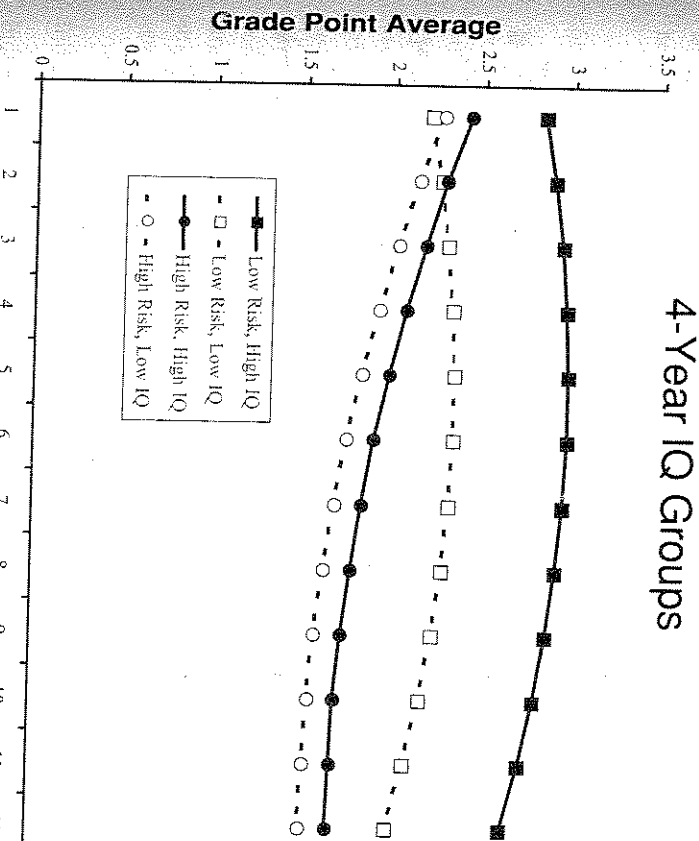


FIGURE 15.5 Effects of 4-year high and low multiple risk and high and low 4-year verbal intelligence on school grades (GPA) from first to twelfth grades.

the number of absences notably higher than those of their low-risk peers as they reached high school. We found preschool promotive effects where both higher intelligence and better mental health had significant direct effects on later school grades but not on absences.

Early intelligence and mental health had significant interactive effects on students' school grades, but these were not the traditional protective effects, as these influences did not help high-risk students; they only maintained the performance of low-risk students. High-competent children, either by virtue of higher 4-year IQ (Figure 15.5) or mental health (Figure 15.6), did well in low-risk environments, but their competence was no benefit if they were at high social risk. High-risk 4-year-olds did poorly throughout the school years whether they were competent or not. Low-competent 4-year-olds in low-risk conditions consistently had higher grade point average than the high-competent children in high-risk conditions.



## 4-Year Mental Health Groups

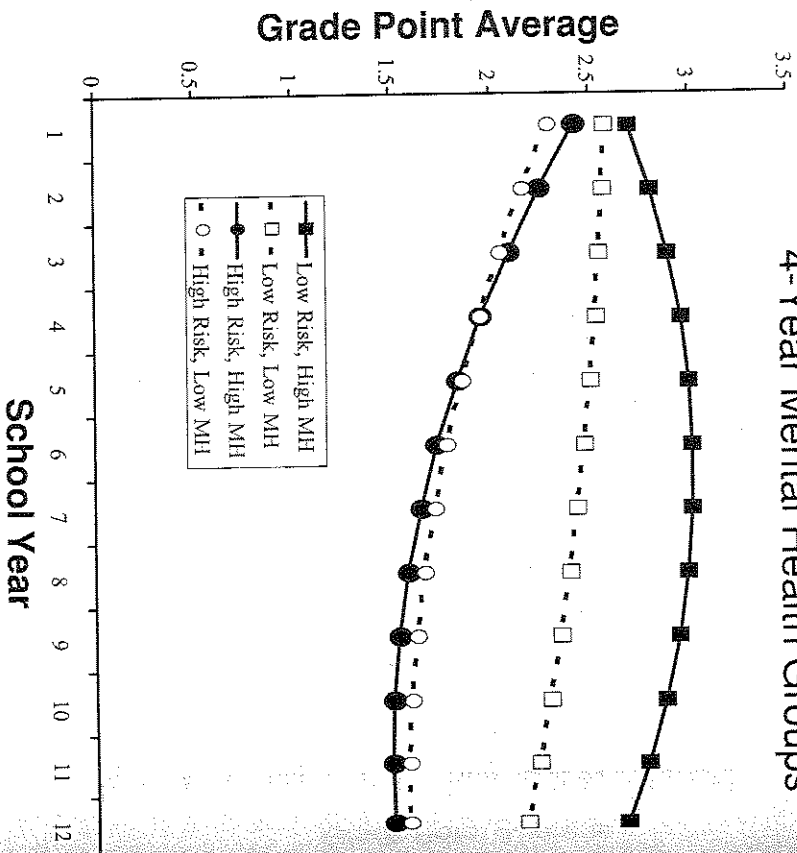


FIGURE 15.6 Effects of 4-year high and low multiple risk and high and low 4-year mental health on school grades (GPA) from first to twelfth grades.

### OVERVIEW

#### Pervasive Effects of Multiple Risks

We have examined the effects of multiple risks across a wide range of studies and have found the accumulation of social risks across the family, peer group, school, and neighborhood to have a consistent by negative effect. The more risks, the worse the outcomes.

#### Nonspecificity of Risks

A variety of developmental problems and disorders have been studied, and in each case different risk factors have been found to produce the

same negative results. Moreover, a similar set of risk factors affect a number of different disorders (Coie et al., 1993; Mrazek & Haggerty, 1994).

#### Small Effects of Single Risks

Single variables, such as income level and marital status on the family side, and gender, race, efficacy, mental health, and achievement on the personal side, taken alone, may have statistically significant effects on children's behavior, but their effects are small in comparison with the accumulation of multiple negative influences that characterize high-risk groups. The overlap in children's outcomes is substantial for low-income groups. The overlap in children's outcomes is substantial for low-income versus high-income families, families with one or two parents, boys versus girls, blacks versus whites, and high-resourceful and low-resourceful youth. But the overlap is far less in comparisons between groups of children reared in conditions of high versus low levels of multiple risks, where the effects of gender, race, resourcefulness, income, and number of parents in the home are accumulated.

#### Individual Competence Is a Weak Protective Factor

Individual competence is a major candidate for a protective factor in the face of environmental adversity. Indeed, when the level of social risk is controlled for, more competent children do better later on than less competent children. However, more competent children in high-risk conditions consistently do worse than less competent children in low-risk conditions.

#### Nonuniversality of Protective Factors

We seriously question most efforts to find a universal protective factor for all children. The positive factors that promote competence may vary according to the age of the child and the developmental outcome being targeted. Paradoxically, promotive processes in one context may prove to be risky in another. For example, although democratic, authoritative parenting may be successful in increasing the academic achievement of white, middle-class children, those who live in more dangerous environments may benefit from higher levels of parental control. Conversely, children living in less risky neighborhoods may experience negative effects of such restrictive control (Baldwin et al., 1990; Baumrind, 1972; Furstenberg et al., 1998; Gutman et al., 2002). To truly appreciate the determinants

of competence requires attention to the broad constellation of ecological factors in which these individuals and families are embedded.

### Necessity of Multiple Interventions to Counter Multiple Risks

A systems perspective requires attention to the multiple influences on child development, ranging from individual competencies to the characteristics of the many social settings in which the child participates. A focus on single characteristics of individuals or families has never explained more than a small proportion of variance in behavioral development. The children at most risk for poor outcomes are those with problems in the longest number of settings. Interventions designed to change the fates of such high-risk children will have to operate in all of these contexts. The proverbial magic bullet may turn out to be as multidimensional as the modern army. The major implication of multiple-risk models is that interventions need to be as complex as development itself.

### References

- Ackerman, B. P., Izard, C. E., Schoff, K., Youngstrom, E. A., & Kogos, J. (1999). Contextual risk, caregiver emotionality, and the problem behaviors of six- and seven-year-old children from economically disadvantaged families. *Child Development, 70*(6), 1415-1427.
- Baldwin, A. L., Baldwin, C., & Cole, R. E. (1990). Stress-resistant families and stress-resistant children. In J. E. Rolf (Ed.), *Risk and protective factors in the development of psychopathology* (pp. 257-280). New York: Cambridge University Press.
- Baldwin, A. L., Baldwin, C., Kasser, T., Zax, M., Sameroff, A., & Seifer, R. (1993). Contextual risk and resiliency during late adolescence. *Development and Psychopathology, 5*, 741-761.
- Baumrind, D. (1972). An exploratory study of socialization effects on black children: Some black-white comparisons. *Child Development, 43*, 261-267.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (1994). Ecological models of human development. In T. Husen & T. N. Postlethwaite (Eds.), *International encyclopedia of education* (2nd ed., Vol. 3, pp. 1643-1647). New York: Elsevier Science.
- Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear modeling applications and data analysis methods*. Newbury Park, CA: Sage.
- Burchinal, M. R., Roberts, J. E., Hooper, S., & Zeisel, S. A. (2000). Cumulative risk and early cognitive development: A comparison of statistical risk models. *Developmental Psychology, 36*(6), 793-807.
- Carnegie Council on Adolescent Development. (1995). *Great transitions: Preparing adolescents for the new century*. New York: Carnegie.
- Centers for Disease Control and Prevention. (2000). Youth Risk Behavior Surveillance - United States, 1999. *Morbidity and Mortality Weekly Report, 49* (SS-5), 1-96.
- Cicchetti, D., & Cohen, D. (Eds.). (1995) *Developmental psychopathology, Vol 2: Risk, disorder, and adaptation*. New York: Wiley.
- Cole, J. D., Watt, N. F., West, S., Hawkins, J. D., Asanow, J. R., Markman, H. J., Ramey, S. I., Shure, M. B., & Long, B. (1993). The science of prevention. *American Psychologist, 48*, 1013-1022.
- Coleman, J. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95-S120.
- Costello, E. J., & Angold, A. (2000). Developmental epidemiology: A framework for developmental psychopathology. In A. Sameroff, M. Lewis, & S. Miller (Eds.), *Handbook of developmental psychopathology* (pp. 57-73). New York: Plenum.
- Damon, W., & Eisenberg, N. (Eds.). (1998). *Handbook of child psychology, Vol. 3: Social, emotional, and personality development* (5th ed.). New York: Wiley.
- Dawber, T. R. (1980). *The Framingham Study: The epidemiology of coronary heart disease*. Cambridge, MA: Harvard University Press.
- Deater-Deckard, K., Dodge, K. A., Bates, J. E., & Pettit, G. S. (1998). Multiple risk factors in the development of externalizing behavior problems: Group and individual differences. *Development and Psychopathology, 10*(3), 469-493.
- Eccles, J. S., Early, D., Fraser, K., Belansky, E., & McCarthy, K. (1997). The relation of connection, regulation, and support for autonomy to adolescents' functioning. *Journal of Adolescent Research, 12*, 263-286.
- Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1994). The childhoods of multiple problem adolescents: A 15-year longitudinal study. *Journal of Child Psychology and Psychiatry, 35*, 1123-1140.
- Furstenberg, F. F., Jr., Cook, T., Eccles, J., Elder, G. H., & Sameroff, A. J. (1999). *Managing to make it: Urban families and adolescent success*. Chicago: University of Chicago Press.
- Garmezy, N. (1993). Children in poverty: Resilience despite risk. *Psychiatry, 56*, 127-136.
- Garmezy, N., Masten, A. S., & Tellegen, A. (1984). The study of stress and competence in children: A building block of developmental psychopathology. *Child Development, 55*, 97-111.
- Gonzales, N. A., Cauce, A. M., Friedman, R. J., & Mason, C. A. (1996). Family, peer, and neighborhood influences on academic achievement among African American adolescents: One-year prospective effects. *American Journal of Community Psychology, 24*, 365-388.
- Gutman, L. M., Sameroff, A. J., & Cole, R. (submitted). *Academic trajectories from first to twelfth grades: Growth curves according to multiple risk and child factors*. Submitted.
- Gutman, L. M., Sameroff, A. S., & Eccles, J. S. (2002). The academic achievement of African-American students during early adolescence: An examination of multiple risk, promotive, and protective factors. *American Journal of Community Psychology, 30*, 367-399.
- Hooper, S. R., Burchinal, M. R., Roberts, J. E., Zeisel, S., & Neebe, E. C. (1998). Social and family risk factors for infant development at one year: An application



- of the cumulative risk model. *Journal of Applied Developmental Psychology*, 19(1), 85-96.
- Luthar, S. S. (1991). Vulnerability and resilience: A study of high-risk adolescents. *Child Development*, 62, 600-616.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, 71, 543-562.
- Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American Psychologist*, 53, 205-220.
- McFarlane, A. H., Bellissimo, A., & Norman, C. R. (1995). The role of family and peers in social self-efficacy: Links to depression in adolescence. *American Journal of Orthopsychiatry*, 65, 402-410.
- Moran, P. B., & Eckenrode, J. (1992). Protective personality characteristics among adolescent victims of maltreatment. *Child Abuse and Neglect*, 16, 743-754.
- Mrazek, P. G., & Haggerty, R. J. (Eds.). (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention programs*. Washington, DC: National Academy Press.
- Peck, S., Sameroff, A., Ramey, S., & Ramey, C. (1999, April). *Transition into school: Ecological risks for adaptation and achievement in a national sample*. Paper presented at the biennial meeting of the Society for Research and Development, Albuquerque, NM.
- Resnick, M., Bearman, P., Blum, R., Bauman, K., Harris, K., Jones, J., Tabor, J., Beuhring, T., Sieving, R., Shew, M., Ireland, M., Bearinger, L., & Udry, R. (1997). Protecting adolescents from harm: Findings from the longitudinal study on adolescent health. *Journal of the American Medical Association*, 278(10), 823-832.
- Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent & J. E. Rolf (Eds.), *Primary prevention of psychopathology: Vol. 3. Social competence in children* (pp. 49-74). Hanover, NH: University Press of New England.
- Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry*, 57, 316-331.
- Sameroff, A. J. (1999). Ecological perspectives on developmental risk. In J. D. Osofsky & H. E. Fitzgerald (Eds.), *WAIMH handbook of infant mental health: Vol. 4. Infant mental health groups at risk* (pp. 223-248). New York: Wiley.
- Sameroff, A. J., Bartko, W. T., Baldwin, A., Baldwin, C., & Seifer, R. (1998). Family and social influences on the development of child competence. In M. Lewis & C. Feiring (Eds.), *Families, risk, and competence* (pp. 177-192). Mahwah, NJ: Erlbaum.
- Sameroff, A., Lewis, M., & Miller, S. (Eds.). (2000). *Handbook of developmental psychopathology*. New York: Plenum.
- Sameroff, A. J., & Peck, S. (2001, April). Individual and contextual influences on adolescent competence. Symposium presentation at the biennial meetings of the Society for Research in Child Development, Minneapolis.
- Sameroff, A. J., Seifer, R., Baldwin, A., & Baldwin, C. (1993). Stability of intelligence from preschool to adolescence: The influence of social and family risk factors. *Child Development*, 64, 80-97.
- Sameroff, A. J., Seifer, R., Barocas, B., Zax, M., & Greenspan, S. (1987). IQ scores of 4-year-old children: Social-environmental risk factors. *Pediatrics*, 79(3), 343-350.
- Sameroff, A. J., Seifer, R., Bartko, W. T. (1997). Environmental perspectives on adaptation during childhood and adolescence. In S. S. Luthar, J. A. Barack, D. Cicchetti, & J. Weisz (Eds.), *Developmental psychopathology: Perspectives on risk and disorder* (pp. 507-526). Cambridge, MA: Cambridge University Press.
- Sameroff, A. J., Seifer, R., & Zax, M. (1982). Early development of children at risk for emotional disorder. *Monographs of the Society for Research in Child Development*, 47(7, Serial No. 199).
- Steinberg, L., Dornbusch, S. M., & Brown, B. B. (1992). Ethnic differences in adolescent achievement: An ecological perspective. *American Psychologist*, 47, 723-729.
- Stouthamer-Loeber, M., Loeber, R., Farrington, D. P., Zhang, Q., van Kammen, W., & Maguin, E. (1993). The double edge of protective and risk factors for delinquency: Interrelations and developmental patterns. *Development and Psychopathology*, 5, 683-701.
- Weist, M., Freedman, A., Pakewitz, D., Proeschler, E., & Flaherty, L. (1995). Urban youth under stress: Empirical identification of protective factors. *Journal of Youth and Adolescence*, 24(6), 705-721.
- White, K., Bruce, S., Farrell, A., & Kilweber, W. (1998). Impact of exposure to community violence on anxiety: A longitudinal study of family social support as a protective factor for urban children. *Journal of Child and Family Studies*, 7(2), 187-203.
- Williams, S., Anderson, J., McGee, R., & Silva, P. A. (1990). Risk factors for behavioral and emotional disorder in preadolescent children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 29, 413-419.
- Zeanah, C. H. (2000). *Handbook of infant mental health*. New York: Guilford press.