



Resilience in Highly Stressed Urban Children: Concepts and Findings

EMORY L. COWEN, PHD, PETER A. WYMAN, PHD, AND
WILLIAM C. WORK, PHD*

Abstract. *The Rochester Child Resilience Project is a coordinated set of studies of the correlates and antecedents of outcomes relating to resilience among profoundly stressed urban children. The studies have been conducted over the course of the past decade. Based on child test data, parent, teacher, and self ratings of child adjustment, and in-depth individual interviews with parents and children, a cohesive picture has developed of child and family milieu variables that consistently differentiate children with resilient versus stress-affected outcomes within this highly stressed sample. Resilient children are characterized by an easy temperament and higher IQ; sound parent/child relationships; a parent's sense of efficacy; the parent's own wellness, especially mental health; and the child's perceived competence, realistic control, empathy, and social problem-solving.*

“Resilience” has been used increasingly in both the popular and scientific literatures. In parallel, research on this topic has burgeoned. This article first describes the concept of child resilience and makes a case for the importance of studying it. Next, it overviews procedures and findings from the Rochester Child Resilience Project (RCRP), a 10-year research effort to identify correlates and antecedents of resilient outcomes among highly stressed urban children. Finally, based on RCRP findings, it suggests steps needed to enhance understandings of the intriguing concept of childhood resilience.

* Dr. Cowen is Professor of Clinical and Social Psychology and Director, Center for Community Study, University of Rochester, Rochester, New York. Dr. Wyman is Senior Research Associate, Associate Professor of Psychology, and Clinical Assistant Professor of Psychiatry, University of Rochester, Rochester, New York, and Co-Director, Rochester Child Resilience Project. Dr. Work is Adjunct Professor of Psychology, State University of New York at Brockport, Brockport, New York, and is Associate Editor, *Journal of Community Psychology*.

Child Resilience: What Is It? Why Study It?

There is less than perfect agreement about a definition of resilience. Popular definitions are looser than scientific ones—loose enough, in fact, so that the term is often used synonymously with good adjustment. Even though research definitions of resilience are more focused and operational, they still vary. For example, although most definitions of the concept feature the two key elements of *good adjustment* in the face of *significant life stress*, those terms are used differently, i.e., whereas some define good adjustment as the absence of significant maladaptation, others (ourselves included) use the more stringent criterion of outstanding adjustment. This issue can significantly shape how resilience studies are designed and subjects identified.

On the other side of the coin, most resilience researchers would agree that, because events and changing life situations significantly affect children's adjustment status, resilient outcomes at any cross-sectional point in time should not be assumed to be permanent. Thus, longitudinal studies are needed to identify factors that facilitate resilient outcomes in the first place and act to maintain, or change, such outcomes over time.¹

In the end, however, substantial agreement about the importance of the concept of child resilience, and the need to better understand it, have made this topic a central focus for the fields of developmental psychopathology (DP)² and prevention.³ As a field, DP applies developmental principles to the study of at-risk and deviant children in seeking to illuminate pathways that subserve good and not-so-good adjustment outcomes.^{4,5} Because DP is built on the assumption that knowledge of normal development can clarify understandings of deviant outcomes and *vice versa*, the topic of resilience, typified by positive adaptive outcomes that run counter to base-rate expectations, falls squarely within its purview.⁵ In this vein, Masten argued cogently that an understanding of the sources of outstanding coping among high-risk children can provide the raw materials from which to fashion preventive interventions.⁶

Relatedly, from a preventive perspective, the case has been

made that understanding the nature of, and pathways to, odds-defying resilient outcomes in children⁷ is a key step in advancing a psychology of wellness.^{8,9} Within such a framework the phenomenon of resilience redirects attention from mental health's past dominant focus on the causes and treatment of pathology (pathogenesis) toward the enhancement of wellness.^{3,8} Earlier, Antonovsky¹⁰ coined the contrast term, salutogenesis, to describe processes that advance wellness outcomes. When such wellness-enhancing objectives are front and center, resilience is an especially appealing concept.

The Rochester Child Resilience Project

The RCRP has been in continuous, active operation for a decade. It grew out of our own earlier work in developing school-based prevention programs for young children^{11,12} and several earlier, still active research programs in child resilience, e.g., Project Competence¹³⁻¹⁵ and the 40-year Kauai longitudinal study.^{16,17} The RCRP's first goal was to identify correlates and antecedents of resilient child outcomes under stress. Its second goal was to illuminate conditions, mechanisms, and processes that underlie the development and maintenance of resilient outcomes. A more distal goal is to harness such information in the service of developing child and family interventions to enhance children's resilience and promote wellness outcomes.

Although the RCRP has explored several byways, its main thrust pivots around two major data collections designed to identify correlates and antecedents of resilient and stress-affected outcomes among highly stressed urban children. These two multi-year, multi-school studies, involving many hundreds of children, focused on fourth through sixth grade, and second and third grade youngsters and their families, respectively. Although the two studies had similar objectives and methodology, they fell short, intentionally, of being clones. For example, the move down from fourth, fifth, and sixth graders in study 1, to second and third graders in study 2, necessitated important changes in study meth-

odology (e.g., modifying and simplifying test measures to reflect developmental realities), plus changes based on experience and “hard knocks” in prior stages of the research (e.g., dropping or replacing ineffective measures, adding measures in promising domains not sufficiently covered on earlier rounds.)

RCRP Background and Foci

Because growing up under stressful life conditions increases susceptibility to adjustment problems, a decision was made to focus the RCRP on poor urban children with heavy exposure to such stress. Notwithstanding age-related adaptations of methodology and instruments in study 2, the two studies had similar foci and used similar procedures to identify subject groups. Both used extensive child testing and in-depth interviews with parents in seeking to identify correlates and antecedents of resilient outcomes among children exposed to major life stress. Also, all target children in both studies had experienced ≥ 4 stressful life events and circumstances (SLE-Cs), based on a parent checklist submitted at the time consent was given for the child to participate. Most of the listed stressors described chronic conditions (e.g., child upset by family arguments, child in foster care, exposure to violence) rather than discrete events.

Resilient and stress-affected samples in both studies were similar sociodemographically and in extent of stress exposure. All RCRP subgroups thus far studied have experienced an average of eight or nine major life stressors. Additionally, to be classified as resilient, a child had to be rated in the top third in adjustment (bottom third for stress-affected), based on three brief adjustment screening measures completed by parents, current-year teachers, and prior-year teachers.¹⁸ These initial group assignment decisions were verified by in-depth ratings of children’s adjustment on a measure completed by current teachers.¹⁹ Thus, although all children in all RCRP studies shared the risk factor of exposure to significant life stress, the two study groups differed sharply in terms of being judged as well or poorly adjusted by informed observers. Moreover, the selected resil-

ient children were not just children in whom no significant adjustment problems had been identified; rather, they were judged to be adjusting much better than sociodemographically matched peers, both stressed and non-stressed.

The two studies also differed in several other respects. Whereas the initial RCRP was done cross-sectionally (we have since continued to track these youngsters), study 2 was set up longitudinally from the start. It also added a new subject group, i.e., highly stressed children with intermediate adjustment, to facilitate study of continuity and change in children's adjustment over time and mediating protective factors (e.g., initial status variables, intervening events) that enhance later adjustment.

We next describe how the two studies were done and what they found. Our findings are presented at a global level in this paper; supporting technical-scientific articles are cited for interested readers.

RCRP I: Fourth Through Sixth Graders

The initial RCRP¹⁸ grew out of an existing knowledge base about resilience^{13,16} and a mini-conceptual model we developed.⁸ The study used three major data sources—an extensive child test battery and separate child and parent interviews.

The 11-measure child test battery was administered to groups of children in two 45-minute sessions.²⁰ It included measures of child self-rated adjustment, perceived competence, empathy, locus of control, realistic control attributions, coping styles, social problem-solving skills, anxiety, depression, and perceived social support. These instruments and their psychometric properties are fully described in prior RCRP articles.^{20,23} Later, children were interviewed individually, for about 1 hour in their home schools, to obtain information in areas for which there were no test measures.²¹

The RCRP's 2¼-hour parent interview included 35 open-ended and 244 objective items²² designed to clarify antecedents of, and pathways to, child resilience under stressful life circumstances. The interview covered eight main areas: family background information; developmental milestones; the infancy, pre-school, and school-age periods; and parent discipline practices,

resources, and views of the child's future. At the end of the interview, interviewers rated the parent and parent-child relationship and judged whether the interviewee was the parent of a resilient or stress-affected child. The interview yielded 300+ scoreable responses that, for manageability's sake, were reduced to 25 super-categories reflecting the main interview foci.²²

Principal findings from the initial RCRP included the following: On test measures, resilient children rated themselves as better adjusted than stress-affected children and more competent in specific domains (e.g., scholastic, social). They were more empathic, had a more internal locus of control and more-realistic control attributions. They had better problem-solving and coping skills, and more support from relatives and friends.²³ Five test variables discriminated resilient and stress-affected children with maximal sensitivity and predicted group status with 84% accuracy: global self-worth, empathy, realistic control attributions, social problem-solving, and self-esteem. Child interviews identified several other key discriminators, i.e., the child's sense of efficacy, future expectations, and view of the parent-child relationship.²¹ The discriminating power of these child test and interview variables suggest that they offer building blocks for future resilience-enhancing preventive interventions.

The parent interview sought to identify factors in the child's history, family milieu, and family interaction processes that favored resilient outcomes in the face of major, ongoing life stress. Salient interview findings included the following: In infancy, an easy child temperament, the early achievement of developmental milestones, *non*-separation of child and caregiver, and support for the mother both from a father figure and others, all predicted later resilient outcomes. Sensitive predictors from the preschool period again included easy temperament and, importantly, a sound parent-child relationship. The latter remained as a key predictor in the school-age period, along with the caregiver's sense of efficacy. Other predictors of resilient outcomes included the parent's: a) use of age-appropriate, consistent, authoritative discipline practices; b)

optimism about the child's future; and c) having a positive self-image, available support, and a sense of life satisfaction.²²

Seven interview variables discriminated parents of resilient and stress-affected children with maximal sensitivity and classified 86% of the children accurately: positive expectations for the child's future; few caregiver-child separations in infancy; easy temperament in infancy; use of age-appropriate, reasoned, and consistent discipline; and child-care involvements of a father figure and others in infancy. Both parent and child interview findings highlighted the importance of a wholesome parent-child relationship, (e.g., warm, mutually positive views, involvement in common activities, use of sound discipline practices) in facilitating resilient outcomes among these highly stressed children.²⁴ Resilient parent-child dyads were also more congruent in their views of the parent-child relationship and their expressive-motor styles, than stress-affected parent-child dyads.²⁵

Follow up of this first RCRP sample showed that high initial reading achievement and global self-worth scores predicted low risk, and exposure to recent stress predicted high risk, for drug and alcohol use 3 years later when these youngsters were in the sixth through ninth grades.¹ Relatedly early positive child expectations for the future predicted better school adjustment and a more internal locus of control, 2 to 3 years later, and acted as a protective factor in reducing the negative effects of stress on self-rated competence.²⁶ Findings from these two studies suggest that knowing a child's adaptive status (resilient *versus* stress-affected) at ages 10 through 12 provides a reasonable base for predicting important aspects of adolescent functioning 3 years later.

These early RCRP findings helped to frame a pilot preventive intervention for young, highly stressed urban children,²⁷ designed to enhance skills found to differentiate resilient and stress-affected children (e.g., social problem-solving, perspective taking, sense of efficacy). Although we recognized that because these

¹ Wyman PA, Work WC, Kerley J, Hightower AD, Cowen EL, Lotyczewski BS. *Predicting substance abuse risk behaviors among inner-city adolescents from childhood competencies and family life-stress: a longitudinal study*. Submitted for publication.

qualities formed slowly over time, a brief child-centered intervention for fourth and fifth graders was not likely, by itself, to produce major and enduring change, we still considered it worthwhile to explore this option as a small step toward helping many children in modern society whose lives are adversely affected by continuing exposure to major stress.

Evaluation of this time- and scope-limited intervention was hampered by problems of methodology and design (e.g., small *n*, no comparison group). Within those limits, study findings provided some evidence of short-term improvement for participants on teacher-rated learning problems and task orientation, as well as child self-ratings of anxiety, realistic control attributions and sense of efficacy.²⁷ Although these findings were modestly encouraging, both common sense and prior empirical data suggest that programs to enhance resilience among profoundly stressed children will ultimately need to: a) start early in the child's life, when they can have basic and enduring shaping impact; b) actively involve primary caregivers; and c) continue over time, introducing pertinent new components in developmentally appropriate formats and providing opportunities to solidify earlier acquired skills.

RCRP 2: Second and Third Graders

The second major RCRP study extended the prior research to highly stressed second- and third-grade inner-city children. The project had two new features: a) it was set up as a longitudinal study from the start, with a first follow-up planned for 1½ to 2 years after the initial assessment; and b) it added a new highly stressed, intermediate-adjustment group, both to provide a broader initial adjustment range and to facilitate later study of factors that shape change in children's adjustment over time.

The study was preceded by extensive scale development work to determine which prior measures could be used with 7- to 8-year-olds and the changes needed to adapt them to the younger group. This process led to the adoption of an 8-measure battery that included one new test (IQ). Two of the other seven, i.e., anxiety and self-rated adjustment, that had had extensive prior

usage and norming with 7- and 8-year-olds, were used “as is.” The remaining five, i.e., efficacy, perceived competence, realistic control attributions, social problem-solving, and empathy, required various mechanical changes, (e.g., dropping complex and redundant items, and simplifying instructions, item wordings, and response metrics). Item meanings, however, were preserved. Although all revised measures were carefully piloted to adapt them to younger children, we recognized that test responses of children 7 and 8 years old, even in the best of worlds, would be less reliable and valid than those of 10- through 12-year-olds because of their more limited comprehension, attention span, and ability to provide self-appraisals.

The parent interview was also revised for this study, by dropping prior insensitive items and adding new ones, particularly items seeking more information about the parents themselves.ⁱⁱ The interview, like its predecessor, took about 2¼ hours to administer and was conducted either at home or at project headquarters. Parents of high-stress intermediate children completed a 45-minute phone interview with about 40% of the items from the full interview.

Study 2 Ss were drawn from all second- and third-grade classes in 11 inner-city schools (5 in Year 1, 6 in Year 2). The consent rate among 2,000+ parents contacted was 37.1%. This low rate, typical for poor, inner-city populations, may exclude some chaotically disorganized families. The new sample had roughly equal numbers of boys and girls, and second and third graders. Its racial composition was: 55% African-American, 27% white, 16% Hispanic, and 2% other. Fewer than 30% of the children lived with both natural parents.

Except for adding high-stress, intermediate-adjustment children, the group classification method used was identical to the one used in the prior study. This procedure identified 74 stress-affected, 85 resilient and 115 high-stress intermediate children in the pooled 2-year sample. The groups were comparable in stres-

ⁱⁱ Wyman PA, Cowen EL, Work WC, Hoyt L, Magnus KB, Fagen DB. *Developmental and caregiving factors differentiating parents of young stress affected and stress resilient urban children. A replication and extension.* Submitted for publication.

sors experienced (overall $M=8.75$) and proportional by gender, grade level and ethnicity. A verification analysis showed that: a) resilient children exceeded high-stress intermediates and stress-affected children, and high-stress intermediates exceeded stress-affected children, on all teacher ratings of children's adjustment; and b) resilient children averaged $\frac{1}{2}\sigma$ above, and stress-affected children $\frac{1}{2}\sigma$ below age and gender-appropriate norms for urban children. In summary, the target groups well met the study's specified stress exposure and adjustment criteria.

Test Measures

In session 1, all children with consent took five test measures. The tests were administered to groups of four to eight students, in the children's home schools. The measures were: child self-rated adjustment (CRS),²⁸ perceived self-efficacy,²⁹ realistic control attributions,³⁰ anxiety,³¹ and empathy.³² Session 2, 3 to 8 weeks later, completed only by identified stress-affected, resilient, and high-stress intermediate children, included individually administered measures of social problem-solving (Work WC. *The Social Problem-solving Cognitive Measure*. Unpublished manuscript, University of Rochester, 1986), perceived competence,³³ and WISC III Vocabulary and Block Design.³⁴ These measures and their psychometric properties are described elsewhere.³⁵

Test findings were similar to those of the first study, albeit somewhat less robust. Specifically, resilient children exceeded stress-affected children in overall self-rated adjustment and perceived competence and several CRS (e.g., anxiety, follows rules) and perceived competence (e.g., global self-worth, behavioral conduct) subscales, as well as on measures of IQ, realistic control, empathy, and social problem-solving. A set of four predictor variables, the two strongest being self-rated rule compliance and IQ, differentiated groups with maximal sensitivity and correctly classified 80% of the children as resilient or stress-affected.³⁵

Parent Interview Findings

The revised parent interview included 261 objective and 18 open-ended items, reflecting 10 domains. The first six sections (background information, developmental milestones, infancy, pre-school and school-age periods, and discipline practices) were much like the corresponding sections of the initial parent interview.²² Section 7 included nine objective items that elicited parent views of the child and expectations about his/her future, plus a four-part open-ended item: "What do you think X's life will be like 10 years from now?", with specific probes for school, work careers, and interpersonal relationships.

Later interview segments introduced new material. One assessed 3 negative parenting attitudes (lack of empathy, role-reversal, and inappropriate expectations) and their sum.³⁶ Another was a composite of three open-ended items from the prior interview, asking how the care giver's childhood influenced her later child-rearing practices, plus 18 new objective items that assessed three dimensions of the caregiver's childhood environment (neglect/indifference, warmth/affection, aggression/hostility) and their sum.³⁷ A parent resources cluster included three sets of items from the prior interview (seven each on life-satisfaction and perceived support, and 16 self-descriptive semantic differential ratings,³⁸ plus a 10-item self-esteem measure³⁹ and a 5-item scale that elicited the parent's view of her own mental-health status (e.g., happy, down-in-the-dumps) in the past year.⁴⁰ A sum score based on these five resource categories was derived.

The interview was completed by 199 parents of resilient, stress-affected and high-stress intermediate children. Its many responses were reduced to 10 main clusters. Comparisons of the parents of resilient and stress-affected children revealed consistent differences favoring the former. Specifically, they reported that their offspring had achieved basic developmental milestones sooner than stress-affected children. They also reported their children to have had easier temperaments in the infancy and preschool periods, and, importantly, more-positive parent-child relationships, including the use of

sounder, more consistent discipline practices during both the preschool and school-age periods. At another level, these parents had more-positive views of their child's future and exceeded parents of stress-affected children in "resources," including global mental health in the past year, perceived support available, and self-ratings, and had fewer negative child-rearing attitudes (e.g., inappropriate expectations, lack of empathy or role-reversal). Also, their child-rearing practices were influenced more by caregiving practices from their own childhood. Interestingly, even though some parents of resilient children had experienced harsh, abusive childhoods, their children were developing very well.

Interviewers correctly classified 80% of the sample as parents of resilient or stress-affected children. A DFA identified a set of seven variables that correctly classified 75% of the children: parent views of the child, future expectations, few negative child-rearing attitudes, own childhood influences on caregiving practices, discipline styles, parent-child relationship (preschool), and child temperament (infancy). The first three named variables were the strongest predictors.

Parent interview findings thus highlighted the importance of a sound parent-child relationship, positive child-rearing attitudes and practices, including discipline styles, and the parent's own competencies and resources, as crucial factors that favor resilient outcomes among children who grow up under stressful life conditions. That constellation resembles the notion of "emotionally responsive parenting" (Egeland et al.⁴¹), found to promote resilient outcomes in highly stressed children.

Follow-up Testing

The second RCRP was planned from the start as a longitudinal study. Its first follow-up probe (T_2), 1½ to 2 years after the initial data collection (T_1), explored the stability of child adjustment and test performance, parent interview variables, and assessed the effects of intervening (T_1 - T_2) occurrences in the child's and family's situations.⁴³

Study families were highly mobile: i.e., 1½ to 2 years after the

initial testing in 11 schools, children were found in 35 local area schools, plus several schools in distant communities. After this extensive search, 183 parents consented to participate in the follow-up (13 could not be located and 3 declined to participate). We were ultimately able to interview 181 parents (of whom 65 were resilient, 44 stress-affected, and 72 high-stress intermediate at T_1) and test 179 children.

At T_2 parents and teachers re-rated children's adjustment on the same measures used at T_1 , and children took five T_1 test measures again. On these measures, resilient children exceeded stress-affected children on overall self-rated adjustment and several adjustment and perceived competence subscales, as well as on empathy, social problem-solving, and realistic control. In parallel, parents of resilient children rated their offspring as better adjusted than did parents of stress-affected children at T_2 . Teachers did likewise on all T-CRS problem and competence subscales and sum scores. The latter finding is especially interesting in that the new teachers were unaware of children's initial group assignment status. A set of four T_2 test measures sensitively differentiated children classified as resilient and stress-affected at T_1 : CRS rule conformity; perceived self-worth, few poor SPS solutions, and high scores on the controllable scale of the realistic control measure.

The short-term stability of the resilient *versus* stress-affected classification system was probed more directly, by correlating scores on the 19 child test subscales and 16 parent and teacher ratings of child adjustment with common T_1 and T_2 formats. For child measures, limited by several weak T_1 alphas, the median T_1 - T_2 correlation was 0.35; the comparable figure for adult ratings of child adjustment was 0.46. These medians suggest moderate short-term stability in resilient and stress-affected children's adjustment and test performance status.

Follow-up Parent Interview

This 45-minute telephone interview included some repeat questions from T_1 and some new ones. T_1 questions about the

child's early development (e.g., milestones, infancy, and preschool periods) were omitted at T_2 . Repeated segments included: sense of efficacy as a parent; available support sources; activities with the child; discipline practices; and a parent resource section reflecting life satisfaction, global mental health, self-image and felt support—all now focused on the T_1 - T_2 time-interval. Parents also provided current child adjustment ratings. There were four new T_2 segments: a) reports (yes-no) of the occurrence of eight behaviors known to predict later delinquency,⁴² e.g., fighting, theft, lying, truancy; b) 13 objective items and one global estimate assessing changes in the family situation (e.g., interpersonal relationships, finances, living conditions) during the T_1 - T_2 interval; c) a 10-item measure of parent coping styles⁴⁴; and d) a 9-item measure of parent expectations for the child's future (e.g., having friends, finishing school).⁴³

At follow-up, parents of resilient children continued to exceed parents of stress-affected children on the perceived quality of the parent-child relationship and self-rated efficacy as a parent. They also exceeded parents of stress-affected children on the parent resource factors of support received, self-esteem, and global mental health during the T_1 - T_2 interval, as well as on interviewer ratings of the parent and the parent-child relationship. Although the groups did not differ on individual items assessing T_1 - T_2 life-changes, parents of resilient children tended overall to see their lives more positively than those of stress-affected children during this period. They also reported fewer predelinquent behaviors in their children, used more adaptive coping strategies, and had more-positive expectations for their child's future. Four predictor variables sensitively discriminated the groups at T_2 and correctly identified 78% of the children as having been classified resilient or stress affected at T_1 : positive expectations for the child's future; absence of predelinquent indicators; parent use of effective coping strategies; and good parent mental health. A median r of 0.53 was found for the 17 variables common to T_1 and T_2 interviews, suggesting that parent interview responses too were reasonably stable across the 2-year time interval.⁴³

In summary, the following are the main findings of the study with younger children. Child test correlates of resilient outcomes³⁵ were similar to those found for fourth through sixth graders,²³ though somewhat less robust, perhaps reflecting the fact that young children's test responses are less reliable and sensitive. Parent interview findings, also much like those from the prior study,²² highlighted the importance of a sound parent-child relationship, the parent's sense of efficacy, having positive future expectations for the child, and the parent's own wellness as factors that facilitate resilient adaptation under stressful life conditions. Follow-up 2 years later showed that T_1 differences between resilient and stress-affected children on test measures, parent and teacher ratings of adjustment, and parent interview indicators held up on parallel T_2 indicators. The set of maximally sensitive resilient *versus* stress-affected differentiators at T_2 included two new measures, i.e., absence of predelinquent behaviors and parent use of adaptive coping strategies, and two prior ones, i.e., positive future expectations for the child and caregiver mental health.

Overview and Future Directions

Findings from the two studies described highlight child test and parent interview indicators that differentiate young, highly stressed urban children evidencing good and poor early adjustment. These findings, important in their own right, underscore the contributions that the study of childhood resilience can make both to developmental psychopathology and a psychology of wellness.

RCRP findings, and those reported by other investigators,² point up the next logical steps in studying child resilience. One needed step is to identify pathways that shape the protective qualities that enable some children to cope well with major life stress, while others, exposed to comparable stressors, falter seriously in crucial spheres of adaptation.^{1,45} This step has been depicted as a shift away from "what" (descriptive) to "how," questions designed to illuminate mechanisms and processes that subserve resilient outcomes under stress.⁵ Knowledge of such

pathways can provide important building blocks for preventive interventions to enhance the adaptive potential of stress-exposed children.⁶

Realistically however, enhancing child resilience is a complex challenge. RCRP findings to date suggest that maximally effective interventions in that sphere are likely to be ones that: a) start very early; b) feature major involvements of the primary caregivers who play fundamental roles in shaping children's formation; and c) include continuing "booster shots" and new inputs consonant with the child's development. Several recent reviews of delinquency prevention programs confirm that the combination of starting such interventions early and featuring a comprehensive family focus enhances outcome effectiveness.^{42, 46} Short of formal prevention programs, awareness of protective factors that favor resilient outcomes can be helpful to health practitioners working with families experiencing chronic and profound stress.

The study of childhood resilience is still in a relatively early stage. There have already been important results from this work. Other significant issues have been identified that remain to be studied. Such continuing study is central to the fields of developmental psychopathology and wellness enhancement. It also holds special potential for blending rigorous scientific inquiry and practical application in ways that can bring major benefit to children in need, and thus, ultimately to society at large.

Acknowledgments

The authors express their sincere gratitude to the W. T. Grant Foundation for its support of the research program described in this article.

The RCRP has benefitted greatly from the inputs and contributions of many people. In particular we thank: Gail R. Parker, Patricia A. Gribble, Michael Wannon, Lynne A. Hoyt-Meyers, Douglas B. Fagen, Keith B. Magnus, Julia Kim and Bohdan S. Lotyczewski.

References

1. Masten AS, Best KM, Garmezy N. Resilience development: contributions from the study of children who overcame adversity. *Devel Psychopathol.* 1989; 2:425–444.
2. Cicchetti D, Garmezy N (eds): Milestones in the development of resilience. *Devel Psychopathol.* 1993;5:497–783.
3. Cowen EL. The enhancement of psychological wellness: challenges and opportunities. *Am J Community Psychol.* 1994;22:149–179.
4. Cicchetti D. Developmental psychopathology: past, present, and future. In: Cicchetti D, ed. *Rochester Symposium on Developmental Psychopathology, Vol. 1.* Hillsdale, NJ: Erlbaum; 1989:1–12.
5. Cicchetti D, Cohen D J. Perspectives on developmental psychology. In: Cicchetti D, Cohen DJ, eds. *Developmental Psychopathology, Vol. 1: Theory and Methods.* New York: Wiley Inter-science; 1995:3–20.
6. Masten AS. Resilience in development: implications of the study of successful adaptation for developmental psychopathology. In: Cicchetti D, ed. *Rochester Symposium on Developmental Psychopathology, Vol. 1.* Hillsdale, NJ: Erlbaum; 1989:261–294.
7. Garmezy N. Stressors of childhood. In: Garmezy N, Rutter M, eds. *Stress, Coping & Development in Children.* New York: McGraw-Hill; 1983:43–84.
8. Cowen EL, Work WC. Resilient children, psychological wellness and primary prevention. *Am J Community Psychol.* 1988;16:591–607.
9. Cowen EL, Wyman PA, Work WC, Parker GR. The Rochester Child Resilience Project (RCRP): overview and summary of first year findings. *Devel Psychopathol.* 1990;2:193–212.
10. Antonovsky A. *Health, Stress and Coping.* San Francisco: Jossey-Bass; 1979.
11. Cowen EL, Hightower AD, Pedro-Carroll JL, Work WC, Wyman PA, Haffey WG. *School-based Prevention for At Risk Children: The Primary Mental Health Project.* Washington, DC: American Psychological Association; 1996.
12. Cowen EL, Trost MA, Lorion RP, Dorr D, Izzo LD, Isaacson RV. *New Ways in School Mental Health: Early Detection and Prevention of School Maladaptation.* New York: Human Sciences Press; 1975.
13. Garmezy N, Masten AS, Tellegen A. Studies of stress-resistant children: a building block for developmental psychopathology. *Child Devel.* 1984;55:97–111.
14. Garmezy N, Tellegen A. Studies of stress-resistant children: methods, variables and preliminary findings. In: Morrison F, Ford C, Keating D (eds). *Advances in Applied Developmental Psychology, Vol. 1.* New York: Academic Press; 1984:1–52.
15. Gest SD, Necman J, Hubbard JJ, Masten AS, Tellegen A. Parenting quality, adversity and conduct problems in adolescence: testing process oriented models of resilience. *Devel Psychopathol.* 1993;5:663–682.
16. Werner EE, Smith RS. *Vulnerable But Invincible: A Study of Resilient Children.* New York: McGraw-Hill; 1991.
17. Werner EE, Smith RS. *Overcoming the Odds: High Risk Children from Birth to Adulthood.* Ithaca, NY: Cornell University Press; 1992.
18. Work WC, Cowen EL, Parker GW, Wyman PA. Stress resilient children in an urban setting. *J Primary Prev.* 1990;11:3–17.
19. Hightower AD, Work WC, Cowen EL, et al: The Teacher-Child Rating Scale: a brief objective measure of elementary children's school problems behaviors and competencies. *School Psychol Rev.* 1986;15:393–409.
20. Parker GR, Cowen EL, Work WC, Wyman PA. Test correlates of resilience among urban School children. *J Primary Prev.* 1990;11:19–35.
21. Wyman PA, Cowen EL, Work WC, et al. Interviews with children who experienced major life stress: family and child attributes that predict resilient outcomes. *J Am Acad Child Adolesc Psychiatr.* 1992;31:904–910.
22. Wyman PA, Cowen EL, Work WC, Parker GR. Developmental and family milieu interview

- correlates of resilience in urban children who have experienced major life-stress. *Am J Community Psychol.* 1991;19:405–426.
23. Cowen EL, Work WC, Wyman PA, Parker GR, Wannon M, Gribble PA. Test comparisons among stress-affected, stress resilient and non-classified 4th-6th grade urban children. *J Community Psychol.* 1992;20:200–214.
 24. Gribble PA, Cowen EL, Wyman PA, Work WC, Wannon M, Raof A. Parent and child views of the parent-child relationship and resilient outcomes among urban children. *J Child Psychol Psychiatr.* 1993;34:507–519.
 25. Cowen EL, Work WC, Wyman PA. Similarity of parent and child self-views in stress affected and stress resilient urban families. *Acta Paedopsychiatr.* 1993;55:193–197.
 26. Wyman PA, Cowen EL, Work WC, Kerley JH. The role of children's future expectations in self-system functioning and adjustment to life-stress. A prospective study of urban at risk children. *Devel Psychopathol.* 1993;5:649–661.
 27. Cowen EL, Wyman PA, Work WC, Iker MR. A preventive intervention for enhancing resilience among young highly stressed urban children. *J Primary Prev.* 1994;15:247–260.
 28. Hightower, A. D., Cowen, E. L., Spinell, A. P., et al. The Child Rating Scale: The development and psychometric refinement of a socioemotional self-rating scale for young school children. *School Psychology Review.* 1987; 16:239–255.
 29. Cowen EL, Work WC, Hightower AD, Wyman PA, Parker GR, Lotyczewski BS. Toward the development of a measure of perceived self-efficacy in children. *J Clin Child Psychol.* 1991; 20:169–178.
 30. Wannon M. *Children's control beliefs about controllable and uncontrollable events: Their relationship to stress resilience and psychosocial adjustment.* Rochester, NY: University of Rochester; 1990. Dissertation.
 31. Spielberger CD. *State-Trait Anxiety Scale for Children: Preliminary Manual.* Palo Alto, CA: Consulting Psychologists Press; 1973.
 32. Bryant BK. An index of empathy for children and adolescents. *Child Devel.* 1982;53:413–426.
 33. Harter S. The perceived competence scale for children. *Child Devel.* 1982;53:87–97.
 34. Wechsler D. *Manual for the Wechsler Intelligence Scale for Children—Revised.* New York: Psychological Corporation; 1991.
 35. Hoyt-Meyers LA, Cowen EL, Work WC, et al: Test correlates of resilient outcomes among highly stressed 2nd-3rd grade urban children. *J Community Psychol.* 1995;23:326–338.
 36. Bavolek SJ. *Handbook for the Adult-Adolescent Parenting Inventory:* Eau Claire, WI: Family Development Resources, Inc.; 1984.
 37. Rohner RJ, Saavedra JM, Granum EO. *Parental Acceptance-Rejection Questionnaire: Test Manual.* American Psychological Association, Journal Supplement Abstract Service; 1983.
 38. Osgood CE, Suci GJ, Tannenbaum PH. *The Measurement of Meaning.* Urbana, IL: University of Illinois Press; 1957.
 39. Rosenberg M. *Society and Adolescent Self-image:* Princeton, NJ: Princeton University Press; 1965.
 40. Berwick DM, Murphy JM, Goldman PA, Ware JE, Barsky AJ, Weinstein MC. Performance of a five-item mental health screening test. *Med Care.* 1991;29:169–176.
 41. Egeland B, Carlson E, Sroufe LA. Resilience as process. *Devel Psychopathol.* 1993;5:517–528.
 42. Yoshikawa H. Prevention as cumulative protection: effects of early family support and education on chronic delinquency and its risks. *Psychological Bull.* 1994;115:28–54.
 43. Cowen EL, Wyman PA, Work WC, Kim J, Fagen DB, Magnus KB. Follow-up study of young stress-affected and stress resilient children. *Devel Psychopathol.* 1997;9. In Press.
 44. Moos RH. *Coping Responses Inventory: Adult Form Manual.* Palo Alto, CA: Center for Health Care Evaluation, Stanford University; 1992.
 45. Rutter M. Psychosocial resilience and protective mechanisms. *Am J Orthopsychiatr.* 1987;57: 316–331.
 46. Zigler E, Taussig C, Black K. A promising preventative for juvenile delinquency. *Am Psychologist.* 1992;47:997–1006.