

Competence in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence

ANN S. MASTEN,^a JON J. HUBBARD,^a SCOTT D. GEST,^b
AUKE TELLEGEN,^a NORMAN GARMEZY,^a AND MARYLOUISE RAMIREZ^a
^a*University of Minnesota; and* ^b*Arizona State University*

Abstract

Competent outcomes in late adolescence were examined in relation to adversity over time, antecedent competence and psychosocial resources, in order to investigate the phenomenon of resilience. An urban community sample of 205 (114 females, 90 males; 27% minority) children were recruited in elementary school and followed over 10 years. Multiple methods and informants were utilized to assess three major domains of competence from childhood through adolescence (academic achievement, conduct, and peer social competence), multiple aspects of adversity, and major psychosocial resources. Both variable-centered and person-centered analyses were conducted to test the hypothesized significance of resources for resilience. Better intellectual functioning and parenting resources were associated with good outcomes across competence domains, even in the context of severe, chronic adversity. IQ and parenting appeared to have a specific protective role with respect to antisocial behavior. Resilient adolescents (high adversity, adequate competence across three domains) had much in common with their low-adversity competent peers, including average or better IQ, parenting, and psychological well-being. Resilient individuals differed markedly from their high adversity, maladaptive peers who had few resources and high negative emotionality. Results suggest that IQ and parenting scores are markers of fundamental adaptational systems that protect child development in the context of severe adversity.

The study of successful adaptation is integral to an understanding of the etiology, prevention, and treatment of problems in development (Cicchetti & Garmezy, 1993; Masten & Coatsworth, 1995; Sroufe & Rutter, 1984). This central tenet of developmental psychopathology emerged from pioneering investigations of children at risk for maladaptation due

to perinatal hazards, parental psychopathology, psychosocial disadvantage, and loss (Garmezy & Rutter, 1985; Masten, Best, & Garmezy, 1990; Sameroff & Chandler, 1975). These studies encompassed a wide variety of risk indicators and provided compelling evidence of individual differences in outcomes. The observation that many of the children in these risk studies appeared to be developing well inspired efforts to understand the processes that avert or ameliorate psychopathology and foster desirable outcomes among children whose development is threatened.

The construct of “resilience” broadly refers to the class of phenomena involving successful adaptation in the context of significant threats to development (Masten, 1994). There is now a considerable body of research on such phenomena. Initially, many studies of resilience were cross-sectional and focused on

The authors are deeply grateful to the participants and student colleagues who made this study possible and to the William T. Grant Foundation for their support of this analysis. Data were collected with the financial support of the National Institute of Mental Health (R01MH33222), William T. Grant Foundation, and the University of Minnesota, through grants to Norman Garmezy, Ann Masten, and Auke Tellegen. Preliminary results were presented at the biennial meeting of the Society for Research in Child Development, March, 1995.

Address correspondence and reprint requests to: Ann S. Masten, Institute of Child Development, University of Minnesota, 51 East River Road, Minneapolis, MN 55455.

single risk factors; subsequent work shifted toward more comprehensive indices of cumulative risk or adversity and prospective designs (Garmezy & Masten, 1994; Masten, in press; Yoshikawa, 1994). Still rare in this literature, however, are prospective studies linking multiple aspects of adaptation, cumulative adversity exposure, and multiple resource/protective factors, particularly over longer time intervals.

This study focused on two questions. First, how are intellectual functioning and parenting quality related to multiple dimensions of competence over time from childhood to late adolescence, particularly in the context of adversity? And, second, how do resilient adolescents differ from maladaptive peers who have not succeeded in the context of adversity and from competent peers who are also successful but have not experienced serious adversity?

Operationalizing the Construct of Resilience

To study resilience, investigators must specify the threat to development, the criteria by which adaptation is judged to be successful, and the features of the individual or the environment that may help to explain resilient outcomes. In this study, cumulative exposure to psychosocial adversity was considered a threat to development (Gest, Reed, & Masten, 1999), adaptational success was defined with respect to competence in salient developmental tasks (Masten, Coatsworth, Neemann, Gest, Tellegen, & Garmezy, 1995), and major psychosocial resources were examined as potential contributors to resilient outcomes. Our approach was based on the premises that (a) the long-term impact of adversity in childhood occurs through the disruption of processes underlying adaptation (Egeland, Carlson, & Sroufe, 1993; Garmezy & Masten, 1994; Masten & Coatsworth, 1995); (b) developmental tasks serve as valuable markers of how well development has been proceeding and as warning signs of possible trouble ahead (Cicchetti, 1990; Sroufe, 1979; Waters & Sroufe, 1983); and (c) the availability of psychosocial resources may counteract or moderate the potentially disruptive influence

of adversity (Garmezy, 1985; Rutter, 1979; Werner & Smith, 1982).

Dimensional (variable-focused) and categorical (person-focused) approaches to resilience

The operational definition and analysis of resilience can be approached from two complementary perspectives, each with a long tradition in the study of individual differences and psychopathology: a dimensional perspective, focused on variables and their covariance patterns, and a categorical perspective, focused on how groups of people sharing defining features compare to other groups of people (Achenbach, 1985; Cairns & Magnussen, 1996; Rutter, 1988). Variable-focused methods include regression, path analysis, and structural modeling, while person-focused methods include cluster analysis, analysis of variance and discriminant function analysis.

Dimensional and variable-focused models of resilience have been tested through regression and latent variable methods (e.g., Gest et al., 1993; Jessor, van den Bos, Vanderryn, Costa, & Turbin, 1995; Luthar, 1991; Masten, Garmezy, Tellegen, Pellegrini, Larkin, & Larsen, 1988). These analyses draw on the statistical power of the full sample, allow for statistical controls to sort out covariance, and provide a sensitive strategy for detecting specific linkages among particular domains of outcome and specific predictors, including synergistic effects. Nonetheless, variable-centered approaches do not fully capture the configural nature of resilience.

When a child is described as "resilient," we infer that a judgment has been rendered on the basis of a pattern of characteristics, akin to making a diagnosis with criteria like these: (a) the child is doing reasonably well on the major developmental tasks important for children of that age and culture and (b) the child has experienced extraordinary adversity. There is not as yet a widely accepted standard for "diagnosing" resilience (cf. Kaufman, Cook, Arny, Jones, & Pittinsky, 1994; Luthar, in press). A wide variety of criteria have been employed to categorize individuals, often

based on the questions at hand and the nature of the sample. A resilient group may be diagnosed by clinical judgments or by cut-off scores on multiple dimensions of competence combined with cut-off scores on the adversity/risk parameter.

Comparisons of resilient and maladaptive individuals, who are similar in risk but divergent in outcome (a strategy typical of "high-risk" studies) may reveal whether hypothesized resources are characteristic of better overall outcomes in the context of adversity (e.g., Cicchetti & Rogosch, 1997; Cowen, Wyman, Work, & Parker, 1990; Werner & Smith, 1982, 1992). Comparisons of resilient and competent individuals, who are similar in outcome but divergent in risk or adversity, are much less common in the literature, but have the potential to reveal whether unusually high levels of resources are required to achieve competence despite adversity, and also, as some have suggested, whether resilience is achieved at the cost of internal well-being (Luthar, 1991).

Overview of the Study

This study examined competence in relation to adversity and resources utilizing both a variable-focused dimensional approach and a person-focused categorical approach. Competence in both childhood and adolescence was defined in terms of a pattern of effective performance on three major age-developmental tasks: (a) academic achievement, (b) conduct (rule-abiding versus antisocial behavior), and (c) peer social competence (including both acceptance and friendship). This definition of competence focused on readily observed external adaptation, though we assumed that many complex dynamic interactions of organism and environment as well as intra-organismic processes underlie competent outcomes (Masten & Coatsworth, 1995, 1998; Waters & Sroufe, 1983). The competence model was tested in a previous study from this project; multiple methods and informants were utilized in childhood and adolescence to assess the competence dimensions, which were corroborated through structural equation modeling (Masten et al., 1995). Although indicators

changed across time to reflect age-appropriate forms of behavior, there was considerable coherence of competence over time. The conduct domain showed striking continuity over a 10-year period, while the academic and peer social dimensions showed moderate coherence (Masten et al.).

For variable-based analyses, each competence domain was examined in separate analyses. In contrast, for the person-based analyses, groups of competent individuals were defined by reasonably good (close to average or better) outcomes on all three major developmental task dimensions in later adolescence. Low competence was defined as poor (below average) outcome on at least two of three competence domains. High adversity was defined as severe to catastrophic levels of chronic adversity both in childhood and adolescence. Thus, resilience reflected a pattern of "OK" competence (ordinary or better functioning) in the context of extraordinary adversity.

Two major resources, intellectual functioning and parenting quality, were investigated as possible influences on the course of competence. Each has been strongly linked to multiple domains of competence over time as well as to better outcomes in children at risk due to prematurity, parental psychopathology, divorce, heterogeneous negative life events, poverty, and other adversities (Haggerty, Sherrod, Garmezy, & Rutter, 1994; Masten et al., 1990; Masten & Coatsworth, 1995, 1998). From a dimensional perspective, each was examined as a direct predictor of each competence domain and also as a moderator of the link between adversity and competence. In categorical analyses, resilient individuals were compared to competent and maladaptive peers with respect to these resources.

In addition, we addressed the issue of whether resilient adolescents, who were observably competent in developmental tasks for their age group (such as achievement and getting along with other people) were faring as well in terms of internal psychological functioning. The idea that adversity may carry a cost, even for the resilient, stems from several provocative lines of work. In their classic longitudinal study of resilience, Werner and

Smith (1992) found suggestive evidence of stress-related health symptoms in otherwise competent adults who had been identified as "high risk" based on multiple factors in early childhood. Luthar (1991) found symptoms of internal distress among a small group of highly competent inner city adolescents. In addition, it is clear that catastrophic trauma can have long term sequelae (Wright, Masten, Northwood, & Hubbard, 1997). Yet, other studies have not found internal distress among resilient individuals (Neighbors, Forehand, & McVicar, 1993).

Theoretically, either possibility might be hypothesized, depending on which aspect of resilience is emphasized. Theories of self-efficacy and pleasure-in-mastery would suggest that the experience of competent performance yields positive affect and cognitions about the self (Bandura, 1977, 1986; White, 1959; see Masten & Coatsworth 1995). Theories of stress and coping might predict, on the other hand, that chronic psychophysiological stress, resulting from either the pressure to maintain competence under adversity or from the adversity itself, could produce health problems, emotional dysregulation, or depression (Goldberger & Breznitz, 1982; Lazarus & Folkman, 1984; Perry, Pollard, Blakley, Baker, & Vigilante, 1995).

Hypotheses

Variable-focused analyses were used to test hypothesized linkages between three major developmental domains of competence (academic achievement, social competence and conduct) and a set of predictors including adversity and two potential compensatory or protective variables: IQ and parenting quality. Concurrent IQ was expected to relate to academic achievement, conduct, and social competence in childhood, but only the first two of these in adolescence. Although peer acceptance, school achievement, and behavior are interconnected among elementary-age students, by adolescence, peer social success appears to be less strongly linked to school achievement (see Masten et al., 1995). IQ was also expected to moderate the relation of ad-

versity to conduct because findings in studies of adversity and antisocial behavior strongly suggest that intellectual functioning not only predicts good academic and social behavior but also may function as a vulnerability or protective factor or both (Kandel, Mednick, Kirkegaard-Sorensen, Hutchings, Knop, Rosenberg, & Schulsinger, 1988; Kolvin, Miller, Fleeting, & Kolvin, 1988; White, Moffitt, & Silva, 1989).

Parenting quality (a combination of warmth, expectations, and structure) was expected to relate to each domain of competence at each point in time because of the extensive evidence linking parenting to child and adolescent competence (Masten & Coatsworth, 1998). Moreover, changes in parenting over time were expected to predict changes in competence. Additionally, in the presence of cumulative risk or adversity, good parenting quality has been associated with fewer problems, particularly in the areas of socialized versus antisocial conduct (Kolvin et al., 1988; Rutter, 1979). Thus, parenting quality was expected to moderate the relation of adversity to conduct. However, parenting is also influenced by child behavior; children with conduct problems may have negative effects on their parents (Patterson, Reid, & Dishion, 1992). Therefore, the possibility of transactional linkages between conduct and parenting were explored further by testing whether child conduct predicted changes in parenting quality over time.

Person-focused hypotheses were tested by comparing Resilient, Competent, and Maladaptive groups of individuals identified by cut-off scores on multiple competence indicators in adolescence and lifetime adversity levels across childhood and adolescence. We did not expect to find many youth in the low-competence, low-adversity group. This group might be labeled "Highly Vulnerable," as these individuals become dysfunctional with little or no challenge, similar to the concept of "reproductive casualty" in the literature on infants at risk (Sameroff & Chandler, 1975). The Highly Vulnerable group was not expected to be large enough in this school sample for meaningful analysis.

Resilient adolescents (high competence,

high adversity) were expected to have more resources (higher IQ, better parenting quality) than their Maladaptive peers (low competence, high adversity). In this regard, they were expected to resemble Competent adolescents (high competence, low adversity). However, because it could require exceptional resources to contend with severe adversity, we hypothesized that Resilient adolescents would have higher levels of intellectual functioning than their Competent peers, consistent with a "compensatory model" (Masten et al., 1988). Individual adaptational skills, such as intellectual functioning, may be particularly important in the context of very high adversity in a normative sample, because many of the stressors out of the child's control are likely to arise predominantly in the family (Cicchetti & Rogosch, 1997). High family-based adversity could reflect or hinder the quality of family functioning as a source of protection for children. Thus, it was not clear what to expect in comparisons of parenting between Resilient and Competent individuals because family resources tend to be closely and causally associated with adversity as well as being correlates of competence.

Method

Sample and procedures

This study integrated data from a longitudinal study of 205 children (91 boys, 114 girls, ages 8–12 years, 27% minority) whose families were initially recruited from a normative school population in two urban schools when they were in third to sixth grades. Minority children had African American (18%), American Indian (5%), Hispanic (3%), and Asian (1%) heritage. Details of the original design and recruitment have been presented in earlier reports (Garmezy & Tellegen, 1984; Masten, 1989; Masten et al., 1995). The cohort was recruited from two schools housed in the same complex. All third to sixth graders in the schools participated in teacher and peer assessments at the outset of the study. Parents were invited by mail to participate in an initial study of life events and competence, and 361

life event questionnaires were returned (59%). Respondents did not differ from nonrespondents on any teacher or peer scores. Subsequently, respondents from this first phase were invited to join a more extensive study, which yielded a sample of 205 children and their parents (57% of the respondents) who participated in the full assessment at Time 1. This sample was slightly more competent (less disruptive and more sociable) than the rest of the school population, differing significantly on three of seven competence scores (Masten et al., 1995). However, all *z*-score mean differences were less than .22.

Families were diverse in socioeconomic status and family structure, as characteristic of the urban school population in the region at the time. The Duncan Socioeconomic Index (Hauser & Featherman, 1977), one of the best SES indicators available (Mueller & Parcel, 1981), was calculated for each family, based on the higher occupational status of the parent or a stable parenting partner in household. Scores ranged from very low (7, reflecting jobs such as household worker or cook) to very high (92.3, such as lawyer), with the average status (43) reflecting lower-middle income occupations of skilled labor and clerical positions. The Minneapolis public schools during the recruitment period were estimated by "sight count" (teacher observations of ethnicity) to have 22% (1977) and 25% (1978) ethnic minority students in the third to sixth grades. (In the school district at this time, parents and children were not asked to identify their ethnicity.) The two schools were estimated to have 38% to 45% minorities in third to sixth grade. As best as can be determined, the original sample was reasonably representative of the overall school and neighborhood populations but may have undersampled minority students in the two participating schools.

Data at Time 1 were collected in the same sequence in two waves, beginning with one school (1977/1978) and following the next year with the second school (1978/1979). In the first year of assessment, school-wide teacher and peer assessments were conducted in the Fall (waiting until teachers and peers knew each other well), and grades were ob-

tained from school records at the close of the school year. Parents completed life event questionnaires by mail. The following year, children were interviewed and individually tested to assess IQ and achievement, as well as other attributes not considered in this study, and parents were interviewed over the course of three home visits. Parents also completed additional life events questionnaires and a developmental questionnaire. Children received small gifts as honoraria, while parents received payments for their time.

Two follow-up assessments were obtained. The first was done by mail, beginning about 7 years after the first assessments, when participants were 14–19 years old. It included life event questionnaires, multidimensional competence ratings, behavior problem checklists, and status questionnaires completed independently by parents and adolescents; data were obtained for 88% of the original sample. The second follow-up, which began 10 years after the first assessments in late adolescence, when the cohort was 17–23 years (M 19.8, SD = 1.6 years), was much more intensive. Adolescents completed numerous questionnaires, assessing life events, mood, personality, perceived competence and self-worth, and other attributes, took a brief IQ test, and were interviewed. In most cases, adolescents came to the university twice. However, to maximize participation, some individual were seen once for a longer period or at another location. Seven out-of-state adolescents were interviewed by telephone. Adolescents received a \$70 honorarium and, in some cases, a bonus (\$20) for completing the assessments. Parents were interviewed at home and also completed a set of questionnaires, including competence rating scales and life event questionnaires, and received \$40 for their participation. In a few cases, it required 3 years to locate an individual and complete the assessments, because an extensive effort was required to find and assess some individuals. At the time of the interview, 69% of the sample lived at home, but some young people in this age group are incarcerated, away at college or the military, or simply busy and mobile. These persistent efforts prolonged the assessment period, but

made it possible to obtain data for 202 of the original 205 participants (98.5%).

Measures of competence

Competence measures are listed in Table 1, along with reliability data and content descriptions. Competence scores for this study were based on measurement models of performance in three competence domains in both childhood and adolescence that were hypothesized on the basis of developmental theory and research. The measures involved multiple methods and informants and were combined on the basis of an empirical data reduction process (see Masten et al., 1995). Reliable indicators of each domain were identified for each assessment period. For this study, composite competence scores were formed for each domain by averaging standardized scores on three or more indicators, including all available indicators except adolescent perceived competence scores. The latter were omitted from competence scores because this type of score is often confounded with personality traits and self-perceptions that were the focus of some analyses in this study (e.g., self-worth, which was measured on the same scale, and negative emotionality, for example, as described below).

Methods assessing competence in childhood included a parent interview that was conducted over three sessions in the parents' home, a child interview typically conducted over two sessions at the child's school, information gathered from school records, individual achievement testing, teacher ratings, and peer assessments. In adolescence, methods included Status Questionnaires completed independently by adolescent and parent, Competence Rating Scales completed by parents, interviewer ratings based on a 3-hr interview of the adolescents at the university, and interviewer ratings based on a 2-hr interview of parents in their homes.

Academic achievement. In late childhood, academic achievement was assessed by the total score on the Peabody Individual Achievement Test (Dunn & Markwardt, 1970), grade point

Table 1. *Measures of competence and psychological well-being*

Time/Construct/Measure	No. Items	Reliability ^a	Description or Sample Item
Competence in late childhood			
Academic ($\alpha = .88$)			
1. Achievement test	1		Total Raw Score Peabody Ind. Ach. Test
2. Grade point average	1		Ave. in Math, Read., Lang., Spell., Sci.
3. Teacher rating	1		Knows material when called upon
4. Parent interview (PI)	3	.80	How is X doing in school?
Conduct ($\alpha = .77$)			
1. PI, home compliance	3	.66	... respond to your rules at home?
2. PI, school compliance	3	.78	... get into fights and quarrels at school?
3. Teacher ratings	8	.93	Breaks classroom rules (reversed)
4. Child interview	6	.89	Reported antisocial behavior
Social ($\alpha = .50$)			
1. Child interview	9	.95	Develops genuine, close, and lasting rels.
2. Negative peer nominations	3	.80	Has trouble making friends (reversed)
3. Positive peer nominations	7	.93	Everyone likes to be with
Competence in late adolescence			
Academic ($\alpha = .90$)			
1. Parent interview	1	.84	How well is X doing in school?
2. Adolescent interview	1	.85	Grades and attainment
3. Adolescent questionnaire	1	.93	How well is X doing in school?
4. Parent questionnaire	1	.85	How well is X doing in school?
Conduct ($\alpha = .79$)			
1. Parent interview	3	.80	Seriousness of trouble w/law (rev.)
2. Adolescent interview	5	.83	Fights and quarrels w/peers (reversed)
3. CRS-Parent	2	.60	Some people rarely get into fights ...
4. Parent questionnaire	1	.77	Seriousness of trouble w/law (rev.)
5. Adolescent questionnaire	1	.92	Seriousness of trouble w/law (rev.)
Social ($\alpha = .86$)			
1. Parent interview	2	.85	Has a positive/active social life
2. Adolescent interview	8	.94	Rel. w/best friend is close and reciprocal
3. Parent questionnaire	1	.66	Has close, confiding relationships
4. Adolescent questionnaire	1	.69	Has close, confiding relationships
5. Parent questionnaire	1	.69	Has positive/active social life
6. Adolescent questionnaire	1	.83	Has positive/active social life
7. CRS-Parent	2	.80	Popular with others their age
8. CRS-Parent	2	.88	Don't have close friend ... (reversed)
Psychological well-being in late adolescence			
Self-worth (CRS-Self)	6	.82	
Psychological distress (SCL90-R)	90	.97	
Positive emotionality			
1. MPQ, PE ^b	11		Positive emotionality
2. MPQ well-being	24	.85	Feels good about self, cheerful outlook
3. POMS Positive ^c	6	.94	Energetic, elated, confident
Negative emotionality			
1. MPQ, NE ^b	11		Negative emotionality
2. MPQ, stress reactivity	26	.90	Easily upset, irritable, prone to worry
3. POMS Negative ^c	6	.93	Anxious, depressed, hostile

Note: PI, parent interview; CRS, Competence Rating Scales; SCL90-R, Symptom Checklist 90-Revised; MPQ, Multidimensional Personality Questionnaire; POMS, Profile of Mood States.

^aReliability coefficients are intraclass correlations for single-item indicators, and coefficient α for multi-item indicators.

^bPE and NE are sums of 11 weighted subscales, each of which has 20–34 items.

^cPOMS Positive and Negative scores are sums of six different subscales, each of which has six items.

average from the school record in the first year of the study, a teacher rating from the Devereux Elementary School Behavior Rating Scale (Spivack & Swift, 1967), and a composite variable based on three structured questions from the parent interview. In late adolescence, academic achievement was based on four variables: two parallel ratings based on information provided by parent and adolescent independently on Status Questionnaires ("How well is . . . doing in school?") plus parallel scores from interviewer ratings of academic achievement based on adolescent and parent reports of success as well as how far the individual had gone in school.

Conduct. The second domain assessed was rule-abiding/socialized versus rule-breaking, disruptive/aggressive/antisocial behavior. In childhood, four factor-based variables were identified as indicators: a three-item composite from structured parent interview questions about compliance at home, another three-item parent interview composite of rule-following versus disruptive/aggressive behavior at school, a 6-item composite from child interview ratings and an 8-item composite from the Devereux teacher ratings concerning breaking classroom rules. In adolescence, the conduct measure assessed law-abiding and social-norm abiding behavior versus fighting and getting into trouble with the law. Indicators included a 3-item factor-derived scale from the parent interview, a 5-item factor-based score from the adolescent interview, parallel ratings based on adolescent and parent status questionnaires and a 3-item composite score from parent ratings of adolescent competence on a set of Competence Ratings Scales (CRS). The CRS were originally developed in consultation with Susan Harter based on her competence scales for adolescents and young adults (Harter, 1986; Masten, Neemann, & Andenas, 1994; Neemann & Harter, 1986).

Social competence. In childhood, the peer social competence indicators assessed peer social acceptance and popularity among school

peers and quality of friendships as judged from the child interview. Two factor-based composites were derived from the Revised Class Play (Masten, Morison, & Pellegrini, 1985; Morison & Masten, 1991), a positive peer reputation score combining nominations from seven positive items and a negative reputation score combining nominations on three negative peer evaluations of social competence. The third indicator was based on nine rating scales completed by the child interviewer concerning competence in developing close and lasting friendships. Although α for this composite was low, structural modeling supported a single latent construct underlying these three indicators (reported in Masten et al., 1995). The adolescent indicators focused on having close, reciprocal friendships and an active social life. Indicators included a 2-item composite from the parent interview, an 8-item composite from the adolescent interview, two ratings based on data from the Status Questionnaire completed by parents and two parallel items based on the adolescent questionnaire, and two composite scales from the Competence Rating Scales completed by parents.

Measures of adversity

Over the course of this longitudinal study, multiple measures and informants had provided extensive information on life events and experiences likely to be stressful to most children or adolescents. These included a series of structured Life Events Questionnaires for children, adolescents, and young adults; simple checklists for indicating whether each life event has occurred over the past 12 months, that were based on earlier measures and refined over the course of this study; and a structured Lifetime Life Events Questionnaire assessing the history of major stressor and traumatic experiences since birth (see Linder, 1985; Gest, Reed, & Masten, 1997; Masten et al., 1988, 1994). At Time 1, there was also a contextual life events interview (see Linder) based on the work of Brown and Harris (1978) and others, as well as a developmental history questionnaire that included many life events. In the adolescent assessments, parents

or adolescents reported events such as marriages, arrests, hospitalizations, rape, being mugged, and other experiences during interviews or in questionnaires.

A computerized data base was developed to organize the extensive data across multiple measures for each of three assessment periods that contained information on life adversities of the children in the study. This made it possible to print charts listing events in a child's life year by year and by content or other qualities. Life events were classified by whether the child could have influenced the event, and for independent events, as to whether they arose in the family, physical self, or larger community (including school and peer groups). Death of a parent for example was a family event considered independent of the child's behavior, while being arrested was a child-related nonindependent event. Independent judges then rated adversity levels for family, physical self, and community events, total independent events, and nonindependent events for time intervals before and between the competence assessments. Judges were blind to other data and did not rate adjacent time intervals, so that ratings would be independent of child adjustment information and life events before or after the interval being judged. Adversity ratings were made on a 7-point rating scale corresponding closely to the Severity of Psychosocial Stressors scale used for Axis IV of the diagnostic system of the American Psychiatric Association (1987). Details are provided by Gest et al. (1999). Only scores based on independent events were included, as controllable life experience scores can be confounded with the type of measures utilized for the analyses of this study. The following scores (listed in Table 2) were included: Total Independent Adversity from birth to Time 1 (92% agreement within one scale-point across all judges and intraclass correlation = .84), from Time 1 to midadolescence (94% agreement and .82 intraclass) and from mid- to late-adolescence (92% agreement; .85 intraclass). For longitudinal analyses, the index of adolescent adversity (adversity spanning late childhood to late adolescence) was created by averaging the latter two scores.

Measures of resources

Intellectual functioning. In childhood, general intellectual ability was estimated by two subtests, Vocabulary and Block Design, of the Wechsler Intelligence Scale for Children-Revised (Wechsler, 1974). This two-test short form had been shown to have the highest correlations with Full Scale IQ Scores, $r = .88$ (Silverstein, 1975). The mean sum of the scale scores was 20.65 ($SD = 5.22$) as compared to an expected mean of 20 ($SD = 6$), based on the norming sample, which suggested that the cohort recruited for this study had a normative mean and distribution of IQ scores. In late adolescence, the same two subtests of the Wechsler Adult Intelligence Scale-Revised (WAIS-R; Wechsler, 1981) were administered: the sample mean was 20.8 ($SD = 5.24$).

Parenting quality. Composite scores of parenting at Time 1 and in late adolescence were based on ratings of the parent-child relationships from the perspective of both child and parent at both points in time. In childhood, 12 parenting items were available from a set of 30 family rating scales completed by interviewers (see Masten et al., 1988). Factor analysis strongly indicated a single dimension underlying these 12 items, $\alpha = .94$. Thus a composite score was formed by averaging z scores. High scores on this composite reflect a combination of high structure and rules, warmth and closeness, and high expectations for child's achievement and prosocial behavior. Similarly, 10 items on parenting were available from a set of ratings completed by the child interviewer. These items, which were related to closeness and structure in the parent-child relationship, also formed a cohesive scale, $\alpha = .89$. These two sets of items (22 items) were also jointly factor analyzed. Results indicated two method factors with all positive cross-loadings, which consisted of the 12 parent-based items and the 10 child-based items. The correlation of the two parenting quality indices was .53. Alpha for all 22 items was .93; however, to give equal weight to the parent and child perspectives, the two parenting quality scores were stan-

Table 2. *Pearson correlations of all predictors and competence criteria (n = 189)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Individual attributes															
1. Sex															
2. Age T ₁	-.06														
3. Minority Status	-.04	-.10													
Psychosocial resources															
4. Child IQ	-.14	-.12	-.24**												
5. Adolescent IQ	-.19**	-.08	-.26***	.78***											
6. Childhood parenting quality	.05	-.11	-.28***	.42***	.38***										
7. Adolescent parenting quality	.17*	-.05	.11	.06	.07	.33***									
8. SES	-.10	-.05	-.13	.31***	.28***	.52***	.14								
Adversity															
9. Childhood	-.03	.03	.13	-.05	-.04	-.34***	-.20**	-.24**							
10. Adolescence	-.01	-.09	.13	-.11	-.14	-.31***	-.14	-.25***	.60***						
Childhood competence															
11. Academic	-.02	-.02	-.15*	.64***	.64***	.38***	.11	.36***	-.07	-.14					
12. Social	.09	.05	.01	.25***	.19**	.29***	.31***	.24**	-.13	-.13	.41***				
13. Conduct	.29***	.01	-.23**	.19**	.22**	.46***	.31***	.26***	-.21**	-.19*	.25**	.23**			
Adolescent competence															
14. Academic	.08	.01	-.07	.43***	.48***	.36***	.27***	.33***	-.16*	-.19*	.41***	.20**	.44***		
15. Social	-.11	-.18*	-.10	.27***	.22**	.41***	.36***	.32***	-.21**	-.16*	.27***	.31***	.14	.25***	
16. Conduct	.20**	-.04	-.04	.11	.20**	.29***	.42***	.12	-.22**	-.18*	.14	.07	.58***	.54***	.17*

* $p < .05$. ** $p < .01$. *** $p < .001$.

dardized and then averaged to form a global parenting quality variable.

In late adolescence, indicators of parenting quality included ratings by interviewers based on separate interviews of parent and adolescent as well as self-report questionnaire ratings by the adolescent and parent of the closeness of their relationship. Four indicators were averaged to form the parenting composite: (a) closeness of the adolescent and mother as judged from the parent interview was measured by a factor-derived eight-item set of ratings of relationship qualities such as warmth, rejection (reversed) and connectedness, $\alpha = .95$; (b) a single rating of connectedness to mother from the adolescent interview (intraclass correlation of raters = .87); and (c,d) two scores based on structured Status Questionnaires (SQs) provided by parent, $\alpha = .86$, and adolescent, $\alpha = .84$, independently. The SQ scores were derived from two data-reduction steps. First, two items reported by parent or adolescent rating closeness to mother were averaged, $r = .68$ for adolescents, .66 for parents, as were two independent ratings done by judges of the closeness of this relationship based on the entire questionnaire (intraclass correlation = .70 for adolescents and .68 for parents). These SQ first-step composites correlated .72 for adolescent- and .75 for parent-based variables and therefore, as step two, these were combined by averaging z scores. Factor analysis of these two scores plus the two scores based on interviews (a and b above) suggested a single dimension underlying the four indicators of parenting quality in late adolescence. Thus, these four scores were composited by averaging standardized scores, $\alpha = .74$.

Measures of psychological well-being in late adolescence

Measures of well-being are listed in Table 1 with reliability data and content descriptions.

Self-worth. An individual's general feelings about himself or herself as a person was assessed by the 6-item Self-Worth scale of a self-perception questionnaire based on Harter's adolescent and young adult scales

(Harter, 1986; Masten, Neemann, & Andenas, 1994; Neemann & Harter, 1986).

Psychological distress. Symptoms of current psychological distress (anxiety, depression, etc.) were indexed by the global score from the Symptom Checklist 90-Revised (SCL90-R; DeRogatis, 1977, 1982), which has good reliability and validity as a global measure of current psychological distress (Payne, 1985; Tennen, Affleck, & Herzberger, 1985).

Positive and negative emotionality traits and mood states. The personality dimensions of positive and negative emotionality were assessed by the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982, 1985; Tellegen et al., 1988). Analyses include the two general trait emotionality dimensions of the MPQ as well as one subscale from each global score representing the most relevant primary factor of the global trait with respect to adaptation under adversity: Well-Being from the Positive Emotionality Composite Score and Stress-Reactivity from the Negative Emotionality Composite Score. Current positive and negative mood states were indexed by scores from the Profile of Mood States (Bi-Polar Form; Lorr & McNair, 1984; Lorr & Wunderlich, 1988) which has psychometric support as a measure of two global mood states.

Results

Compensatory and protective effects of psychosocial resources

Correlational analyses were conducted on a subsample of 189 of the original participants who had complete longitudinal data for the competence, adversity and resource variables (82 males, 107 females, 25% minorities: 92% of the cohort) over a 10-year interval. These 189 did not differ significantly on competence and adversity measures at Time 1 from the 16 individuals excluded due to missing data (2-tailed t tests).

Intercorrelations among the competence composites (academic, social, conduct), adversity scores, SES, IQ and parenting vari-

ables are presented in Table 2. Simple correlations indicated that competence in childhood and late adolescence were generally related to more resources and lower adversity. Global adversity in childhood and adolescence also was related as expected to level of family-based resources. Correlations also indicated considerable continuity over time in resources, competence and adversity.

Two sets of hierarchical multiple regressions were conducted to test the hypothesized linkages of cumulative uncontrollable adversity, IQ and parenting to competence outcomes. In the first set, each of the three competence criteria at Time 1 was regressed on an ordered sequence of predictors. All interval-scale variables were centered prior to forming interaction terms, as recommended by Aiken and West (1991). The rationale for entry order was as follows: Steps 1 and 2 were sex and age, to control for gender differences in the criteria and the age variation at Time 1; SES, a widely-observed correlate of child and adolescent competence, was entered at Step 3 as a control variable prior to the hypothesized effects of child IQ, entered at Step 4 and parenting, entered at Step 5. In this way, any significant effect of IQ or parenting would not be due to shared variance with this social status indicator. Adversity was entered after other main effects at Step 6. Once main effects were controlled, interactions of adversity and each of the key resource variables were entered at Steps 7–8, retaining the same ordering as main effects. The possible moderating effects of gender and socioeconomic status on the relation of IQ, parenting and adversity to outcome were examined in exploratory analyses, as were the main and interaction effects of minority status.

Results of the regressions with Time 1 competence composites as dependent variables are presented in Table 3. The increment in R^2 for each step is indicated for each criterion. Academic achievement was predicted by SES and IQ. Once all predictors were entered at Step 8, inspection of the regression results indicated that these two variables each contributed unique variance; after all other variables were entered, these two still were significant. Beta weights at Step 8 indicated that

IQ was a relatively more substantial unique predictor of academic achievement than SES (.58 versus .16, respectively).

Peer social competence also was predicted by SES and IQ, except that only IQ proved to be a unique predictor at Step 8. The variance SES predicts in the outcome of social competence is shared with other variables; inspection of the regression results indicates that parenting was the key variable overlapping with SES in predicting social competence. Either variable alone was significantly related to competence; but when either one was controlled, the other variable was rendered non-significant, suggesting that it is shared variance in SES and parenting that is related to social competence.

Conduct was predicted by sex (boys had worse conduct), SES, IQ, and parenting quality, and additionally by the interaction of IQ-by-adversity. At Step 8, only gender and parenting proved to be unique predictors. IQ and SES both become nonsignificant predictors as soon as parenting was controlled, suggesting that the variance each of these variables share with conduct is also shared with parenting. The interaction of IQ-by-adversity was significant at Step 7, consistent with the hypothesis that IQ might be moderating the role of adversity. However, this interaction was no longer significant at Step 8, when all predictors are included, because of shared variance with the interaction term, parenting-by-adversity. Parenting-by-adversity would also be significant if entered before the IQ interaction at Step 7, $\Delta R^2 = .03$, $p < .05$.

Interactions are illustrated in Figure 1. Figure 1A shows the interaction of IQ and adversity in predicting conduct, plotting the regression lines at Step 7 (using procedures recommended by Aiken & West, 1991) for representative high (+1 *SD*) and low (–1 *SD*) levels of IQ and low (–1 *SD*) and high (+1 *SD*) levels of adversity. This figure, which controls for other main effects, is consistent with vulnerability/protective role for IQ and suggests that conduct is a strong correlate of IQ at very high levels of adversity. Figure 1B shows the similarity of the parallel interaction of parenting and adversity when plotted alternatively at Step 7. Finally, to approximate the

Table 3. Hierarchical regression results predicting competence at Time 1 from individual attributes, resources, and adversity

Step	Competence Criterion		
	Academic ΔR^2	Social ΔR^2	Conduct ΔR^2
1. Sex	.00	.01	.09***
2. Age	.00	.00	.00
3. SES	.13***	.06***	.08***
4. IQ	.32***	.05**	.03*
5. Parenting	.00	.02	.10***
6. Adversity	.00	.00	.00
7. IQ \times adversity	.00	.00	.03**
8. Parenting \times adversity	.00	.00	.01
Total R^2	.45	.15	.33
Overall F	18.56***	3.95***	11.21***

* $p < .05$. ** $p < .01$. *** $p < .001$.

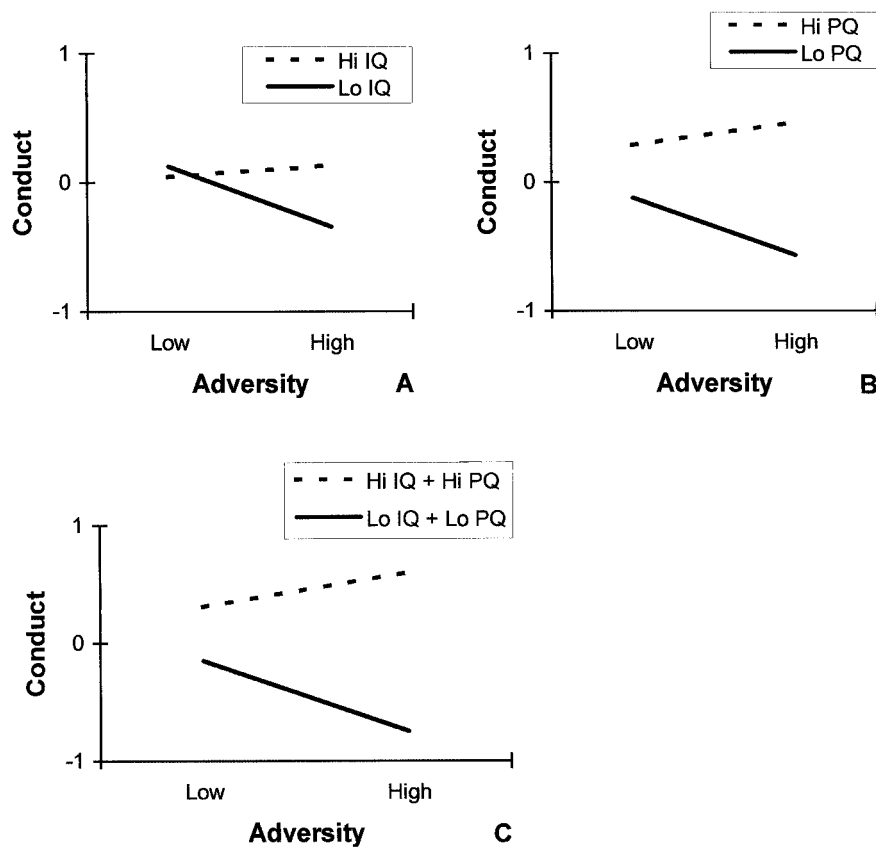


Figure 1. Interaction effects of adversity with IQ and parenting quality in the prediction of conduct in childhood. (A) The interaction of IQ by adversity plotted at Step 7. (B) The alternative interaction of parenting quality by adversity at Step 7. (C) Includes both interactions plotted at Step 8.

combined impact of IQ and parenting, given the substantial main effects of parenting on this outcome and the similarity of the two interaction effects, Figure 1C shows the combined effect of IQ and Parenting Quality (PQ) when both are high and when both are low, plotted at Step 8 to include both interactions.

Exploratory analyses of gender and SES interactions revealed no significant findings. Exploratory analyses of minority main and interaction effects indicated few differences. Social competence was slightly higher in minority children (only after the parenting quality variable was controlled). For academic achievement, a significant interaction of minority status and SES led us to run this regression separately for each group. Results suggested that SES was a significant predictor of academic achievement for majority but not minority children.

A second set of hierarchical regressions tested longitudinal effects. For each competence outcome, the corresponding competence indicator at Time 1 was entered first at Step 1, so that all subsequent effects were related to *changes* in competence or, in other words, variance in competence at outcome that was not attributable to Time 1 competence and its continuity over time. Following the controls for gender (Step 2) and SES (Step 3), Time 1 predictors, IQ, parenting and adversity were added at Steps 4, 5, and 6, respectively. Next the adolescent components were added at Steps 7 (IQ), 8 (parenting), and 9 (adversity). This ordering tested whether IQ variance (or parenting or adversity) in adolescence that was *unrelated* to IQ (or parenting or adversity) in childhood predicted changes in competence for each domain. Finally, the four interactions of adversity and IQ or parenting were entered (ordered by parallel logic) to test for hypothesized moderating effects of IQ and parenting on the relation of adversity to conduct, as well as to explore possible interaction effects for academic and social competence.

Results of the longitudinal analyses are presented in Table 4. Academic attainment at outcome was predicted by achievement at Time 1 and then additionally by SES, child and adolescent IQ and adolescent parenting. However, examination of the simultaneous re-

gression results at Step 13 that neither childhood achievement nor childhood IQ had unique relations to this outcome criterion once all other predictors were controlled. Childhood achievement became nonsignificant as soon as childhood IQ was controlled, suggesting shared variance among these two variables as predictors of achievement outcomes. Childhood IQ became nonsignificant as soon as adolescent IQ was controlled, suggesting that earlier IQ was related to later achievement primarily through the mediating pathway of the continuity in IQ.

Once early social competence was controlled, adolescent social competence was predicted by gender, SES, childhood parenting, and adolescent parenting. The regression equation at Step 13 indicated unique effects for gender, childhood parenting, and adolescent parenting. The gender effect reflected a positive shift in mean social scores for boys over time and a negative shift for girls; in childhood, boys had slightly lower mean scores than girls, $-.10$ versus $.08$, in sample-based z scores, but in adolescence, boys had somewhat higher scores than girls, $.12$ versus $-.10$. SES became a nonsignificant predictor as soon as parenting was added to the equation, suggesting that the effect of SES observed at Step 3 could be attributed to parenting.

For conduct, the competence domain with the greatest continuity in this study (see Masten et al., 1995), both IQ and parenting quality scores in adolescence added to the prediction of adolescent conduct over and above earlier conduct scores. Also contributing was the interaction of early childhood adversity and IQ, the same interaction term that was a significant predictor of conduct at Time 1 (see Table 3). Over time, the conduct gap widened between low- and high-IQ adolescents experiencing high adversity. However, once again, this interaction was not unique, because the significance of this interaction was lost when the parallel interaction of parenting-by-adversity from Time 1 was controlled, again suggesting shared variance between IQ and parenting. In adolescence, the parenting interaction was weaker and would not be significant if entered before IQ. Only childhood

Table 4. Hierarchical regression results predicting competence in late adolescence from competence at Time 1, resources, and adversity

Step	Competence in Late Adolescence		
	Academic ΔR^2	Social ΔR^2	Conduct ΔR^2
1. Competence T_1^a	.16***	.10***	.34***
2. Sex	.01	.02* ^b	.00
3. SES	.04**	.06***	.00
4. Childhood IQ	.05***	.01	.00
5. Child. parenting	.01	.05***	.00
6. Child. adversity	.00	.00	.01
7. Adolescent IQ	.05***	.00	.02*
8. Adol. parenting	.03**	.05***	.06***
9. Adol. adversity	.00	.00	.00
10. Adv \times child IQ	.00	.00	.02*
11. Adv \times child par.	.01	.01	.00
12. Adv \times adol. IQ	.00	.00	.00
13. Adv \times adol. Par.	.00	.00	.00
Total R^2	.35	.31	.45
Overall F	7.35***	6.02***	11.17***

^aThe corresponding competence indicator at Time 1 was entered in each case (e.g., academic achievement at Time 1 was entered at Step 1 for the outcome variable academic achievement in late adolescence).

^bPositive changes were associated with being a boy.

* $p < .05$. ** $p < .01$. *** $p < .001$.

conduct and adolescent parenting were unique predictors of this competence outcome.

Several planned exploratory analyses were conducted. The first focused on the transactional nature of the connection between parenting and child competence discussed in the introduction, in which children themselves may contribute to the quality of their parenting. The findings of moderate continuity in parenting quality (see Table 2), and the unique predictive role of parenting in both childhood and adolescence (Tables 3, 4) were not inconsistent with the possibility that child competence predicts changes in parenting quality over time. To examine this possibility, parenting quality at outcome was regressed on Time 1 parenting (Step 1), gender (Step 2) and then the three child competence variables (Step 3). Changes in parenting quality were significantly predicted by gender, $\Delta R^2 = .02$ (being a girl relating to better parent–adolescent relationships), and by child competence, $\Delta R^2 = .07$. Better conduct and peer social

competence in children independently predicted better parent–adolescent relationships, but the latter was a unique predictor, consistent with the possibility that the quality of relationships children have with their peers and with their parents mutually influence one another.

Exploratory analyses of minority effects, gender and SES interactions indicated only one small significant gender interaction. Given the number of variables, this most likely was a chance finding.

Results of these dimensional analyses supported the importance of IQ and parenting as resources for the development of competence and as protective factors with respect to the development of prosocial behavior in a high adversity context. These two factors had considerable shared and some unique variance as predictors. They also shared predictive variance with SES in numerous cases. However, SES appeared to have a unique role with respect to academic achievement. Therefore, in

subsequent analyses, all three variables were included as psychosocial resources for competence.

Comparisons of resilient, maladaptive, and competent individuals

The second approach to analysis focused on resilience as a configural characterization of a person's life, a profile of adequate competence across multiple domains in the context of a life history of adversity. Planned comparisons were made among groups of individuals identified as Resilient (adequate competence, high adversity); Maladaptive (low competence, high adversity); and Competent (adequate competence, low adversity). Groups were identified by a priori cut scores. Competence was defined as adequate when an individual was higher than one-half a standard deviation below the sample mean on all three composite indicators of competence at outcome in late adolescence (i.e., z score $> -.50$). Low competence was defined as falling more than one-half a standard deviation below the mean on at least two of the three major dimensions of competence (i.e., z score $< -.50$). High adversity was defined by ratings of severe to catastrophic adversity (≥ 5.0) both in childhood (prior to the initial competence assessments) and in adolescence, while low adversity was defined as ratings below 5.0 throughout childhood and adolescence. The resulting high adversity group had experienced either a combination of many serious events (such as divorce or hospitalization of parents or financial crises), multiple traumatic experiences (such as the death of parents, rape, or assault), or chronic severe stressors (such as living with a violent alcoholic parent in chronic poverty). The resulting high adversity groups had very high scores (averaging above 6 = "extreme" on this 7-point scale) across childhood and adolescence. Individuals who did not meet the criteria for high or low levels of adversity and competence (middle or mixed groups) were not included in the main analyses that follow.

These cut scores yielded 43 Resilient individuals (17 males, 26 females; 28% minority); 29 Competent individuals (10 males; 17 fe-

males; 10% minority); and 32 Maladaptive individuals (15 males, 17 females; 28% minority). A test of the sample distribution in the three by three (high, middle, low levels of competence and adversity) table indicated a nonrandom distribution, $\chi^2 [df = 4] = 16.22$, $p < .01$. For example, only 8% (3 of 38, as compared to an expected value of 24%) of the adolescents fell in the low competence-low adversity group; while 76% (29 of 38, as compared to an expected value of 49%) fell into the high competence-low adversity group. Chi-square tests indicated that the proportion of females and minorities in the Competent, Resilient, and Maladaptive groups did not differ significantly from the sample distributions. Competence and adversity score patterns were also inspected within minority status groups and found to be highly similar.

Additional analysis supported the validity of the distinctions between the Resilient, Maladaptive and Competent groups. First, during the interview in late adolescence, interviewers of parents and adolescents nominated individuals as resilient based on the partial picture provided by the interview. Twelve individuals were independently classified as resilient by interviewers of both the parent and the adolescent; of these, nine fell into the Resilient group identified by empirical cut scores, with the other three failing to meet cutoff criteria (Fisher's exact test, $p = .00005$). Second, cluster analysis (including the same variables used in the cut score approach) yielded Resilient, Maladaptive, and Competent groups that were slightly larger but highly comparable to the groups defined by cut scores, and led to essentially the same conclusions regarding the psychosocial resources associated with these groups. A detailed presentation of results will be limited to the cut score groups, which were better matched on adversity history and the competence outcome criteria than the cluster-based groups.

Means for the three groups on the identification criteria and other variables are shown in Table 5. A series of repeated-measures MANOVAs indicated significant group differences for Time 1 Competence, $F(6, 200) = 9.14$, $p < .001$; for psychosocial resources, $F(10, 180) = 4.66$, $p < .001$; and for measures

Table 5. Group means for competent, resilient, and maladaptive adolescents

	Competent	Resilient	Maladaptive	One-Way F for Group (χ^2) ^d
Defining Criteria				
Adolescent competence				
Academic	.52	.47	−1.28	
Social	.59	.49	−.81	
Conduct	.73	.41	−1.37	
Adversity				
Childhood	3.12	6.03	6.28	
Adolescence	3.91	6.16	6.28	
Planned Comparisons				
Child competence				
Academic	.22 ^a	.18 ^a	−.57 ^b	8.08***
Social	.44 ^a	.06 ^{ab}	−.29 ^b	4.78*
Conduct ^d	.72 ^a	.25 ^b	−.95 ^c	(38.73***)
Psychosocial Resources				
IQ				
Child	.26 ^a	.46 ^a	−.56 ^b	13.03***
Adolescent	.24 ^a	.28 ^a	−.57 ^b	8.17***
Parenting				
Child	.66 ^a	.20 ^a	−.65 ^b	18.70***
Adolescent ^d	.52 ^a	.20 ^a	−.45 ^b	(11.09***)
SES	.23 ^a	.04 ^{ab}	−.47 ^b	4.44*
Defining Criteria				
Adolescent well-being				
Self-worth (Harter)	.31 ^a	.27 ^a	−.37 ^b	5.41**
Global Distress (SCL90-R)	−.33	−.17	.18	NS
Negative Emotionality MPQ ^d	−.62 ^a	−.16 ^b	.43 ^c	(12.79***)
Stress-Reactivity Subscale	−.34 ^a	−.21 ^a	.44 ^b	5.13**
Negative Emotion (POMS)	−.12	−.05	.40	NS
Positive Emotionality MPQ ^s	−.09	.20	−.11	NS
Well-Being Subscale	.29	.08	−.21	NS
Positive Emotion (POMS)	.00	.13	−.04	NS

Note: Groups with different superscripts differ significantly. As described in the text, for variables noted by superscript d, a nonparametric analysis (Kruskal–Wallis) has been conducted due to unequal variances across groups and in these cases; the χ^2 value is provided in parentheses rather than the F value. Superscript s indicates a gender interaction effect described in the text. Adversity means are reported in raw score averages; all other scores are reported in full sample-based Z scores.

of psychological well-being, $F(16, 170) = 1.87, p < .05$.

Follow-up analyses were conducted for each listed variable. Given the risk of unequal variances across groups defined by cutoff scores, each dependent variable was tested for homogeneity of variance (Levene test). When variances were significantly different, a nonparametric test was used to analyze group differences (Kruskal–Wallis). If the groups dif-

fered significantly, two planned contrasts were tested: Maladaptive versus the other two groups and Competent versus Resilient. For all other variables, two (sex) by three (groups) ANOVAs were performed first, followed by one-way ANOVAs to clarify group differences when main effects were significant. Given the number of comparisons, the conservative Scheffé procedure was used.

As a direct result of the cutoff method, Re-

silient and Maladaptive groups did not differ in either childhood or adolescent adversity, while Resilient and Competent groups did not differ on the three competence criteria in adolescence. However, there was a gender by group interaction for conduct, $F(2, 98) = 9.45$, $p < .001$. Both genders in the Maladaptive group scored significantly lower than the other two groups, but the boys more so than the girls: means were .58, .34, -2.09 for Competent, Resilient, and Maladaptive groups of boys, respectively, and .80, .45 and $-.73$ for girls. Also, although childhood competence was not used to define the groups, adolescents identified as Resilient and Competent generally showed more competence than the Maladaptive group 10 years earlier. It is worth noting that the Resilient group, though better behaved than the Maladaptive group and above the sample mean on Conduct, was less rule-abiding than the Competent group.

Comparisons of psychosocial resources indicated clear differences between the Maladaptive and the other two groups, both in childhood and late adolescence. Competent and Resilient groups were similar with respect to these fundamental resources. IQ was quite high in the Resilient group and low in the Maladaptive group, which would be consistent with protective or vulnerability processes; however, the differences between the Competent and Resilient groups were not significant in pairwise comparisons.

Analyses of internal adaptation again suggested that Resilient adolescents resembled Competent adolescents more than Maladaptive adolescents. The three groups did not differ on emotional state measures of positive or negative mood. Maladaptive adolescents had lower self-worth and higher negative emotionality (NE) than the other two groups. Resilient adolescents had somewhat below average negative emotionality scores for the sample, but the Competent group had even lower scores, significantly lower than the Resilient group. Of particular relevance to adaptation in the context of adversity, the NE subscale called Stress-Reactivity was considerably higher in the maladaptive adolescents than the other two groups. For Positive Emotionality, there was a significant sex interac-

tion, $F(2, 88) = 4.43$, $p < .05$, so follow-up analyses were run within gender. Results indicated that Resilient girls (but not boys) reported significantly more positive emotional engagement than Competent girls ($M = .44$ versus $-.39$, respectively), with the Maladaptive group falling in between ($M = -.16$).

Discriminant function analyses corroborated the overall pattern of MANOVA results. Utilizing the resources and well-being indicators from childhood and adolescence listed in Table 5 as predictors, the Resilient and Competent groups could not be discriminated while the Maladaptive group was clearly differentiated from the other two groups. A discriminant function for just the Resilient and Maladaptive groups with the same set of predictors resulted in a correct classification of 80% of the Resilient cases and 89% of the Maladaptive cases. Time 1 IQ and parenting quality scores were found to be the most discriminating predictors.

Given the inconsistent literature on the issue of emotional well-being in resilient individuals, which could be due in part to inconsistency in the criteria for defining Resilient and Competent groups, we checked further within the Resilient group to ascertain whether the most competent of the Resilient group might show signs of greater distress and whether specific subscales of the SCL-90 for anxiety and depression might show differences. First, we tested group differences for the subscales of the SCL-90R; no differences were found among the three groups. Second, we identified a subgroup of excelling resilient youth by raising the competence criteria to a very high level, more congruent with those of Luthar (1991), who found evidence of emotional distress among a group of nine inner city adolescents who met her criteria for resilience. Then we could compare results for the "Excelling Resilient" (14 Resilient adolescents who had all competence indicators at or above 1 *SD* above the mean) and the "Average Resilient" (the other 29 Resilient adolescents) on their internal well-being scores. The Excelling Resilient generally had even more positive scores than the Resilient group as a whole, sometimes significantly better than the Average Resilient. For example, the Excelling

Resilient group mean score on Positive Emotionality was .78 compared to $-.06$ for the Average Resilient group, a significant difference, $F(1, 39) = 5.93, p < .05$.

As a further follow-up to the results presented in Table 5, we also examined differences between comparable groups defined by adversity and competence *in childhood*. Results were strikingly congruent with findings for groups defined by adolescent outcomes and lifetime adversity through adolescence. The Childhood-Maladaptive group had significantly worse psychosocial resources than the Competent or the Resilient groups on all resources. For example, child IQ means (in sample z scores) were .25 for the Childhood-Competent, .35 for the Childhood-Resilient, and $-.65$ for the Childhood-Maladaptive groups, in comparison to .26, .46, and $-.56$, respectively (as shown in Table 5), for the comparable groups defined in adolescence. Similarly, adolescent well-being was favorable in the Childhood-Competent and Childhood-Resilient groups and significantly lower and quite negative in the Childhood-Maladaptive. For example, the means for Negative Emotionality (which was assessed 10 years after the variables used to define status as childhood-resilient or maladaptive) were $-.57$ for the Childhood-Competent, $-.25$ for the Childhood-Resilient, and .67 for the Childhood-Maladaptive, $F = 15.44, p < .001$, as compared to $-.62, -.16$, and .43 for the adolescent-based groups.

Integrative analysis

A final post hoc analysis brought together the key themes of the regression and group-comparison findings. The regression analyses indicated that particular resources may buffer the impact of adversity on particular domains of competence, while the group comparisons suggested a pervasive contrast between the adequate psychosocial resources available to Resilient individuals relative to the inadequate resources available to Maladaptive individuals. These patterns raise this question: to what extent were individuals with consistently adequate psychosocial resources protected from the potentially disruptive effects of adversity?

Using the same logic as above for a priori cut scores, the association between low versus high adversity (defined as above) and adolescent competence was examined for individuals with adequate resources (z score $> -.50$ for IQ, parenting, and SES) and individuals with low resources (z score $< -.50$ on two of three resources). Overall competence was scored as the number of dimensions on which the individual met the competence criterion for OK, z score $> -.50$ or higher. Four groups held particular interest: low adversity and low resources, $n = 7$; low adversity and average/high resources, $n = 17$, whom we would expect to be competent; high adversity and low resources, $n = 45$, whom we would expect to be maladaptive and hence low in competence; and high adversity and average/high resources, $n = 33$, whom we would expect to be resilient. Analysis revealed unequal variances in the dependent measure of overall competence. Therefore group differences were tested by nonparametric procedures. The Kruskal-Wallis test indicated a significant group difference, $\chi^2 = 19.32, p < .001$. Three planned contrasts were done to clarify group differences: (a) high versus low resources when adversity was low, (b) high versus low adversity when resources were high, and (c) the group combining low resources-high adversity versus the other three groups. Only the last of these tests was significant, $p < .001$, suggesting that it was the combination of high adversity and low resources that resulted in competence problems rather than either high adversity or low resources alone. In a benign rearing environment, low resource children developed competence much like the high resource children. In a threatening environment, high resource children also developed competence much like the low adversity children. Results are illustrated in Figure 2.

Discussion

Results of this study converge on four main conclusions: (a) The development of competence is related to psychosocial resources, (b) good resources are less common among children growing up in the context of adversity, (c) if reasonably good resources *are* present,

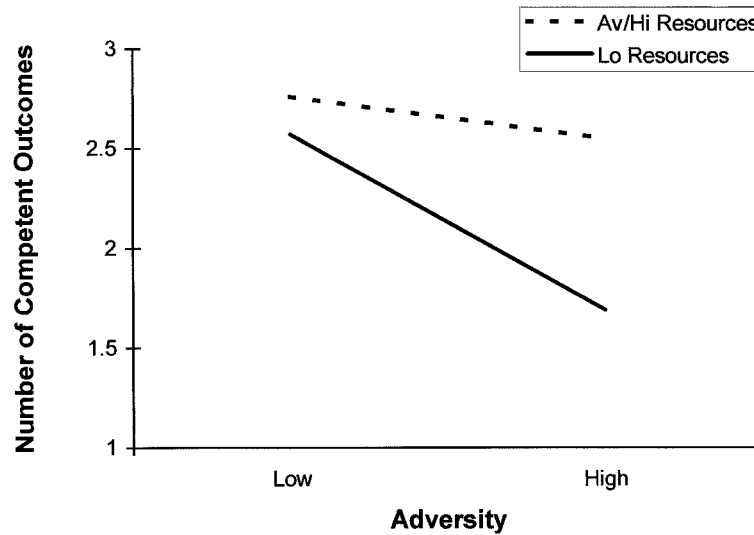


Figure 2. Competence outcome (number of competence dimensions $\geq .5$ SD or better for three competence domains) as a function of low or high adversity (low to moderate throughout childhood and adolescence versus severe to catastrophic) and level of resources. High resource groups have z scores above $-.5$ on IQ, parenting, and SES variables; low resource youth scored $< -.5$ on two or more of these.

competence outcomes are generally good, even in the context of chronic, severe stressors, and (d) maladaptive adolescents tend to be stress-reactive and have a history of adversity, low resources, and broad-based competence problems. These findings add to the growing longitudinal evidence suggesting that good parents and cognitive skills are general advantages for development that may be particularly important for overcoming serious chronic adversity. Results also raise interesting questions about the issue of “cost” versus “mastery” in resilience.

IQ and parenting quality as resources for competence and resilience

Results from variable-oriented and person-oriented analyses consistently supported the significance of intellectual functioning and parenting quality as markers of current and future adaptation in childhood and adolescence, which is consistent with a broad literature on competence and its correlates as well as developmental theories of adaptation (Masten & Coatsworth, 1995, 1998). Good intellectual functioning and well functioning parent-child

relationships may signify that fundamental human adaptational systems, presumably the legacy of evolution, are operational and sufficient to sustain normal development under unfavorable conditions (Masten et al., 1990; Masten & Coatsworth, 1998).

The findings for IQ and parenting indicated both unique and shared linkages with specific domains of competence. IQ had unique significance for academic achievement, though it also shared variance with parenting and SES. As expected, IQ was a significant predictor of social competence in childhood and not so in adolescence, congruent with other literature suggesting that peer relations are linked to cognitive functioning in childhood and decouple by adolescence (cf. Masten & Coatsworth, 1995). The predictive significance of IQ for the conduct domain of competence was not unique. IQ scores predicted conduct in childhood and adolescence, but this covariance was shared with parenting quality. The variance in IQ related to conduct was the variance IQ shared with parenting; thus, controlling for parenting quality rendered IQ main effects nonsignificant. In addition, the interaction of IQ and adversity was

not unique, for the same reason. In childhood, both the interaction of IQ with adversity and parenting quality with adversity were each significant if entered ahead of the other, and neither was significant once the other was entered. In other words, this interaction reflects variance common to both predictors, which could be due to genetic covariance, transactional influences, or many other shared "causes."

The finding that childhood IQ continued to have a moderating effect on adversity in late adolescence with respect to conduct suggests that early cognitive functioning may have long-term consequences in the context of adversity. The combination of low IQ and high adversity was related to conduct problems that were evident in childhood and worsened over time. This result replicates findings implicating intellectual functioning as a vulnerability or protective factor for the development of antisocial behavior problems in high risk groups (Kandel et al., 1988; Kolvin et al., 1988; White, Moffitt, & Silva, 1989). Numerous processes could underlie this effect: Good verbal, learning, or problem solving aptitude could play a role in assessing threat, accessing resources, effective seeking of healthier environments or relationships for development, appealingness to teachers, etc. And these processes could easily be linked to parent competence, genetically, transactionally, or both (see Masten & Coatsworth, 1998).

Parenting quality had unique significance for conduct in childhood and all three competence domains by adolescence, even with IQ and SES controlled, suggesting that the role of parenting extended beyond genetic covariance in intellectual aptitude that could partially underlie all three variables. The unique role of parenting in adolescence after all other variables were controlled suggested that parents were changing in ways that continued to influence the development of competence during adolescence. It was interesting to find that childhood parenting also had unique effects in predicting social competence during adolescence, over and above the effects of adolescent parenting. This finding suggests that qualities of the parent-child relationship in childhood contributed to changes in peer so-

cial competence over the course of adolescence, which is congruent with developmental theory predicting that parents influence peer relationships (Parke & O'Neil, in press; Sroufe & Fleeson, 1986). Additionally, exploratory analyses indicated that child competence predicted changes in parenting quality in adolescence, suggesting that the parent-child influences are bidirectional (Brown & Huang, 1995; Maccoby, 1992). Presumably this linkage could reflect many influences over time involving a child's relationships with parents and peers. For example, changes in child behavior resulting from influences of deviant peers could have a negative effect on child-parent relationships (cf. Brown & Huang, 1995). Clearly, there are many ways in which children may influence the quality of their own resources, yet such transactional processes have been neglected in studies of resilience (Masten, in press).

Socioeconomic and minority status as resources or risks for competence and resilience

Results of this study for socioeconomic status are consistent with widely reported linkages of SES to competence in general and academic achievement in particular, and also to child IQ, parenting quality, and adversity exposure (Gersten, Langner, Eisenberg, & Simcha-Fagen, 1977; Kopp, 1983; Masten & Coatsworth, 1995; McLoyd, 1990; Patterson, Kupersmidt, & Vaden, 1990; Rutter, 1979; Sameroff & Chandler, 1975). SES appeared to play a unique role, at least for White students, with regard to long-term academic attainment, an effect that could not be attributed to good parenting or good intellectual skills. This result may reflect the role of correlates of SES, such as parental education level, educational opportunities and expectations, etc. With regard to other domains, the predictive significance of SES was related to covariance with IQ and parenting. In these cases, the correlations of SES with child and adolescent competence could be attributed to qualities of the child or parent associated with SES.

Minority status was related to some aspects of psychosocial risk and childhood compe-

tence; however, when other resource variables were controlled, this status variable appeared to have little overall significance for competence or resilience.

Competent, resilient, and maladaptive youth

The distribution of competent individuals for high and low adversity levels provided compelling evidence of resilience and a nearly empty cell for the low-risk-low-competence pattern. The anticipated infrequency of the latter pattern is revealing. This cell represents the highly vulnerable individual for whom normative challenges may be overwhelming. Such individuals are likely to be underrepresented in normal school populations as well as relatively few in number. This "empty cell" phenomenon has been noted or can be inferred from other studies of resilience in which groups have been formed by criteria on competence and adversity (Luthar, 1991; Cowen, Lotyczewski, & Weissberg, 1984). This phenomenon warrants more attention. It may reflect an evolutionary "bias" of development toward good adaptation when the environment is generally favorable (Hartmann, 1958; Waddington, 1966).

Overall, competent adolescents, whether they had experienced high or low levels of adversity, appeared to have much in common with respect to both resources and indicators of psychological well-being. On all individual differences examined (see Table 4), the average score for Resilient adolescents was at or better than the sample mean (i.e., in the direction associated with adaptation). Intellectual functioning was not significantly better for the Resilient group than for the Competent, which we had hypothesized, though childhood scores were higher.

Few differences were found between Competent and Resilient individuals. Resilient adolescents had been somewhat less rule-abiding than Competent peers as children, though still at the average level for the cohort (not low). In adolescence, they described themselves as experiencing more negative affect than Competent peers, though once again at levels more positive than average for the sample (and at the average level on the norms for

this measure). Nonetheless, these results might reflect subtle effects of high adversity on behavior even at the high end of behavioral functioning.

On the whole, however, the well-being of the Resilient group appeared to be fine. Looking across indicators of internal adaptation, Resilient youth either resembled Competent peers or did not differ from sample averages. Resilient girls had higher positive emotionality than any other group. This does not mean that the experiences of trauma and stress have no other short or long term effects. But in this urban school-based sample, for a range of well-being markers, this group of resilient individuals generally does not appear to have significant problems in emotional adjustment or self-concept. Consistent with results obtained by Neighbors, Forehand, and McVicar (1993), who found lower levels of depressed mood and anxiety among competent adolescents who had experienced high interparental conflict, our results are more congruent with predictions from pleasure-in-mastery/self-efficacy theory than stress-and-coping theory. Similarly, Cicchetti and Rogosch (1997) have found that competence among maltreated children is associated with positive self-esteem, ego control, and ego resiliency. Our results contrast with those of Luthar (1991) who found evidence of "cost" in internalizing symptoms among a small group of very competent inner city adolescents who had experienced high levels of recent negative life events. Contextual/cultural differences between the two studies as well as age differences and long (this study) versus short (Luthar) time intervals could be factors. Moreover, internal distress could be greater immediately during and after intensely negative experiences or during the early adolescent years. It is also conceivable that both "mastery" and "cost" processes are operating and that the former outlast the latter. Further investigation is needed to ascertain the linkages between internal and external indicators of adaptation in children experiencing adversity, particularly studies that combine short and long time horizons.

It was the maladaptive adolescents in this study who appeared to be at risk for negative

emotional reactions. In addition, it should be noted that the higher order personality dimension, "Negative Emotionality," encompasses both behavioral and emotional tendencies, including the trait components of aggression and alienation, which foster and reflect adversarial and aversive interpersonal engagements and experiences. Their conduct and personality scores suggest that these individuals, who have experienced very high levels of adversity with few protective resources, may have become prone to adversity they contribute to by their own behavior, and are also stress-reactive, such that they respond to stressors with distress and negative emotion.

Resilient youth differed dramatically from Maladaptive youth in current and past resources, and in psychological well-being. Moreover, the competence of these two groups of adolescents was already quite different in childhood with respect to both academic achievement and conduct, suggesting that the processes underlying their divergent paths in development were well underway by late childhood.

Limitations and directions for future research

This study had a number of limitations. First, long intervals between assessments and a focus on broad-band competence criteria provided a "big picture" analysis suitable to early stages in study of phenomena, but precluded close examination of underlying processes. Second, it was clear that the resources and adversity variables in the study covaried (negatively), yet it was not feasible within the design of the study to examine in depth the significance of this covariance for competence and resilience in development. Third, adversity data were retrospective, sometimes across long intervals of time, though data were collected at multiple time points with multiple measures and informants. Fourth, only two informants (adolescent and parent) provided data about late adolescence, though multiple methods were used; additional perspectives (peers, employers), though difficult to obtain, might yield different results. Fifth, the sample size was too small for the most

rigorous examination of certain hypotheses and issues: (a) it was too small to utilize a structural modeling approach in the dimensional analyses; (b) sample size also precluded a powerful analysis of ethnic minority effects by specific ethnic group; and, (c) the potential size of possible diagnostic groups (e.g., resilient group) limited statistical power to detect subtle differences and also limited consideration of extreme groups defined by criteria that varied in stringency. And, finally, we only considered part of the story of these children's lives. Though substantial effects were found, much of the variance was left unexplained. Many other influences on their lives could be considered, including individual differences in personality or attention regulation or extrafamilial resources in the community.

Future studies must address questions about the nature of the complex processes underlying resources such as intelligence or parenting that may influence development in nonoptimal environments. One step toward a better understanding of these processes would be to disaggregate global resources such as "IQ" or "parenting quality" into meaningful components that may have differential significance for different aspects of child competence or for adaptation in different environments. IQ may be a marker for many processes, such as executive functioning and memory, or simply an indicator that brain development is proceeding normally, with many attendant processes available for adaptation (Masten & Coatsworth, 1998). Parenting quality includes dimensions such as structure, warmth, and expectations that covary but may well have differential connections to conduct, achievement, and social functioning with peers under different conditions. Baldwin, Baldwin, and Cole (1990) found that the "structure" dimension, though not warmth, of parenting differed for parents of competent children depending on whether they lived in dangerous versus safer neighborhoods; stricter parenting may be protective in unsafe environments.

It was not possible in the design of this study to examine the origins of the stress-reactivity found for maladaptive adolescents,

which would require earlier and more frequent assessments of temperament or personality variables, life adversities, and cognitions revealing how children interpret life experiences. Dispositions such as negative emotionality may influence development in nonoptimal environments but they may also develop in response to adversity experiences. Repeated assessments of personal attributes, competence, and adversity would be needed to capture transactional influences. Genetic designs would inform efforts to sort out the experiential as well as genetic influences on the covariance of high adversity-exposure, poor parenting, lower cognitive ability, negative emotionality, and failures to negotiate normative developmental tasks (Dodge, Bates, & Pettit, 1990; Plomin, 1994; Plomin & McLearn, 1993; Scarr, 1992; Wachs, 1992). Future studies also could examine in greater depth the ways in which children's exposure to adversity is related to parental behaviors and a child's own personality disposition and how chronic and severe adversity may shape brain development, personality, and cognitive development in children. These topics reflect in part a central agenda in the coming generation of developmental science to examine the interplay of nature and nurture in development (Rutter, 1997).

This study adds to the growing list of longitudinal investigations that corroborate the

phenomenon of resilience. Ultimately, we believe that the study of resilience will be subsumed by developmental models that accommodate the full range of variations in organisms and environments and their interactions that result in multifinality and equifinality of developmental pathways (Cicchetti & Rogosch, 1996; Masten, in press). Meanwhile, it is important to fill in with finer detail the broad-stroke knowledge that this and other investigations have provided about possible risk, compensatory, vulnerability, and protective factors and processes that could account for resilient versus maladaptive pathways of development in adverse environments (Masten, 1994, in press).

Results of resilience research suggest multiple strategies for promoting better outcomes, including risk/adversity-focused, resource-focused, and process-focused strategies (Masten, in press; Masten & Coatsworth, 1998). It remains to be seen how informative our knowledge about naturally occurring resilience will be for the design of protective interventions. However, signs of falling resources and rising adversity in the lives of American children, and the high levels of failure in developmental tasks among disadvantaged children, provide powerful incentives for testing evolving theories about risk and resilience by intervening to promote more desirable outcomes among children.

References

- Achenbach, T. M. (1985). *Assessment and taxonomy of child and adolescent psychopathology*. Beverly Hills, CA: Sage.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.
- Baldwin, A. L., Baldwin, C., & Cole, R. E. (1990). Stress-resistant families and stress resistant children. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 257–280). New York: Cambridge University Press.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Brown, G. W., & Harris, T. (1978). *Social origins of depression: A study of psychiatric disorder in women*. New York: The Free Press.
- Brown, B. B., & Huang, G.-H. (1995). Examining parenting practices in different peer contexts: Implications for adolescent trajectories. In L. J. Crockett & A. C. Crouter (Eds.), *Pathways through adolescence: Relation to social contexts* (pp. 151–174). Mahwah, NJ: Erlbaum.
- Cairns, R. B., & Magnusson, D. (1996). Developmental science: Toward a unified framework. In R. B. Cairns, G. H. Elder, & E. J. Costello (Eds.), *Developmental science* (pp. 7–30). New York: Cambridge University Press.
- Catalano, R. F., & Hawkins, J. D. (1996). The social development model: A theory of antisocial behavior. In J. D. Hawkins (Eds.), *Delinquency and crime: Current theories*. New York: Cambridge University Press.
- Cicchetti, D. (1990). The organization and coherence of socioemotional, cognitive, and representational development: Illustrations through a developmental psy-

- chopathology perspective on Down Syndrome and child maltreatment. In R. Thompson (Ed.), *Nebraska Symposium on Motivation: Vol. 36. Socioemotional development* (pp. 259–366). Lincoln, NA: Cambridge University Press.
- Cicchetti, D., & Garmezy, N. (1993). Prospects and promises in the study of resilience. *Development and Psychopathology*, 5, 497–502.
- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology*, 8, 597–600.
- Cicchetti, D., & Rogosch, R. A. (1997). The role of self-organization in the promotion of resilience in maltreated children. *Development and Psychopathology*, 9, 797–815.
- Cowen, E. L., Lotyczewski, B. S., & Weissberg, R. P. (1984). Risk and resource indicators and their relationship to young children's school adjustment. *American Journal of Community Psychology*, 12, 353–367.
- Cowen, E. L., Wyman, P. A., Work, W. C., & Parker, G. R. (1990). The Rochester Child Resilience Project: Overview and summary of first year. *Development and Psychopathology*, 2, 193–212.
- DeRogatis, L. R. (1977). *SCL-90R administration, scoring and procedures. Manual I*. Baltimore: Clinical Psychometric Research.
- DeRogatis, L. R. (1982). *Adolescent norms for the SCL-90R*. Baltimore: Clinical Psychometric Research.
- Dodge, K. A., Bates, J. E., & Pettit, G. S. (1990). Mechanisms in the cycle of violence. *Science*, 250, 1678–1683.
- Dunn, L. M., & Markwardt, F. C. (1970). *Peabody Individual Achievement Test*. Circle Pines, MN: American Guidance Service.
- Egeland, B., Carlson, E., & Sroufe, L. A. (1993). Resilience as process. *Development and Psychopathology*, 5, 517–528.
- Garmezy, N. (1985). Stress-resistant children: The search for protective factors. In J. E. Stevenson (Ed.), *Recent research in developmental psychopathology: Journal of Child Psychology and Psychiatry Book Supplement #4* (pp. 213–233). Oxford: Pergamon Press.
- Garmezy, N., & Masten, A. S. (1994). Chronic adversities. In M. Rutter, L. Herzov, & E. Taylor (Eds.), *Child and adolescent psychiatry: Modern approaches* (3rd ed., pp. 191–208). Oxford: Blackwell Scientific Publications.
- Garmezy, N., Masten, A. S., & Tellegen, A. (1985). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development*, 55, 97–111.
- Garmezy, N., & Rutter, M. (1985). Acute reactions to stress. In M. Rutter & L. Hersov (Eds.), *Child psychiatry: Modern approaches* (2nd ed., pp. 152–176). Oxford: Blackwell Scientific.
- Garmezy, N., & Tellegen, A. (1984). Studies of stress-resistant children: Methods, variables, and preliminary findings. In F. Morrison, C. Lord, & D. Keating (Eds.), *Advances in applied developmental psychology* (Vol. 1, pp. 231–287). New York: Academic Press.
- Gest, S. D., Neemann, J., Hubbard, J. J., Masten, A. S., & Tellegen, A. (1993). Parenting quality, adversity, and conduct problems in adolescence: Testing process-oriented models of resilience. *Development and Psychopathology*, 5, 663–682.
- Gest, S. D., Reed, M., & Masten, A. S. (1999). Measuring developmental changes in exposure to adversity: A life chart and rating scale approach. *Development and Psychopathology*, 11, 171–192.
- Gersten, J. C., Langner, T. S., Eisenberg, J. G., & Simcha-Fagan, O. (1977). An evaluation of the etiologic role of stressful life-change events in psychological disorders. *Journal of Health and Social Behavior*, 18, 228–244.
- Goldberger, L., & Breznitz, S. (1982). *Handbook of stress: Theoretical and clinical aspects*. New York: Free Press.
- Haggerty, R. J., Sherrod, L. R., Garmezy, N., & Rutter, M. (1994). *Stress, risk, and resilience in children and adolescents: Processes, mechanisms, and interventions*. New York: Cambridge University Press.
- Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development*, 21, 34–64.
- Harter, S. (1986). *Manual: Self-Perception Profile for Adolescents*. Unpublished manuscript, University of Denver.
- Hartmann, H. (1958). *Ego psychology and the problem of adaptation*. New York: International Universities Press.
- Hauser, R. M., & Featherman, D. L. (1977). *The process of stratification: Trends and analysis*. New York: Academic Press.
- Jessor, R., Van Den Bos, J., Vaderryn, J., Costa, F. M., & Turbin, M. S. (1995). Protective factors in adolescent problem behavior: Moderator effects and developmental change. *Developmental Psychology*, 31, 923–933.
- Kandel, E., Mednick, S. A., Kirkegaard-Sorensen, L., Hutchings, B., Knop, J., Rosenberg, R., & Schulsinger, F. (1988). IQ as a protective factor for subjects at high risk for antisocial behavior. *Journal of Consulting and Clinical Psychology*, 56, 224–226.
- Kaufman, J., Cook, A., Arny, L., Jones, B., & Pittinsky, T. (1994). Problems in defining resiliency: Illustrations from the study of maltreated children. *Development and Psychopathology*, 6, 215–229.
- Kolvin, I., Miller, F. J. W., Fleeting, M., & Kolvin, P. A. (1988). Risk/protective factors for offending with particular reference to deprivation. In M. Rutter (Ed.), *Studies of psychosocial risk: The power of longitudinal data* (pp. 77–95). New York: Cambridge University Press.
- Kopp, C. B. (1983). Risk factors in development. In P. H. Mussen (Ed.), *Handbook of child psychology* (4th ed., Vol. 2: M. M. Haith & J. J. Campos (Eds.), *Infancy and developmental psychobiology* (pp. 1081–1188). New York: Wiley.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Linder, H. D. (1985). *A contextual life events interview as a measure of stress: A comparison of questionnaire-based versus interview-based stress indices*. Unpublished doctoral dissertation, University of Minnesota.
- Lorr, M., & McNair, D. M. (1984). *Manual of the Profile of Mood States, Bi-Polar Form*. San Diego, CA: Educational and Industrial Testing Service.
- Lorr, M., & Wunderlich, R. (1988). Self-esteem and negative affect. *Journal of Clinical Psychology*, 44(1), 36–39.
- Luthar, S. S. (1991). Vulnerability and resilience: A study of high-risk adolescents. *Child Development*, 62, 600–616.
- Luthar, S. S. (in press). Measurement issues in the empirical study of resilience: An overview. In M. Glanz, J.

- Johnson, & L. Huffman (Eds.), *Resilience and development: Positive life adaptations*. New York: Plenum.
- Maccoby, E. E. (1992). The role of parents in the socialization of children: An historical overview. *Developmental Psychology*, 28, 1006–1017.
- Masten, A. S. (1989). Resilience in development: Implications of the study of successful adaptation for developmental psychopathology. In D. Cicchetti (Ed.), *Rochester Symposium on Developmental Psychopathology: Vol. 1. The emergence of a discipline* (pp. 261–294). Rochester, NY: University of Rochester Press.
- Masten, A. S. (1994). Resilience in individual development: Successful adaptation despite risk and adversity. In M. C. Wang & E. Gordon (Eds.), *Educational resilience in inner city America: Challenges and prospects* (pp. 3–25). Hillsdale, NJ: Erlbaum.
- Masten, A. S. (in press). Resilience comes of age: Reflections on the past and outlook for the next generation of research. In M. Glanz, J. Johnson, & L. Huffman (Eds.), *Resilience and development: Positive life adaptations*. New York: Plenum.
- Masten, A. S., Best, K. M., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology*, 2, 425–444.
- Masten, A. S., & Coatsworth, J. D. (1995). Competence, resilience, and psychopathology. In D. Cicchetti & D. Cohen (Eds.), *Developmental psychopathology: Vol. 2. Risk, disorder, and adaptation* (pp. 715–752). New York: Wiley.
- Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from successful children. *American Psychologist*, 53, 205–220.
- Masten, A. S., Coatsworth, J. D., Neemann, J., Gest, S. D., Tellegen, A., & Garmezy, N. (1995). The structure and coherence of competence from childhood through adolescence. *Child Development*, 66, 1635–1659.
- Masten, A. S., Garmezy, N., Tellegen, A., Pellegrini, D. S., Larkin, K., & Larsen, A. (1988). Competence and stress in school children: The moderating effects of individual and family qualities. *Journal of Child Psychology and Psychiatry*, 29, 745–764.
- Masten, A. S., Morison, P., & Pellegrini, D. S. (1985). A revised class method of peer assessment. *Developmental Psychology*, 21, 523–533.
- Masten, A. S., Neemann, J., & Andenas, S. (1994). Life events and adjustment in adolescents: The significance of event independence, chronicity, and desirability. *Journal of Research on Adolescence*, 4, 71–97.
- McLoyd, V. C. (1990). The impact of economic hardship on black families and children: Psychological distress, parenting, and socioemotional development. *Child Development*, 61, 311–346.
- Morison, P., & Masten, A. S. (1991). Peer reputation in middle childhood as a predictor of adaptation in adolescence: A seven-year follow-up. *Child Development*, 62, 991–1007.
- Mueller, C. U., & Parcel, T. L. (1981). Measures of socioeconomic status: Alternatives and recommendations. *Child Development*, 56, 13–20.
- Neemann, J., & Harter, S. (1986). *Manual for the Self-Perception Profile for College Students*. Unpublished manuscript, University of Denver.
- Neighbors, B., Forehand, R., & McVicar, D. (1993). Resilient adolescents and interparental conflict. *American Journal of Orthopsychiatry*, 63, 462–471.
- Parke, R. D., & O'Neil, R. (in press). Social relationships across contexts: Family-peer linkages. In W. A. Collins & B. Laursen (Eds.), *Minnesota Symposia on Child Development: Vol. 30. Relationships as developmental contexts: A tribute to Willard W. Hartup*. Hillsdale, NJ: Erlbaum.
- Patterson, C. J., Kupersmidt, J. B., & Vaden, N. A. (1990). Income level, gender, ethnicity, and household composition as predictors of children's school-based competence. *Child Development*, 61, 485–494.
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys*. Eugene, OR: Castaglia.
- Payne, R. W. (1985). Review of the SCL-90-R. In J. Mitchell, Jr., (Ed.), *The ninth mental measurements yearbook* (pp. 1325–1326).
- Perry, B. D., Pollard, R. A., Blakley, T. L., Baker, W. L., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation, and "use-dependent" development of the brain: How "states" become "traits." *Infant Mental Health Journal*, 16, 271–291.
- Plomin, R. (1994). *Genetics and experience: The interplay between nature and nurture*. Thousand Oaks, CA: Sage.
- Plomin, R., & McClearn, G. E. (1993). *Nature, nurture, and psychology*. Washington, DC: American Psychological Association.
- 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. (Ed.). (1988). *Studies of psychosocial risk: The power of longitudinal data*. New York: Cambridge University Press.
- Rutter, M. (1997). Nature–nurture integration: The example of antisocial behavior. *American Psychologist*, 52, 390–398.
- Sameroff, A. J., & Chandler, M. J. (1975). Reproductive risk and the continuum of caretaking casualty. *Review of Child Development Research*, 4, 187–244.
- Scarr, S. (1992). Developmental theories for the 1990s: Development and individual differences. *Child Development*, 63, 1–19.
- Silverstein, A. B. (1975). Validity of WISC-R short forms. *Journal of Clinical Psychology*, 31, 696–697.
- Spivack, G., & Swift, M. (1967). *Devereux Elementary School Behavior Rating Scale Manual*. Devon, PA: The Devereux Foundation.
- Sroufe, L. A. (1979). The coherence of individual development: Early care, attachment, and subsequent developmental issues. *American Psychologist*, 34, 834–841.
- Sroufe, L. A., & Fleeson, J. (1986). Attachment and the construction of relationships. In W. Hartup & Z. Rubin (Eds.), *Relationships and development* (pp. 51–71). Hillsdale, NJ: Erlbaum.
- Sroufe, L. A., & M. Rutter (Eds.). (1984). The domain of developmental psychopathology. *Child Development*, 55, 17–29.
- Tellegen, A. (1982). *Brief manual for the Differential Personality Questionnaire*. Unpublished manuscript, University of Minnesota, Minneapolis.
- Tellegen, A. (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681–716). Hillsdale, NJ: Erlbaum.

- Tellegen, A., Lykken, D. T., Bouchard, T. J., Wilcox, K. J., Segal, N. L., & Rich, S. (1988). Personality similarity in twins reared apart and together. *Journal of Personality and Social Psychology*, 54, 1031–1039.
- Tennen, H., Affleck, G., & Herzberger, S. (1985). Review of the SCL-90-R. In D. J. Keyser & R. C. Sweetland (Eds.), *Test critiques* (Vol. 3, pp. 583–594).
- Wachs, T. D. (1992). *The nature of nurture*. Newbury Park, CA: Sage.
- Waddington, C. H. (1966). *Principles of development and differentiation*. New York: Macmillan.
- Waters, E., & Sroufe, L. A. (1983). Social competence as a developmental construct. *Developmental Review*, 3, 79–97.
- Wechsler, D. (1974). *Wechsler Intelligence Scale for Children-Revised*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (1981). *Wechsler Adult Intelligence Scale-Revised*. San Antonio, TX: The Psychological Corporation.
- Werner, E. E., & Smith, R. S. (1982). *Vulnerable but invincible: A study of resilient children*. New York: McGraw-Hill.
- Werner, E. E., & Smith, R. S. (1992). *Overcoming the odds: High risk children from birth to adulthood*. Ithaca, NY: Cornell University Press.
- White, J. L., Moffitt, T. E., & Silva, P. A. (1989). A prospective replication of the protective effects of IQ in subjects at high risk for juvenile delinquency. *Journal of Consulting and Clinical Psychology*, 57, 719–724.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297–333.
- Wright, M. O'D., Masten, A. S., Northwood, A., & Hubbard, J. J. (1997). Long-term effects of massive trauma: Developmental and psychobiological perspectives. In D. Cicchetti & S. L. Toth (Eds.), *Rochester Symposium on Developmental Psychopathology: Vol. 8. The effects of trauma on the developmental process* (pp. 181–225). Rochester, NY: University of Rochester Press.
- Yoshikawa, H. (1994). Prevention as cumulative protection: Effects of early family support and education on chronic delinquency and its risks. *Psychological Bulletin*, 115, 28–54.