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Measuring developmental changes in exposure to adversity: A Life Chart and rating scale approach

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Abstract
The reliability and validity of a comprehensive, integrative strategy for assessing adversity exposure in childhood and adolescence was examined in a community-based longitudinal study of 205 children. Extensive data from multiple measures completed by adolescents and their parents regarding chronic and acute life experiences were aggregated into a Life Chart record of lifetime adversity exposure. Severity of adversity in three nonoverlapping time spans was rated by trained judges with excellent interrater reliability. As hypothesized, Family adversity predominated over all other types of adversity in childhood, remained salient into midadolescence, and showed considerable stability over time. Adversity related to an individual's own behavior and psychological functioning rose to equal prominence by late adolescence. Adversity arising from physical ailments that were independent of the individual's psychological functioning declined over time, while adversity arising from the community rose; physical and community events were uncommon for most individuals but substantial for some. Results suggest that coherent developmental trends in adversity exposure may be identified effectively through judges' ratings of severity of adversity over multiple-year time spans.

The question of how adverse life experiences are related to the course of individual development has long captured the attention of investigators in diverse fields concerned with both normative development and psychopathology (Bowlby, 1946; Elder, 1974; Freud, 1895; Kopp, 1983; Sameroff & Chandler, 1975). Most generally, the study of adversity, like the study of family, peer, and community contexts, contributes to an understanding of the role of experience in development (Horowitz, 1987). Developmental psychopathologists, in particular, have argued that the study of variations in how individuals adapt to adversity can inform developmental theory and guide intervention efforts (Cicchetti & Toth, 1992; Masten, Best, & Garmezy, 1990). For all these reasons, the study of adversity plays a key role in emerging multidisciplinary approaches to understanding the full range of variation and influences in development (Cairns, Elder, & Costello, 1996; Cicchetti & Cohen, 1994; Magnusson & Greitz, 1996).

Although many studies have examined the linkages between adversity and child outcomes, most have focused on relatively specific experiences such as parental psychopathology (Downey & Coyne, 1990), family economic loss (Elder, 1974), or divorce (Hetherington, Cox, & Cox, 1985). These studies provide insights into the sequelae of specific experiences, but their interpretation can be problematic because many adversities are interrelated and may have cumulative, nonspecific effects (Garmezy & Masten, 1994). There is a need for studies that consider a more comprehensive set of negative

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life experiences and that encompass longer periods of time (Masten & Wright, in press), but methods for quantifying cumulative adversity exposure are in short supply.

The goal of this study was to develop a procedure for examining the cumulative effects of adversity on adaptation from childhood to adolescence. This required the integration of large amounts and diverse sources of information on challenging life experiences. It also required the consideration of single experiences in the context of the subject's age and the seriousness and density of other adversities. The result was the present Life Chart and rating scale approach. The specific aims of the present study were to determine the reliability of the rating system developed to quantify adversity during multiyear time intervals, and to test hypotheses about developmental changes in adversity exposure from childhood to mid- and late adolescence.

This study builds upon previous advances in the assessment and scoring of adversity. Most broadly, the concept of a lifetime record of adversity exposure was inspired by Adolf Meyer's early use of Life Charts as a tool for the holistic analysis of organ functioning, illness, and life events (Meyer, 1948). The present assessment strategy was informed by early checklist measures of adversity (Coddington, 1972a, 1972b) as well as by the contextual life events interview approach developed by Brown and Harris (1978; see also Goodyer, Kolvin, & Gatzanis, 1985). The present rating scales elaborate on earlier efforts to rate the severity of individual events (APA, 1980, 1987; Brown & Harris, 1978; Skodol, 1991). The unique contributions of the present study are in the aggregation of adversity information across multiple measures completed by adolescents and their parents, and the development of scales to rate the severity of overall adversity exposure for multiple-year time spans.

Adversity was defined as *events and conditions judged by outside observers as likely to be stressful to most individuals*. We excluded anticipated events that did not occur (Cohen, 1988), chronic role strains (Pearlin & Schooler, 1978), and daily hassles (Kanner, Coyne, Schaeffer, & Lazarus, 1981) because personality characteristics such as negative emotionality may more strongly affect the identification of these experiences. By focusing on events and conditions that we judged most people would consider undesirable (e.g., death of a relative) or whose desirability was ambiguous (e.g., having a baby), we excluded life changes which are typically judged as desirable (e.g., a promotion at work). Even though positive events also require readjustment and change (Holmes & Rahe, 1967; Selye, 1956), most of the covariation between major life events and adaptation is captured by negative and ambiguous events (Cohen, Burt, & Bjorck, 1987; Compass, 1987; Johnson & Bradlyn, 1988; Rowlison & Felner, 1988). These judgments regarding desirability, as well as subsequent ratings of severity, were made by outside observers and did not necessarily correspond to participants' perceptions of the stressfulness of the events and conditions (e.g., Cowen, Pryer–Brown, Hightower, & Lotyczewski, 1991; Rende & Plomin, 1991). This definition of adversity encompassed acute events as well as chronic conditions (Garmezy & Masten, 1994).

Aggregating information across measures and across adolescent and parent report had advantages for the purpose of constructing comprehensive records of adversity exposure. Checklist measures, which require respondents to indicate which events from a printed list occurred in a given period (Compas, Davis, Forsythe, & Wagner, 1987; Masten et al., 1988; Masten, Neemann, & Andenas, 1994), rely on a single informant, exclude rare and idiosyncratic events, and exclude events outside of the reporting period. In contrast, the present Life Charts include checklist data but also incorporate a contextual life events interview (Linder, 1985), open-ended interview questions, and reports of events across the life span. Aggregation across measures was based on Linder's finding that upon inquiry, parents often added events to previous reports of events but seldom retracted an earlier report. Aggregation across parent and adolescent report was based on the view that both reporters provide valid information about the adolescent's life experiences, despite only moderate agreement on the occurrence of spe-

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cific events (Masten et al., 1994). Presumably parent–adolescent disagreements reflect both errors of omission (Linder) and differential knowledge of the event. For example, although we have no "gold standard" by which to judge the accuracy of parent and adolescent reports, we suspect that parents provided more complete accounts of events in early childhood, while adolescents could report upon some events that may have been unknown to their parents.

A conservative probabilistic approach was used to classify events as independent or nonindependent of the individual's behavioral or psychological functioning. Masten et al. (1994) note that independent events need to be considered separately from nonindependent events in studies of adjustment because nonindependent events are confounded with adjustment measures due to (a) direct measurement overlap (Dohrenwend, Dohrenwend, Dodson, & Shrout, 1984; Masten et al., 1994), (b) the possibility that adjustment problems cause life events, rather than the reverse, and (c) the possibility that a common antecedent (e.g., mental illness) may lead to both life events and poorer adjustment. Accordingly, *Independent* events were defined as those whose origin was almost certainly independent of the subject's functioning (e.g., parent lost job), while *Nonindependent* events were defined as those whose origin may have been related to the subject's behavior or psychological functioning (e.g., subject arrested).

Independent events were subclassified according to the active agent, system or context involved in the origination of the event: the Physical Self, Family, or Community. Independent events describing illnesses or ailments were categorized as Physical (e.g., "surgery for congenital heart condition"). Independent events whose origin *may have been* related to a family member's behavior or psychological functioning or physical vulnerabilities were categorized as Family (e.g., "parents divorced," "father had heart attack"). Finally, independent events whose origin was *almost certainly* independent of the functioning of family members and of the subject were categorized as Community (e.g., "best friend moved out of town"). Community events could happen to the subject, a family member, a friend, or to the community itself (e.g., natural disaster). All Nonindependent events were grouped together since they may have originated with the behavior or psychological functioning of the subject. Separate scores for severity of adversity exposure were obtained for Nonindependent and Independent adversity, as well as for the three subtypes of Independent adversity (i.e., Physical, Family, and Community).

Trained judges rated the severity of adversity over three multi-year time spans after considering the severity of individual events as well as their idiosyncratic features, developmental timing and duration, and temporal relation to other significant stressors. We expected that for a seminarrative measure such as a Life Chart, which contains some highly unique events and spans multiple years, such contextual considerations could be quite important. Other scoring strategies were considered less desirable because they are less sensitive to these contextual issues. For example, unweighted tallies of events assume that each event has the same severity; while weighted tallies assume that a given event has the same severity regardless of its context. Such tallies may be quite useful for scoring adversity occurring over a standard and brief time frame (e.g., Larson & Ham, 1993), because event-density is controlled, or for measures with generic event descriptions, because standard severity-weights can be defined. Future research may lead to the development of quantitative algorithms that incorporate such contextual factors into adversity scores for multi-year Life Charts, but we believed trained judges are currently the best alternative.

Ironically, the starting point for the rating scales used by judges in the present study, Axis IV of the DSM-III-R, was revised in DSM-IV (APA, 1994) to require only a list of areas of psychosocial adversity without a rating of severity. This change was based on the infrequent use of Axis IV ratings in clinical settings and inadequate evidence of their reliability (Skodol, 1991; Skodol & Shrout, 1990). In this regard, the present Life Charts bear some resemblance to the narrative case histories often available in clinical diagnostic

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settings. This suggests that the reliability of judges' ratings in the present study could inform efforts to incorporate contextual information into diagnoses in clinical settings.

Hypotheses

Reliability of adversity ratings

Our first hypothesis (H_1) was that judges provided with written guidelines would make reliable ratings of severity of adversity across all rating scales and time spans. We also expected (H_2) that for reasonably long time spans (i.e., 5 years or greater) judges' ratings would not be strongly associated with variations in the length of the time span considered. In childhood, for example, the number of years summarized in the charts ranged from 8 (birth to age 7) to 12 (birth to age 11); in mid-adolescence the number of years ranged from 5 to 8; while in late adolescence the number of years ranged from 2 to 5. We expected ratings in childhood and mid-adolescence would be less related to the length of the time span than in late-adolescence, when the much shorter time spans may have led to lower ratings for some subjects.

External correlates of nonindependent and family adversity

(H_3) Measures of participants' adjustment were expected to be moderately correlated with Nonindependent adversity. This follows from the definition of Nonindependent adversity as those events and conditions that may have been associated with the participants' own behavior or emotional functioning. Similarly, (H_4) ratings of parental competence were expected to be moderately correlated with ratings of Family adversity. This reflects the view that poor parental competence (e.g., unstable work and relationship history; trouble with the law) would be associated with considerable adversity from the child's perspective. Moreover, (H_5) we expected that judges' ratings would contain reliable variance related to these external correlates even after controlling for indices of the density of events in the chart.

Differences in mean levels across types of adversity and age

In this community sample, we expected (H_6) that family adversity would predominate over all other types of adversity in childhood because many of the most stressful experiences in childhood take place within the family context (e.g., parental divorce and remarriage, child abuse, changes in residence). We expected (H_7) that adversity related to subjects' own behavior or psychological functioning (i.e., nonindependent adversity) would increase markedly in adolescence, due to the increasing capacity of children to choose their own environments and increasing autonomy and mobility afforded adolescents. This can be a source of both accomplishments and adversity (e.g., obtaining a driver's license and being in a car accident). However, (H_8) ratings on the Nonindependent scale in adolescence were expected to be higher for males than for females, since adolescent males tend to "get in trouble," especially with the law, more frequently than adolescent females (Masten et al., 1995). Following the same reasoning as for Nonindependent adversity, (H_9) adolescents' increasing engagement in the broader community was expected to be reflected in increased exposure to adversity originating in the community context (e.g., being robbed).

Stability of individual differences

Adversity ratings were expected to exhibit significant continuity over time, with (H_{10}) moderate continuity for the Nonindependent and Independent scales, and the Family subtype of independent adversity; more modest continuity for the Physical Self scale; and lowest continuity for the Community scale. This expectation derived from the view that proximal variables which influence the occurrence of events found in the Nonindependent and Family scales, and which presumably reflect the functioning of the subject or his family members, are more enduring than the variables influencing physical and community-based events. We also expected (H_{11}) that ratings on the Nonindependent scale would

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show *increasing stability* over time due to a developmental niche-building phenomenon (e.g., adoption of a lifestyle) and the consolidation of personality characteristics in adolescence.

Interrelations among types of adversity

We expected (H_{12}) some evidence of discriminant validity between the different types of adversity over time, so that, for example, childhood Family adversity would be more strongly correlated with mid-adolescence Family adversity than with other types of adversity at mid-adolescence. Finally, we expected (H_{13}) that ratings on the Nonindependent scale would be positively and moderately correlated with ratings on the Family and Independent scales because of the profound influence of the biological, family and larger environments on a child's psychological and behavioral characteristics and the influence of children's personal characteristics on their environment.

Methods

Sample

Subjects were 205 children (91 boys, 114 girls) from 179 families, who were originally recruited from the third through sixth grade classrooms of two urban elementary schools in Minneapolis (ages 8 to 12, $M = 10.0$, $SD = 1.1$). Details of the recruitment process and sample characteristics are reported elsewhere (Garmezy & Tellegen, 1984; Masten et al., 1995). Twenty-seven percent of the sample were ethnic/racial minorities, primarily African American. Socioeconomic status ranged from 7 to 92.3 on the 100-point Duncan Socioeconomic Index (Hauser & Featherman, 1977), with the sample mean of 43 representing skilled labor and clerical work. Two follow-up assessments were conducted. A questionnaire assessment through the mail, conducted when subjects were 14 to 19 years old ($M = 16.9$, $SD = 1.2$ years), provided data on 88% of the cohort (Morison & Masten, 1991). A more comprehensive Time 3 assessment was obtained for 98.5% of the cohort in late adolescence, when subjects were 17 to 24 years old ($M = 19.8$, $SD = 1.6$ years).

Procedures

The Time 1 assessments spanned 2 years. Questionnaire information collected in the first year was verified and described in more detail in face-to-face interviews in the 2nd year. For example, Life Event Questionnaires (LEQs, described below) were completed at the initiation of the study, as well as 1 year later. Parents were interviewed after having completed both LEQs. This allowed interviewers to gather contextual information about the events endorsed on the LEQs. The same sequence of questionnaires followed by interviews occurred at Time 3, again so that interviewers could inquire about events reported on the LEQs during the face-to-face interviews.

Measures: Time 1 ($M_{age} = 10.0$)

Life Event Questionnaire (*LEQ*). The LEQ was a 50-item modification of Coddington's (1972a, 1972b) Social Readjustment Rating Scale for Children, which had been modeled on the Holmes and Rahe (1967) measure. The modification involved deleting some events and adding some which were a better fit for a working class population, as well as adding positive events to offset the negative tone of the scale (Garmezy & Tellegen, 1984; Masten et al., 1988). The parent circled "yes" or "no" to indicate which events on the printed list had occurred during the past year. The LEQ was administered for 2 consecutive years for all subjects, with some subjects completing the LEQ for a 3rd year.

Parent interview. Each child's parent (typically the mother) was interviewed in the child's home in three 2-hour sessions. The first visit yielded information on family moves, employment and other history and activities. The second visit focused on the child's developmental history and current behavior. During this interview parents completed a 50-item behavior checklist that was similar in form and content to the Child Be-

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havior Checklist (Achenbach & Edelbrock, 1983). Factor-based indices of Internalizing and Externalizing behavior problems were derived from parents' responses, and these broad-band dimensions were averaged to form a single index of child behavior problems. The third interview consisted of detailed questions regarding the context of all life events endorsed on the LEQs or described in the interview (Linder, 1985). Coding forms completed by the interviewer during the interview summarized family moves, child school changes, parental job changes, and parental relationship changes (e.g., marriages, divorces). Following all three interviews, interviewers' made a global rating of parental competence (on a scale of 1 to 5).

Measures: Time 2 ($M_{age} = 16.9$)

Life Event Questionnaire for Adolescents. The 67-item LEQ for Adolescents was an expansion and revision of the Time 1 LEQ (Masten et al., 1994). Events significant in adolescence were added (e.g., involved in a car accident), drawing upon other published LEQs, the Diagnostic and Statistical Manual of the American Psychiatric Association (1987), and "write-in" events from the Time 1 LEQ (Masten et al., 1994). Some items from the Time 1 LEQ were excluded and others were rewritten. Parallel versions of the LEQ-A were completed by subjects and their parents (generally the mother).

Status Questionnaires. The Status Questionnaire was developed to gather biographical information regarding the adolescent's recent history and current status with respect to academic and job performance, future aspirations, activities, friendships, relationships with family, health and other major life events (Morison & Masten, 1991). The format was structured rather than open-ended. Parallel versions of the questionnaire were completed by subjects and their parents.

Mothers' Life Events Questionnaire. The 62-item Mother's LEQ was adapted from the LEQ for Adolescents. Items were reworded to pertain to the mother, and several events pertinent for mothers were added.

Youth Self Report and Child Behavior Checklist. Adolescents described their internalizing and externalizing behavior problems in the Youth Self Report (YSR; Achenbach & Edelbrock, 1987). Externalizing and Internalizing problem scores were computed and averaged to form a Total Problem score. Similarly, parents completed the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983), yielding parallel scores for Externalizing, Internalizing, and Total Problems. To create a single index of adjustment problems in mid-adolescence, the standardized Total Problem scores from the YSR and the CBCL were averaged.

Measures: Time 3 ($M_{age} = 19.8$)

Life Event Questionnaire for Young Adults. The LEQ for Young Adults was a revision of the LEQ for Adolescents used at the Time 2 assessment. Revisions involved slight rewording of some items to improve clarity and the addition of age-appropriate items. Parallel versions of the LEQ for Young Adults were completed by subjects and parents.

Status Questionnaires. The Status Questionnaire used in the Time 2 assessment was revised substantially to gather age-appropriate biographical information regarding academics, work, health, family and peer relationships, activities, and major life events. Parallel questionnaires were completed by the subjects and parents.

Lifetime Life Events Questionnaire and mother interview. The Lifetime LEQ was designed to gather information from the subjects' mothers regarding the occurrence and frequency of significant life events. The broad categories of events included losses, marital events, other family separations, accidents and injuries, moves, traumas, as well as financial and legal events. Parents were asked to specify the year in which an event occurred, as well as the child's age and grade placement at the time. Questions included how many times an event

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occurred, length of the event, and who the event involved. During a subsequent 2-hr semi-structured home interview, mothers were shown a summary of the events they had endorsed on the Lifetime LEQ. The events endorsed on the Lifetime LEQ had been transcribed onto an 11×17 chart, with rows corresponding to single years in the child's life. Mothers were given the opportunity to review the chart for accuracy; corrections and additions were made, as necessary, at that time. The resulting charts, representing the integration of information from the Lifetime LEQ and the mother interview, were used in subsequent phases of Life Chart compilation. At the conclusion of the interview, interviewers rated maternal competence (on a scale of 1 to 5) based on information mothers provided in the interview regarding their educational, employment, and relationship history.

Procedure

Compilation of Life Charts. Seven research assistants compiled initial versions of the 205 Life Charts by reviewing the measures described above. The manual which standardized this process contained a blank copy of each measure with relevant sections highlighted; brief, standard phrases to summarize most events (e.g., "parents divorced"); and the content category of each event (i.e., Death/Loss, Family Composition, Financial/Job, Health, Move, School, Family Relations, Peer Relations, Legal or Trauma). Event descriptions were brief phrases that excluded information about the subject's response to the event. Contextual information was included when it added critical information about the event's severity (e.g., "grandmother died" might be elaborated to read "grandmother, who was primary caretaker, died"). Events were recorded on a multi-page form with rows corresponding to calendar years. Compilers were instructed to consult whatever case material was necessary (e.g., interview transcripts) to resolve vague or contradictory reports. After preliminary versions of all charts were complete, the four most experienced compilers followed standardized instructions to review all charts to verify their accuracy and completeness. It required an average of 6 to 8 hr to compile and verify each Life Chart. The resulting handwritten charts were entered onto a computer database with 22,150 total events (i.e., an average of over 100 events per subject). Data entry was double-checked for accuracy.

Categorizing life events. Nine members of the research project independently categorized 115 events from a randomly selected Life Chart as (a) Nonindependent, (b) Physical, (c) Family, or (d) Community. (The latter three categories are subtypes of events or conditions judged to be independent of the individual's behavioral or psychological functioning; they were rated both separately and together as an Independent scale in the rating task.) Perfect agreement among all nine individuals was achieved for 81% of all events (93/115); and seven or more individuals agreed for 93% of all events (107/115). Following a group discussion of reasons for discrepancies, three of the nine individuals classified events for all remaining charts, with periodic checks of each others' coding and resolution of any discrepancies by consensus.

Two pediatric health experts (a pediatric neurologist and a clinical psychologist with a specialty in pediatric neuropsychology) were consulted to classify subjects' physical illnesses as either Physical or Nonindependent. The consultants were provided with a list of 180 distinct Health events from the 205 Life Charts. The only context provided for each event was the subject's age. The consultants independently classified the etiology of each health event/condition as (a) almost certainly independent of behavior/emotional functioning, (b) some possible influence of behavior/emotional functioning, or (c) probably not independent of behavior/emotional functioning. The consultants were asked to base their judgments on the research literature rather than clinical judgments so that their ratings would reflect current views in the field as much as possible. The two consultants made the same ratings for 95% of events (171/180). Accordingly, an event was classified as Physical Self only if both consultants agreed its etiology

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was almost certainly independent of the subject's behavior/emotional functioning. Overall, 52% (94/181) of the health events were classified as Physical events.

Adversity rating process. Severity of adversity was rated on 7-point scales. Descriptors for scale points were based on the stress rating scale of the DSM-III-R (APA, 1987). Written instructions for raters included definitions of the rating scales, general issues to consider in determining the severity of events, examples of events for each level of severity, general issues to consider in rating severity of overall adversity in a time span, and guidelines for anchoring scale points for each scale (see Appendix for the full instructions to judges).

The Life Charts were printed with events listed in rows corresponding to the subject's age, and in columns organized according to event content. For each individual, three nonoverlapping time spans were identified, corresponding to the intervals from birth to the first competence assessment ($M_{age} = 10.0$), between the first and second competence assessments ($M_{age} = 16.9$), and between the second and third competence assessments ($M_{age} = 19.8$). Accordingly, the first time span covered the childhood years (birth through age 9 years), the second time span covered the midadolescent years (ages 10 through 15 years), and the third time span covered the late adolescent years (ages 16 through 19 years). Variations across participants in the number of years included in each time span allowed for an examination of the degree to which judges' ratings were influenced by the number of years being rated.

Three procedures ensured that raters considered only the appropriate subset of events when rating a scale. First, each subject's Life Chart was printed in 15 sections, with each section including only one of the five types of stressors at one of the three time spans (e.g., Family events in the first time span). Raters were instructed to rate one scale for all subjects before moving to the next scale. This minimized potential halo effects that could have occurred, for example, by rating a subject's Physical stressors immediately after rating that same subject's Family stressors. Second, raters were not permitted to rate adversity for the same subject across adjacent time spans, thereby preventing cognitive carryover resulting from recognition of unusual events recurring across time spans. Third, raters were disqualified from making ratings for a subject if they had been involved in data collection, Life Chart compilation, or Life Chart data entry for that subject.

Within the constraints just described, for each subject and time span, two raters were randomly assigned to complete the five rating scales independently. Pairs of raters were randomly determined so that each pairwise combination of raters occurred equally often (except where substitute raters were used). The six primary raters and three substitute raters comprised seven advanced graduate students of child development (including four students also trained in clinical psychology), one undergraduate, and the principal investigator (as a substitute rater). Ages ranged from 24 to 42 years with a mean of 33. All raters were Caucasian; two were from outside the United States. Raters were trained by rating the same set of three or four charts independently, then meeting as a group to discuss discrepancies between their ratings and those of two "anchor" raters who had experience from a pilot study of the rating task. This process was repeated for four successive sets of charts over 4 weeks. The task of producing final ratings for all 205 Life Charts also spanned 4 weeks. Each week, raters were assigned sections of charts for approximately 50 subjects, grouped by rating scale. At the end of each week, pairs of raters who had disagreed by more than one point met to reach a consensus rating.

For subjects with no missing data on the measures from which Life Charts were compiled, sections of charts which did not contain any stressors were systematically assigned the lowest possible rating. For subjects with missing data on one or more measures ($n = 62$), when missing measures resulted in an absence of stressors on a scale, a "missing rating" code was assigned. When scales were assigned the highest possible rating despite some missing data, ratings were considered valid. In all other cases, ratings were consid-

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ered either valid or were invalidated by the "missing rating code" after a close examination of individual case material (i.e., the specific configuration of missing and available measures).

Results

Prototypical life charts

Examples of Life Charts that received Low, Severe, and Catastrophic ratings for Family and Nonindependent adversity are presented in Tables 1 and 2, respectively. These prototypical charts were constructed by blending the charts of several subjects (to protect confidentiality). The prototypical charts are representative of actual charts in terms of the average number, content and severity of the events listed.

Reliability of adversity ratings

Interrater reliability was very good to excellent across all rating scales and time spans (see Table 3). This was true whether reliability was defined in terms of percent agreement within one scale point (range 90% to 98%, median 93%), Pearson correlations (range .78 to .92, median .83), or intraclass correlations (range .82 to .96, median .85). Moreover, these estimates of reliability are for the *judgments of single raters*. Since every section of every chart was rated independently by two raters, the adversity scores used in all analyses were calculated as the *average of two raters' judgments*; the reliability of these averaged scores can be estimated by Cronbach's α (Cronbach, 1951). Based on the Pearson correlations between raters, values of alpha ranged from .88 to .96, with a median of .91. These results strongly support the hypothesis (H_1) that raters can make reliable judgments about the overall severity of different types of adversity across multiple-year time frames.

Ratings of Independent and Nonindependent adversity at Time Span 1 and Time Span 2 were not significantly correlated with the length of the time span. The number of years in Time Span 1 ranged from 8 (birth through age 7 years) to 12 (birth through age 11 years), with number of years completely uncorrelated with Independent adversity, $r = .00$, and not significantly correlated with Nonindependent adversity, $r = .12$, *ns*. Nearly identical patterns existed at Time Span 2, when the number of years considered ranged from 5 to 8: for Independent adversity, $r = .00$; for Nonindependent adversity, $r = .10$, *ns*. In contrast, for Time Span 3, which ranged from 2 to 5 years, number of years was modestly correlated with both Independent adversity, $r = .20$, $p < .01$, and Nonindependent adversity, $r = .28$, $p < .01$. These findings indicate that for the longer Time 1 and Time 2 time spans, judges' ratings were not substantially related to the number of years summarized by the chart (H_2), but that ratings for the shorter Time 3 span were associated with the number of years summarized by the chart. Any decreases in ratings of adversity at Time 3 should be interpreted with caution since they could be due in part to the shorter span of years considered at Time 3.

External correlates of nonindependent and family adversity

In childhood, parents' reports of child behavior problems were correlated with ratings of Nonindependent adversity, $r = .29$, $p < .001$. Parents' and adolescents' combined reports of behavior problems in mid-adolescence were also correlated with levels of Nonindependent adversity in mid-adolescence, $r = .52$, $p < .001$, and late-adolescence, $r = .37$, $p < .001$. This is consistent with the hypothesis (H_3) that Nonindependent events are associated with children's behavior problems. Similarly, judges' ratings of *parental* competence in childhood were correlated with ratings of childhood Family adversity, $r = -.27$, $p < .001$. Ratings of parental competence in late-adolescence were also correlated with ratings of Family adversity in mid-adolescence, $r = -.38$, $p < .001$, and late-adolescence, $r = -.30$, $p < .001$. This is consistent with the hypothesis (H_4) that Family adversity is associated with parents' adjustment problems.

There was some discriminant validity of Nonindependent and Family adversity with respect to these external correlates. In both

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Table 1. *Family adversity in childhood: Prototypical life charts rated as low, severe, or catastrophic severity*

Age	Low (Rating = 3)	Severe (Rating = 5)	Catastrophic (Rating = 7)
Chronic events	None	None	• Witnessed violence in mother's relationships • Mother abusing drugs/ alcohol • Physically abused by other
0	• Mother returned to work	• Mother returned to work • Mother left child's bio-father	• Grandparent died • Moved twice within city • Father in jail • Mother begins new job
1	• Family moved within city	• Bio-father stopped financial support	• Moved once within city • Parents "separated" (never married) • Mother changed jobs
2	• Sibling born	• Mother remarried • Family moved within city • Grandmother had medical problems, came to live w/ family	• Moved once to another city • Sibling born, died 2 months later • Mother begins new job
3	• Father laid off, changed jobs	• Sibling born • Stepfather had problems with alcohol	• Moved twice within city • Mother changed jobs • Mother hospitalized 30 days for substance abuse • Lived with aunt for 2 months
4		• Mother hospitalized 6 days due to injuries from car accident • Family moved to nearby city	• Mother gets married • Family moves in w/ stepfather • Great-grandparent died • Stepfather abuses alcohol
5	• Mother hospitalized 2 days • Grandparent died	• Mother–stepfather having marital problems • Lost contact with bio-father	• Stepfather changed jobs • Family moved • Changed schools
6		• Mother–stepfather separate • Grandmother hospitalized, died	• Sibling hospitalized briefly • Stepfather fired from one job, began another • Mother changed jobs
7	• Family moved within city; no change in schools	• Mother–stepfather divorce • Family moves due to money problems • Mother works longer hours • Changed schools	• Stepfather attempted to molest subject • Family moved • Changed schools • Mother–stepfather separated for 3 months
8	• Pet died	• Sibling hospitalized	• Older sibling moved out and returned 3 months later • Stepfather lost job
9		• Mother's new boyfriend moves in with family	• Marital violence, police called

Note: Ratings refer to the *overall* severity of Family adversity across ages 0–9 years (all events in the column considered together) rather than to the severity of each separate event in the column.

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Table 2. *Nonindependent adversity in midadolescence: Prototypical life charts rated as low, severe, or catastrophic severity*

Age	Low (Rating = 3)	Severe (Rating = 5)	Catastrophic (Rating = 7)
10	• Increased arguments with parents • Broke arm	• Increased arguments w/ parents • Moved to live with father • Changed schools	• Increased arguments with parents
11		• Broke arm in bike accident • Got into fights at school • Hospitalized for asthma complications	• Truant • Suspended from school • Failed a grade and was held back
12	• Increase in arguments with sibling	• Caught breaking into school • School initiated truancy proceedings • Increased arguments w/ parent	• Received treatment for substance abuse • Beaten up by schoolmates
13	• Failed a grade and was held back	• School initiated truancy proceedings • Suspended from school • Increased arguments with parents over choice of friends	• Convicted of burglary, on probation • Caught vandalizing school with boyfriend • Broke up with boyfriend • Received treatment for substance abuse • Hospitalized for depression
14	• Broke up with girlfriend	• School initiated truancy proceedings • Ran away from home for 2 weeks	• Ran away from home multiple times • Truant • Suspended from school • Dropped out of school for 3 months • Changed schools • Received treatment for substance abuse
15	• Started job at fast food restaurant	• Girlfriend became pregnant • School initiated truancy proceedings • Started part-time job • Fired from job • Broke ankle in car accident	• Ran away multiple times • Lived with relative after returning home • Truant • Received treatment for substance abuse • Suspended and later expelled from school • Got part-time job • Fired for insulting customer • Became pregnant • More legal trouble; spent time in detention center

Note: Ratings refer to the overall severity of Nonindependent adversity across ages 0–9 years (all events in the column considered together) rather than to the severity of each separate event in the column.

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Table 3. *Reliability of adversity ratings: Percent agreement, Pearson correlations, and intraclass correlations by scale and time span*

	Pre-T1			T1 → T2			T2 → T3		
Rating Scale	PA[a]	Pearson	ICC[b]	PA	Pearson	ICC	PA	Pearson	ICC
Nonindependent	.93	.83	.83	.93	.82	.89	.92	.83	.87
Independent	.92	.84	.84	.94	.78	.82	.92	.81	.85
Physical self	.93	.85	.84	.97	.86	.94	.98	.78	.96
Family	.90	.84	.84	.96	.80	.84	.93	.84	.87
Community	.95	.83	.82	.95	.87	.91	.95	.92	.94

[a]Percent agreement was calculated as percentage of cases for which the two raters were within 1 scale point on the 7-point scale.
[b]Intraclass correlations (ICC) were calculated according to the formula recommended by Tinsley and Weiss (1975): $ICC = MS_b\ MS_w/MS_b + MS_w\ (k - 1)$, where k is the number of raters, MS_b is the mean square between groups, and MS_w is the mean square within groups.

mid- and late-adolescence, Family adversity was more strongly correlated with parental competence, $r_2 = -.38$, $r_3 = -.30$, than with child adjustment problems, $r_2 = .15$, $r_3 = .08$, $t\text{diff}_2(171) = 2.67$, $p < .01$, $t\text{diff}_3(171) = 2.48$, $p < .05$. Conversely, Nonindependent adversity in mid-adolescence was more strongly correlated with child behavior problems, $r_2 = .52$, than with parental competence, $r_2 = -.26$, $t\text{diff}_2(171) = 3.31$, $p < .01$. There was no such discriminant validity in childhood, when neither type of adversity was differentially correlated with child adjustment problems and parental competence.

These external correlates also provided evidence of the unique variance captured by the present ratings as opposed to tallies of events. As hypothesized (H_5), the adversity ratings contained reliable variance unrelated to the *density* of events (i.e., the number of events divided by the number of years in the time span). For example, ratings of Family adversity were strongly correlated with the density of Family events at all three time spans, rs = .73, .75, and .74, respectively, but these correlations were substantially below the reliability of the Family adversity ratings (>.90). Moreover, after controlling for the *density* of family events (in hierarchical regression analyses), *ratings* of Family adversity were still significant predictors of concurrent ratings of parental competence at all three time spans, $\Delta R^2 = .02$, $p < .05$; $\Delta R^2 = .07$, $p < .01$; and $\Delta R^2 = .03$, $p < .05$. Similarly, ratings and density measures of Nonindependent adversity were strongly correlated at all three time spans, rs = .72, .78, .70, respectively, but below the reliability levels of the ratings (>.88). Again, after controlling for the *density* of Nonindependent events, *ratings* of Nonindependent adversity improved the prediction of child adjustment problems at all three time spans, $\Delta R^2 = .04$, $p < .01$; $\Delta R^2 = .04$, $p < .01$; and $\Delta R^2 = .03$, $p < .05$. These analyses suggest the present ratings of severity of adversity captured reliable and theoretically meaningful variance not present in indices based on unweighted tallies of events.

Differences in mean levels across types of adversity and age

Differences in mean levels of adversity across Adversity Type, Time Span and Gender first were tested with a repeated measures MANOVA. Adversity Type was a within-subjects factor with four levels (Family, Nonindependent, Physical and Community); Time Spans was a within-subjects factor with three levels (Time Spans 1, 2, and 3); and Gender was a between-subjects factor with two levels. The main effect for Gender was nonsignificant, as were the 2-way interactions of Gender by Adversity Type and Gender by Time Span, and the 3-way interaction of Gender by Adversity Type by Time Span. There were significant effects for Adversity Type, $F(4, 172) = 553.73$, $p < .001$; for Time Span, $F(2, 174) = 65.14$, $p < .001$; and for the Adversity by Time Span interaction term, $F(8, 168) =$

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34.53, $p < .001$. Follow-up F tests indicated significant effects for Time Span within each Adversity Type; and significant effects for Adversity Type within each Time Span. Consequently, 19 planned contrasts relevant to specific hypotheses were carried out to clarify the developmental trends for each type of adversity, and the relative salience of each type of adversity at each time span. To reduce the likelihood of Type I error, only contrasts with $p < .002$ are interpreted below (i.e., .05/19 = .0026).

As hypothesized (H_6), childhood levels of Family adversity ($M = 4.82$) were significantly and substantially higher than childhood levels of Physical ($M = 1.81$), Community ($M = 1.69$), and Nonindependent ($M = 2.17$) adversity (Table 4). Family adversity continued to predominate over all other types of adversity in midadolescence (Time Span 2). By late adolescence (Time Span 3), levels of Family adversity ($M = 4.23$) were still significantly higher than levels of Physical ($M = 1.16$) or Community ($M = 2.60$) adversity, but they were not significantly different than levels of Nonindependent adversity ($M = 4.05$).

The converging levels of Family and Nonindependent adversity were largely due to increases in Nonindependent adversity (H_7) rather than to decreases in Family adversity. Nonindependent adversity was substantially higher in both mid- and late-adolescence ($M = 4.16$, $M = 4.05$) than it had been in childhood ($M = 2.17$). Contrary to our hypothesis (H_8), levels of Nonindependent adversity in late adolescence were not significantly higher for boys ($M = 3.89$) than for girls ($Mg = 4.17$), $F(1, 183) = 1.91$, *ns.* Levels of Family adversity showed less substantial developmental change; at mid-adolescence they were slightly higher than in childhood, while in late-adolescence they were somewhat lower than in childhood. The latter finding may be due in part to the fact that Time Span 3 was much shorter than Time Span 1 (see above).

There was a rise in Community adversity between childhood and both mid- and late adolescence (H_9). The parallel increases in Community and Nonindependent adversity are consistent with the view that increases in autonomy and community engagement in adolescence are associated with increases in adversity related to one's own behavior and psychological functioning, and increases in adversity in the community setting.

Physical adversity declined from Very Low levels in childhood to Minimal levels by late adolescence ($M_1 = 1.81$ vs. $M_3 = 1.16$). This trend is reflected in the increasing proportion of subjects with Minimal physical adversity (58.5%, 78.7%, and 87% with ratings of 1 on the 7-point scale); and the declining proportion of subjects with at least Moderate levels of physical adversity (11.2%, 5.0%, and 1.5% with ratings of 4 or higher).

Stability of individual differences

As expected (H_{10}), there was considerable individual difference stability in levels of Family adversity across adjacent time spans, $r_{12} = .62$; $r_{23} = .50$, both $p < .001$ (see Table 5) and from childhood to late adolescence, $r_{13} = .39$, $p < .001$. Stability in levels of Physical and Community adversity was more modest, with correlations ranging from .18 to .28. There was only weak stability from childhood to mid-adolescence in levels of Nonindependent adversity, $r_{12} = .25$, with no reliable stability from childhood to late adolescence, $r_{13} = .05$, *ns*. Consistent with expectations (H_{11}), however, individual difference stability for Nonindependent adversity was significantly stronger from mid- to late-adolescence, $r_{23} = .59$; test for difference between r_{12} and r_{23}, $t(186) = 4.33$, $p < .001$.

Interrelations among types of adversity

There was support for the hypothesis (H_{13}) that Family adversity is positively correlated with Nonindependent adversity in adolescence, $r_{22} = .35$, $p < .001$; $r_{33} = .23$, $p < .01$. Moreover, in a multiple regression analysis, Family adversity in childhood was positively associated with levels of Nonindependent adversity in adolescence, even after controlling for childhood levels of Nonindependent adversity ($\Delta R^2 = .09$, $p < .001$). In other words, childhood Family adversity predicted *changes* in relative levels of Nonindependent adversity, which is consistent with the view that

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Table 4. *Descriptive statistics for adversity ratings by scale and time span*

Adversity Type	Time Span 1 (Ages 0–9 years)	Time Span 2 (Ages 10–15 years)	Time Span 3 (Ages 16–19 years)
Nonindependent			
M	2.17[b]	4.16[a,b]	4.05[a]
SD	1.31	1.47	1.54
% 1 (floor)	38	2	7
% 7 (ceiling)	0	5	1
Physical			
M	1.81[b]	1.40[b]	1.16[a,b]
SD	1.25	.97	.57
% 1	59	82	91
% 7	0	0	0
Family			
M	4.82	5.15[a]	4.23[a]
SD	1.56	1.23	1.50
% 1	2	1	6
% 7	12	11	2
Community			
M	1.69[b]	2.60[a,b]	2.25[a,b]
SD	1.15	1.48	1.15
% 1	59	32	50
% 7	0	0	1
Independent			
M	4.97	5.34[a]	4.51[a]
SD	1.47	1.15	1.48
% 1	1	0	4
% 7	14	14	4

Note: An omnibus MANOVA indicated no main effects for gender or for the interactions of gender with Adversity Type (4 levels, excluding Independent) or Time Span (3 levels). There was a significant Adversity Type by Time Span interaction, $F(8, 168) = 34.53$, $p < .001$. Within each Time Span, Family adversity was contrasted separately with Nonindependent, Physical, and Community adversity; within each Adversity Type, Time Spans 2 and 3 were separately contrasted with Time Span 1. To reduce the likelihood of Type I error, the significance thresholds for contrasts was set conservatively at $p < .002$ (i.e., .05/19 = .0026).

[a]Mean is significantly higher than mean level of the same type of adversity at Time Span 1.

[b]Mean is significantly lower than mean level of Family adversity in the same Time Span.

there is intergenerational continuity in adversity exposure.

The longitudinal correlations among the four categories of adversity provided support for their discriminant validity (H_{12}). In 11 of 12 instances, levels of adversity from one time span are stronger predictors of the same type of adversity in subsequent time spans than of other types of adversity. For example, Family adversity in childhood is correlated $r = .62$ with Family adversity in mid-adolescence, but no more than $r = .33$ with any other type of adversity in mid-adolescence. Similarly, Physical adversity has a stability correlation of $r_{12} = .28$, but correlates no more than $r = .21$ with other types of adversity.

Utility of Independent Adversity Scale

The extremely strong correlations between the Family scale and the Independent scale (which includes Family, Physical, and Com-

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Table 5. *Correlations among adversity rating scales*

	Time Span 1 (Ages 0–9 years)					Time Span 2 (Ages 10–15 years)					Time Span 3 (Ages 16–19 years)				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Time Span 1															
1. Nonindependent	—														
2. Physical	.30	—													
3. Family	.12	.17	—												
4. Community	.18	.10	.24	—											
5. Independent	.21	.27	.92	.34	—										
Time Span 2															
6. Nonindependent	**.25**	.16	.33	.03	.36	—									
7. Physical	.18	**.28**	.10	.04	.19	.21	—								
8. Family	.15	.13	**.62**	.15	.63	.35	.11	—							
9. Community	.20	.21	.19	**.20**	.21	.31	.15	.22	—						
10. Independent	.17	.14	.63	.16	**.63**	.43	.17	.91	.39	—					
Time Span 3															
11. Nonindependent	**.05**	.07	.28	.00	.30	**.59**	.25	.31	.19	.34	—				
12. Physical	.02	**.18**	.00	.04	.07	.10	**.26**	–.02	.06	.02	.08	—			
13. Family	.10	.07	**.39**	.15	.41	.11	.00	**.50**	.03	.43	.23	–.01	—		
14. Community	.00	.10	.16	**.22**	.20	.26	.10	.22	**.25**	.23	.34	.16	.14	—	
15. Independent	.07	.12	.41	.17	**.42**	.16	.04	.51	.10	**.45**	.30	.14	.88	.43	—

Note: Stability correlations are in boldface. For $r \geq .14$, $p < .05$; for $r \geq .19$, $p < .01$; for $r \geq .25$, $p < .001$.

munity adversity) raise the question of whether the Independent scale has any reliable variance outside of its association with Family adversity. The correlations between the two scales, which were rated by the same raters, approaches the reliability of each scale ($r_{11} = .92$, $r_{22} = .91$, $r_{33} = .88$). However, for individuals who experienced significant Physical or Community adversity, the Independent scale yielded ratings that were substantially higher than for the Family scale (see Table 6). When both Physical and Community adversity were Minimal (ratings of 1 on the 7-point scale), ratings of Family and Independent adversity were virtually identical (within .05 scale points), and the two scales were almost perfectly correlated, $r = .96$. In contrast, when either Physical or Community adversity was Severe (ratings of 5 or higher), ratings of Independent adversity were significantly and substantially higher than ratings of Family adversity (by .45 to 1.62 scales points), and the correlations between the two scales fell below the reliability level of the scales. This suggests that for subjects experiencing substantial Physical or Community adversity, the Independent scale captured important information not present in the Family scale.

Discussion

Results suggest that adversity originating in the family predominated in childhood and remained salient through late adolescence, but that adversity related to adolescents' own behavior and psychological functioning rose to equal prominence by late adolescence. In this urban community sample, serious physical ailments were increasingly rare across development but contributed substantially to overall levels of adversity for some individuals. Serious adversity arising from the community was similarly uncommon, but increased across development and was substantial for some subjects. These trends are consistent with the view that the family environment remains highly salient throughout a process of emerging autonomy and community engagement in adolescence. The coherence of these findings, and their overall consistency with

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Table 6. *Family and independent adversity for individuals with minimal versus severe physical or community adversity*

	Level of Physical/Community Adversity				
	Minimal (Both Ratings = 1)		Severe (Either Rating ≥ 5)		
	Pearson *r*	*M*	Pearson *r*	*M*	
Time Span 1	.97 ($n = 71$)		.94 ($n = 16$)		
Family		4.56		4.47	$t(15) = 6.45$, $p < .001$
Independent		4.56		6.09	
Time Span 2	.96 ($n = 54$)		.74 ($n = 20$)		
Family		4.95		5.88	$t(19) = 3.11$, $p < .01$
Independent		4.92		6.33	
Time Span 3	.97 ($n = 90$)		.46 ($n = 13$)		
Family		4.06		5.65	$t(12) = 2.54$, $p < .05$
Independent		4.01		6.46	

hypotheses derived from developmental theory, support the validity of the present Life Chart and rating scale strategy for assessing adversity.

As expected, there was considerable individual difference stability in levels of Family adversity. Continuity in parental adjustment problems seems a likely source of this stability. Family adversity was moderately correlated with interviewers' ratings of parental competence, and Table A3 exemplifies how parental struggles in a variety of domains of functioning can be experienced as adversity by the child (e.g., persistent psychopathology; instability in patterns of work, romantic relationships, or residence). It seems unlikely that serious problems in parental functioning during childhood would suddenly be resolved as the child enters adolescence. There is evidence that it is this parent-related type of adversity that is most strongly associated with children's adjustment (Gest, Neemann, Hubbard, Masten, & Tellegen, 1993; Jensen, Richters, Ussery, & Bloedau, 1991).

The increasing levels and stability of Nonindependent adversity in adolescence is consistent with the view that as adolescents become more autonomous in the community, individual differences in adjustment problems may become manifest in a pattern of self-generated stressors. The increase in Nonindependent adversity and its increasing individual difference stability may reflect a developmental niche-building phenomenon (Scarr & McCartney, 1983). The prototypical high Nonindependent adversity chart in Table A.1 appears to reflect an emerging tendency toward stressful experiences across many emerging developmental arenas (e.g., getting a job leads to being fired; obtaining a driver's license leads to car accidents). Some of the Nonindependent stressors emerging in late adolescence are similar in content to the events and conditions generated by parents in the form of Family adversity (e.g., treatment for substance abuse, work instability).

Perhaps it is not surprising, then, that the severity of Family adversity experienced in childhood is correlated with the severity of Nonindependent adversity experienced in adolescence. The prototypical charts suggest this association could reflect the intergenerational transmission of adjustment problems in multiple domains. Multiple processes of influence could be at work, including direct parental modeling of behaviors and/or values (e.g., substance abuse or violent relationships), disrupted parental monitoring due to parental difficulties in other domains, indirect effects of growing up in a low-SES environment, or genetic similarities between parents and children which are probabilistically associated with high-adversity life courses. The present study cannot address what combination of these processes may be occurring, but it does suggest that children who grow up in homes with

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high levels of adversity are more likely to experience adversity in adolescence that may be associated with their own behavior or functioning.

More generally, information on adversity captures an important facet of a child's social ecology that is at least partially independent of other aspects of the social context, such as parenting and socioeconomic status. For example, Masten et al. (1999) found that Independent adversity and parenting quality made additive contributions to the prediction of childhood conduct problems. Moreover, among children with low levels of parenting quality and few socioeconomic resources, lifetime adversity exposure was negatively associated with adolescent competence (Masten et al., 1999). These findings suggest that in addition to providing descriptive detail on the context of individual development, measures of adversity exposure may contribute to the prediction of adaptation independent of other measures of social context.

Clinical researchers have long asserted the importance of adversity for purposes of diagnostic assessment and prognosis (Brown & Harris, 1978), so the lack of systematic attention to strategies for measuring adversity in clinical settings is somewhat surprising. Axis IV was introduced into the DSM system to encourage more systematic attention to adversity, but the scale's reliability was largely undocumented and it was perceived as difficult to use by clinicians (Skodol, 1991; Skodol & Shrout, 1990), so it was reduced to a listing of psychosocial stressors in DSM-IV (APA, 1994). The present study suggests that semi-narrative summaries of life experiences spanning multiple years can be rated reliably. This is important because the Life Charts are not unlike the narrative "psychosocial history" available in many clinical settings.

Two critical research questions remain before a system for quantifying adversity on Axis IV could be advocated in clinical settings. First, there is the fundamental question of whether adversity has any validity for predicting the onset, course, or response to treatment of disorder. If so, a second question is whether ratings are superior to other strategies for scoring adversity in clinical settings. The present ratings captured reliable and meaningful variance not contained in a simple index of event-density, but it is unclear whether these unique aspects of ratings would be clinically meaningful or achievable in everyday clinical settings. Potential advantages of ratings could be lost in the process of modifying rating instructions to be practical in applied settings. These empirically testable issues of the tradeoffs between clinical reliability and validity in everyday clinical settings are a moot point, however, until clinical validity has been established in research settings.

The aggregation of information across measures and sources into a single Life Chart for each subject was based on the previous finding from this study that individuals tend to under-report rather than over-report events (Linder, 1985), the trade-offs of different measurement procedures, and the expectation that adolescents and their parents each have valid and sometimes unique knowledge of events. Linder's finding that parents often omitted important events from checklists they completed suggested it was worth asking the same informant to describe adversity on multiple occasions. Experience also suggested that checklist measures provided good coverage of common events but omitted rare or idiosyncratic events; whereas interviews provided less comprehensive coverage but captured idiosyncratic events and important contextual information (Brown & Harris, 1978). Finally, although we had no way to verify the accuracy of either mother or adolescent reports, we expected mothers provided unique information on early childhood adversity, whereas adolescents (particularly those living away from home) provided unique information on adversity during adolescence. For the purposes of arriving at a comprehensive record of adversity exposure, this aggregation of information across measures and sources provided some insurance against the likely omissions of any one procedure.

The particular procedures used to integrate diverse information from the research case records were not anticipated at the outset of the study. This suggests there may be similar potential in other research settings with case data on life experiences. In this regard, the

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rating scales and guidelines in the Appendix are sufficiently general to be used at a variety of age levels and in a variety of research designs. The rating scales themselves are independent of the underlying source of information, which could be a single procedure such as a Life History Calendar interview (Freedman, Thornton, Camburn, Alwin, & Young–DeMarco, 1988), an existing longitudinal data set with multiple relevant measures, or clinical records compiled over months or years. Keys to the Life Chart compilation process were standardized written instructions, use of all available case materials to resolve ambiguities, and independent verification of all final Life Charts. Raters were required to reach a criterion level of reliability during training and all final adversity ratings reflected the averaged or consensus judgments of two individuals. These procedures were time consuming but not out of proportion to the effort that went into the original data collection.

The ceiling effects obtained on some rating scales suggests that when the time span under consideration is greater than 1 year, or when the sample is drawn from a clinical population, the present 7-point rating scales may be inadequate. In this community sample, 10–14% of all individuals were assigned the highest possible score for the Family and Independent scales in childhood and midadolescence (Hubbard & Masten, 1997). These time spans were quite long (7 to 10 years) in comparison to the 1-year time span for which the DSM descriptors were originally intended. One would expect that even greater ceiling effects would have existed in a high-risk or clinical sample. The options in such cases would be to adopt more stringent criteria for the highest scale points, or to extend the number of high-adversity scale points (e.g., creating a 9-point scale).

This study has a number of limitations. First, some important proximal and distal stressors such as chronic role strains, daily hassles, anticipated events that did not occur, racial discrimination, and developmental stressors (e.g., puberty) were excluded. Second, the aggregation of information across sources before ratings were made precludes an analysis of how ratings would differ if they were based on only parent report or only adolescent report. Third, the existence of 23 sibling pairs in the sample creates nonindependence of measurement for these pairs. When the present analyses were repeated after randomly excluding one sibling from each pair, however, all results were essentially identical, suggesting the technical nonindependence created by the sibling pairs did not affect our substantive results or conclusions.

A fourth limitation is that, except for the several LEQs (which concerned events in the previous 12 months), reports of adversity were retrospective across multiple years. Several procedures mitigated the disadvantages of retrospective reporting in the present study. First, structured interview techniques with visual cues were used to facilitate recall (e.g., the Lifetime LEQ and Mother Interview procedure). Freedman et al. (1988), using a Life History Calendar approach, found that such structured interviews led to more acceptable agreement between contemporaneous and retrospective accounts. Second, reliance on single retrospective accounts was minimized by considering all available sources of information in the Life Chart compilation process, resulting in convergent evidence on the occurrence and timing of many events. Third, the present retrospective reports concerned highly salient events (e.g., divorces, deaths, residence changes), which generally yield better agreement with contemporaneous accounts than reports of psychological states or family processes (Henry, Moffitt, Caspi, Langley, & Silva, 1994).

The study of cumulative adversity exposure is essential to understanding the sequelae of specific challenging experiences (Garmezy & Masten, 1994). Without knowing the context of cumulative adversity, effects may be attributed to individual stressors when in fact they may result from the multiple, correlated adversities existing within a target population (e.g., elevated rates of unemployment, marital conflict, and divorce may exist in families with a mentally ill parent). In this regard, studies of specific stressors in the context of cumulative adversity exposure could be particularly informative. The present findings suggest there may be existing data sets, per-

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haps focused on particular stressors, which could yield reliable and valid indices of cumulative adversity exposure. Such efforts advance understanding of the role of adversity, both cumulative and specific, in the development of competence and psychopathology.

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Appendix: General Guidelines for Adversity Ratings

Severity of individual events

Raters should begin by scanning all of the events entered for the time span being rated. Although no formal rating of individual events will be made, it is necessary to note the severity of individual events in order to make the overall rating of adversity. To aid in this process, four general issues in evaluating event severity are discussed below. In addition, examples of events which vary in severity are provided for each rating scale (see Table A.1).

Developmental level. Events may differ in "stressfulness" at different developmental stages. For example, abandonment by a parent before specific attachment formation may be less stressful than following relationship establishment; loss of friendship in preschool years may be less stressful than loss during adolescence.

Duration of the effect. Life events with enduring or permanent effects are likely to be more stressful than events with more transitory effects. For exam-

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Table A.1. *Severity of individual events: Generic examples*

Severity	Family	Community	Nonindependent
Minimal	• Mild illness in parent • Sibling arrested or jailed overnight	• Friend moved	• Did worse than expected on exam
Very low or low	• Pet died • Parent travels on job	• School entry • Normative school changes	• Suspended from school • Ran away from home overnight • Arrested or jailed overnight
Moderate	• Uncomplicated birth of sibling • Family moves • Short-term marital separation • Parent remarries • Short-term health problems of parent	• Laid off from work • Death of friend • Victim of mugging	• Failed a grade • Unemployment • Birth of child • Marital separation
Severe or extreme	• Parents divorce • Severe family conflict including violence • Parent goes to jail • Death or suicide of family member • Serious or chronic health problems of family member • House burned down	• Victim of rape or sexual abuse outside the family	• Disfiguring condition following accident nonindependent of behavior • Lengthy incarceration
Catastrophic	• Abandoned by caregiver • Death of both parents • Chronic physical or sexual abuse by family member	• Parent murdered by a stranger • Kidnapped by a stranger • Natural disaster destroys community	• Paralyzed after drunk driving accident

ple, the death of a parent happens only once, yet its effects are long lasting.

Severity of stressor. Some stressors are more inherently stressful than others and are likely to be more challenging to adaptation. For example, traumatic life experiences, such as sexual abuse warrant a higher ratings than stressors of lower magnitude, such as minor illness or normative school changes.

Gender. Gender is not shown on life charts because raters should not take it into account to rate the severity of events and time periods. If gender is made clear on life charts by description of certain events, raters should try to maintain a gender-free judgment.

Rating scales and examples of stressors

Table A.1 contains *generic examples* of the level of severity for three of the five rating scales. Your judgment of the severity of an event may differ from the examples below, based on the specific description of the event and your use of the general considerations discussed above. Keep in mind that a single event of a particular severity level is seldom sufficient to justify the same severity level for the rating of adversity for the entire time period. For instance, if a single acute stressor of moderate severity is the only stressor found in the whole time period, the level of severity for the period is low (see Table A.2).

The *Physical* scale measures the level of the child's exposure to illnesses and conditions whose etiology and course is unaffected by the child's behavior and psychological functioning. The *Family* scale measures the level of the child's family-based stress exposure (i.e., stressors which originate within the family of origin). These may be related to the family's behavior, functioning or vulnerabilities. "Family" includes immediate and extended family, pets, and family property. The *Community*

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Table A.2. *Overall severity of adversity in a time span: General guidelines*

1	Minimal	• No stressors or very few stressors that require minimal adjustment
2	Very low	• Single acute stressor of "moderate" severity
	or	• Accumulation of acute stressors of "low" severity
3	low	• Chronic stressor of "low" severity
4	Moderate	• Single acute stressor of "severe" severity
		• Accumulation of acute stressors of "low" to "moderate" severity
		• Chronic stressor of "moderate" severity
		• Accumulation of chronic stressors of "very low" to "low" severity
		• Combination of both acute and chronic stressors of "low" severity
5	Severe	• Single acute stressor of "extreme" severity
	or	• Accumulation of acute stressors of "moderate" or "severe" severity
6	extreme	• Chronic stressor of "severe" severity
		• Accumulation of chronic stressors of "moderate" severity
		• Combination of both acute and chronic stressors of "moderate" severity
7	Catastrophic	• Single event with profound lasting consequences
		• Accumulation of acute stressors of "extreme" severity
		• Chronic stressor of "extreme" severity
		• Accumulation of chronic stressors of "severe" severity
		• Combination of both acute and chronic stressors of "severe" severity

scale measures the level of the child's direct exposure to stressors independent of the behavior, functioning, and vulnerabilities of the child and the child's family of origin. The *Independent* scale (combined Physical, Family, and Community scale) measures the child's direct exposure to stressors independent of the child's behavior and functioning. Do not simply average the Physical, Family, and Community ratings. Consider physical, family and community events as a whole to make a new rating. The *Nonindependent* scale measures the level of the child's exposure to stress related to the child's own behavior and psychological functioning.

Overall severity of adversity in a time span

Ratings will be made on a 7-point scale, ranging from 1 (*Minimal*) to 7 (*Catastrophic*). Use the guidelines in Table A.2 to anchor your ratings *for the whole time period* for each of the stressor rating scales. Raters should consider all of the events in a time span to make an overall rating of adversity. To aid in this process, four general issues in rating adversity across the time span are discussed below. In addition, general guidelines for anchoring scale points are provided.

Length of time period rated. Judgments of overall level of stress exposure for similar configurations of stressors are likely to vary based on the length of time period rated. For example, separation and divorce of parents, with one parent remarrying within a 3-year time period, would warrant a higher rating than the same stressors occurring over a 7-year period.

Number and density of stressors. When events accumulate within a given time period, a higher stress rating is warranted than when there are fewer events of similar stress level in the same time period.

Chronicity of stressors. Ongoing life events are likely to be more stressful than acute events. For example, chronic parental conflict would warrant a higher rating than an acute conflict (e.g., a short-term argument lasting hours or days rather than months or years).

Life context. The presence of certain combinations of stressors, or combinations of stressors and particular life circumstances, may lead to a higher rating of overall severity.

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