To the Graduate Council:

I am submitting herewith a dissertation written by Jean M. Gerard entitled "Cumulative Risk and Youth Problem Behaviors: The Role of IQ, Cognitive Problem-Solving Ability, and Self-Esteem." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Human Ecology.

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We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor and
Dean of the Graduate School

CUMULATIVE RISK AND YOUTH PROBLEM BEHAVIORS: THE ROLE OF IQ, COGNITIVE PROBLEM-SOLVING ABILITY, AND SELF-ESTEEM

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Jean M. Gerard

August 2000

DEDICATION

To my parents for modeling a work ethic marked by patience, persistence, and pride in one's accomplishments--qualities that sustained me through this project.

To my son, Matthew, for inspiring my thinking.

And to my partner and dear friend, Fred, for his faith and steadfast companionship during this educational journey.

ACKNOWLEDGEMENTS

I would like to acknowledge several people who facilitated the completion of this project. My sincerest appreciation goes to Dr. Cheryl Buehler, my committee chairperson, for her mentorship and counsel during the past six years. Working with Cheryl has been an enriching experience. Her enthusiasm for research and methodological rigor has given me a fuller appreciation of the research process. I am grateful to her for recognizing my potential and offering me opportunities to develop as a scholar.

An individual note of appreciation also is extended to each of my committee members. I thank Dr. Greer Litton Fox for introducing me to secondary data analysis techniques. Her course offering on this topic equipped me with an additional tool to take into future research projects. I thank Dr. John Orme for sharing his expertise in multiple regression analysis. His special talent for keeping statistical discussions within the reach of students and communicating information that is both interesting and useful deserves recognition. I am grateful also to Dr. Vey Nordquist for his clinical insight and keeping me grounded in the social significance or "real-life" implications of my research findings.

As a final acknowledgement, I extend appreciation to my colleagues, Ambika Krishnakumar and Gaye Stone, for their ongoing friendship, availability, and willingness to be the sounding board for my ideas. I am greatly indebted to them for their support and encouragement throughout my graduate training.

ABSTRACT

This study examined the relationships among cumulative environmental risk exposure, youth personal attributes (IQ, cognitive problem-solving ability, and self-esteem), and indicators of youth maladjustment in a nationally representative sample of adolescent youth. Cross-sectional analyses revealed a significant positive, linear association between cumulative risk and both externalizing and internalizing problem behavior. The concurrent association between cumulative risk and internalizing problem behavior was significantly stronger for female and Caucasian youth. A protective effect of self-esteem on both externalizing and internalizing problem behaviors was demonstrated as well as a weak protective effect of cognitive problem-solving ability on externalizing problem behaviors. Longitudinal findings indicated that cumulative risk was a significant predictor of change over time in internalizing problem behavior. Cognitive problem-solving ability and self-esteem demonstrated compensatory roles in the risk-maladjustment relationship, suggesting that the protective quality of these assets is immediate rather than long-term.

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

Youth's psychosocial development is multiply influenced and shaped by a host of familial and environmental factors. Deficits and inadequate support in the varied socialization contexts of youth place them at risk for a wide array of adjustment problems. Youth maladjustment, a multidimensional construct, is conceptualized as the relative inability of youth to engage successfully and appropriately in interpersonal relationships and in the realms of work, play, and academic activities over time with relative freedom from aversive behaviors and burdensome emotion (Trotter, 1989). Conceptually, this definition focuses on the incongruity between youth's behavioral and emotional responses and demands across time, people, and multiple settings (Lorian, Cowen, & Caldwell, 1975).

Two broad indicators of youth maladjustment are externalizing and internalizing problem behaviors. The former refers to outer-directed behavior (e.g., aggression, stealing, lying) that functions maladaptively in society by producing distress or harm to others, whereas the latter refers to inner-directed behavior (e.g., excessive fear, anxiety, depression) that functions maladaptively by producing distress or harm to self (Reynolds, 1992). Externalizing and internalizing problem behaviors warrant attention as indicators of youths' psychosocial wellbeing. These forms of maladjustment constitute primary reasons for referring youth to mental health services (Borduin, Henggeler, & Manly, 1995; Kazdin, 1995; Reynolds, 1992). Moreover, evidence of problem behaviors during early and middle adolescence may hold implications for

adjustment in adulthood. Longitudinal investigations have demonstrated a link between early problem behaviors and impaired adult functioning, including poor mental health outcomes, substance abuse, and problematic social relationships (Farrington, 1991; Kovacs et al., 1984; Maughan & Rutter, 1998; Pine, Cohen, Gurley, Brook, & Ma, 1998; Robins & McEvoy, 1990).

Social scientists have shown a longstanding interest in the etiological factors that give rise to youth problem behaviors. Research efforts have culminated in a vast body of findings underscoring particular life events and circumstances that predispose youth to adjustment problems. Much of this research has focused on single risk factors, such as poverty or parental divorce. However, a number of researchers have broadened their outlook by exploring how multiple risk factors affect youth (Deater-Deckard, Dodge, Bates, & Pettit, 1998; Rutter, 1979; Sameroff, Bartko, Baldwin, Baldwin, & Siefer, 1998; Williams, Anderson, McGee, & Silva, 1990). This research indicates that exposure to multiple risk factors poses a greater threat to youths' long-term psychological well-being than does any single risk factor.

Managing chronic strain poses a unique challenge to adolescents. Taking a developmental perspective to stress and coping, Aneshensel and Gore (1991) contend that coping with high levels of stress can be a difficult task for youth because they are less skilled than adults in handling the day-to-day struggles of life. Given a limited repertoire of available coping mechanisms and relatively immature cognitive abilities to manage the meaning of stress, youth may not fare

well in the face of persistent adversity. Consequently, adolescents might cope through aggressive behavior or by internalizing their distress (Honig, 1986).

At the same time, it also is recognized that children show considerable variation in their response to any given risk factor(s) (Garmezy, 1983, 1988; Rutter, 1988). Whereas some children display poor outcomes in the face of adversity, others seem to escape this risk with little evidence of psychological harm. In the past, researchers have focused primarily on those children who display poor functioning in the context of risk. However, researchers are increasingly reluctant to dismiss variation in their samples, aware of the fact that doing so overlooks a potential opportunity to garner meaningful clues about individual attributes that mitigate environmental risk. Such information is regarded necessary to enhance theory in the area of children's stress-resistance and to aid the development of appropriate intervention strategies for populations of high-risk youth.

Taken as a whole, these observations have promoted an interest among risk researchers in protective factors--variables that serve an ameliorative function in the context of risk by either promoting positive youth outcomes or reducing the probability of negative outcomes (Masten & Garmezy, 1985). Numerous protective factors have been identified in the literature. Generally speaking, these can be classified into three broad types: (1) personal attributes of the child; (2) a supportive family environment; and (3) the availability and use of external support systems (Garmezy, 1983).

At the present time, research efforts have focused primarily on documenting *which* protective factors promote resistance to environmental stress to the exclusion of *how* these factors operate to reduce vulnerability to stress (Jackson & Frick, 1998). Despite the availability of various stress-resistance models (Garmezy, Masten, & Tellegen, 1984; Masten et al., 1988), few researchers have made predictions from these models. This constitutes an important deficit in the literature. Rutter (1987) has argued that it is more meaningful to understand the means by which protection occurs rather than to merely identify factors that are associated with better youth outcomes.

In the present study, a model of risk is proposed that addresses this issue by examining the associations among multiple risk exposure, youth protective factors, and youth problem behaviors. Drawing from extant stress-resistance models, a central goal of this study is to glean insight into the specific ways that attributes and internal resources of the child figure into the relationship between environmental risk and youth problem behaviors. The purpose of this study is to determine whether the roles of intellectual ability, cognitive problem-solving skills, and self-esteem in the risk-adjustment relationship are compensational or protective in nature (Garmezy et al., 1984; Scaramella, Conger, & Simons, 1999). The distinction between these stress-resistance mechanisms will be discussed later in this review.

The focus on youth protective factors implies a transactional approach to the relationship between environmental risk and youth problem behaviors. According to this model of development, behavioral and emotional tendencies

arise from the interaction between characteristics of the child and his or her environment (Bronfenbrenner & Crouter, 1983; Sameroff, 1983). Thus, assessing youth problem behaviors with a singular focus on the environment neglects active contributions by the child to regulate, adapt, or modify his or her experience. Likewise, a mere focus on the child neglects characteristics of the environment that determine the quality of experiences available to him or her. In this investigation, the roles of youth intelligence, problem-solving skills, and self-esteem are examined in the context of cumulative environmental risk exposure. These specific attributes are chosen because of their prominence in the literature as personal characteristics that promote positive outcomes (Compas, 1987; Hauser, 1999; Jessor, 1993; Masten et al., 1988; Rutter, 1990).

Consideration also is given to various youth social contexts through the assessment of environmental risk at multiple levels of social organization. Bronfenbrenner's (1977) ecological framework views the individual as developing within a nested system of interrelated social contexts. At the simplest level are microsystem influences or influential factors stemming from one's immediate setting (e.g., family, school , and work). These interrelated systems, taken as an entirety, comprise the second level of organization--the mesosystem. Family, peer group, and school typically represent the adolescent's mesosystem. Development can be seen as a product of the interrelations among one's activities and roles in these settings. At the next level of organization is the exosystem. Essentially an extension of the mesosystem, the exosystem includes higher-order social structures such as neighborhood and formal/informal social

networks. These contexts might affect individual development at any level of the system as either a direct influence, an indirect influence, or as a moderating condition (Gephart, 1997).

An individual's location within these various systems shapes his or her development. Low family and community resources, stressed family relationships, and poor standing with one's peers represent contextual risk factors that impinge upon the child (Brooks-Gunn, Duncan, & Aber, 1997; Parker & Asher, 1987). Yet at the same time, this framework recognizes that individuals "act and react in relation to the opportunities and restrictions offered by the environment" (Magnusson, 1995, p. 36). Hence, varied developmental outcomes are expected among children given constitutional differences and differential abilities to cope with circumstantial realities.

Developmental pathways also are likely to differ as a function of youth background characteristics including gender, age or grade level, and racial status. Researchers have shown that risk and protective agents often exert their influence selectively, leaving particular demographic groups of children more susceptible to negative outcomes (Baldwin et al., 1993; Deater-Deckard et al., 1998; Kliewer & Sandler, 1992; Masten et al., 1988). Given this information, the model of risk and protection proposed in this study takes into account possible moderating effects of youth gender, grade level, and ethnicity.

Before outlining the details of this analytic model, it is important to review the various ways that multiple risk and protective factors are operationalized in the literature. This review is divided into four sections. In the first section, several

models for assessing multiple risk are presented. Herein, a case will be made for measuring risk exposure with a cumulative risk index. In the second section, the risk literature is reviewed to identify major sources of risk to youth. This establishes the foundation for creating a cumulative index. In the third section, a brief review of the cumulative risk literature is undertaken to identify its major contributions to the broader field of risk research and to highlight areas that need further development. It is noted that although cumulative risk is a parsimonious way to examine the effects of multiple risk exposure on youth, research using this model typically has lacked specification. In the fourth section, the concept of protective factors is elaborated with specific attention devoted to extant models of stress-resistance. In the final section, these models will be used to describe the empirical relationships among children's intellectual ability, problem-solving skills, and self-esteem as they figure into the risk-adjustment relationship. Based on this review of the literature, hypotheses will be drawn as a means to test predictions about their respective roles in this relationship.

Measuring Multiple Risk

For purposes of this discussion, multiple risk is defined as a set of conditions or variables that compromise well-being or social performance (Voydanoff & Donnelly, 1998). Such conditions include aspects of the child's immediate or distant environment that are associated with negative child outcomes. Researchers have devised several means for assessing multiple risk. Conceptually, each of these approaches recognizes that the interplay among risk factors is a crucial element in comprehending youth vulnerability to

environmental stress. However, the methods underlying their construction vary. In this section, predominant measurement models of risk are reviewed and cast in terms of their relative strengths and weaknesses for assessing risk conditions. As a caveat, this review is not exhaustive--variants of the presented models appear in the literature. For a more detailed review of this literature, the reader is directed to Luther and Zigler (1991) and Masten and Garmezy (1985).

Life events method. Based on the assumption that a high level of recent stressful experiences is unfavorable to children's well-being, risk often is conceptualized in terms of the amount or number of stressful events recently encountered by youth (Johnson, 1982). A stressful event, in this instance, is any environmental stimulus that produces ongoing tension and has the potential to interfere with normal coping processes (Jackson & Frick, 1998; Masten & Garmezy, 1985). Conceived in this manner, risk frequently is assessed using a life event checklist, an approach that involves summing the number of self-reported stressful life experiences recently encountered to obtain an overall index of total life stress (e.g., Compas, Howell, Phares, Williams, & Giunta, 1989; Cohen, Burt, & Bjorck, 1987; DuBois, Felner, Brand, Adan, & Evans, 1992; Ge, Lorenz, Conger, Elder, & Simons, 1994). Due to criticisms aimed at the use of predetermined values to weight the stressfulness of each inventory item, some of the more recently developed inventories ask children to not only provide a tally of the stressors they have experienced but also to rate whether the event was desirable or undesirable and the extent to which it has impacted their lives (e.g., Sandberg et al., 1993). Additionally, some researchers utilizing these measures

make distinctions between "controllable" events (e.g., being suspended from school) and "uncontrollable" events (e.g., parental divorce) as a means to assess whether they differentially predict outcomes.

Citing advantages of life event inventories in a review of the stress-resistance literature, Luthar and Zigler (1991) note their relative ease with respect to administration, consistency in predicting youth adjustment, and convenience with respect to drawing comparisons between high and low risk youth. With respect to the latter advantage, comparisons between high and low stress groups are drawn easily without requiring the added burden of locating specific high-risk and control samples.

Offsetting these advantages are several limitations. The most serious of these is a problem with confounded measurement (Johnson & Bradlyn, 1988; Luthar & Zigler, 1991; Sandberg et al., 1993). Although life events measures generally correlate significantly with indices of adjustment, many of the items comprising these inventories overlap with symptoms of maladjustment. Items assessing controllable events are more likely suspects of this problem. For example, the Life Events Checklist (Johnson & McCutcheon, 1980) includes "getting into trouble with police" and being suspended from school" as two potentially stressful events for children. However, if one's outcome measure is externalizing problem behavior or conduct problems, the inclusion of these items might result in spuriously high correlations. Consequently, inference of causality is blurred as one can not be sure whether stress precedes adjustment or, conversely, adjustment precedes stress.

A second limitation of life inventory checklists is their limited predictive ability. As a solitary means for examining the relationship between risk and youth problem behaviors, life event inventories are of limited value because they typically account for only modest amounts of variance in indices of youth maladjustment (about 9-16%). Important sources of variation these inventories fail to account for are those contributed by sociodemographic variables and attributes of the child (e.g., IQ). Studies that examine life events in conjunction with these other variables have considerably more predictive power (Luthar, 1991; Masten et al., 1988). For instance, Garmezy et al., (1984) accounted for 41% of variance in children's classroom engagement and 21% of variance in disruptive behaviors using a measure of socioeconomic status (SES) and child IQ in addition to a life events inventory.

Additionally, it appears that life event measures are better predictors of concurrent adjustment rather than later adjustment. Within the adolescent population, these measures often produce nonsignificant longitudinal and prospective effects for indices of behavioral and emotional adjustment (see as examples Cohen et al., 1987; Dubow, Tisak, Causey, Hryshko, & Reid, 1991; Swearingen & Cohen, 1985). Cohen et al. (1987) have even demonstrated that the causal relationship between negative life events and adolescent adjustment flows from the latter to the former. In this investigation, Time 1 adolescent psychological distress (anxiety and self-esteem) predicted change scores in negative life stress from Time 1 to Time 2. Study findings, therefore, indicate that

early adolescent adjustment might play a causal role in determining the negative life stresses one experiences.

A final limitation of life inventory checklists has less to do with how they are constructed but rather how they are typically used in research. In many studies, the relationship between stressful life events and youth problem behaviors is assumed to be linear (e.g., Cohen et al. 1987; Compas et al., 1989; DuBois et al., 1992). However, this ignores the possibility of a curvilinear relationship that could manifest itself as either an acceleration of youth problem behaviors at a given number of stressful events or, feasibly, a threshold pattern that may indicate a leveling off of adjustment problems at increasingly higher rates of stress (i.e., a saturation model). Although this limitation is easily remedied by including a curvilinear term in one's analytic model, few researchers report testing this possibility (see as an exception, Garmezy et al., 1984; Jackson & Frick, 1998; Masten et al., 1988).

Multiple measures of risk. Another commonly used approach is to examine the relationship between a given youth outcome and a set of individually measured risk factors. Generally speaking, the goal of this type of research is to determine the unique contribution of individual risk factors after statistically controlling for the interrelations among all other risk variables. To achieve this end, a procedure called hierarchical regression modeling often is used. This analytic strategy helps identify variance contributed by individual risk factors or groups of risk factors entered in sets. The order in which variables are entered is dictated by several considerations including theory and one's conceptualization

of risk processes (see Pedhazur, 1997). Variables that remain significant after subsequent blocks of variables are entered can be interpreted as contributing unique variance to one's outcome variable of interest. When several risk factors predict maladjustment, they can be interpreted as having *independent and additive* (cumulative) influences on youth maladjustment (Gerard & Buehler, 1999a).

As an illustration, Baldwin et al. (1993) employed this strategy to examine the relationship between youth global mental health (a composite measure of anxiety disorder, behavior disorder, mood disorder and depression) and several environmental risk factors. Risk variables were conceptualized according to their psychological proximity to the child. Parenting variables (e.g., parental warmth and control) constituted the most proximal of these. Family variables (e.g., parental mental health and intelligence, crowding in the household, child's stressful life events) represented an intermediate level. Socioenvironmental variables constituted the most distal level (e.g., neighborhood desirability, parents' education and occupation). In a regression analysis, these sets of variables were entered hierarchically, with proximal variables entered first and distal variables entered last. This approach allowed the researchers to determine the amount of variance accounted for by each set of risk factors. Parenting variables accounted for 20% of variance in global mental health outcomes, family variables accounted for 15%, and distal variables accounted for an additional 9%. Child's stressful life events, parents' occupation, parental education, and minority status were among the significant predictors in the model.

In contrast to the life event method, a clear advantage of this approach is that individual risk factors retain their identity and scale properties. Thus, the nature of the relationship between each risk factor and youth adjustment can be determined. This strategy also lends itself to the exploration of interactive (i.e., conditional) relationships between risk factors and protective factors (or between risk factors themselves). However, testing interactions can get unwieldy when a large number of variables is being considered. As Masten and Garmezy (1985) aptly state, "there is danger of being overwhelmed by all of the many possible relationships...sorting out the role of single risk factors becomes enormously difficult; most risk factors turn out to be quite heterogeneous and intricately related to a myriad of other factors." (p. 37). Thus using this approach, one might easily lose sight of theory as well as statistical power to find true relationships among risk and protective variables.

Cumulative risk models. An alternative approach for assessing multiple risk is represented by those studies that examine the relationship between cumulative risk and child problem behaviors (e.g., Liaw & Brooks-Gunn, 1994; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Sameroff, Seifer, Seifer, Baldwin, & Baldwin, 1993). Posited by Rutter (1979) and Sameroff and colleagues (Sameroff, Seifer, Zax, & Barocas, 1987), this approach assumes that the critical element in youths' adjustment is not any particular array of risk factors, but rather the number of environmental risk factors they are exposed to at a given point in their development. Theoretically, youth who experience more risk factors will have higher levels of problem behaviors, regardless of any one

particular risk factor or cluster of risk factors. Conceptualizing risk in this manner supports tenets of stress-coping literature. According to existing formulations of the stress process, chronic strains have the potential to generate new forms of strains or exacerbate existing ones. These strains potentially lead to the depletion of positive psychological resources, or alternatively, an overreliance on previously established negative coping strategies (Boss, 1988; Pearlin, Lieberman, Menaghan, & Mullan, 1981).

Essentially a blend of the former two approaches, this strategy involves identifying a set of individually measured risk factors that bear a significant relationship to one's outcome variable of interest and summing the number of present risk factors across individual children. Like the life events approach, multiple risk factors are compiled into a simple summative index. From a psychometric standpoint, however, cumulative risk indices have not fallen under attack for problems of confounded measurement. Like the multiple measures approach, one has more control over selection of risk factors; yet, parsimony is gained through the collapsing of risk factors into one index (Sameroff et al., 1993). According to their proponents, cumulative risk indices have practical value because the presence of more risk is related to a higher certainty of negative outcome and risk factors generally occur in conjunction with each other (Siefer, Sameroff, Baldwin, & Baldwin, 1992).

In a fairly recent assessment of their viability, Luthar (1993) concludes that cumulative risk indices have a sound place in the study of risk negotiation. Citing arguments in their favor, she mentions their high face validity, consistency in

predicting adjustment, and potential for considering risk at multiple levels of organization (i.e., individual, family, neighborhood, etc.). Noting potential areas for criticism, she raises the possibility that some of the risk factors comprising these summative inventories may overlap (e.g., poverty and minority status) and/or may carry different weight with respect to their degree of seriousness. Yet countering this argument, Luthar asserts that (a) it is common practice in the social science to form scales by adding multiple items; b) these items generally have high shared variance (rightfully so as a matter of internal consistency; and c) items often vary markedly in how strongly they are related to a particular outcome.

Related to this issue is the possibility that cumulative risk indices are merely a proxy for social class--in effect, high risk equals low social standing. To address this issue, Sameroff et al. (1998) examined the relationship between cumulative risk and general youth adjustment across groupings of low, medium, and high SES youth. This analysis revealed that the influence of cumulative risk exposure was virtually the same for each SES grouping--incremental rises in risk exposure were accompanied by corresponding increases in negative outcomes. It is worth noting, however, although the constellation of risk factors in children's lives was a better predictor of adjustment across SES groupings than any single environmental risk factor in this study, high risk is more likely to be found among less-affluent families.

As a final criticism, an argument can be made that cumulative risk indices lose predictive power due to the partly arbitrary collapsing of multiple risk

measures into a single composite. Research findings give credence to this concern. In Sameroff's investigation, cumulative risk at age 4 accounted for 37% of the variance in 13-year IQ, whereas multiple measures of risk predicted 50% of this variance. Deater-Deckard, Dodge, Bates, and Pettit (1998) found that individual risk factors predicted externalizing problem behaviors after controlling for cumulative risk (an index with 20 risk factors). Although an obvious limitation, this problem must be weighed against the goals of one's investigation. The primary aim of this investigation is to assess the *amount* of risk in early and middle adolescents' environment and examine how youth attributes influence their experience within the constraints and limitations posed by environmental factors. A cumulative risk index is compatible with the goals of this study given their (a) consistency in predicting adjustment, (b) face validity with respect to capturing the quality of youth's environment, and (c) value with respect to testing nonlinear and interactive relationships among variables.

Assessing Cumulative Risk - Identifying Important Risk Factors

It is incumbent upon the researcher to provide empirical or theoretical justification for the risk factors comprising a cumulative risk index. In this section, a brief review of the children's risk literature is undertaken to identify major sources of risk to youth. Drawing from studies that represent some of the best work in the respective literature, the intended goal is to provide the reader with a sampling of findings supporting each risk factor's deleterious effect on adjustment. In keeping with the ecological approach, risk factors are organized under the social context into which they fall. General domains of interest include

family demographics, family process, peer context, and neighborhood context. Similar conceptualizations have been devised by other researchers (see as examples Baldwin et al., 1993; Cohen, Brook, Cohen, Velez, & Garcia, 1990; Deater-Deckard et al., 1998).

Family demographic variables. Structural characteristics of family households have been implicated in the development of poor socioemotional outcomes among children. According to McLanahan (1997) variables such as parents' marital status, parents' level of education, poverty status, and family household size dictate the "quality and quantity of parental resources" and consequently children's developmental growth (p. 36). These are considered individually.

Parent's marital status. In a recent commentary on the importance of family structure in determining children's well-being, McLanahan (1997) noted that social scientists' views on this issue have undergone several changes since the 1960s. Early research depicted divorce and single parenthood as highly pathological conditions for raising children. Criticizing this early work on various methodological grounds, some researchers argued that the poor outcomes evidenced in children of such families were a consequence of related factors such as poverty and racial discrimination. Ethnographic studies in the 1970s availed themselves with this alternative viewpoint by highlighting single-parent family strengths and the value of extended-family networks. According to McLanahan (1997), the current perspective falls in the middle of these extremes:

> A new consensus has emerged with regard to the effects of family structure on children: children who grow up with only one biological parent are less successful, on average, than children who grow up with both parents. These differences extend to a broad range of outcomes, and they persist into adulthood. The size of the family structure effect ranges from small to moderate depending on the outcome being examined (p. 36).

In her review of 12 longitudinal studies, McLanahan (1997) concluded that family structure, as well as poverty, were important predictors of children's outcomes. Children who had experienced a marital disruption or who lived in poverty had significantly more problems. Associations were stronger for family structure than poverty when predicting emotional and behavioral problems. Associations were stronger for poverty than family structure when predicting IQ or educational attainment.

Parental education. Parent's' educational background is linked both with youth externalizing and internalizing problem behavior. Analyzing data from the Infant Health and Development Program (IHDP) and from the Children of the National Longitudinal Survey of Youth (NLSY), Chase-Lansdale and colleagues (Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1997) found a significant association between low maternal education and these outcome measures in 5-6 year old children (IHDP data set only). In their ecological model of risk, Baldwin et al. (1993) regressed global mental health scores of 18-year old youth on 15 environmental risk factors. Environmental variables that were taken into account

included various parenting behaviors (e.g., parental control and warmth), parenting values (e.g., values child independence), parental IQ and mental health, household characteristics (e.g., parental education, crowding in the home) and neighborhood quality. In a reduced regression model, parental education was included among the "best fitting" subset of variables.

Poverty. In the past decade, the child development literature has witnessed a surge of interest in the relationship between poverty and children's socioemotional adjustment. A direct response to the growing rate of poverty among our nation's youth (Duncan, 1991), this attention is well founded. Researchers have garnered strong support for poverty's deleterious effect on developmental outcomes (Blum, Boyle, & Offord, 1988; Chase-Lansdale et al., 1997; Dubow & Ippolito, 1994; Dubow & Luster, 1990; Duncan, Brooks-Gunn, & Klebanov, 1994; Hanson, McLanahan, & Thomson, 1997; McLanahan, 1997; Sameroff & Seifer, 1995; Takeuchi, Williams, & Adair, 1991; Zill, Moore, Smith, Stief, & Coiro, 1995). Taken as a whole, these studies suggest that poverty is detrimental to children of all ages. Its effect extends to a broad array of outcomes including behavioral, emotional, and academic well-being.

Given the covariation among poverty and other demographic variables (parental education, race, etc.), one needs to consider its relative importance as a unique predictor of youth outcomes. Utilizing data from the National Health Interview Survey on Child Health, Zill et al. reported that 4-7 year-old children who live in families who are poor were more than twice as likely to fail academically and demonstrate serious conduct and discipline problems (Zill et

al., 1995). This finding held for families receiving welfare benefits as well as for poor families not receiving governmental assistance. Similar results emerged when the researchers replicated the analysis using a sample of 7-17 year-old youth from the 1986 Child Supplement to the National Longitudinal Survey of Labor Market Experience of Youth. Controlling for several background factors (parent education, family structure and size, race, etc.), developmental differences between welfare and nonpoor children and between poor, nonwelfare and nonpoor children were attenuated; however, the control variables did not completely eliminate these outcomes differentiated by poverty status.

Household size. Household size, or overcrowding in the home, has appeared in several studies both as an isolated risk factor (e.g., Dubow & Luster, 1990) and in conjunction with other risk factors in cumulative risk indices (e.g., Baldwin et al. 1993; Deater-Deckard et al., 1998; Rutter, 1979; Sameroff et al., 1998). Theoretical explanations for using this variable are tied to the low availability or "dilution" of parental resources (Downey, 1995). According to this viewpoint, parents possess a finite amount of resources (e.g., energy, income, time) to distribute among their children. As the number of children in the family increases, the proportion of parental resources allocated to any one child decreases. Household size has been linked with children's low educational attainment (Downey, 1995), aggression (Deater-Deckard et al., 1998), and antisocial activity (Dubow & Luster, 1990).

Family process variables. The study of interaction patterns within the family constitutes a large proportion of research on child socialization. This focus

stems from the view that much of children's socialization resides within the family. Through the family, the developing child is afforded the opportunities and experiences necessary to acquire the fundamental skills, behaviors, values, and knowledge that enable him or her to engage successfully in social relationships (Maccoby, 1992). As such, risk researchers often look to the family for potential sources of stress to youth's development. Prominent risk factors include poor marital quality, poor parental monitoring of children's activities, lack of parental warmth, and low parental involvement.

Marital functioning. Ample evidence is available to suggest that poor marital functioning is associated with a variety of negative child outcomes, including conduct problems, depression, withdrawal, and poor academic performance (Amato & Keith, 1991; Forehand, Neighbors, Devine, & Armistead, 1994; Forehand, Wierson, McCombs, Brody, & Fauber, 1989; Grych, Seid, & Fincham, 1992). This relationship has been evidenced across studies that rely on global measures of marital functioning (marital adjustment or marital satisfaction) (Howes & Markman, 1989; Christensen, Phillips, Glasgow, & Johnson, 1983; McHale, Freitag, Crouter, & Bartko, 1991) as well as studies that use more specific measures of marital conflict (Burman, John & Margolin, 1987; Katz & Gottman, 1993). Studies falling under the latter approach generally yield stronger associations (Buehler et al., 1997; Cummings, Davies, & Simpson, 1994; Jouriles, Barling & O'Leary, 1987; Katz & Gottman, 1993). The hostility, rancor, and dissatisfaction parents outwardly display seems to affect children of all ages and family compositions (Acock & Demo, 1994; Forehand et al., 1989;

Grych, Seid, & Fincham, 1992). Moreover, such effects appear to last over time. Gerard and Buehler (1999b) analyzed two waves of data from the National Survey of Families and Household (NSFH). The time span between data collection points was five years. Controlling for initial problem behaviors, they found that marital conflict at Time 1 was positively associated with Time 2 problem behaviors in a sample of 12-17 year old youth. This finding replicates a previous analysis conducted by Acock and Demo (1998) with many of the same subjects.

Parental monitoring. Historically, parenting behaviors have been classified along the dimensions of control and support (for reviews of this literature see Maccoby & Martin, 1983 and Petersen & Rollins, 1987). Although conceptualized differently by individual researchers (Becker, 1964; Schaefer, 1959), these broadband dimensions of parenting are critical to the developing child's socialization experience. Briefly defined, parental control refers to the means by which parents attempt to influence or direct their child toward desired behavior (Rollins & Thomas, 1979). Parental support, on the other hand, can be viewed as communication to the child that sends the message that he she is valued and loved by parents (Peterson & Rollins, 1987). Parental monitoring falls under the control dimension. It refers to parental knowledge about children's whereabouts and daily activities (Steinberg, 1987).

According to Steinberg, (1987), insufficient parental supervision constitutes a major social issue affecting contemporary families. Wage-earning parents are often forced to leave children on their own for long periods of time,

rendering them unavailable to children and restricting their ability to provide supervision. Coupled with society's high rate of divorce and marital disruption, family life in many households has become "chaotic." Such conditions place parents under duress, taxing their ability to monitor effectively. This lack of parental vigilance puts youth at considerable risk, leaving them particularly vulnerable to antisocial behavior and delinquency (Bank, Forgatch, Patterson, & Fetrow, 1993; Barber, Olsen, & Shagle, 1994; Loeber & Dishion, 1984; Patterson, & Stouthamer-Loeber, 1984; Sampson & Laub, 1994). These problems may appear as early as late childhood or early adolescence when peer pressure begins to intensify (Steinberg, 1987).

Parental warmth. Conceptualized as a support variable, parental warmth refers to parents use of affirming messages that communicate to the child that he or she is a valued member of the family and seen as important in the eyes of the parent. Such behavior sets a positive affective tone to the parent-child relationship. Qualities associated with parental warmth include positive displays of affection, responsiveness, and emotional availability to the child. Youth may construe a lack of these qualities as a feeling of not being loved, accepted, or supported by parents.

A negative linear association between parental warmth and youth problem behaviors is well documented. Using samples of preadolescent and adolescent youth, researchers have linked low levels of parental warmth with alcohol consumption (Coombs & Landsverk, 1988; Whitbeck, Hoyt, Miller, & Kao, 1992), high levels of aggression (Fauber, Forehand, Thomas, & Wierson, 1990; Olweus,

1980), delinquency (Loeber & Dishion, 1984; Simons, Robertson, & Downs, 1989), depression (Lempers, Clark-Lempers, & Simons, 1989; Fauber et al., 1990), low self-competence (Kurdek & Fine, 1994), and poor general emotional adjustment (Kline, Johnston, & Tschann, 1991). Across these studies, the magnitude of the association between parental warmth and problem behaviors ranges from .20 to .46 (the direction of the effect depends on whether adjustment is positively or negatively anchored at the high end of the scale). Findings from Rothbaum and Weisz's meta-analysis (1994) indicate that higher correlations are yielded from studies that rely on observational measure of parental warmth or interviews. This study also suggests that the relationship between parental warmth and externalizing problem behaviors is stronger for males and older children.

Parental involvement. Another support variable, parental involvement is the degree to which the parent spends time and is actively and positively involved with his or her child. Such behavior is a sign of a cohesive parent-child relationship. Indicators of involvement include regular discussions about youth's activities and personal problems, working together on school projects, and attending such events as religious services, sporting events, and movies. Although some reduction of these activities is considered normative during adolescence when peer relationships are given priority (Brown, 1990), marked detachment from parents during this development stage is neither typical nor desirable. Steinberg (1990) estimates that only 5% to 10% of families experience "dramatic deterioration in the quality of parent-child relationships during

adolescence" (p. 260). Those that do are more likely to be households with delinquent or psychologically troubled youth. Parental involvement has been considered in several studies of adolescent psychosocial adjustment (Conger et al., 1992, 1993; Kandel, 1990; Miller, Cowan, Cowan, Hetherington, & Clingempeel, 1993). These studies link low levels of parental involvement and warmth with higher levels of antisocial behavior and depression as well as lower levels of obedience.

Peer context. Although the formation of peer groups begins well before adolescence, changes in the quality of peer relations that begin prior to adolescence transform the peer group into a prominent social context of adolescent development (Brown, 1990). Brown highlights four major changes that differentiate childhood from adolescent peer groups: (a) a greater amount of time spent in peer interaction; (b) more autonomous functioning within the peer group or, in effect, less adult guidance or control; (c) a move away from gender-segregated relationships to opposite sex relationships; and (d) an expansion beyond dyadic relationships to larger peer networks.

According to Brown, these changes result not only from aspects of individual development (e.g.,quest for identity and pubertal factors) but also from adolescents' efforts to meet challenges posed by the new social environment to which they are exposed. With the transition into middle school, students exit a structure based on "self-contained classrooms" in which they spend considerable amount of time with the same small number of like-aged classmates and enter one that introduces a larger, shifting array of peers, many of whom are

unfamiliar. Also accompanying this transition are increased demands to take part in school-based social activities (e.g., clubs, dances) and greater expectations by teachers for autonomy and personal responsibility among students. Thrust into this new environment, early adolescents are forced to devise strategies for negotiating the influx of new peer relationships and increased school demands. Aligning oneself with a group of peers facilitates this transition by providing the individual with a source of social support in the midst of changing routines and expectations and by ensuring his or her participation in school-related activities. Aside from these functions, the establishment of peer friendships plays a positive role in adolescent development by increasing self awareness, promoting a sense of intimacy and emotional connection, and teaching such social skills as empathy and perspective-taking (Savin-Williams & Berndt, 1990).

Perceived social support by peers. Social support is defined as information leading the individual to believe that he or she is cared for, esteemed, loved, esteemed, and is a member of a network of communication (Dubow & Tisak, 1989). Adolescents may derive a sense of support from various sources including parents, teachers, and peers. Yet, peer support takes on special meaning during adolescence, a period associated with increasing independence from family and the development of close friendship ties. Through supportive peers, youth may receive emotional sustenance, identity validation, and problem-solving resources that may facilitate adaptation during periods of acute stress (Hirsch, 1991).

Addressing methodological considerations in research that focuses on social support during adolescence, Cauce and colleagues highlight the various strategies for operationalizing social support (Cauce, Mason, Gonzales, Hiraga, & Liu, 1996). These include social networks (the size and density of an individual's support system), received or enacted support (the frequency of actual supportive transactions an individual receives by persons in his or her social network) and perceived support (subjective evaluations of supportive transactions by others and the personal meanings attached to them). Based on existing research, they believe there are compelling practical reasons for using the latter type of measure. Their review of the literature suggests that measures of perceived social support are more salient indicators of youth adjustment than are received support and network size.

Using such measures to assess the degree of perceived support from parents, friends, school, and extended family members, these researchers examined the relationship between each support construct and depression in a sample of African-American adolescents. Although all relationships were significant, the highest correlation was found for the relationship between perceived peer support and depression. Dubow and Tisak (1989) reported similar findings. Using a prospective design, Hirsch and Dubois (1992) examined the relationship between perceived peer support and youth adjustment in a sample of elementary and junior high school children. Global assessments of children's adjustment (a composite measure of depression, anxiety, and hostility) were taken on four separate occasions. Reported correlations across waves of data

collections are -.48, -.43, -.27 and -.17. In a regression analysis, these researchers determined that peer support predicts subsequent outcomes after controlling for earlier levels of adjustment.

Peer rejection. A primary risk factor stemming from the peer context is rejection by one's schoolmates. In a comprehensive review of the peer relations literature, Parker and Asher (1987) concluded that low peer acceptance constitutes an important risk factor for later psychological adjustment. Concerned with how early peer adjustment related to later dropping out of school, juvenile and adult crime, and adult psychopathology (i.e., schizophrenia, hospitalization, alcoholism, and neurosis), these researchers organized study findings by design characteristics (follow-up versus follow-back), sampling characteristics (clinical, school, and high-risk), and measurement strategies (peer sociometric ratings versus teacher ratings; assessments of peer acceptance versus assessments tapping behavioral styles of children--aggressive and shy/withdrawn). Across studies and outcomes, support was gleaned for the deleterious effect of peer rejection on later adjustment. These researchers reported that depending on the outcome under consideration 28% to 70% of disordered adults demonstrated an early history of problematic peer relationships.

In addition to these findings, several recent longitudinal studies indicate that children who are rejected by peers are at risk for future externalizing and internalizing problem behavior (Burks, Dodge, Price, 1995; Coie, Terry, Lenox, Lochman, & Hyman, 1995; Deater-Deckard et al., 1998; Kupersmidt, Burchinal, & Patterson, 1995; Schwartz, McFayden-Ketchum, Dodge, Pettit, & Bates, 1998).

Taken as a whole, these studies suggest that the relationship between early peer rejection and later youth problems holds across different reporters of outcome measures as well as different outcomes including aggression, delinquency, depression, and anxiety/withdrawal.

Neighborhood context. Within the past decade, increasing attention has been paid to characteristics of youth's neighborhood in the child psychopathology literature. Once considered the domain of sociologists, neighborhood qualities and their implications for child development have come to be appreciated by developmental psychologists (Brooks-Gunn, Duncan, & Aber, 1997; Baldwin et al., 1993). This recent trend has been traced to growing concerns about the expansion of concentrated poverty, increased numbers of homeless families, and recent scholarly writings on urban poverty and a growing underclass (Gephart, 1997. In a series of papers published collectively as *The Truly Disadvantaged* , William Julius Wilson (1987) forwarded the argument that urban neighborhoods have experienced social upheaval as a direct consequence of increased concentration of poverty and male joblessness. Such conditions have, arguably, resulted in isolation from the general labor force and mainstream society, lack of exposure to role models who are gainfully employed, little access to decent schools, and women's lack of marriageable men with steady income.

Neighborhood quality. Wilson's thesis has served as a guiding framework for recent work on the effects of neighborhoods on families and children. In a collection of empirical articles (Brooks-Gunn et al., 1997), an interdisciplinary team of researchers reported findings from several studies designed specifically

to capture the underclass phenomenon that Wilson (1987) described. Using variables measured at the neighborhood-level, consideration was given to such demographic characteristics as male joblessness, poverty, unemployment, ethnic composition and their relationship to child outcomes.

Using a developmental framework, Chase-Lansdale and colleagues (Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1997) analyzed data from the Infant Health and Development Program (IHDP) and from the Children of the National Longitudinal Survey of Youth (NLSY) to test the hypothesis that older children would be more greatly affected by neighborhood influences than younger children. The IHDP included longitudinal assessments of children aged 3 to 4 during wave 1 and aged 5 to 6 during wave 2. The NLSY data also included children in these age categories; however the data are cross-sectional. These researchers incorporated the following neighborhood measures into their analytic model: low SES, high SES, male joblessness, family concentration (i.e., crowded housing, young population), and ethnic diversity. Findings generally supported their hypothesis. Few neighborhood effects were found in preschool children. Those that did emerge were inconsistent across data sets. For the older children, three neighborhood effects were found. Children residing in neighborhoods with higher rates of male joblessness and greater ethnic diversity evidenced more internalizing problems. Children in neighborhoods with denser family concentration had higher rates of externalizing problem behavior.

In a sample of 13-18 year-old youth, Cohen et al. (1990) examined neighborhood risk factors in conjunction with 11 other potential sources of risk

(e.g., parental sociopathy, early somatic risk, maternal inattention, low father involvement, etc.). Neighborhood variables included urbanicity, neighborhood crime, residential instability, low SES, and social isolation. In regression analyses that controlled for child age and gender, neighborhood crime was a unique predictor of externalizing problems; social isolation and low SES uniquely predicted internalizing problem behavior. Coulton, Korbin, Su, and Chow (1995), used 1990 census tract data to assess the incidence of juvenile delinquency in the city of Cleveland, Ohio. This city was chosen because of its high concentration of poverty and racial segregation. A regression analysis revealed that community impoverishment and contiguity to poverty predicted juvenile delinquency. Respective standardized betas are .49 and .23, indicating a fairly strong relationship between neighborhood conditions and delinquency. Finally, Duncan et al. (1994) found that low-income neighborhoods, operationalized by the fraction of families in the census tract with incomes below $10,000, predicted mother reported externalizing problem behaviors such that every 10% increase in the proportion of low income neighbors was associated with an increase in problem behaviors of .60.

Neighborhood problems. Turning to studies with subjective measures of neighborhood quality, a few researchers have found that the prevalence of neighborhood problems is a good predictor of child outcomes. Using a sample of African-American youth aged 12 to 15, Mason, Cauce, Gonzales, Hiraga, and Grove (1994) relied on parent and youth reports to assess problematic conditions in the neighborhood such as vandalism, gang activity, drug-use and stealing.

Their path analysis revealed a significant pathway from neighborhood environment to parent- and youth-rated externalizing problem behavior. Baldwin et al., (1993) used a similar measure in their study of multiple risk, a composite scale derived from parent and youth reports assessing the severity of 31 neighborhood problems. The bivariate relationship between this measure and global mental health of 18 year-old youth was .29. This variable was not significant, however, in a regression analysis with 14 other risk factors. The small sample size (N = 90) may have restricted the researcher's ability to find an effect.

Neighborhood satisfaction. Only recently are researchers beginning to address the importance of understanding the different meanings of neighborhood experience and their relation to developmental outcomes (Greenberg, Lengua, Coie, & Pinderhughes, 1999). Whereas objective neighborhood measures reflect physical aspects or demographic characteristics, appraisals of neighborhoods tap "individuals' personal evaluations of their social milieu and the quality of the geographic area they define as neighborhood" (Burton, Price-Spratlon, & Spencer, 1997, p. 139). Such appraisals include degree of neighborhood satisfaction and perceptions of environmental risk and safety. Theories of cognitive appraisals suggest that developmental outcomes are not the mere product of actual danger and risk in the environment (Hyson & Bollin, 1990). Discontent with one's environment and perception of harm might be equally important.

In an investigation of the effects of multiple risk on developmental outcomes in first-grade children, Greenberg et al. (1999) tested this notion by

incorporating a measure of perceived neighborhood context in their study. Scale items assessed parents' satisfaction with various aspects of the neighborhood as well as perceived safety. Correlations between this measure and children's externalizing and internalizing behavior were .23 ($p \leq .001$) and .16 ($p \leq .01$). Although accounting for a small proportion of variance in child outcome measure, perceived neighborhood context added significantly to the prediction of both teacher- and parent-reported child externalizing problem even after demographic and several family context variables were considered.

The little research conducted in this area has, more often than not, focused on parents' perceptions of neighborhoods. However, some researchers have noted that children's perceptions of environmental risk are uniquely important to developmental outcomes (e.g., Garbarino, Kostelny, & Dubrow, 1991). The period of adolescence lends itself to an inquiry of neighborhood perceptions given the increased autonomy and cognitive maturity associated with this developmental stage. Adolescent youth are more likely to have direct exposure to their neighborhood and a keener awareness of the quality of their environmental surrounding.

Gaps in the Cumulative Risk Literature

Using multiple indicators of risk--such as socioeconomic status, overcrowding in the home, parental conflict, maternal depression--several researchers have found support for the notion that cumulative risk poses a greater threat to youth than the presence of any one risk factor considered in isolation (Deater-Deckard et al., 1998; Jessor et al., 1995; Rutter, 1979; Sameroff

et al., 1998; Sameroff et al., 1987; Shaw & Emery, 1988; Williams et al. 1990). In a striking illustration, Rutter (1979) found in a sample of institutionalized youth that two familial risk factors provided a fourfold increase in the likelihood of child psychiatric disorder; four factors increased this risk tenfold. More recently, Sameroff and colleagues (Sameroff, Bartko, Baldwin, Baldwin, & Seifer, 1998) found that the relative risk in a high-risk group of adolescents (those who had 8 or more risk factors) for several poor outcomes--academic performance, psychological adjustment, self-competence, and activity involvement--was significantly and substantially higher than in the low-risk group (those with 0 to 3 risk factors). Strongest effects were found for academic performance followed by psychological adjustment and problem behavior. High-risk youth were six times more likely than low-risk youth to fall in the 25% percentile for worst performance on poor psychological adjustment; these same youth were five times more likely than low-risk youth to demonstrate severe problem behavior.

Among its contributions, the study of cumulative risk has enhanced the children's risk literature in several ways. First, by promoting the idea that the interplay among risk factors is essential to understanding youths' vulnerability to environmental risk, this literature moves beyond mere identification of discrete risk factors to the more meaningful exploration of risk processes.

Second, through investigations to determine whether specific constellations of risk factors are better predictors of child outcomes than others, this literature has demonstrated the general systems principle of "equifinality"--the idea that individuals may arrive at a common end point through an assorted

variety of antecedent conditions (Cicchetti & Rogosch, 1996). Using cluster analysis to generate profiles of individuals from their samples, researchers have shown that negative child outcomes develop through any number of distinct etiologies (Deater-Deckard et al., 1998; Sameroff et al., 1993).

Finally, this research has not only yielded clues about the potential of the environment to hinder children's developmental progress, but also to undermine the expression of positive attributes and strengths that children bring to their environment. Such characteristics of the individual are labeled "resiliency" qualities in the risk literature. They are assumed to protect youth in the face of high adversity, having little or no influence on youth facing minimal risk (Gore & Eckenrode, 1994; Masten et al., 1988; Rutter, 1987). Challenging the idea of resiliency, Sameroff and colleagues (Sameroff, et al., 1998) discovered in their ongoing longitudinal investigation that high-risk youth identified as resilient (i.e., possessing such characteristics as high intelligence and resourcefulness) displayed considerably worse outcomes on a variety of measures than low-risk/high resiliency youth *and* low-risk/low resilient youth. Moreover, this discrepancy in outcomes appears to intensify the longer the child endures the high-risk environment. Interpreting this finding, these researchers contend that high-risk environments, particularly those that remain hazardous over time, do not afford youth adequate opportunity or resources that would allow them to realize their full potential. An exemplary investigation demonstrating the degree to which the environment shapes development over time, this study is

nonetheless limited in its generalizability. A large percentage of the sampled youth are offspring of mothers with some form of mental illness.

Although much insight has been gleaned from studies of cumulative risk, four important deficits exist in this small body of literature. First, researchers typically draw their samples from clinical or community samples. Few, if any, attempts have been made to replicate these findings with nationally representative samples of youth. Currently, little is known about cumulative risk in the general population of youth.

The relationship between cumulative risk and indices of youth adjustment takes a linear form in most studies (Deater-Deckard et al., 1998; Jessor et al., 1995; Sameroff et al., 1993. However, Rutter's (1979) study suggests the possibility of a curvilinear effect. His findings indicate a linear relationship between cumulative risk and youth adjustment at low levels of risk that eventually curves (accelerates) at higher levels of risk. Replication of this pattern is lacking in the literature. Unfortunately, it is not readily clear from the methods section of many studies whether the failure to replicate is a genuine reflection of the data or the investigator's failure to test for such a pattern. This deficit is addressed by examining the association between cumulative risk and youth problem behaviors in a nationally representative sample of youth. The possibility of a curvilinear relationship is acknowledged and tested. However, based on most studies of cumulative risk the following hypothesis is forwarded:

Hypothesis 1: The relationship between cumulative risk and both youth externalizing and internalizing problem behavior will be positive and linear.

A second issue relates to the specificity of cumulative risk in predicting youth problem behaviors. Although research has shown a relationship between cumulative risk and both externalizing and internalizing problem behaviors (Williams et al., 1990), the high degree of shared variance between these two outcomes limits any conclusions about their nonshared relationship to cumulative risk. At the present time, it is not known whether cumulative risk is a better predictor of adjustment problems that are outer-directed or inner-directed. Despite the availability of statistical procedures that would address this question (see Cohen et al., 1990), cumulative risk researchers have not pursued this line of inquiry. This issue will be explored using their outlined procedure (i.e., net regression). More details about this technique are given in the Methods section.

Third, with the exception of a handful of studies (Deater-Deckard et al., 1998; Sameroff et al., 1998) cumulative risk investigations typically are limited to only one or two domains of risk. Generally speaking, researchers focus on risk stemming from the child and/or risk occurring within the familial environment (Blanz, Schmidt, & Esser, 1991; Dubow & Luster, 1990; Rutter, 1979; Shaw & Emery, 1988; Williams et al, 1990). However, recent research demonstrates the importance of extrafamilial environments in the development of youth problem behaviors, such as the neighborhood context (Brooks-Gunn et al., 1997; Simons, Johnson, Beaman, Conger, & Whitbeck, 1996) and peer context (Burks et al.,

1995; Hoza, Molina, Bukowski, & Sippola, 1995; Schwartz et al., 1998; Simons et al., 1996). Given the expanded social network of adolescent youth (Brooks-Gunn et al., 1997; Brown, 1990), variables from these other contexts are meaningful to include in indices of cumulative risks. This broader approach agrees with Bronfenbrenner's (1977) perspective by considering the developing child's new roles outside of the family and his or her 's increasing interaction in the distant environment.

And finally, although the study of protective factors has grown considerably in the past two decades, much of this work has focused on the protective quality of family-level variables (e.g., good parent-child relationships) and environmental influences (e.g., social support networks). Much less is known about the role of child attributes in modifying the relationship between cumulative risk and youth problem behaviors. Narrative reviews commonly cite child IQ, cognitive problem-solving ability, and self-esteem as protective factors (Brooks, 1994; Compas, 1987; Hauser, 1999; Jessor, 1993; Rutter, 1990); yet, in reality, their buffering quality has not been firmly established. Generalizations about the protective roles of these variables overlook important qualifying factors stemming from subgroup characteristics (e.g., ethnicity, gender, and an early history of problem behaviors), and the outcome being assessed. Furthermore, researchers often interpret significant main effects of IQ, problem-solving ability, and self-esteem as evidence of their protective quality. As will be pointed out shortly, a distinction has been drawn in the literature between true protective variables and those that promote good outcomes in a more general sense (Garmezy et al.,

1984; Scaramella et al., 1999). The primary focus of this study is to identify the means by which child IQ, problem-solving ability, and self-esteem manifest their influence in the risk-maladjustment relationship.

Models of Stress-Resistance

Based on observations that children differ in their response to stress and adversity, the study of risk has shifted from a focus on vulnerability to a focus on risk negotiation (Rutter, 1987). At the core of this movement is a search for protective factors or variables that shield youth from harmful environmental circumstances. Stated earlier in this review, protective factors exert their influence either by fostering positive youth outcomes or reducing the likelihood of negative outcomes. Closely linked to the concept of resiliency, protective factors can be viewed as the primary means through which effectual risk negotiation skills develop. Such factors facilitate adaptation in the face of risk, presumably by serving as a positive resource from which youth can draw. Garmezy and Masten (1985) draw a fine distinction between resiliency qualities and protective qualities. Whereas resilience connotes the individual or internal resources of the child that aid adaptation, protective factors is a broader term that includes both individual and environmental characteristics (e.g., a nurturing family environment, availability of social support in one's community).

To the dismay of many scholars, risk researchers treat different statistical relationships as evidence of protective characteristics (Kliewer & Sandler, 1992; Luthar, 1993). Whereas some researchers reserve the term "protective" to describe interactive relationships, others use it more generally to describe main

effects. In the former approach, it is argued that protective factors are meaningful only in the presence of high levels of stress (Masten et al., 1988; Rutter, 1987). According to this viewpoint, the presence of protective factors appears to lower the risk of negative outcomes in youth exposed to *high* levels of risk; such variables have little or no effect on youth facing minimal risk. In the latter approach, protective factors are viewed as those that promote good adjustment irrespective of youths' risk status (e.g., Werner & Smith, 1992). In this sense, they can be seen as the opposite of risk factors (Sameroff et al., 1998).

Although this confusion has been dismissed by some as a simple semantic debate, Luthar cautions against this viewpoint:

> All sciences are built upon classifications that structure their domains of enquiry. Over the last few decades, resilience has been increasingly recognized as a distinct field of enquiry within developmental psychology. As with any emerging discipline, the development of specific terms for pivotal constructs--with clear operational definitions to ensure similar meanings for different professionals--are vital for heuristic purposes. (p. 447).

Bearing this issue in mind, an attempt is made to clarify for the reader the different means by which positive child attributes facilitate positive adjustment. Garmezy et al.'s (1984) models of stress-resistance mechanisms offer the clearest articulation on this topic. These models are reviewed before delving into empirical literature that describes the roles of child IQ, problem-solving ability,

and self-esteem in the cumulative risk-adjustment relationship. They will be referred to frequently as a means for assessing extant research findings.

Compensatory model. In this model, cumulative risk and child attributes are seen as combining additively in the prediction of youth problem behaviors; thus each bears a direct main effect to youth problem behaviors (e.g., see Scaramella et al., 1999 as an example of this model). Whereas cumulative risk is expected to covary positively with youth problem behaviors, child attributes are expected to covary negatively with youth problem behavior. Hence, personal attributes of the child might compensate or counteract the influence of risk on youth problem behaviors.

Protective vs. vulnerability model. In this model, a conditional relationship between cumulative risk and child attributes exists such that personal attributes modify (exacerbate or buffer) the impact of cumulative risk on youth problem behaviors. A protective or stress-buffering effect is implied if, for example, children with high intelligence show relatively low levels of youth problem behaviors at high levels of risk, whereas children low on intelligence show high levels of youth problem behaviors at high levels of risk. Conversely, low intelligence serves an exacerbating function by increasing the probability of poor outcomes under high-risk circumstances. In drawing a clearer distinction between compensatory and protective factors, Rutter (1987) has pointed out that protective factors have an impact on adjustment by virtue of their interaction with risk factors, instead of (or in addition to) having direct effects on their own

(compensatory). Similarly, exacerbating factors confer vulnerability by their interaction with other risk factors.

Challenge model. According to this model, cumulative risk bears a linear relationship to youth problem behaviors only when the number of protective factors is small. When protective factors are high, moderate levels of cumulative risk might actually enhance adjustment. However, when a child experiences high levels of cumulative risk, even high numbers of a protective factors will be overwhelmed and adaptive behavior will decrease. In this model, some degree of risk can be tolerated and even beneficial to youth provided the level of risk is not excessively high. Essentially, this posits a curvilinear relationship between risk and youth problem behaviors such that some amount of risk might actually enhance adjustment, providing that levels of stress are not too high. Although theoretically plausible, this model has generated little research. Thus, little work can be drawn upon to make confident predictions from this model. It is presented here merely for illustrative purposes.

Using these models as a reference, studies on youth IQ, problem-solving ability, and self-esteem are reviewed to assess each of their respective roles in promoting positive youth outcomes. The goal of this examination is to determine whether these child attributes are truly protective (they interact with risk status) or if they promote positive outcomes in a more general sense (compensatory effect). Using each child attribute as a subheading, this review is organized as follows. First, the construct of interest is defined for the reader followed by theoretical justification for its inclusion in this study. Next, empirical literature

addressing both main effects and interactive effects is presented for externalizing and internalizing problem behavior. Based on general findings, hypotheses are stated for each outcome measure.

Youth Attributes - Compensatory versus Protective Effects

The focus on youth attributes as variables that conditionalize the risk-adjustment association is a means for assessing the relative weight of personal factors and environmental factors in determining subsequent developmental outcomes. This emphasis does not negate the importance of other available resources youth might draw upon to facilitate coping (e.g., quality of family environment, community assets). Its intended purpose is to address the following question--are personal assets sufficient, by themselves, to circumvent risk brought on by elevated levels of environmental hazards?

According to some, the answer to this question might be no. In an interesting test of the resiliency notion, Baldwin and colleagues (Baldwin et al., 1993) matched 25 pairs of individuals on global mental health scores. One member of the pair had an actual mental health score that was higher than the obtained predicted value from an analysis regressing global mental health on a set of environmental variables; the other member had an actual mental health score that was lower than predicted. Based on these residual effects, the former group of individuals was considered resilient (mentally healthier than would be expected from the environment); the latter group was considered nonresilient (less mentally healthy than predicted by the environment). Mean comparisons were drawn on several child variables as a means for determining markers of

resilience. Results from these analyses indicated that none of the personality variables significantly differentiated the resilient from the nonresilient group; however, marginal findings were found for global self-esteem and intelligence (a measure of cognitive problem-solving was not utilized in the Baldwin et al. study). Reflecting on the concept of resilience, these authors sum up their findings as follows:

> No evidence from this study indicates that there is any kind of personal characteristic of the child that meets [the resilience] criterion. There are traits that mark children who develop good mental health scores but not children with the same mental health score who do better than expected in contrast to those who do worse. The traits of people with the same mental health are very much the same regardless of whether they got there by exceeding expectations or failing to live up to expectations. (p. 760).

As important as these findings are, they rest on a stringent definition of resiliency. It is one thing to demonstrate that child attributes offer protection against unfavorable environmental circumstances, yet quite another to demonstrate their role in fostering the capacity to do *well* under these circumstances. The latter could be too much to expect of any youth attribute in the context of limited resources and several forms of social disadvantage. In the former instance, one need not assume that a protective effect for a given child attribute results in a highly positive outcome, only that the outcome for high-risk youth is *better* when the attribute is present than when it is absent.

Furthermore, these researchers did not report how large the residual differences between actual and predicted scores were. Youth might have been classified into resilient and nonresilient categories based on relatively small discrepancies between these scores. If so, such classifications are superficial, reflecting little difference between those who do better than expected and those who do worse. Given these considerations, the marginal findings these researchers found for IQ and self-esteem warrant further consideration. These traits predicted positive mental health in the larger sample comprising this investigation (demonstrating main effects on mental health). Although intelligence and self-esteem did not differentiate resilient and nonresilient youth in accordance with Baldwin et al's. (1993) criterion, a more yielding definition of resilience might have resulted in different findings.

Intelligence. For purposes of this discussion, intelligence is viewed as an indication of high mental capacity. Researchers employing this variable typically assess it with a standardized measure of intelligence. Generally speaking, the role of intellectual ability has been examined in terms of its direct association with outcome measures (Luthar & Ripple, 1994; White, Moffitt, & Silva, 1989). Recently, researchers have shown an interest in the ways intelligence interacts with psychosocial risk in influencing adjustment. At the present time, greater consideration has been given to the moderating role of intelligence in the relationship between risk and externalizing problem behavior rather than to its role in the relationship between intelligence and internalizing problem behavior.

Despite its appearance in the child risk/resiliency literature, little theory has guided discussion on the connection between youth intelligence and externalizing problem behaviors. Speculating on protective mechanisms that underlie this relationship, Garmezy and Masten (1991) offer two possibilities. High intelligence might reflect assets that motivate youth to evaluate consequences of their behaviors, to delay gratification, and to monitor impulses. Or, alternatively, high intelligence might protect youth by directing their energy to academic pursuits and ensuring school success. Thus, by virtue of their intelligence, bright children might be better equipped to avoid antisocial activity, perhaps enabled by goal-seeking behavior and visions of academic success.

Investigations have yielded a mixed array of findings with respect to how intelligence interacts with risk to predict behavioral adjustment. Some researchers have found protective effects of high intelligence in the face of high-risk (Kandel et al., 1988; Masten et al. 1988). In a school-based investigation of preadolescent youth, Masten et al. (1988) found that a high number of stressful life events was related to disruptive classroom behavior (an index that combined teacher and peer reports of aggressive behavior) but only for children with low IQ scores. Youth with high IQs were shielded from this risk. Kandel et al. (1988) found that IQ protected adult men who were at an elevated risk for antisocial outcome. In this study, men who avoided criminal behavior despite high-risk status (i.e., having severely criminal fathers) had significantly higher IQ scores than did men identified as high-risk/seriously criminal, low-risk/seriously criminal, and low-risk/noncriminal.

Yet, other researchers have failed to find interactive effects of intelligence between psychosocial risk and adjustment. In an attempt to replicate the findings of Kandel et al. (1988), White, Moffitt, and Silva (1989) found that IQ scores were significantly higher among nondelinquent groups of adolescent youth irrespective of their risk status. High-risk status, in this instance, was defined as early self-reported antisocial activity. The mean IQ score for the high-risk nondelinquent group was comparable to that of the low-risk nondelinquent group, indicating that IQ promotes good outcomes in a general sense rather than protecting those most vulnerable to delinquency. Thus, in contrast to the protective effects of IQ found in the Kandel et al. (1988) study, this study's findings are more in line with a compensatory model. Easterbrooks, Davidson, and Chazan (1993) report similar findings. Using mother- and teacher-rated externalizing, internalizing, and total problem behaviors, these researchers failed to find a significant interaction between cumulative risk and IQ in a sample of low-income, elementary school children. However, they did find that children scoring in the clinical range on total problem behavior, as rated by teachers, had significantly lower verbal intelligence scores. In their school-based sample of 8-14 year old youth, Jackson and Frick (1998) found a robust compensatory effect for their measure of child attributes (a scale combining intellectual ability, SES, and temperament) on externalizing scores. The aggregate measure of child attributes, however, might mask an interaction between risk and IQ.

And finally, using data from the National Longitudinal Survey of Youth to examine adjustment in a subsample of 8-15 year-old youth, Dubow and Luster

(1990) found a significant main effect for IQ on mother-reported total problem behavior (a composite measure assessing youth antisocial behavior, hyperactivity, depression, and peer conflict). IQ did not predict mother-reported antisocial behavior when this outcome measure was looked at in isolation from other outcomes, however. No significant differences on total problem behavior emerged when at-risk children (youth having at least one risk factor related to outcome) were classified into low and high IQ groups. Thus, a compensatory effect of IQ is supported in this study.

Compounding these disparate findings, Rossman and Rosenberg's (1992) study of 6-12 year old youth yielded a negligible correlation (-.07) between verbal IQ and mother-reported total problem behavior on the Child Behavior Checklist (CBCL). In a subsequent regression analysis, IQ and the interaction term between stressful life events and IQ were poor predictors of adjustment. However, a close look at the researchers' outcome variable lends insight into these findings. The total problem behavior scale included items assessing social competence and social activity in addition to externalizing and internalizing problem behavior. This leaves open the question of whether significant findings would have emerged if a pure measure of externalizing problem behavior had been used.

One is readily inclined to attribute these divergent findings to different sample characteristics and to the use of different measurement devices for constructs of primary interest. However, this issue remains unclear. Although a sufficient number of studies exist to generate disparate findings across studies,

too few are available to draw definitive conclusions about the source of these inconsistencies. Thus, it might be premature to make specific predictions about the moderating role of IQ in the relationship between cumulative risk and externalizing problem behaviors. Given equal evidence for both compensatory and protective effects of IQ, alternative hypotheses will be tested. These are as follows:

Hypothesis 2: IQ will combine additively with cumulative risk to predict youth externalizing problem behaviors. A compensatory effect for IQ will be found such that externalizing problem behavior will covary negatively with increments in IQ.

Hypothesis 3: IQ will buffer the positive association between cumulative risk and externalizing problem behavior. This association will not be as strong for youth with higher IQ scores as it is for youth with lower IQ scores.

Little research is available to draw inferences about the moderating role of intelligence in the relationship between cumulative risk and internalizing problem behavior. However, a theoretical framework advanced by Luthar and colleagues (Luthar, 1991; Luthar & Zigler,1992; Luthar & Ripple, 1994) lends insight into the potential role of IQ in this relationship. According to these researchers, bright children possess highly developed cognitive skills that make them more acutely aware of their surroundings. This heightened sensitivity to environmental inequalities promotes high reactivity to subjective emotional distress. Challenged by societal standards for cognitively advanced individuals and their own inner

distress, intelligent youth are susceptible to a host of negative emotional outcomes. Thus unlike most existing theories that posit a positive association between cognitive ability and adjustment, this formulation highlights the double-edged nature of intelligence. Whereas high intellect offers protection against externalizing problem behavior, it might serve as a vulnerability factor for internalizing problem behavior.

Through a series of investigations with a sample of inner-city adolescents, Luthar garnered support for this notion. In the first of these investigations, Luthar (1991) discovered that highly intelligent youth fare well on various indices of school-based competence (i.e., assertive-responsible behavior with peers and school grades) but lose this advantage at high levels of stress. At more extreme levels of stress, these bright children show rates of competence that are similar to their less intelligent peers--essentially, low assertiveness and poor school grades. In this same study, it also was found that resilient youth--those demonstrating high competency despite high levels of stressful life events--evidenced significantly higher internalizing problem behavior than low stress/high competent children and high stress/low competent children. In a subsequent investigation (Luthar & Ripple, 1994), it was found that children's competence levels are partially determined by the interaction between intelligence and other child attributes including depression and anxiety. In this sample of youth, highly intelligent children displayed lower assertiveness and school grades when depression and anxiety were high.

Although thoughtfully developed and theoretically appealing, this argument is not fully substantiated. A critical piece of information missing from these analyses is whether or not high-risk, highly intelligent children actually display greater levels of emotional distress (internalizing problem behavior) than high-risk, low intelligent youth. In order to address this question, an analysis that considers the interaction between stressful life events and IQ as a predictor of internalizing problem behaviors is needed. This test was never conducted. Rather, a leap was made from the finding that resilient children often show deficits in emotional adjustment to the finding that highly intelligent youth show poorer outcomes when their distress is high. *Resiliency, however, was not defined by level of intelligence.* In the proposed study, this omission is addressed. Given Luthar's findings as well as other evidence suggesting a positive relationship between depression and IQ (for females only; Block & Gjerde,1990), the following hypothesis is forwarded:

> *Hypothesis 4: IQ will exacerbate the association between cumulative risk and youth internalizing problem behavior. This association will be stronger for youth with higher IQ scores than youth with lower IQ scores.*

Given evidence of higher internalizing behavior problem among female adolescents (Ge et al., 1994) and the positive association between depression and IQ found by Block and Gjerde (1990), the interaction term between cumulative risk and IQ will be further conditionalized by gender.

Cognitive problem-solving ability. The way an individual manages the stress of everyday problems is an important gauge of psychosocial well-being. According to Spivack, Platt, and Shure (1976), who have conducted extensive research in the area of problem-solving ability, the cognitive steps one follows in response to a social problem are a direct indicator of his or her personal adjustment. In their formulation of healthy development, five essential problem-solving skills are necessary. These are: a) a sensitivity to the existence of problems; b) an ability to generate alternative solutions; c) demonstration of "means-ends" thinking or planfulness with respect to carrying out a solution; d) evaluation of the consequences and/or outcomes of social acts; and e) demonstration of social causal thinking or, essentially, flexibility with respect to taking another's perspective and postponing action until sufficient information is gathered.

Showing a strong developmental component, these skills are thought to emerge as function of child's cognitive maturity and his or her readiness for learning. However, the acquisition of problem-solving skills should not be considered a mere function of general intelligence. Spivack et al. (1976) argue that problem-solving ability reflects more than intelligence as measured by standard IQ tests--it represents a culmination of interpersonal experience with problem situations that, for young children, often begins with early caretakers and role models for developmentally-appropriate behavior.

The distinction between problem-solving ability and intelligence is deemed important in light of the fact that the latter is under consideration as a protective

factor in the proposed study. In a series of investigations with samples of adults and children of various developmental levels, Spivack et al. (1976) have demonstrated the utility of their Interpersonal Cognitive Problem-Solving Skills ICPS) inventory in predicting social adjustment. Findings from these investigations reveal that: a) the dimensions comprising problem-solving ability are only slightly related to standard measures of IQ (e.g., Stanford Binet, Scholastic Aptitude Test, Peabody Picture Vocabulary Test, etc.), thus do not constitute a proxy for intelligence; b) problem-solving ability accounts for unique variance in psychosocial adjustment apart from that accounted for by measures of intelligence; and c) problem-solving ability differentiates healthy, adapted youth from those who are overly impulsive and overly inhibited.

Placing this information in the context of cumulative risk, it stands to reason that the possession of effective problem-solving skills offers youth protection from the day-to-day manifestations of a high-risk environment; a lack of these skills might leave high-risk youth vulnerable to problem behaviors. A variety of studies support this assertion. Comparing self-reported depression scores of adults under high- versus low-stress levels, Nezu and Ronan (1985) found minimal differences for those who possessed effective problem-solving abilities. In a longitudinal investigation of kindergarten children, Dodge, Bates, and Pettit (1990) found that at-risk children (those who were maltreated by caretakers at an early age) developed biased and deficient patterns of processing social information including lack of attendance to relevant social cues, a bias to attribute hostile intentions to others, and a lack of competent behavioral

strategies to solve interpersonal problems. These children, as compared to non-maltreated youth, displayed considerably higher rates of teacher-, peer-, and observer-rated aggression.

Dubow and Tisak (1989) discovered that problem-solving skills interacted with stressful life events to predict concurrent parent- and teacher-rated global problem behaviors in a sample of elementary youth. Among highly stressed youth, those who scored higher on problem-solving ability demonstrated significantly fewer problem behaviors than those who scored lower on this measure. The same finding, however, did not hold in a subsequent longitudinal investigation. When Time 1 problem-solving ability was used to predict change in problem behaviors over time, neither the main effect of problem-solving ability nor the interaction between problem-solving ability and stressful life events was significant (Dubow et al., 1991). Thus, the protective effect of cognitive problem ability was limited to the cross-sectional analysis. These researchers did nonetheless find a fairly robust main effect (i.e., compensatory effect) for Time 2 problem-solving ability on Time 2 problem behavior change scores.

Not all researchers have found moderating effects of social problem-solving skills. In a sample of elementary children that included children attending regular education classes (RE) and special education classes (SE), Quamma and Greenberg (1994) found a main effect for problem-solving skills on child-reported conduct problems across RE and SE groups of children. However, the interaction between problem-solving skill and stressful life events was not significant. The main effect accounted for a relatively small amount of variance in

this outcome measures (3% and 8%, in the RE and SE group, respectively). However, given the fact that problem-solving skill was assessed one year prior to all other variables, the researchers cautioned that developmental change in children's problem-solving competence might have been missed, potentially reducing the power of this variable to predict outcomes.

In summing this section, sufficient evidence has been gathered to support the possible protective role of problem-solving ability. This literature is relatively small. Consequently, little information is available to make differential predictions about its role in the development of externalizing problems versus internalizing problem behaviors. Problem-solving ability could contribute to these outcomes through separate processes (compensatory or protective). The reviewed studies favor the buffering hypothesis. In light of the reviewed findings, the following hypothesis is forwarded:

> *Hypothesis 5: Cognitive problem-solving ability will buffer the positive associations between cumulative risk and both youth externalizing and internalizing problem behaviors. These relationships will not be as strong for youth with higher problem-solving ability as they are for youth with lower problem-solving ability.*

Self-esteem. A growing body of literature attests to the importance of people's feelings of self-worth and perceived ability to deal with life's challenges in determining psychological well-being. Broadly defined, self-esteem is viewed as an individual's personal assessment of his or her self-worth (Harter, 1990).

Self-esteem in the adolescent years is of particular concern because of the unique developmental characteristics associated with this stage of life. Hallmark features associated with this developmental period include increased introspection, evaluation of self, preoccupation with how one is perceived by others, and more generally the formation of identity and self-concept (Harter, 1990; Rosenberg, 1989). Mastery at this stage is indicated by the successful integration of past, present, and future experiences to form a unified conception of self (Muuss, 1988; Thomas, 1996). Difficulty at this stage might occur when the individual lacks a coherent sense of his or her self-defining characteristics and foreseeable insight into the future. This internal struggle for individuation leaves youth vulnerable to a host of negative outcomes including anxiety, depression, aggression, and delinquent activity (Battle, 1987; Brage & Meredith, 1994; Dubow & Luster, 1990; Garber, Robinson, & Valentiner, 1997; Kliewer & Sandler, 1992)

Given these implications, it seems reasonable to suggest that positive self-esteem enhances the likelihood of successful adaptation in the midst of environmental risk. Indeed, narrative literature reviews on the stress-coping relationship often cite high self-esteem as a protective factor in the stress-adjustment relationship (e.g., Brooks, 1994; Compas, 1987; Hauser & Bowlds, 1990; Rutter, 1990). Although evidence to back this assertion is available, it would be a misstatement to claim that the protective function of self-esteem is firmly established in the literature. Like the previous child attributes considered here, research on the protective role of self-esteem lags far behind the study of

other protective factors, most notably external social support and positive family relationships. Further research in this area is warranted, particularly in the adolescent population.

Theory is available to speculate about the protective role of self-esteem. In an esteem-enhancement model of adjustment, Kaplan and colleagues (Kaplan, 1980; Kaplan, Robbins, & Martin, 1983) contend that humans are intrinsically motivated to guard, maintain, and enhance their feeling of self-worth. However, this need to preserve a positive mental posture might become frustrated by a history of unsatisfactory group-membership experiences in which "the subject cannot defend against, adapt to, or cope with circumstances having self-devaluing implications" (Kaplan et al., 1983, p. 231). Experiences such as ongoing life stress, poor peer relationships, parental neglect, and socioeconomic disadvantage have the potential to be internalized by youth to such a degree that positive self-esteem is eroded. Accordingly, the interaction between environmental risk and self-esteem assumes that the self-rejecting individual has sparse internal coping resources to manage the effects of these self-devaluing circumstances. Depression is one likely manifestation of this vulnerability as the individual has little to draw from that would enhance self-esteem. Delinquency is another possible outcome. According to Kaplan, unsatisfactory experiences in conventional society direct some youth to deviant peers and delinquent activity as a means for self-enhancement and approval. In contrast, youth who are able to maintain positive self-attitudes in spite of risk are protected from these negative outcomes.

Kaplan's viewpoint comports with Epstein (1973) who describes the individual with an adaptive view of self as one who possesses such general beliefs that he or she is a competent, worthwhile person, and who is able to assimilate threatening external events without experiencing undo negative arousal and disorganization. Pinpointing specific processes by which this assimilation might occur, Harter (1986) contends that youth with high self-esteem utilize developmentally advanced mechanisms for dealing with external threats to their self worth. These include *discounting* or minimizing the importance of events and *beneffectance* or perceiving self as selectively responsible for desired, but not undesired events.

Before reviewing empirical findings, it is important first to consider how self-esteem is operationally defined in the literature. Generally speaking, measurement approaches to self-esteem take three different forms. Quite commonly, self-esteem is operationalized as a unidimensional construct that captures global self-esteem (e.g., the degree to which the individual is satisfied with his or her life, feels he or she as a number of good qualities, feels useless, or has a positive attitude about self, etc.). Although global in the sense that it assesses the individual's general sense of self-respect and acceptance, this approach is specific in its content. A predominant figure in self-esteem research, Rosenberg (1989) has strongly advocated this approach.

Addressing the possibility that self-concept evaluations vary across different social contexts and roles, another often-used strategy is to assess self-esteem as a multidimensional construct by tapping domain-specific content

areas. Domains that are typically assessed include academic competence, social competence, and physical competence (Battle, 1987; Harter, 1982; Coopersmith, 1967). Harter is a strong supporter of this approach; yet she also sees the value in a global assessment of self-esteem and has built a measure similar to Rosenberg's (1989) into her measure.

The third approach is to combine items that assess domain-specific competence to form a total self-esteem score. This aggregate measure is considered to reflect the child's global self-esteem (e.g., The Coopersmith Self-Esteem Inventory; Coopersmith, 1967). However, based on studies that demonstrate that children make clear distinctions between theoretically-derived domains, this approach has been criticized (Harter, 1983; Wylie, 1989). For present purposes, consideration is given to a unidimensional measure of global self-esteem (the first approach). This focus is warranted given the reliability of this type of measure in predicting various indices of adjustment. Moreover, the broad measure of risk that is utilized in this study calls for a nonspecific measure of self-esteem that readily applies to youth facing various types of risk.

A review of the self-esteem literature reveals a clear preference among researchers to examine this variable with internalizing problem behavior, particularly depression. This focus on depression makes theoretical sense given the negative cognition associated with each; yet, it has limited the understanding of the relationship between self-esteem and externalizing problem behavior. Studies that are available focus on delinquency as their outcome. As a whole, this research suggests that the direct relationship between self-esteem and

delinquency is not straightforward. Consideration of the temporal sequencing of self-esteem and delinquency is important. As will be pointed out shortly, this holds implications for making predictions about the protective role of self-esteem in the risk-externalizing problem behavior relationship.

Cross-sectional analyses lend support to the protective role of self-esteem in the risk-externalizing problem behavior relationship. Cited earlier in this review, Dubow and Luster (1990) drew comparisons on antisocial behavior scores between two groups of at-risk youth who differed on their level of self-esteem (a high versus low group). (At-risk status was determined by identifying sampled youth who had at least one risk factor among measured poverty, large household size, low maternal education, low maternal self-esteem, urban residence, etc.) They found that youth with high self-esteem constituted a significantly smaller proportion of those with high antisocial scores than youth with lower levels of self-esteem. This study lends only tangential support to the protective role of self-esteem because the statistical interaction between risk status and self-esteem was not tested.

More direct support for the buffering effects of self-esteem is derived from two studies. In a sample of 6-9 year-old youth recruited from a large health maintenance organization, Weigel, Wertlieb, and Feldstein (1989) found that undesirable life events interacted with general perceived competence (but not cognitive, social, or physical competence) to predict broad-based adjustment (an aggregate measure of externalizing and internalizing problem behaviors). Findings from this study indicate that the interaction term was more strongly

related to the outcome measure than either the main effects for life events or general perceived competence. Interpretation of the significant interaction is limited, however, because the researchers did not plot the slopes of behavior problem on stressful events at different levels of self-esteem. Using similar independent and dependent measures, Kliewer and Sandler (1992) found that negative life events interacted with general self-esteem to predict global adjustment in a community sample of 8-16 year old youth. However, in this study the interaction was significant for girls only (a main effect for self-esteem was found for boys) and, furthermore, was qualified by a third variable--locus of control. Findings from this investigation, therefore, indicate that high self-esteem buffers high-risk females from adjustment problems but only when internal locus of control is high. In contrast, risk and self-esteem combine additively for male youth (a compensatory effect). Taken as a whole, these studies support the protective effect of self-esteem; yet, they are limited by their focus on broad-based adjustment. One cannot tell from these studies whether the protection function of self-esteem would hold if a pure measure of externalizing were used.

These findings are tempered by more sophisticated investigations employing causal modeling techniques for examining reciprocal and prospective relationships between self-esteem and delinquency (Bynner, O'Malley, & Bachman, 1981; Owens, 1994; Rosenberg, Schooler, Schoenbach, 1989). Designed to test Kaplan's esteem-enhancement model of adjustment, these studies highlight the complex association between self-esteem and delinquency. Recall that Kaplan's formulation supports the idea that individuals are protected

against self-devaluing circumstances by maintaining a high level of self-esteem. However, when unfavorable life circumstances deplete coping resources, the individual might arrive at self-rejecting attitudes. Motivated to enhance self-worth, youth ultimately restore feelings of self-worth brought on by environmental risk by seeking out deviant peers that offer acceptance and positive appraisal. Hence, although low self-esteem might promote delinquency (a negative association), delinquency itself might raise self-esteem (a positive relationship). This theoretical account raises two possibilities: reported self-esteem may be high among delinquent youth and self-esteem may serve as a vulnerability factor rather than a protective factor for this particular group of individuals.

Providing varying levels of support for Kaplan's notion, Owens (1994) and Rosenberg et al. (1989) demonstrated that the relationship between self-esteem and delinquency flows primarily from the former to the latter when concurrent measures of each are considered; however, findings from both studies revealed a weak positive association between delinquent behavior and self-esteem. Using two waves of data from a panel study of youth making the transition to high school, these researchers constructed similar analytic models that posited reciprocal pathways between self-esteem and delinquency. (Owens' investigation was designed to replicate the findings of Rosenberg et al., 1989. Unlike Rosenberg, who conceptualized self-esteem as a unidimensional construct, Owens disaggregated Rosenberg's measure into two dimensions--positive self-attributes and self-deprecation.) With statistical controls for Time 1 self-esteem and delinquency, both studies demonstrated that low self-esteem at Time 2

predicts delinquency at Time 2. In Owen's (1994) study, a slight trend indicating delinquency's "beneficial" influence on self-esteem was detected as evidenced by the negative pathway from delinquency to self-deprecation and the positive pathway from delinquency to positive self-worth; however, neither of these pathways were statistically significant. Rosenberg et al. (1989), on the other hand, found that the pathway from delinquency to self-esteem was positive and marginally significant, suggesting weak support for the enhancement theory. (Subsequent analysis revealed that the marginal effect was due to bidirectional effects for low SES youth only.)

An even more complicated picture arises when these variables are assessed over longer periods of time. Using the same sample of youth and similar measures, Bynner et al. (1981) expanded these studies by including a third wave of data. They found a negative association between Time 1 self-esteem and Time 2 delinquency but a positive association between Time 2 delinquency and Time 3 self-esteem. Upon entering high school, youth with low levels of self-esteem who subsequently engaged in delinquent behavior were seemingly able to enhance their self-esteem through the recognition and positive appraisals by deviant peers.

In light of this information, one is faced with the possibility that a compensatory or protective effect of self-esteem may mask itself under a prevalence of reported high self-esteem among youth with an early history of delinquency. Given additional evidence that aggressive youth bear a tendency to represent themselves in an idealized manner and inflate self-rated competence

relative to ratings made by other reporters, this consideration is taken seriously (Hughes, Cavell, & Grossman, 1997; Patterson, Kupersmidt, & Griesler, 1990). It will be dealt with in two ways. By controlling for earlier level of delinquency, the effect of self-esteem on average change in delinquency from Time 1 to Time 2 is assessed. To address the possibility that the moderating role of self-esteem in the risk-externalizing problem behavior is a function of early externalizing status, a three-way interaction term will be tested in light of a significant interaction between risk and self-esteem (i.e., risk x self-esteem x Time 1 externalizing status). Based on the findings presented in this section, the following hypothesis is forwarded:

Hypothesis 6: Self-esteem will buffer the positive association between cumulative risk and externalizing problem behavior. This association will not be as strong for youth with higher levels of self-esteem.

Relative to externalizing problem behavior, the association between low self-esteem and internalizing problem is firmly established. This review is limited to studies that focus on depression given the preponderance of studies that consider this outcome measure and its centrality in the present study. Across samples of adults and children, research indicates that the strength of the association between general self-esteem and depression is moderate to high, with correlations ranging from -.36 to -.76 (Andrews & Brown, 1993; Battle, 1987; Fernandez, Mutran, & Reitze, 1998; Garber et al., 1997; Lakey, 1988; McGee, Anderson, Williams, & Silva, 1986; Orme, Reis, & Herz, 1986; Robertson &

Simons, 1989). Generally speaking, most correlations fall in the moderate range. This applies to studies relying on self-report measures of self-esteem as well as those using observer ratings of self-esteem obtained through semi-structured interviews (see as an example Andrews & Brown, 1993).

The variance these constructs share raises the possibility that self-esteem may actually constitute an early symptom of depression rather than a true causal variable. Evidence from several lines of research suggests that this is not the case. Factor analytic studies have demonstrated discriminant validity between commonly used measures of depression and self-esteem. For example, Orme et al. (1986) factor analyzed items from the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977)--an index of adult depression--with items from Rosenberg's Self-Esteem Scale (RES; Rosenberg, 1989). Correlations of CES-D items with the total self-esteem scale ranged from .06 to .68. Fourteen of the twenty CESD-D items had correlations below .40. Seven of these were below .30. These authors concluded that the CES-D achieved satisfactory discriminant validity.

Investigations employing causal modeling techniques for estimating the reciprocal effects of youth self-esteem and depression have demonstrated that the concurrent relationship between these constructs is best captured with a birdirectional model (Owens, 1994; Rosenberg et al., 1989). Findings from these studies suggest that self-esteem and depression mutually influence each other in the adolescent population and do so to a similar degree. For instance, in the Owens (1994) study the pathway coefficient from global self-esteem to

depression was -.23; the pathway coefficient from depression to global self esteem was -.27.

Finally, direct effects of self-esteem on depression have been found in causal models designed to test the intervening effect of the former in the relationship between various risk factors (e.g., low parental support, parental behavioral and psychological control, difficulties in school, etc.) and youth depression (Garber et al., 1997; Robertson & Simons, 1989; Simons & Miller, 1987). Simons and Miller, however, found that the relationship between Time 1 self-esteem and Time 2 depression was not significant after statistically controlling for Time 1 depression. Thus, it may be that the relationship between self-esteem and depression weakens over time. (In the present study, the correlation between concurrent measures of these constructs was -.57; the correlation between Time 1 self-esteem and time 2 depression was -.33.) Whisman and Kwon (1993) report a similar attenuation in their study of undergraduate students. Unlike Simons and Miller (1987), however, they found a statistically significant main effect for Time 1 self-esteem on Time 2 depression.

In sum, it appears that self-esteem is conceptually distinct from depression and is useful in models that posit causal pathways to depression. Self-esteem is a reliable and robust predictor of concurrent depression; however, its association to later depression seems attenuated. Although evidence suggests that self-esteem bears a weaker and less reliable relationship to later depression, this assertion is based on a handful of studies. More research is needed before making definitive conclusions about this relationship.

Contrary to direct effects, much less is known about the moderating role of self-esteem in the risk-youth internalizing problem behavior relationship. However, studies from the adult risk literature lend modest support for the buffering hypothesis. As part of a series of investigations designed to test how self-esteem confers vulnerability to the onset of major depression in adult women, Miller, Kreitman, Ingham, and Sashidharan (1989) tested for main effects of prior self-esteem (as measured by select items from Rosenberg's scale) and stressful life events on subsequent depression as well as an interaction between self-esteem and total life stress. In this study, three mutually exclusive categories of stressful life events were used: uncertain stress (outcome of stress was difficult to determine), impaired relationships, and multifaceted stress (stress involving at least two of the following characteristics--personal loss, victimization, important decision-making, or feelings of hopelessness). A composite index derived from these life stress categories also was used to assess total life stress. Findings from a series of regression analyses suggested that the best-fitting model for predicting major depression onset involved an interaction between total life stress and self-esteem (the main effect for self-esteem was not significant when entered at any point in the equation). Interpretation of this finding indicated that the combination of low self-esteem and high total stress was the most potent predictor of major depression. Although no attempt was made to statistically control for early levels of clinical symptoms, these researchers reanalyzed their data after removing a substantial number of

participants who had previously consultation with a psychiatrist. The interaction between life events and self-esteem became stronger.

Reporting results from another series of well-designed investigations, Andrews and Brown (1993) pulled together findings from several of their studies in drawing the conclusion that prior low self-esteem exacerbates the risk of subsequent major depression in female adults when coupled with threatening life events. They reported a fourfold increase in the risk of depression onset among women with low self-esteem and a provoking crisis in their life compared with an absence of an effect of self-esteem in earlier investigations that did not take life stress into account. Although generally supportive of the buffering effect of self-esteem, this study and the Miller et al. study (1989) are limited by their generalizablility to the adult female population.

And finally, Fernandez et al. (1998) found that early-reported self-esteem interacted with work-related stresses to predict depression in a sample of older-aged working adults. Adults with high levels of work-related stress evidenced significantly lower levels of depression when self-esteem was high. A problem with this study, however, is that stressful life events were assessed only at Time 2; thus, Time 1 self-esteem was used as a moderator in the relationship between Time 2 stress and depression. This neglects the possibility that self-esteem could have changed from Time 1 to Time 2.

Contradicting the findings generated by these studies, Lakey (1988) found no evidence of a significant main effect for prior self-esteem on later depression or an interaction between self-esteem and stressful life events in a sample of

undergraduate students. In addition to self-esteem, this study considered the moderating effects of personal control beliefs and cognitive problem-solving skills, which resulted in an analytic model with several main effect tests and interaction tests. Given the ratio between sample size (N = 99) and number of variables included for analysis (12), this study might have lacked statistical power to detect a relationship for self-esteem. Or, as addressed previously, the lack of findings might indicate a weak association between Time 1 self-esteem and later depression. Given the high correlation between concurrent self-esteem and depression (-.61) and the brief interval between data collections (2 1/2 months), this latter possibility does not seem likely. It could be the case that self-esteem overlapped with control beliefs and/or problem-solving ability in the prediction of depression.

Turning to the adolescent risk literature, Kaplan et al. (1983) revealed that environmental risk (measured with a life events inventory) interacted with early self-esteem to predict depression ten years later in a large sample of 7th grade students. In this study, three dimensions of stressful life events were used to create an equal number of interaction terms with the global measure of self-esteem: a summative scale assessing the number of "bad" events, a summative scale assessing the number of events that caused a change in routine, and a summative scale of the number of events that created a new demand that the individual could not meet. The standardized regression coefficient for each of these interaction terms was significant, although weakly associated with

depression. Given the long interval between the assessment of self-esteem and depression (10 years), these findings are noteworthy.

Cited earlier as support for the moderating effect of self-esteem in the risk-externalizing problem behavior relationship, Kliewer and Sandler (1992) and Weigel et al. (1989) both found that self-esteem served a buffering function. Recall that these studies utilized global measures of adjustment (aggregate measures of externalizing and internalizing problem behavior). The former's measure, however, was more heavily weighted with items assessing depression and anxiety. Additionally, this study found that the buffering effect was significant for females only; a compensatory effect was found for boys.

In sum, the compensatory effect of self-esteem on depression is well-established in the literature. This relationship is strong; however, research suggests that the concurrent association between these variables is stronger than the prospective association. In addition, several studies have found that self-esteem exerts a protective influence, particularly against depression. Based on these findings, the following hypothesis is forwarded:

Hypothesis 7: Self-esteem will buffer the positive association between cumulative risk and internalizing problem behavior. This association will not be as strong for youth with higher levels of self-esteem as it is for youth with lower levels of self-esteem.

There is some indication that the ameliorative function of self-esteem is limited to females. However, given the few studies that have considered gender differences in this context, no specific hypothesis is made with respect to this

variable. To address this possibility, the interaction between cumulative risk and self-esteem will be furthered conditionalized by gender to assess the latter's role in this relationship.

Objectives of Study

In sum, the primary focus of this study is to examine the relationship between cumulative risk and youth problem behaviors with special attention given to the role of child attributes in modifying this relationship. Risk from four general socialization domains is considered. These include risk stemming from family demography, the family and parenting environment, peer relationships, and the neighborhood environment. This study addresses the following questions:

1) Is there a relationship between cumulative risk and youth problem behaviors in a national sample of youth? If so, what is the nature of this relationship (i.e., linear or curvilinear)? Does this relationship differ by age, gender, and ethnicity of child? Is this relationship stable over time?
2) Does cumulative risk differentially predict youth externalizing and internalizing problem behavior? In effect, is the relationship between cumulative risk and youth problem behaviors stronger for externalizing or internalizing problem behavior?
3) Do positive attributes of the child (e.g., IQ, problem-solving ability, and self-esteem) modify the relationship between cumulative risk and youth problem behaviors? If so, by what means--a compensatory influence or

protective influence? Do age, gender, and ethnicity alter these relationships? Are significant relationships stable over time?

This study focuses on the developmental stages of early and middle adolescence. Such emphasis allows for the examination of risk conditions across a group of youth making the transition to high school as well as those that have already made this transition but may be adjusting to changes in the school environment, daily routines, and their peer groups. Issues of self-esteem, social comparisons, and peer pressure begin to peak during these years. Self-derogating feelings coupled with risk stemming from the home, school, and/or neighborhood environment may steer youth in the direction of deviant peers or, alternatively, leave one prone to depression.

The study strengthens the extant literature on cumulative risk in four ways. First, the relationship between cumulative risk and youth problem behaviors is examined using a large, nationally representative sample of adolescent youth. Extant literature is limited by an overreliance on clinical and convenience samples. Second, to the author's knowledge, no one has addressed whether cumulative risk shows specificity with respect to the outcomes it predicts. This information has practical implications for professionals working with high-risk youth. Third, risk indicators from a wider array of social domains are considered including underrepresented contexts such as peer and neighborhood. And finally, the role of child attributes in modifying the relationship between cumulative risk and youth problems is assessed in greater detail than past investigations. Based on theoretically-derived models of stress resistance

mechanisms, specific attention is devoted to the means by which several child attributes exert their influence in the risk-adjustment relationship. Important qualifying factors emerged from this review of the literature. These have been taken into account when drawing hypothesis about the relationships among cumulative risk, child attributes, and youth problem behaviors.

CHAPTER II

METHODOLOGY

Data

This study made use of public-use release data from the National Longitudinal Study of Adolescent Health (Add Health), Waves I and II (Udry, 1998). The Add Health was designed to assess how various social contexts influence the health and psychosocial adjustment of a nationally representative sample of 7th-12th grade youth. Designed as a multistage clustered sample, the primary sampling frame included all high schools in the United States that had an 11th grade and at least 30 enrollees in the school. From this a random sample of 80 high schools was selected proportional to enrollment size, stratified by region, urbanicity, school type, and ethnicity. For each high school, the largest feeder school (typically a middle school) also was recruited when available. Overall, 79% of the schools contacted agreed to participate, for a final sample of 134 schools. The public-use data contains information on 6,504 adolescents for the first wave of data and 4,834 adolescents for the second wave of data (Kelley & Peterson, 1997). It includes a special over-sample for African-American youth from well-educated families.

For this study, a subsample was drawn from the larger pool of participants included in Wave 1 public-use data (n = 4173). To capitalize on developmental processes from early to middle adolescence, only youth from the 7th-10th grade levels were included. Given the focus on environmental risk, youth with disabling physical and mental conditions were excluded from this analysis. As a group,

disabled youths' social experiences may differ from nondisabled youth, particularly in the peer context.

Data were analyzed with provided population weights to ensure a sample that is representative of the U.S. population of nondisabled 7th-10th grade youth. This approach corrects for over-sampling of particular subpopulations by mathematically adjusting subgroup proportions in accordance with national population estimates. Some researchers have articulated concern about the use of sampling weights in model testing because they may produce biased coefficients and estimates of standard errors (DuMouchel & Duncan, 1983; Winship & Radbill, 1994). According to these researchers, the source of this bias is the use of common statistical software packages that rely on an incorrect formula to estimate this information. These programs are based on the assumption that error terms in the model are independent across observations and distributed with equal variance in the population--the condition of homoscedasticity. Weighted data, however, introduces heteroscedasticity (i.e., unequal error variances across observations) because error variance is calculated using the individual's assigned weighting value. To address this issue, a survey software program was used that makes necessary adjustments for design effects associated with differential case weighting. (See Analytic Procedures for more details on the handling of design effects.)

The weighted subsample was diverse in terms of youth gender (51% male, 49% female), grade level (26% 7th graders, 24% 8th graders , 26% 9th graders , 24% 10th graders), and racial makeup (65% non-Hispanic White, 14.8%

non-Hispanic Black, 12.9% Hispanic, 4% American Indian, 3.3% Asian). For 90% of the subsampled adolescents, a parent (in most instances a mother) also completed an in-home interview in the first year of the study. These reports indicate that 16% of parents had not graduated from high school; 32.3% had either a high school degree, completed a GED, or attended a vocational school instead of high school; 10.4% had vocational training beyond high school; 31.2% had some college education or a college degree; and 8% had professional training beyond college. Median age of the parents was 40 years old. Approximately 70% of parents were married; 6.2% were single, never married; 19% were either divorced or separated; and 3% were widowed. Approximately ten percent of parents reported receipt of public assistance, 8.2% reported receipt of AFDC, 13.8% reported receipt of food stamps, and 3.5% reported receipt of a housing subsidy.

The subject attrition rate between waves of data collection was 12.5%, falling within a range similar to other longitudinal studies (Dubow et al. 1991). The number of Time 2 cases was 3,650, reflecting a loss of 523 participants. In terms of demographic makeup, the Time 2 subsample is highly similar to the Time 1 subsample on both youth and parent characteristics. Breakdown of youth gender, grade level, and race is as follows: 51% male, 49% female; 26% 7th graders, 24% 8th graders, 26% ninth graders, and 24% 10th graders; 65.2% non-Hispanic white, 14.2% non-Hispanic black, 4.1% American Indian, 3.2% Asian, and 13.2% Hispanic origin. Of those youth that were missing Time 2 data, 92% had Time 1 parent data, a figure that is slightly higher than the Time 1 sample.

The demographic breakdown of parental education is as follows: 15.3% had not graduated from high school; 32.1% had either a high school degree, completed a GED, or attended a vocational school instead of high school; 10,4% had vocational training beyond high school; 32% had some college education or a college degree; and 8.2% had professional training beyond college. In terms of marital status, 70.5% of parents were married; 6.2% were single, never married; 18.8% were either divorced or separated; and 2.9% were widowed. Percentages for the various poverty indicators were essentially the same from Time 1 to Time 2.

Comparisons were drawn between youth with complete data and those who were missing Time 2 data to locate possible sources of bias. Identical comparisons were drawn also between youth with complete data and those who were missing parent-report data (approximately 10%). In terms of the effects of subject attrition, the subsample that participated in both waves of the study were more likely to be Caucasian youth {χ^2 = 38.93 (p = .000)}, children with married parents {χ^2 = 7.25 (p = .007)}, and children of parents with higher education {χ^2 = 5.927 (p = .02)}. With respect to the effects of parent missing data, youth whose parents took part in the study were more likely to be Caucasian youth {χ^2 = 58.19 (p = .000)} and living with married parents {χ^2 = 7.54 (p = .006)}. Adolescents who had data for both waves of the study were not significantly different on measures of externalizing problem behavior, internalizing problem behavior, nor cumulative risk from those who participated only in the first wave. Adolescents

whose parents participated in the study were significantly lower on the measure of externalizing problem behavior ($F = 3.996$, $p < .05$) and significantly higher on cumulative risk (28.44, $p < .000$) than youth whose parents did not participate. Although some bias is evident, it does not seem to be substantial. The fact that the subsample who participated in both waves of the study was generally better adjusted than the subsample who participated only in the first wave is consistent with other large-scale longitudinal studies (Dubow et al., 1991; Lefkowitz, Eron, Walder, & Huesmann, 1977).

Measurement

Included in Table 1 are descriptions of variables comprising the cumulative risk index and the risk cutoff point for each measure. Reliability information on all scales comprising this study is presented in Table 2 (unweighted sample) and Table 3 (weighted sample). For comparative purposes, this information is broken down by youth gender, grade level, and racial status.

The *cumulative risk* index was computed by aggregating risk variables from the four social contexts of interest. Measurement properties of each variable are described below under respective headings. Each risk factor was dichotomously coded so that "0" reflects an absence of the risk factor and "1" reflects the presence of the risk factor. Unless noted otherwise, the criterion for risk status on continuous measures is a score that falls at or above the 75th percentile. This cutoff point is consistent with the strategy used by Sameroff et al. (1998). For nominal variables, classifications consistent with empirical literature were used to determine youth risk status. The number of risk factors was tallied

Table 1
Coding Scheme for Cumulative Risk Index

Risk Variables	Reporter	No. of Items (Reliability Coefficient)	Select Descriptors of Variables	Risk Criterion[a]
Family Demographic				
Poverty status	Parent	4	Parent or member of household received any of the following sources of government support in the past month: public assistance such as welfare, AFCD, food stamps, a housing subsidy or public housing	A response of "yes" to any of the four items.
Parental education	Parent	1	Parent's educational attainment	Parent response of "8th grade or less", "more than 8th grade, but did not graduate from high school" or "never went to school".
Marital status	Parent	1	Parent's current marital status	Single (never married), divorced, or separated.
Household size	Youth	1	Constructed variable using household roster variables	Four or more children in the household.
Family Process				
Marital functioning	Parent	2 (r = .43)[c]	Parent's rating of their relationship with current spouse/partner on a scale from 1 to 10, where 1 equals completely happy and 10 equals completely unhappy[b] Parent fights or argues with current spouse/partner on a 4-point scale ranging from "not at all" to "a lot"[b]	Youth whose parents scored at or above the 75% percentile on the two aggregated and standardized items
Parental warmth/ connectedness	Youth	8 (α = .82)	Closeness to mother (father); perceived caring by mother (father); feeling attended to, loved and wanted, and understood by family members on a 5-point response format ranging from "very much" to "not at all".	Youth scoring at or above the 75th percentile
Parental involvement	Youth	18 (α = .71)	Number of different activities engaged in with mother and father in past four weeks (averaged across parents)	Youth scoring at or below the 25th percentile

Table 1 (continued)

Risk Variables	Reporter	No. of Items (Reliability Coefficient)	Select Descriptors of Variables	Risk Criterion[a]
Peer Context				
Peer support	Youth	3 (α = .61)	Feel friends care for you[b] (5-point scale ranging from "very much" to "not at all"), feel close to people at school, and feel socially accepted (latter two items are on a 5 -point scale ranging from "strongly agree" to "strongly disagree")	Youth scoring at or above the 75th percentile on the three aggregated and standardized items
Peer troubles	Youth	1	Had trouble getting along with other students on a 5-point scale ranging from "never" to "everyday"	Youth scoring at or above the 75th percentile
Neighborhood Context				
Neighborhood quality	Census	6 (α = .74)	Risk conditions: (a) modal race is Black; (b) proportion Hispanic; (c) modal marital status is never married; (d) high proportion of persons under poverty line; (e) modal educational attainment of individual's aged 25 and over is no high school; (f) high unemployment rate (summed)	Youth scoring at or above the 75th percentile
Neighborhood problems	Parent	2 (r = .46)[c]	Neighborhood problems with (a) trash and litter on the streets and sidewalks and (b) drug dealers and users in the neighborhood on a 3-point scale ranging from "no problem at all" (1) to "a big problem" (3)	Youth whose parents scored at or above the 75th percentile
Neighborhood satisfaction	Youth	2 (r = .46)[c]	Happy living in neighborhood on a 5-point scale ranging from "very much" to "not at all"[b] ; happy or unhappy to move to some other neighborhood on a 5-point scale ranging from "very unhappy" to " very happy"	Youth scoring at or above the 75th percentile on the two aggregated and standardized items
Neighborhood safety	Youth	1	Feel safe in this neighborhood (yes/no format)	Youth response of "no"

[a] Youth meeting the respective risk criterion are coded "1"; all others are coded "0". The number of present risk factors is tallied for each child, yielding an overall cumulative risk score.
[b] Variable is reversed coded.
[c] Pearson correlation coefficient was used to assess reliability of 2-item measures where appropriate.

Table 2
Reliabilities for Total Sample and by Youth Gender, Grade Level, and Race (Unweighted Sample)

Variable	No. of Items	Alpha							
		Total	Gender		Grade		Race		
			Male	Female	7th-8th	9th-10th	White	Black	Other
Outcome Measures									
T1 Externalizing behavior	14	.83	.85	.79	.82	.83	.82	.83	.83
T1 Internalizing behavior	19	.86	.83	.88	.85	.87	.86	.85	.86
T2 Externalizing behavior[a]	14	.82	.85	.79	.82	.82	.81	.82	.84
T2 Internalizing behavior[a]	19	.87	.84	.88	.86	.88	.87	.84	.87
Risk Factors									
Marital functioning	2[b]	.40	.42	.38	.38	.43	.43	.32	.39
Parental warmth	8	.83	.81	.84	.82	.82	.84	.79	.82
Parental involvement	18	.71	.72	.71	.73	.71	.71	.74	.72
Peer support	3	.50	.49	.48	.49	.46	.53	.38	.47
Neighborhood quality	8	.74	.74	.73	.75	.73	.62	.72	.68
Neighborhood problems	2[b]	.46	.46	.45	.47	.44	.38	.54	.49
Neighborhood satisfaction	2[b]	.47	.45	.48	.46	.47	.48	.46	.42
Youth Attributes									
Cognitive problem-solving	4	.73	.73	.74	.75	.72	.73	.73	.73
Self-esteem	4	.79	.77	.80	.79	.78	.80	.72	.80

Note. Unweighted n for total sample is 4173.
[a]Unweighted n = 3650
[b]Pearson correlation coefficient was used to assess 2-item measures where appropriate.

Table 3
Reliabilities for Total Sample and by Youth Gender, Grade Level, and Race (Weighted Sample)

Variable	No. of Items	Alpha							
		Total	Gender		Grade		Race		
			Male	Female	7th-8th	9th-10th	White	Black	Other
Outcome Measures									
T1 Externalizing behavior	14	.83	.85	.79	.83	.83	.83	.84	.83
T1 Internalizing behavior	19	.86	.82	.88	.85	.87	.86	.85	.85
T2 Externalizing behavior[a]	14	.82	.84	.78	.82	.82	.80	.83	.84
T2 Internalizing behavior[a]	19	.87	.85	.78	.82	.82	.80	.83	.84
Risk Factors									
Marital functioning	2[b]	.43	.44	.41	.41	.45	.44	.38	.40
Parental warmth	8	.82	.81	.84	.82	.82	.83	.77	.81
Parental involvement	9	.71	.72	.71	.72	.71	.71	.75	.72
Peer support	3	.47	.49	.47	.50	.44	.51	.35	.46
Neighborhood quality	8	.73	.74	.72	.74	.72	.60	.71	.67
Neighborhood problems	2[b]	.46	.46	.45	.48	.43	.39	.56	.49
Neighborhood satisfaction	2[b]	.46	.44	.48	.45	.47	.47	.48	.40
Youth Attributes									
Cognitive problem-solving	4	.75	.74	.75	.76	.73	.74	.75	.76
Self-esteem	4	.79	.76	.80	.79	.78	.80	.71	.80

Note. Weighted n for total sample is 14,589,539
[a]Weighted n = 14, 517,306
[b]Pearson correlation coefficient was used to assess 2-item measures where appropriate.

for each child, yielding an overall cumulative risk score. Scores ranged from zero to 11. Because of extremely low frequencies, youth with values of 10 and 11 were combined with youth having nine risk factors.

To determine whether each of the risk factors was indeed an environmental risk condition, Time 1 externalizing and internalizing scores for the low-risk and high-risk groups were compared for each risk factor separately. Sameroff and colleagues (Sameroff & Seifer, 1995) used a similar approach. For all risk factors the high-risk group had higher mean values on both outcome measures. Differences for externalizing problem behavior generally ranged from one-fourth to one-third of a standard deviation. Differences for internalizing problem behavior were more pronounced, generally ranging between one-third to over one-half of a standard deviation.

Family demographic variables. Poverty status was assessed using four parent-report items asking whether she or he received public assistance, ADFC, food stamps, or a housing subsidy (yes/no format). Youth with parents who responded positively to any of these items were deemed at risk and received a score of "1". *Parental education* was assessed with one item asking the parent how far he or she went in school. Youth with parents who reported receiving less than 12 years of formal education were considered at risk. This variable was dichotomized by coding responses of 8th grade or less, more than 8th grade, but did not graduate from high school, and never went to school as "1" and all others as "0". *Parent's marital status* was assessed with a one-item measure. Youth residing with a divorced, separated, or single/never married parent were

considered at risk, thus coded a "1". A measure of *household size* (i.e., overcrowding) was constructed using several youth-report items from household roster variables. These items ask youth to identify his or her relationship to every member of the household, thus they served as a means for obtaining the number of children or siblings in the household. In line with other studies (e.g., Dubow & Luster, 1990; Siefer et al., 1992), four or more children constituted the cut-off point for risk. Accordingly, families with fewer than four children were coded "0"; families with four or more children were coded "1".

Family process variables. Marital functioning was assessed using two parent-report items. The first item asked parents to rate their relationship with their current spouse or partner on a scale of 1 to 10, where 1 equals completely happy and 10 equals completely unhappy. The second item assessed the frequency with which the respondent fights with current spouse. The 4-point Likert scale ranges from a lot (1) to not at all (4). This item was reversed coded so that high values reflect more fighting. The two items were standardized and averaged (r = .43, p < .000). A score at or above the 75th percentile constituted risk status. Youth whose parents fell within this range were assigned a value of "1".

The amount of missing data on this variable is substantial due to the fact that 10% of parents did not participate in this study and the fact that an additional 25% of responding parents were not married at the time of data collection or did not have a partner. Following the approach taken by Deater-Deckard et al. (1998), unmarried parents were coded "0". The remaining 10% of missing cases

were treated using the imputation procedure outlined in the Methods section under the subheading Analytic Procedures.

Moving to parenting variables, *parental warmth* was measured using eight items that assessed the extent to which youth feel close to each parent, cared for, attended to, loved, understood, and connected to the family. The 5-point Likert scale responses were coded so that higher values reflect lower parental warmth. Items were aggregated using the mean value. Cronbach's alpha is .82. Youth scoring at or above the 75th percentile were considered at risk and assigned a value of "1". *Parental involvement* was measured using nine items that assessed residential parent-adolescent participation in activities during the previous four weeks (e.g., shopping, attending religious services, working on a school project, playing a sport together). Identical questions were asked about mother and father involvement. Youth received a score of "1" for each activity that was marked positively (yes/no format). Items were averaged across responses for both mothers and fathers. Conceptually, this approach recognizes the importance of each parent's involvement with the child and accurately represents the parental environment of varying family structures in this study (Gerard & Buehler, 1999a). From a methodological standpoint, this remedies the high amount of missing data stemming from families where no residential father is present (30%). Cronbach's alpha for this measure is .71. Youth scoring at or below the 25th percentile were considered at risk and assigned a value of "1". A measure of *parental monitoring* was created using three items assessing how often youth's residential mother and father are at home when he or she leaves for

school, returns from school, and at bedtime. Identical items were asked to assess both maternal and paternal monitoring. For the items asking how often parents are home when the youth leaves for and returns from school, the 6-point response format ranges from always (1) to never (5) with an additional response option of she/he takes me to school (6; first item) and she/he brings me home from school (6; second item). Responses of "6" were merged with responses of "1" ("always") given that the parent is readily available in the respective context. The item that asks how often parents are home when at youths' bedtime is assessed on a 5-point scale ranging from always (1) to never (5). Responses to these six items were combined to form a parental monitoring index. Reliability of this measure was unacceptably low (α = .31); therefore, it was not included in the cumulative risk index.

Peer context. Perceived peer support was assessed using three items that measure the extent to which youth feel socially accepted, feel close to people at school, and feel cared for by friends. The 5-point response format for these items range from strongly agree (1) to strongly disagree (5). Items were aggregated using the mean value. Cronbach's alpha for this scale is .61. A one-item global measure was used to assess *peer rejection* or in essence trouble in the peer domain. This item assessed the degree to which youth have difficulty getting along with other students. The 5-point response format ranges from never (1) to everyday (5). For both peer measures, youth scoring at or above the 75th percentile were considered at risk and assigned a value of "1".

Neighborhood context. One objective measure and two subjective measures of neighborhood risk were initially conceptualized for this study--neighborhood quality (Census data), neighborhood problems (parent report), and neighborhood satisfaction (youth report). This approach follows the recommendation of Huston, McLoyd, and Coll (1994) who have suggested the need for subjective measures of poverty and economic hardship in addition to objective measures as a way to understand the meaning of environment to children and families.

In order to assess discriminative validity, the correlation structure of the neighborhood context variables was examined through factor analysis before creation of the neighborhood measures (described in more detail below). Using maximum likelihood extraction with oblimin rotation, a three-factor solution was specified reflecting the constructs of interest. Overall, results of this analysis were consistent with stated theory. Three distinct factors were supported as evidenced by consistently high loadings across items (.40 or above) and minimal cross loading. (See Appendix for factor structure of items.) However, based on factor analytic results the following modifications were made. First, two Census tract items representing neighborhood quality were omitted because of low loadings across factors. These items assessed the proportion of children under five years old in the neighborhood and the sex composition of the neighborhood. Second, although conceptualized as a measure of youth neighborhood satisfaction, an item assessing whether or not youth feel safe in their neighborhood failed to load at an acceptable criterion with the other two youth-report items assessing this

construct. Nor did it load on the either two factors. Given this finding, the item was not included in the neighborhood satisfaction scale. However, the neighborhood safety item was retained for analysis as a one-item measure given its theoretical importance as a risk to youth (Burton et al.,1997; Hyson & Bollin, 1990).

Six items that measure various demographic characteristics of youths' neighborhood were used to assess *neighborhood quality*. These items are derived from Census tract data and represent block group characteristics. The block group is a "U.S. Bureau of the Census defined geographic area, which in 1990, averaged 452 housing units, 1,100 people. It is the lowest level of geography for which the Census Bureau publishes sample data" (Billy, Wenzlow, & Grady, 1998). As such, it assesses the smallest accessible contextual qualities of the areas in which youth live. Risk items include the following neighborhood characteristics: (a) modal race is Black; (b) high proportion Hispanic; (c) modal marital status is never married; (d) high proportion of persons under poverty line; (e) modal educational attainment of individual's aged 25 or over is no high school degree or equivalency; and (f) high unemployment rate. Youth residing in neighborhoods with any of these conditions were coded "1". A neighborhood quality score was derived by summing values across the six items. Cronbach's alpha for this measure is .74. Youth whose scores placed them at or above the 75th percentile were considered at risk and assigned a value of "1".

Turning to subjective measures, *neighborhood problems* were measured with 2 parent-report items that assessed problems with trash and litter on the

streets and sidewalks and problems with drug dealers and users in the neighborhood (r = .46, p = .000). The 3-point response format for both items ranges from no problem at all (1) to a big problem (3). Youth whose parents fell at or above the 75th percentile were considered at risk. *Neighborhood satisfaction* was measured using two youth report items that assess on a 5-point scale how happy the respondent is with his or her neighborhood and how happy or unhappy he or she would be if the family were to move. Items were coded respectively so that higher values reflect greater unhappiness living in the neighborhood and greater happiness with moving to a new neighborhood. The two items were aggregated using their mean value (r = .46, $p \leq .001$). Youth scoring at or above the 75th percentile were considered at risk and coded a "1. *Neighborhood safety* was assessed with one youth report item that asked the respondent whether he or she felt safe in his or her neighborhood (yes/no response format). Youth responding negatively on this item were considered at risk and assigned a value of "1".

Youth attributes. Intelligence was assessed using youth scores on the Add Health Picture Vocabulary Test (AHPVT), a computerized abridged version of the Peabody Picture Vocabulary Test-Revised (PPVT-R). The PPVT-R is a measure of receptive vocabulary that requires the respondent to indicate among a selection of four pictures the one that best illustrates a word presented by the interviewer. Presented words are ranked according to increasing difficulty with word order initially determined through latent trait analysis--an analytic procedure that made it possible to construct a growth curve for the latent trait receptive

vocabulary and to select items that fit this growth pattern (Miller & Lee, 1993). From a psychometric standpoint, the PPVT-R has demonstrated evidence of internal consistency, alternate-form reliability, and retest reliability (McCallum, 1985). Further, McCallum noted that the PPVT-R has been found to correlate with other established measures of intelligence including the Wechsler Full Scale IQ and Stanford-Binet IQ, with coefficients generally ranging from .40 to .60. This measure has been used in several studies of psychosocial risk as a means to capture youth's verbal intelligence (e.g., Brooks-Gunn et al, 1997; Dubow & Luster, 1990; Easterbrooks et al., 1993). Scores are standardized by age to account for developmental differences in the acquisition of language. *Cognitive problem-solving ability* was measured using 4 items that assess the degree to which youth research solutions to problems, generate multiple approaches to problem, use rational decision-making strategies, and evaluate outcome of decisions. These items correspond with Spivack et al.'s (1976) conceptualization of the problem-solving skills necessary for optimal child development. Items are measured on a 5-point scale ranging from strongly agree (1) to strongly disagree (5). These items were reversed coded so that high values reflect greater levels of problem-solving ability. Cronbach's alpha for the scale is .75. *Self-esteem* was measured using four items that assess global feelings of self-worth and efficacy. The content of these items address the degree to which youth feel they possess lots of good qualities, have a lot to be proud of, like self as are, and are doing everything right. Items are measured on a 5-point scale ranging from strongly agree (1) to strongly disagree (5). These items were reversed coded so that

higher values reflect greater levels of self-esteem. Cronbach's alpha for this scale was .79.

Outcome measures. As a preliminary step before index creation, externalizing and internalizing items were subjected to a factor analysis as a means to examine their correlation structure (separate analyses were conducted for Time 1 and Time 2 measures). Using maximum likelihood extraction with oblimin rotation, a two-factor model was specified. Results of this analysis supported a two-factor model. (See Appendix for factor structure.) All items loaded highly on their respective constructs with minimal cross loading. The correlation between Time 1 externalizing and internalizing problem behavior was .27 (7% shared variance); the correlation between Time 2 externalizing and internalizing problem behavior was .22 (5% shared variance).

Externalizing problem behavior was assessed using youth reports on 14 items measuring the frequency in which they engaged in aggressive behavior directed to another person and/or object and both minor and serious forms of delinquent behavior in the past twelve months. Sample items include "How often do you shoplift?", "How often do you lie to parents about your whereabouts?", "How often do you sell drugs?", and "How often do you take part in a group fight?" Items are measured on a 4-point scale ranging from <u>never</u> (0) to <u>5 or more times</u> (3) during the previous year. The longitudinal design of the Add Health allows one to examine these measures concurrently and prospectively. Respective alphas for Time 1 and Time 2 externalizing problem behavior are .83 and .82.

Internalizing problem behavior was assessed using youth reports on 19 items measuring depression. Items are taken from the Center for Epidemiology Studies Depression Scale for Children, a commonly used index of depression that has documented evidence of reliability and validity (CES-DC; Radloff, 1977) including cross-cultural measurement equivalency (Tally et al., 2000). Items tap various types of symptoms common to depression, including somatic disturbances, interpersonal problems, and degree of both depressed and positive affect. Sample items under the following question stem, "In the past week, how often were you...." include "bothered by things", "had poor appetite", "hopeful about the future", "felt life was not worth living", "felt fearful", and "felt lonely". Items are assessed on a 4-point Likert scale ranging from never or rarely (0) to most or all of the time (3). Those expressing positive content (e.g., "felt happy") were reversed coded so that high values reflect greater levels of depressive affect. Respective alphas for Time 1 and Time 2 internalizing problem behavior are .86 and .87.

Demographic control variables included youth gender, grade level, and race. These variables were used because of their anticipated relationship with the outcomes of interest in this study. They often play an important role in risk processes, showing both main effects and moderating effects on youth outcomes (e.g., Baldwin et al., 1993; Scaramella et al., 1999). Respective values for males and females are "0" and "1". The grade levels represented in this study are 7th-8th graders and 9th-10th graders, coded respectively as "0" and "1". Racial categories include non-Hispanic white, non-Hispanic black, and all others. Using non-

Hispanic white youth as the reference group, two dummy codes were created for drawing comparisons between non-Hispanic white and non-Hispanic black youth and between non-Hispanic white and all other youth.

Analytic Procedures

All scales and indices were created in SPSS. The amount of missing data varied across variables of interest, but generally constituted less than 5% of cases. Exceptions to this included items taken from parent reports, which were missing 10% of cases. Missing data were imputed at the scale level using the expectation maximization method in SPSS (EM). EM is a full information method of imputing missing values that uses an iterative procedure to sort through data and fit the best values. It is preferable to other available procedures for handling missing data because it produces less bias in results (Acock, 1997). To handle any bias that may result from the missing parent data, a mechanism variable marking cases without parent data was included in the regression analyses for these youth. The inclusion of this variable helps remove bias that might be present in the estimation of parameters (Acock, 1997). Additionally, a mechanism variable was used to reflect subject attrition between the two waves of data collection.

The Add Health sample is stratified by region, urbanicity, school type and ethnic mix. This complex sampling design necessitates the use of a statistical software program that adjusts for design effects that may result from stratification, clustering, and differential case weighting. Using data from the National Survey of Families and Households, Johnson and Elliott (1998)

demonstrated that standard errors of parameter estimates were underestimated when adjustment for sampling design effects were not taken into account. Without these adjustments, imprecise conclusions might be drawn from one's data. Accordingly, data were analyzed in SUDAAN--a statistical software program that makes necessary corrections for design effects.

Data were analyzed using multiple regression with hierarchical entry of variables. This strategy is particularly suited for research of this nature because it allows one to enter the interaction and squared terms necessary for testing interactive and curvilinear patterns of risk (Aiken & West, 1991). Additionally, this procedure allows one to isolate variance contributed by individual or groups of variables entered in different blocks. Variables comprising interaction terms were centered. Devised as a means to deal with multicollinearity between variables, this procedure entails subtracting the mean of a variable from its individual scores (Aiken & West, 1991). Significant interactions were probed using simple slope analysis as outlined by Aiken and West (1991). For continuous variables, such as self-esteem and problem-solving ability, high and low values were represented respectively by one standard deviation above and below the centered mean of zero. Using these values, results were plotted to determine whether significant interactions were consistent with stated hypothesis. Although moderating effects might be evident in the analysis, results could feasibly contradict expectations (e.g., self-esteem serves as an exacerbating variable in high-risk youth rather than a protective factor).

The first aim of this study was to determine whether a relationship between cumulative risk and youth problem behaviors exists and, if so, what is the nature of this relationship. Is it modified by gender, grade level, or ethnicity? To address these questions, entry of the variables proceeded in the following block order: control variables including youth gender, grade level, ethnicity, and the two missing data mechanism variables; cumulative risk; the squared cumulative risk term (to test for a possible nonlinear relationship with youth problem behaviors); and the interaction terms between cumulative and demographic control variables (i.e., gender, grade level, and race). In this final block, the three interaction terms were entered individually rather than a block of variables to avoid possible problems with multicollinearity.

The second study goal was to determine whether or not cumulative risk differentially predicts youth externalizing and internalizing problem behavior. In other words, does cumulative risk show specialized effects by predicting one outcome more significantly than the other? Claims that a risk factor's effect is larger for one outcome than another are often made without appropriate statistical comparisons of the differences. This possibility is tested formally using a procedure called "net regression" (Cohen et al., 1990). Beginning with standardized measures of externalizing (X) and internalizing problem behavior (Y), these outcomes were regressed in separate equations on cumulative risk with controls for gender, grade level, ethnicity, and mechanism variables. The predicted values of these equations were used to create a new variable (Z) that is the sum of the predicted value of Y minus X (or, alternatively, the sum of the

predicted value of X minus Y). This new variable was then regressed on the set of predictor variables. Generating standard regression statistics, the analysis yields an R and associated F that provide a test of model significance. The partial coefficient for cumulative risk and its corresponding t indicate the strength and significance of the difference of the effects between outcomes.

The final question that was addressed is whether IQ, cognitive problem-solving ability, and self-esteem modify the relationship between cumulative risk and youth problem behaviors and, if so, by what means--a compensatory or protective influence. To address this question, entry of the variables proceeded in the following block order: all control variables including mechanism variables; cumulative risk; IQ, cognitive problem-solving ability; and finally the interaction terms between cumulative risk and each of the child attributes. Like the interaction terms between cumulative risk and the demographic control variables, these were entered individually in separate blocks and equations.

CHAPTER III

RESULTS

Descriptive statistics for outcome measures, continuously measured risk variables, the cumulative risk index, and positive child attributes are located in Table 4 (unweighted sample) and Table 5 (weighted sample). Means and standard deviations were generated in SPSS. SPSS and SUDAAN yield identical means; however, because SPSS has been shown to underestimate standard errors of the means, this information was generated in SUDAAN for more precise estimates (see Table 5). For comparative purposes, means and standard deviations are provided for the total sample as well as for gender, grade, and racial subgroups. The average number of risk factors for the total weighted sample was 2.72 (SD = 2.03) with little variation across youth gender and grade. Broken down by race, the non-Hispanic white group had the fewest number of risk factors (M = 2.39, SD = 1.92), followed by the mixed ethnic group (M = 3.12, SD = 2.04), then non-Hispanic black youth (M = 3.63, SD = 2.08).

Table 6 lists the prevalence of the dichotomously coded risk factors for the total sample as well as for subgroups of youth. In general, the prevalence of family demographic and neighborhood risk is highest among non-Hispanic black youth and those in the mixed ethnic group. This discrepancy is most obvious for family poverty and the neighborhood measures, reflecting disparities in living standards across different ethnic groups and the subjective meanings attached to this social reality. Prevalence of risk in the family process and peer domain generally was more consistent across subgroups of youth.

Table 4

Means and Standard Deviations for Dependent Variables, Risk Factors, Cumulative Risk Index, and Youth Attributes (Unweighted Sample)

Measure	Total		Gender				Grade				Race					
			Male		Female		7-8th		9-10th		White		Black		Other	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Outcome Measures																
T1 Externalizing behavior	3.96	4.86	4.51	5.46	3.43	4.15	3.49	4.51	4.37	5.12	3.70	4.68	3.85	4.78	4.83	5.35
T1 Internalizing behavior	10.64	7.41	9.66	6.41	11.56	8.05	10.02	7.07	11.18	7.66	9.80	7.03	11.31	7.79	12.27	7.67
T2 Externalizing behavior[a]	3.29	4.46	3.69	5.04	2.92	3.82	3.16	4.34	3.40	4.57	3.18	4.29	2.98	4.18	3.93	5.15
T2 Internalizing behavior[a]	10.73	7.48	9.54	6.55	11.80	8.08	10.12	7.20	11.27	7.68	9.91	7.22	11.37	7.37	12.36	7.95
Risk Factors																
Marital functioning[b]	.01	.79	.03	.82	-.06	.77	.02	.80	.01	.79	.05	.84	.05	.70	-.01	.77
Parental warmth/family connectedness	1.67	.56	1.62	.51	1.72	.60	1.58	.54	1.76	.57	1.67	.55	1.64	.56	1.70	.60
Parental involvement	.37	.20	.35	.19	.39	.20	.37	.20	.37	.19	.37	.19	.38	.20	.36	.20
Peer support	1.97	.60	1.99	.59	1.94	.60	1.94	.60	1.99	.59	1.94	.59	2.00	.61	2.00	.60
Peer troubles	.93	.99	.94	1.01	.91	.96	1.01	1.05	.85	.93	.93	.95	.96	1.08	.88	.99
Neighborhood quality	.91	1.39	.91	1.40	.92	1.38	.93	1.41	.90	1.37	.36	.82	2.05	1.67	1.16	1.44
Neighborhood problems	1.52	.52	1.52	.52	1.53	.53	1.51	.53	1.53	.52	1.46	.48	1.67	.57	1.53	.56
Neighborhood satisfaction	2.24	.97	2.23	.95	2.25	.98	2.16	.97	2.31	.96	2.13	.94	2.44	1.00	2.31	.96
Cumulative risk	2.70	2.01	2.71	1.97	2.68	2.04	2.68	2.03	2.72	1.99	2.34	1.90	3.29	2.04	3.04	2.04
Youth Attributes																
Intelligence (PPVT-R)	100.25	14.51	100.79	14.53	99.74	14.48	99.49	14.63	100.91	14.38	104.69	12.36	93.61	14.11	95.27	16.03
Cognitive problem-solving	3.78	.63	3.78	.65	3.78	.60	3.76	.65	3.79	.61	3.73	.63	3.88	.64	3.80	.60
Self-esteem	4.10	.63	4.21	.58	4.00	.66	4.18	.60	4.03	.64	4.08	.63	4.23	.59	4.02	.67

Note. Unweighted n = 4173. Means and standard deviations were generated in SPSS.

[a]Unweighted n = 3650.

[b]Standardized measure was used.

Table 5

Means and Standard Deviations of Dependent Variables, Risk Factors, Cumulative Risk Index, and Youth Attributes (Weighted Sample)

Measure	Total		Gender				Grade				Race					
			Male		Female		7-8th		9-10th		White		Black		Other	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Outcome Measures																
T1 Externalizing problem	4.06	4.98 (.12)	4.63	5.58 (.16)	3.47	4.19 (.13)	3.83	4.60 (.16)	4.56	5.29 (.15)	3.83	4.84 (.14)	4.15	5.08 (.25)	4.72	5.26 (.25)
T1 Internalizing problem	10.70	7.37 (.18)	9.72	6.47 (.18)	11.70	8.07 (.26)	9.01	7.05 (.24)	11.34	7.63 (.24)	9.01	7.03 (.20)	12.21	8.15 (.36)	12.13	7.47 (.33)
T2 Externalizing problem[a]	3.34	4.45 (.10)	3.70	5.01 (.15)	2.98	3.76 (.11)	3.23	4.36 (.15)	3.47	4.54 (.13)	3.23	4.24 (.12)	3.05	4.35 (.18)	3.93	5.10 (.21)
T2 Internalizing problem[a]	10.76	7.48 (.19)	9.69	6.79 (.22)	11.86	7.98 (.24)	9.95	7.12 (.26)	11.44	7.76 (.24)	9.95	7.20 (.20)	12.07	7.49 (.35)	12.39	7.92 (.40)
Risk Factors																
Marital functioning[b]	.02	.81 (.02)	.03	.83 (.02)	.04	.79 (.02)	.08	.80 (.03)	.02	.82 (.02)	.08	.84 (.02)	.09	.72 (.02)	-.01	.78 (.03)
Parental warmth/family connectedness	1.68	.57 (.01)	1.62	.52 (.02)	1.74	.61 (.02)	1.68	.54 (.01)	1.77	.57 (.01)	1.68	.56 (.02)	1.66	.57 (.03)	1.69	.59 (.02)
Parental involvement	.36	.20 (.01)	.34	.19 (.01)	.38	.20 (.01)	.37	.20 (.01)	.36	.19 (.01)	.36	.19 (.01)	.37	.21 (.01)	.35	.20 (.01)
Peer support	1.97	.59 (.01)	2.00	.60 (.02)	1.94	.59 (.02)	1.95	.60 (.02)	1.99	.59 (.01)	1.95	.59 (.02)	2.03	.62 (.03)	1.99	.59 (.02)
Peer troubles	.94	1.00 (.02)	.98	1.04 (.03)	.91	.95 (.03)	.95	1.06 (.03)	.85	.92 (.02)	.95	.97 (.03)	1.01	1.14 (.05)	.88	.99 (.04)
Neighborhood quality	.82	1.32 (.09)	.82	1.34 (.10)	.82	1.30 (.10)	.36	1.34 (.14)	.81	1.30 (.11)	.36	.79 (.06)	2.78	1.68 (.15)	1.25	1.45 (.15)
Neighborhood problems	1.52	.53 (.02)	1.51	.52 (.02)	1.53	.53 (.03)	1.46	.54 (.04)	1.53	.52 (.03)	1.46	.48 (.02)	1.74	.59 (.04)	1.55	.56 (.04)
Neighborhood satisfaction	2.22	.96 (.02)	2.21	.95 (.03)	2.23	.97 (.03)	2.14	.96 (.04)	2.28	.95 (.03)	2.14	.94 (.03)	2.47	1.00 (.04)	2.27	.94 (.04)
Cumulative Risk	2.72	2.03 (.09)	2.75	2.00 (.08)	2.69	2.06 (.11)	2.69	2.06 (15)	2.74	2.00 (.09)	2.39	1.92 (.08)	3.63	2.08 (.16)	3.12	2.04 (.12)
Youth Attributes																
Intelligence (PPVT-R)	100.40	14.27 (.64)	100.93	14.27 (.71)	99.85	14.26 (.67)	104.30	14.26 (.90)	101.05	14.25 (.73)	104.30	12.19 (.47)	91.10	13.48 (.99)	94.67	15.84 (.88)
Cognitive problem-solving	3.76	.64 (.01)	3.77	.66 (.02)	3.74	.62 (.02)	3.73	.67 (.02)	3.78	.62 (.02)	3.73	.63 (.02)	3.86	.67 (.02)	3.78	.64 (.02)
Self-esteem	4.09	.63 (.01)	4.21	.57 (.02)	3.97	.66 (.02)	4.08	.60 (.02)	4.01	.64 (.02)	4.08	.62 (.01)	4.22	.57 (.03)	4.03	.66 (.03)

Note. Weighted n is 14,589,539. Means and standard deviations were obtained in SPSS. Standard errors of means (values in parentheses) were obtained in SUDAAN.
[a]Weighted n = 14,517,306. [b]Standardized measure was used.

Table 6
Prevalence of Risk Variables by Total Sample and by Youth Gender, Grade, and Race (Weighted Sample)

Risk Variables	Total	Male	Female	7th-8th	9th-10th	White	Black	Other
Parent's marital status	25	26	25	25	25	19	51	27
Parental education	15	15	15	15	14	9	17	31
Poverty status	15	15	16	18	13	10	32	21
Household size	6	6	6	5	6	4	8	10
Marital functioning	25	25	25	25	25	27	21	22
Parental warmth	27	23	30	21	32	27	27	26
Parental involvement	31	35	27	31	30	28	39	34
Peer support	32	34	30	30	34	30	38	33
Trouble with peers	18	20	16	21	16	18	21	18
Neighborhood quality	23	23	23	23	23	10	63	36
Neighborhood problems	29	28	29	29	28	26	41	30
Neighborhood satisfaction	27	26	28	25	29	24	37	28
Neighborhood safety	11	11	12	12	11	8	19	16

Note. Weighted n for total sample is 14,589,539. Percentage of sample or group with presence of risk.

Table 7 contains zero-order correlations between risk factors measured on their original scales and youth outcome measures. Correlations varied in magnitude with strongest relationships evidenced for family process and peer context variables, a pattern that is consistent with other studies of multiple risk (see as examples Deater-Deckard et al., 1998; Jessor et al., 1995). Table 8 contains zero-order correlations between control variables, positive child attributes, cumulative risk and outcome measures. With the exception of the association between externalizing problem behavior and intelligence (PPVT-R), all correlations between the child attribute variables and outcome measures are in the expected direction. Correlations between cumulative risk and Time 1 externalizing and internalizing problem behavior are .26 and .41, ($p < .000$), respectively. The significant relationships between cumulative risk and youth problem behaviors held across time; however, the strength of these associations attenuated. Respective correlations at Time 2 are .14 and .31 ($p < .000$).

Findings from a series of regression analyses are organized by the three major research questions guiding this study. Each question is addressed in full by presenting cross-sectional results, longitudinal results using a model without a statistical control for early problem behaviors and longitudinal results using a model with this covariate. Separate longitudinal models were tested to examine whether prospective relationships differ substantively when initial levels of problem behaviors are not statistically controlled compared to a model that reflects average change in problem behaviors over time. The latter model

Table 7
Correlations between Risk Factors and Dependent Variables (Weighted Sample)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) Marital status																	
(2) Parental education	.09																
(3) Poverty	.37	.27															
(4) Household size	-.08	.11	.10														
(5) Marital functioning	.04	.01	.07	.03													
(6) Parental warmth	.07	-.00	.02	-.01	.13												
(7) Parental involvement	-.29	-.08	-.17	-.01	-.06	-.32											
(8) Peer support	.09	.04	.06	.02	.04	.37	-.24										
(9) Trouble w/peers	.08	.06	.07	-.01	.04	.13	-.10	.29									
(10) Neighborhood quality	.25	.24	.32	.05	.03	-.01	-.13	.07	.04								
(11) Neighborhood problems	.20	.10	.25	.02	.09	.05	-.11	.06	.05	.37							
(12) Neighborhood satisfaction	.16	.04	.11	-.03	.08	.29	-.18	.26	.13	.13	.17						
(13) Neighborhood safety	.09	.08	.12	.02	.05	.12	-.09	.17	.12	.22	.23	.31					
(14) T1 Externalizing problem	.12	.11	.10	.09	.17	.31	-.11	.16	.20	.03	.07	.13	.11				
(15) T1 Internalizing problem	.13	.13	.14	.10	.16	.42	-.19	.35	.28	.13	.11	.22	.21	.27			
(16) T2 Externalizing problem	.06	.03	.01	.04	.08	.24	-.07	.08	.14	.00	.03	.08	.02	.56	.18		
(17) T2 Internalizing problem	.10	.10	.10	.04	.06	.33	-.15	.26	.17	.11	.08	.16	.13	.20	.58	.22	

Note. Weighted n = 14,589,539. Correlations obtained in SPSS.

Table 8

Correlations between Control Variables, Cumulative Risk, Positive Youth Attributes, and Dependent Variables (Weighted Sample)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Youth gender												
(2) Youth grade	-.00											
(3) Race (white/black)	.00	.03										
(4) Race (white/all others)	-.01	.02	-.21									
(5) Cumulative risk	-.01	.01	.19	.10								
(6) Intelligence (PPVT-R)	-.04	.05	-.27	-.20	-.25							
(7) Cognitive problem-solving	-.02	.03	.07	.02	-.19	.17						
(8) Self-esteem	-.19	-.12	.08	-.05	-.26	-.01	.30					
(9) T1 Externalizing problem	-.12	.10	.01	.07	.26	.14	-.19	-.20				
(10) T1 Internalizing problem	.13	.09	.09	.10	.41	-.25	-.12	-.45	.27			
(11) T2 Externalizing problem	-.08	.03	.07	-.03	.14	.12	-.10	-.14	.56	.18		
(12) T2 Internalizing problem	.15	.09	.11	.07	.31	-.21	-.08	-.34	.20	.58	.22	

Note. Weighted n = 14,589,539. Correlations obtained in SPSS.

constitutes a more stringent test than the former particularly in light of the relatively short time span between data collections.

Research Question #1

Cross-sectional findings. Table 9 summarizes findings from the first set of regression analyses, which were undertaken to address the first research question--is there a relationship between cumulative risk and youth problem behaviors and, if so, what is the nature of this relationship. Beginning with the block of control variables, significant predictors of Time 1 externalizing problem behavior included gender, grade level, and race (non-Hispanic white versus non-Hispanic blacks). These findings indicated that male youth, 9th- 10th grade youth, and non-Hispanic white youth are at higher risk for externalizing problem behavior than female, 7th-8th grade, and non-Hispanic black youth. The set of control variables accounted for 3% of the variance in externalizing problem behavior. For Time 1 internalizing problem behavior, significant predictors included gender, grade level, and race (non-Hispanic whites versus all others). These findings indicated that female youth, 9th-10th grade youth, and those in the mixed racial group are at higher risk for internalizing problem behavior than male youth, 7th-8th graders, and white youth. The amount of variance accounted for by this set of variables is 5%.

Constituting a primary inquiry, the association between cumulative risk and youth problem behavior was examined next. Supporting Hypothesis 1, results from these analyses revealed that the relationship between cumulative risk and both Time 1 externalizing and internalizing problem behavior is positive,

Table 9
Regression of Time 1 Externalizing and Internalizing Problem Behavior on Cumulative Risk Variables

	Time 1 Externalizing Problem Behavior				Time 1 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1:				.03				.05
Missing parent data	.78*	.33	.05*		.95**	.38	.04**	
Missing Time 2 data	-.20	.26	-.01		.47	.43	.02	
Youth gender	-1.12***	.18	-.11***		2.09***	.24	.14***	
Youth grade	.94***	.19	.10***		1.14***	.29	.08***	
Youth race (all others)	.34	.28	.03		1.39**	.41	.08**	
Youth race (black)	-.60*	.26	-.04*		.41	.38	.02	
Block 2:				.07				.15
Cumulative risk	.63***	.04	.26***		1.44***	.06	.40***	
Block 3:				.00				.00
Cumulative risk^2	.00	.02	.00		.00	.02	.00	
Total R^2				.10				.20
F				209.26				857.80

Note. Weighted n = 14,589,539. Analysis includes mechanism variables for missing parent data at Time 1 and subject attrition between Time 1 and Time 2.
*p ≤ .05 **p ≤ .01 ***p ≤ .001

linear, and moderate in strength, with no evidence of an accelerating or threshold pattern (i.e., the curvilinear term was not significant for either outcome measure). The unstandardized beta for cumulative risk reflects an average increase of .63 in externalizing problem behavior with every unit increment in risk; the corresponding figure for internalizing problem behavior is 1.44. Respective values in standardized units are .26 and .40 ($p < .000$). For externalizing scores, the difference between youth with an absence of risk and those with the highest amount of risk is more than one standard deviation. For internalizing problem behavior, this difference approximates two standard deviations. Figures 1 and 2 depict these relationships graphically and show the mean levels of externalizing and internalizing problem behaviors, respectively, at each level of risk after controlling for demographic background factors. For both outcome measures, youth with the greatest amount of risk had approximately three times as many problem behaviors as youth with zero risk factors. Cumulative risk accounted for 7% of unique variance in externalizing problem behavior and 15% in internalizing problem behavior.

Also of interest is whether youth gender, grade level, and race moderate the relationship between cumulative risk and youth maladjustment. No significant interactions were found for externalizing problem behavior. However, results from these analyses (not shown in tables) revealed a significant interaction between cumulative risk and gender in the prediction of internalizing problem behavior ($b = .58$, $p = .000$). A close look at this interaction revealed that the association between cumulative risk and internalizing problem behavior is significant both for

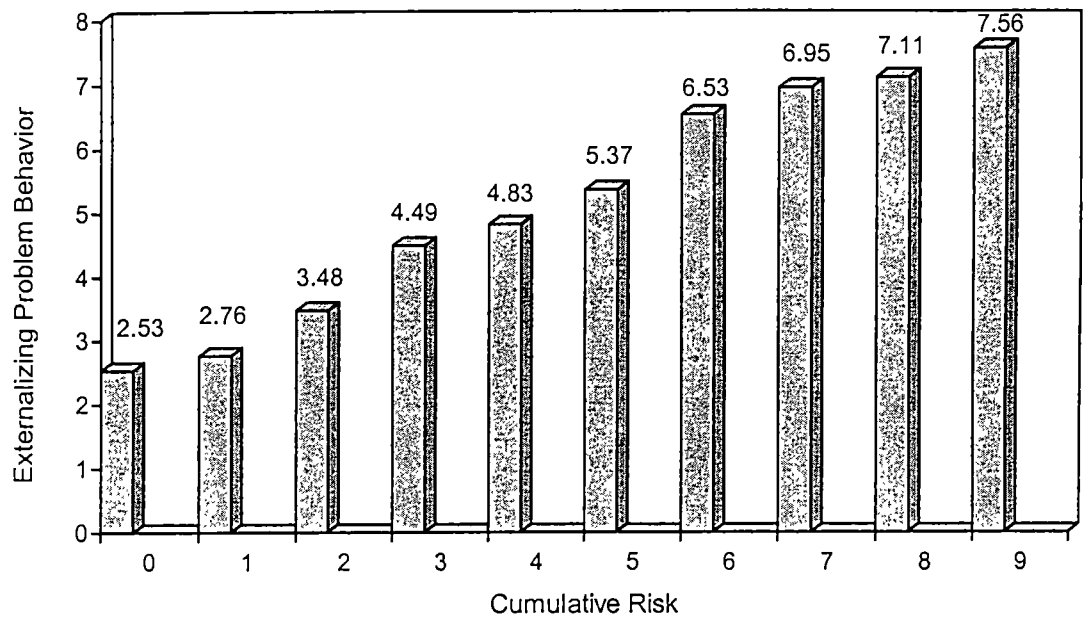

Figure 1. Mean level of Time 1 externalizing problem behavior at levels of cumulative risk adjusting for youth gender, grade level, and race.

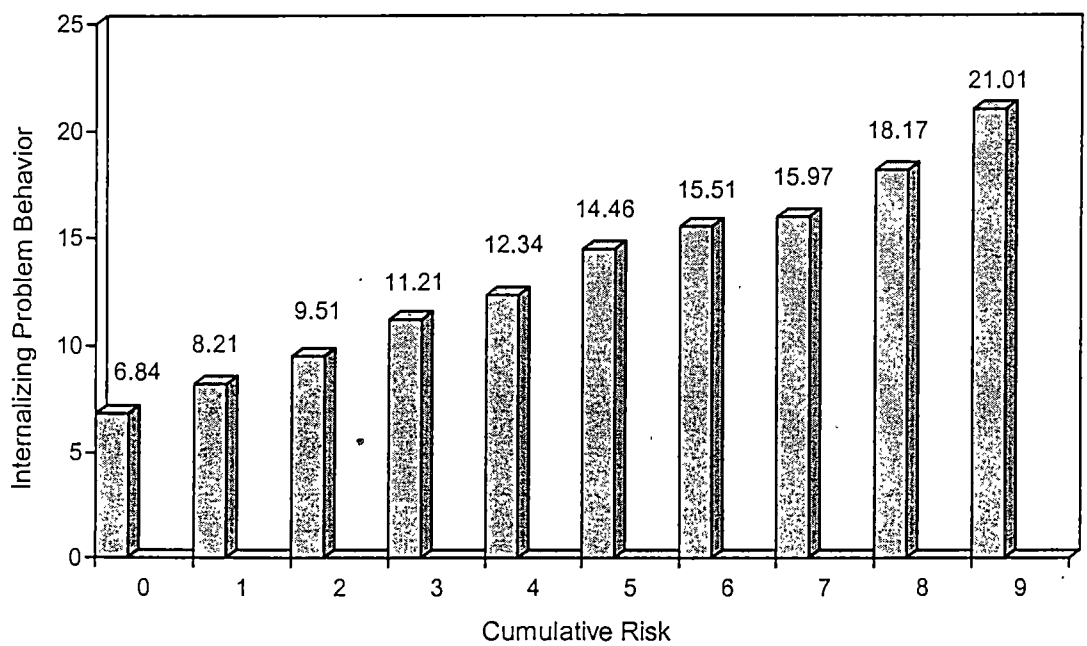

Figure 2. Mean level of Time 1 internalizing problem behavior at levels of cumulative risk adjusting for youth gender, grade level and race.

males and females but this association is stronger for female youth. As indicated in Figure 3, the average change in internalizing problem behavior that is associated with each increase in cumulative risk is 1.73 for females compared to 1.15 for males. On average, females who scored at the highest level of risk had eight more depressive symptoms per week than equally at-risk males. This compares with a difference of two between these groups when risk is absent, or in effect, when cumulative risk equals zero.

A significant interaction also was detected between cumulative risk and race (b = .90, p = .01), indicating that the relationship between cumulative risk and internalizing problem behavior was stronger for white youth when they were compared to youth in the mixed racial group. As reflected in Figure 4, the average change in internalizing problem behavior that is associated with each risk factor is 1.97 for non-Hispanic white youth compared to 1.07 for those in the mixed ethnic group. At low levels of risk, white youth had similar rates of internalizing problem behavior as the racially mixed group; however, at greater levels of risk differences between these groups were more pronounced with non-Hispanic white youth evidencing significantly more internalizing problem behaviors than the group of minority youth.

Longitudinal Findings (without covariate for Time 1 problem behavior). Findings from this set of analyses are located in Table 10. Gender and race predicted externalizing problem behavior, once again reflecting higher rates of externalizing problem behavior for male and non-Hispanic white youth (when compared with non-Hispanic black youth). Grade level, however, was no longer

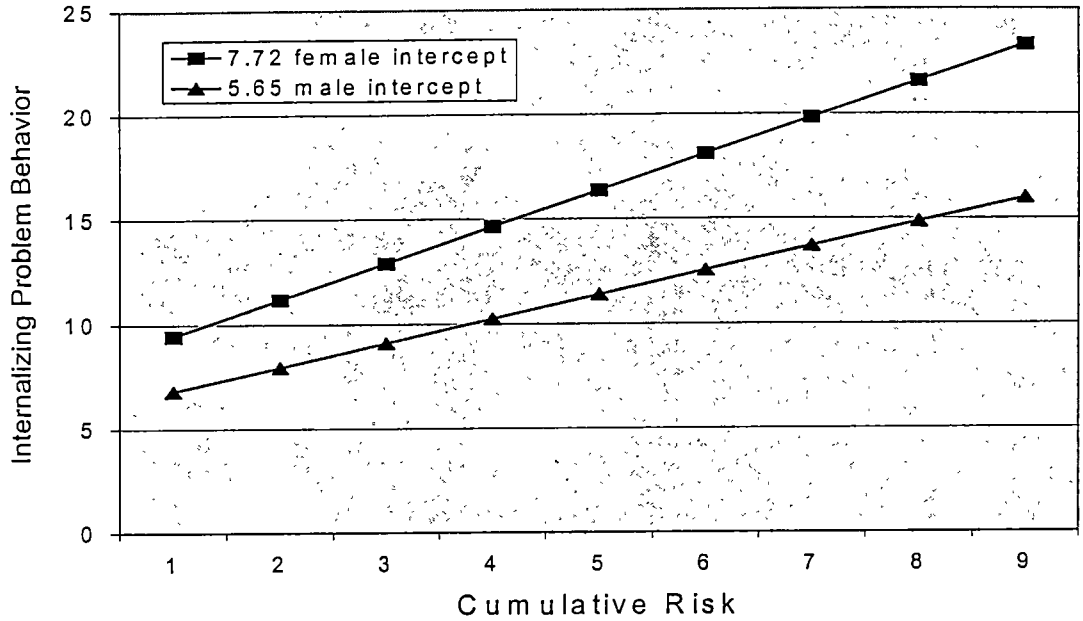

Figure 3. Cumulative risk by gender for Time 1 internalizing problem behavior.

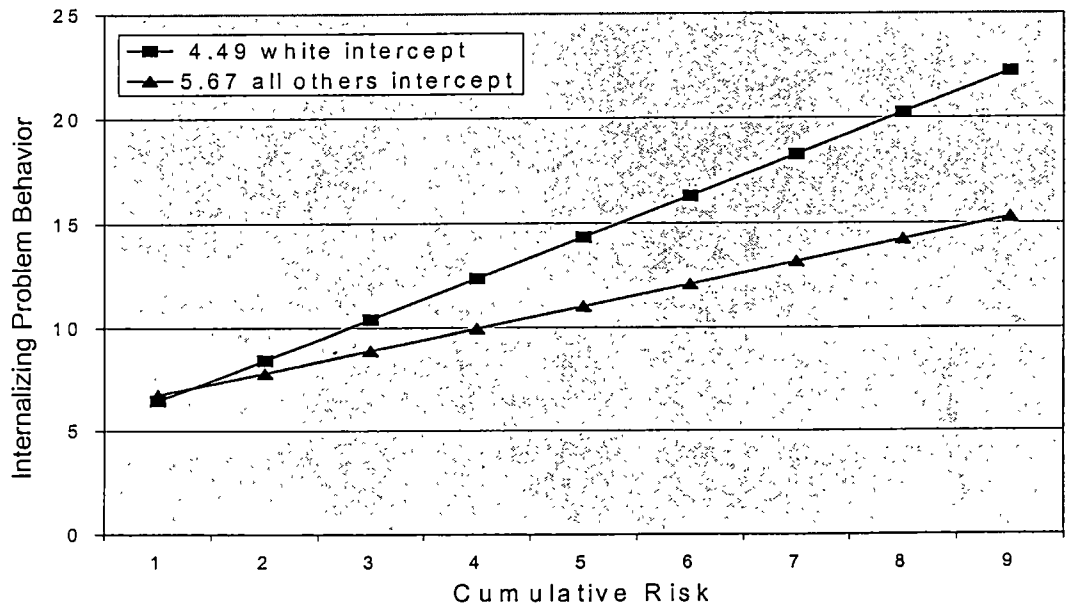

Figure 4. Cumulative risk by race for Time 1 internalizing problem behavior (non-Hispanic white versus mixed racial category).

Table 10

Regression of Time 2 Externalizing and Internalizing Problem Behavior on Cumulative Risk Variables without Covariate for Time 1 Problem Behavior

	Time 2 Externalizing Problem Behavior				Time 2 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1:				.02				.05
Missing parent data	.25	.35	.02		1.22**	.46	.04	
Youth gender	-.69***	.16	-.08***		2.28***	.24	.15***	
Youth grade	.21	.19	.02		1.17***	.31	.08***	
Youth race (all others)	.44	.24	.04		1.54***	.43	.08***	
Youth race (black)	-.63**	.21	-.05**		.63	.39	.03	
Block 2:				.02				.08
Cumulative risk	.32***	.04	.15***		1.10***	.07	.30***	
Block 3:				.00				.00
Cumulative risk^2	-.03	.02	-.04		-.04	.03	-.03	
Total R^2				.04				.13
F				161.00				818.34

Note. Weighted n = 14,517,306. Analysis includes a mechanism variable for missing parent data at Time 1.
*p ≤ .05 **p ≤ .01 ***p ≤ .001

significant suggesting that differences in levels of externalizing problem behavior between early and mid-adolescent youth lessen over time. As a block, the control variables accounted for 2% of the variance in externalizing problem behavior. Gender, grade level, and race (non-Hispanic white versus all others) remained stable predictors of internalizing problem behavior. At Time 2, females, older youth, and minority youth evidenced higher levels of depressive affect than males, 7th-8th graders, and non-Hispanic white youth. The control variables accounted for 5% of variance in internalizing problem behaviors.

Significant positive linear relationships between cumulative risk and youth outcome measures remained over time; however, the strength of these associations weakened. (See Figures 5 and 6 for mean levels of externalizing and internalizing problem behaviors at levels of cumulative risk.) Respective betas for externalizing and internalizing problem behavior are .15 and .30 (p = .000). Cumulative risk accounted for 2% of variance in externalizing problem behavior and 8% of variance in internalizing problem behavior. Gender, grade level, and race did not play a contextual role in these relationships. Thus, cross-sectional findings that the relationship between cumulative risk and internalizing problem behavior is stronger for female and non-Hispanic whites did not hold across time.

Longitudinal findings (with coviariate for Time 1 problem behavior). An identical pattern of findings was found with respect to the role of control variables in the prediction of change in youth outcome measures. (See Table 11.) As a matter of redundancy, these relationships are not described in detail. However, it

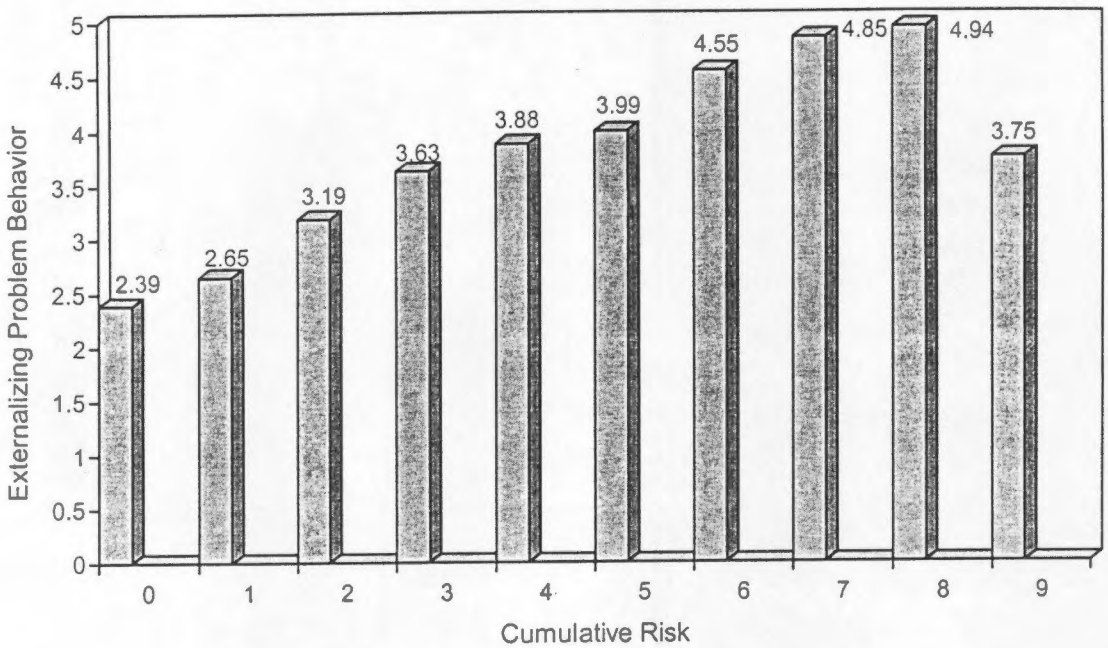

Figure 5. Mean level of Time 2 externalizing problem behavior at levels of cumulative risk adjusted for youth gender, grade level, and race.

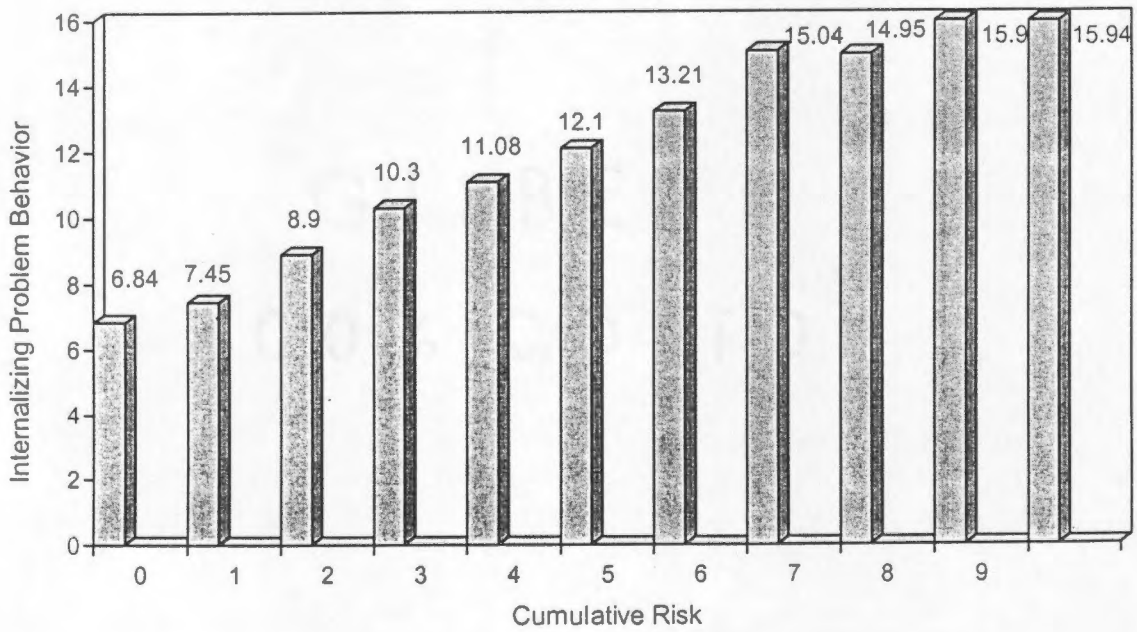

Figure 6. Mean level of Time 2 internalizing problem behavior at levels of cumulative risk adjusted for youth gender, grade level, and race.

Table 11

Regression of Time 2 Externalizing and Internalizing Problem Behavior on Cumulative Risk Variables with Covariate for Time 1 Problem Behavior

	Time 2 Externalizing Problem Behavior				Time 2 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1:				.31				.34
Time 1 problem behavior	.50***	.04	.56***		.54***	.02	.53***	
Block 2:				.003				.02
Missing parent data	-.23	.29	-.01		.55	.41	.02	
Youth gender	-.40*	.13	-.05*		1.20***	.20	.08***	
Youth grade	-.28	.15	-.03		.55*	.25	.04*	
Youth race (all others)	.28	.19	.03		.93*	.30	.05*	
Youth race (black)	-.36*	.18	-.04*		.36	.30	.02	
Block 3:				.001				.02
Cumulative risk	.01	.04	.00		.35***	.06	.10***	
Block 4:				.001				.00
Cumulative risk^2	-.02	.01	-.02		-.03	.02	-.02	
Total R^2				.32				.38
F				286.64				1218.32

Note. Weighted n = 14,517,306. Analysis includes a mechanism variable for missing parent data at Time 1.
*p ≤ .05 **p ≤ .01 ***p ≤ .001

is noted that the strength of the associations between control variables and outcome measures weakened when earlier level of problem behaviors was taken into consideration, a finding consistent with the literature (e.g., Jessor et al., 1995). As a whole, the control variables accounted for .3% of variance in externalizing problem behavior and 2% in internalizing problem behavior.

After statistically controlling for the influences of initial problem behavior and demographic background factors, the relationship between cumulative risk and externalizing problem behavior was not significant. Putting this into context with the previously reported longitudinal findings, antecedent risk demonstrates predictive ability with respect to later externalizing problem behavior; however, for this sample of youth it does not predict average change in externalizing problems over a one-year period of time. In contrast, cumulative risk remained predictive of internalizing problems after taking into account initial levels of behavior, accounting for 2% of the variance in this outcome measure (Beta = .10, p = .000).

Research Question #2

The second study goal was to determine whether or not cumulative risk demonstrates specificity with respect to the outcomes it predicts. Findings from this set of analyses are located in Tables 12 and 13. Table 12 summarizes cross-sectional and longitudinal findings from a net regression model that did not take into account the influence of youth attributes. Table 13 summarizes cross-sectional and longitudinal findings from a regression model that did include these variables.

Table 12

Net Regression Analyses: Significant Differences in Cumulative Risk in Predicting Youth Externalizing and Internalizing Problem Behavior

	Cross-Sectional Analysis[a]			Longitudinal Analysis[b]		
	B	SE	Beta	B	SE	Beta
Missing Time 2 data	-.11	.06	-.03	NA	NA	NA
Missing parent data	.03	.07	.01	-.11	.08	-.03
Youth gender	-.51***	.03	-.24***	-.46***	.04	.22***
Youth grade	.04	.04	.02	-.11	.04	-.05
Youth race (all others)	-.08	.06	-.03	-.11	.06	-.04
Youth race (black)	-.18*	.06	-.06*	-.23*	.05	-.08*
Cumulative risk	-.06**	.01	-.12**	-.07***	.01	-.14***
F	42.83			44.22		

Note. Dependent variable is standardized externalizing scores minus individual predicted values from a model regressing standardized internalizing scores on cumulative risk and control variables.

[a]Weighted n = 14,589,539.

[b]Weighted n = 14,517,306

*p ≤ .05 **p ≤ .01 ***p ≤ .001

Table 13

Net Regression Analyses: Significant Differences in Cumulative Risk and Youth Attributes in Predicting Youth Externalizing and Internalizing Problem Behavior

	Cross Sectional Analysis[a]			Longitudinal Analysis[b]		
	B	SE	Beta	B	SE	Beta
Missing Time 2 data	.14	.05	-.03	NA	NA	NA
Missing parent data	-.08	.07	.04	-.02	.08	-.01
Youth gender	-.40***	.03	-.19***	-.38***	.04	-.18***
Youth grade	.08	.04	.04	-.09	.04	-.04
Youth race (all others)	.06	.06	.02	.01	.06	.00
Youth race (black)	-.07	.06	-.03	-.12	.05	-.04
Cumulative risk	-.01	.01	-.02	-.04*	.01	-.07*
IQ (PPVT-R)	.02	.00	.22	.01	.00	.18
Cognitive problem-solving	-.15**	.03	-.09**	-.10*	.03	-.06*
Self-esteem	.40***	.03	.24***	.26***	.03	.15***
F	53.28			46.03		

Note. Dependent variable is standardized externalizing scores minus individual predicted values from a model regressing standardized internalizing scores on cumulative risk and control variables.

[a]Weighted n = 14,589,539

[b]Weighted n = 14,517,306

*p ≤ .05 **p ≤ .01 ***p ≤ .001

Cross-sectional findings. Results from the net regression analysis suggest that cumulative risk is a significantly stronger predictor of Time 1 internalizing problem behavior than Time 1 externalizing problem behavior among this sample of youth after statistically controlling for the influences of gender, grade level, and race (Beta = -.12, p = .000). A more stringent test of this model also was conducted by entering youth intelligence, cognitive problem-solving ability and self-esteem as simultaneous predictors into the regression model. This test produced a nonsignificant beta for cumulative risk, suggesting that cumulative risk predicted the outcome measures equally well when these other predictors are added into the regression model. This analysis also revealed that cognitive problem-solving ability is a significantly stronger predictor of externalizing problem behavior (Beta = -.09, $p < .01$) and self-esteem is a significantly stronger predictor of internalizing problem behavior (Beta = .24, $p <$ .001.

Longitudinal findings (without covariate for Time 1 problem behavior). Mirroring cross-sectional findings, results from this analysis indicated that antecedent cumulative risk is a significantly stronger predictor of Time 2 internalizing problem behavior than Time 2 externalizing problem behavior (Beta = -.14, p = .000). In contrast to cross-sectional results, this finding remained significant when youth attributes were entered as predictors in the regression equation (Beta = -.07, p = .01). Cognitive problem-behavior retained its stronger relationship to externalizing problem behavior (Beta = -.06, $p <$ .05). Self-esteem likewise retained its stronger relationship to internalizing problem behavior (Beta

= .15, p < .001). This analysis was not repeated using a covariate for initial problem behavior because cumulative risk did not predict externalizing problem behavior in this set of analyses. Thus, it can be inferred that the relationship between cumulative risk and internalizing problem behavior is stronger than that for externalizing problem behavior.

Research Question #3

The third study goal was to determine whether IQ, cognitive problem-solving ability, and self-esteem modify the relationship between cumulative risk and youth problem behaviors and, if so, by what means--a compensatory or protective influence. Findings for this set of analyses are located in Table 14. Moderating tests were conducted to determine whether main effects of youth attributes differed by gender, grade level, and race. This information is not included in the tables; however significant interactions and their corresponding coefficients are reported in this section.

Cross-sectional findings. For externalizing problem behavior, regression results indicate a main effect for IQ (Beta = .07, $p < .01$), cognitive problem-solving ability (Beta = -.08, $p < .001$) and self-esteem (Beta = -.12, $p < .001$). Countering Hypothesis 2--a posited compensatory relationship between IQ and externalizing problem behavior--the positive coefficient for IQ indicates that increments in IQ scores are associated with increases in externalizing behavior. Thus, among this sample of youth intelligence exerted a slight risk for externalizing problem behavior. The negative coefficients for cognitive problem-

Table 14

Regression of Time 1 Externalizing and Internalizing Problem Behavior on Cumulative Risk and Positive Youth Attributes

	Time 1 Externalizing Problem Behavior				Time 1 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1:				.03				.05
Missing parent data	.69*	.32	.04		-.01	.42	.00	
Missing Time 2 data	-.18	.26	.01		.34	.39	.01	
Youth gender	-1.35***	.16	-.14***		.89***	.23	.06***	
Youth grade	.80***	.19	.08***		.66**	.27	.05**	
Youth race (all others)	.56*	.28	.05*		.40	.40	.02	
Youth race (black)	-.04	.27	-.01		.49	.36	.02	
Block 2:				.06				.15
Cumulative risk	.55***	.04	.23***		.93***	.06	.26***	
Block 3:				.03				.13
IQ (PPVT-R)	.20*	.01	.07*		-.49***	.01	-.18***	
Cognitive problem-solving (CPS)	-.67***	.15	-.10***		.12	.17	.01	
Self-esteem (SE)	-.92***	.15	-.12***		-4.42***	.21	-.38***	
Block 4:								
Cumulative risk x IQ	.10*	.00	.05*	.003	-.02		.00	
Block 4:								
Cumulative risk x CPS	-.18*	.07	-.05*	.002	-.04	.09	-.01	
Block 4:								
Cumulative risk x SE	-.23*	.08	-.06*	.004	-.41***	.09	-.09***	.01
Total R^2				.12			-.05	.34
F^a				182.55				795.44

Note. Weighted n = 14, 589,539. Analysis includes mechanism variables for missing parent data at Time 1 and subject attrition between Time 1 and Time 2. Coefficients reported are from Block 3 of the regression equation.

[a] Statistic associated with Block 3 of the regression equation.

*p ≤ .05 **p ≤ .01 ***p ≤ .001

solving ability and self-esteem indicate the positive role these variables play in counteracting risk--higher levels of cognitive problem solving ability and self-esteem are associated with lower levels of externalizing problem behavior. The finding for cognitive problem-solving ability is qualified, however, by youth grade level. Although significant for both 7th-8th and 9th-10th grade youth, the influence of this youth attribute was stronger for older adolescents (7th -8th grade $\underline{b}$ = -.40, $\underline{p}$ <. 001; 9th-10th grade $\underline{b}$ = -.93, $\underline{p}$ < .001). As a whole, the relative contribution of this set of variables to the prediction of externalizing problem behavior was small, accounting for 3% of variance in externalizing problem behavior.

Qualifying these main effects, each child attribute was shown to interact with cumulative risk in the prediction of externalizing problem behavior. IQ functioned as a vulnerability factor in this relationship ($\underline{b}$ = .07, $\underline{p}$ = .01). This stands in contrast to studies that have demonstrated either a compensatory or protective effect of IQ, and fails to support stated hypothesis (Hypothesis 3)--an alternative to Hypothesis 2 that allowed for the possibility of a protective effect for IQ. This interaction is depicted in Figure 7. Although weak in nature, the plotted interaction indicates that high-risk youth with higher IQ scores have greater levels of externalizing problem behavior than high-risk youth that are lower on this attribute. Yet, at the same time those in the low risk group regardless of IQ level show similar rates of externalizing problem behavior.

As predicted (Hypothesis 5 and 6), the interactions between cumulative risk and cognitive problem-solving ability ($\underline{b}$ = -.13, $\underline{p}$ < .05) and between cumulative risk and self-esteem were significant ($\underline{b}$ = -.18, $\underline{p}$ < .05). Similar in

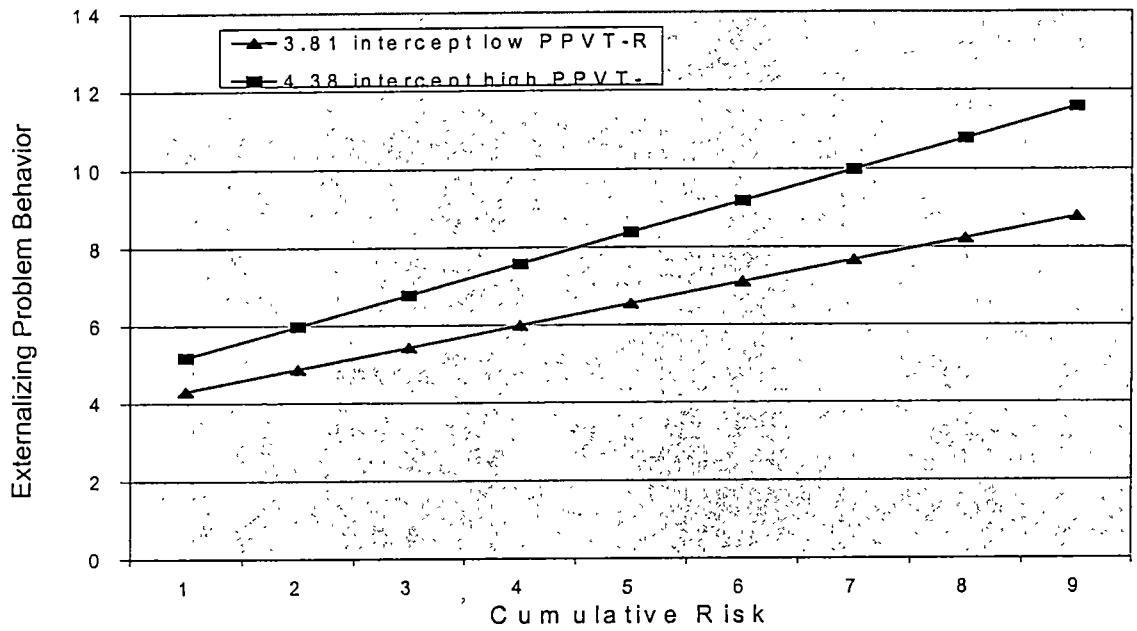

Figure 7. Cumulative risk at low and high levels of IQ for Time 1 externalizing problem behavior.

their influence, these youth attributes served a mild protection function in the face of high environmental risk. (See Figures 8 and 9, respectively, for plotted slopes.) In light of the significant interaction between cognitive problem-solving ability and youth grade level that was reported earlier, a three-way interaction between cumulative risk, cognitive problem-solving ability, and grade level was tested to determine if the protective influence of cognitive problem-solving ability was further moderated by grade level. The result of this test was consistent with the two-way interaction, indicating that the protective effect of cognitive problem-

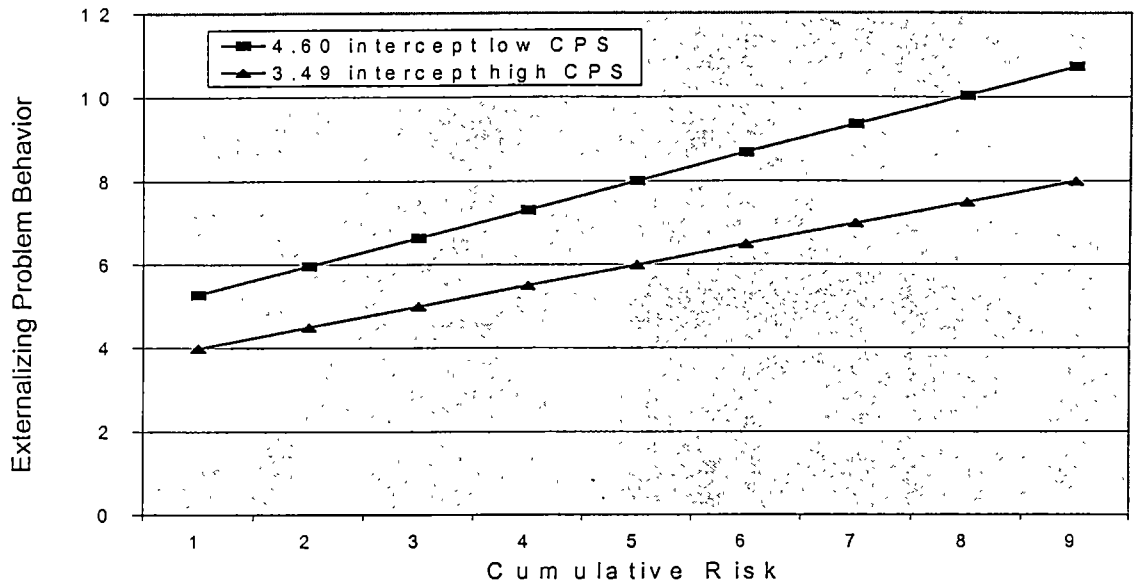

Figure 8. Cumulative risk at high and low levels of cognitive problem-solving ability for Time 1 externalizing problem behavior.

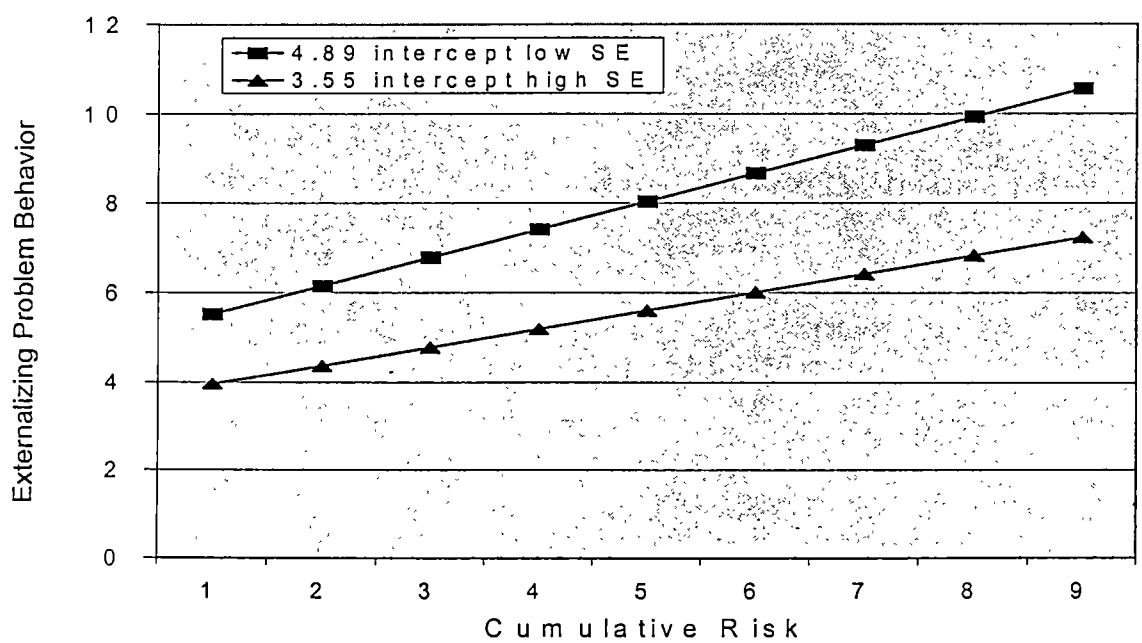

Figure 9. Cumulative risk at low and high levels of self-esteem for Time 1 externalizing problem behavior.

solving ability is greater for 9th-10th graders; however, this finding is marginally significant (b = -.28, p = .06).

With respect to internalizing problem behavior, significant main effects were found for IQ (Beta = -.18, p < .001) and self-esteem (Beta = .38, p < .001). The negative coefficients indicate that higher IQ and self-esteem are associated with fewer internalizing problem behaviors. However, the finding for self-esteem is qualified by gender. The influence of this attribute, although significant for males and females, was stronger for female youth (female b = -4.89, p < .000; male b = -3.79, p =.000). Collectively, these variables accounted for 13% of unique variance in internalizing problem behavior. The relationship between cognitive problem-solving ability and internalizing problem behavior was not significant. Yet, a significant two-way interaction (data not shown) emerged when cognitive problem-solving ability was paired with race (non-Hispanic white versus non-Hispanic black comparison). This child attribute had a strikingly different influence in the two racial groups, perhaps accounting for why a main effect was not found. The unstandardized beta coefficient for the non-Hispanic white youth was -.19, not statistically significant but in the anticipated direction (covaries negatively with problem behaviors). In contrast, the unstandardized beta coefficient for non-Hispanic black youth was 1.05 (p = .000), indicating a fairly strong positive association between cognitive problem-solving ability and internalizing problem behavior for this group. Thus, the higher reasoning skills of non-Hispanic black youth makes them prone to internalizing problem behavior,

promoting risk independently of cumulative environmental risk rather than counteracting its negative influence.

In contrast to externalizing problem behaviors, fewer of the interaction terms between cumulative risk and youth attributes were significant when internalizing was the criterion of interest. The interactions between cumulative risk and IQ and between cumulative risk and cognitive problem-solving ability were not significant. Thus, the expectation that IQ would exacerbate the influence of cumulative risk for internalizing problem behavior when levels of this attribute are high (Hypothesis 4) was not supported. The posited protective influence of cognitive problem-solving ability for both outcome measures (Hypothesis 5) received partial support as the interaction term was significant only for externalizing problem behavior.

Supporting Hypothesis 7--a posited protective influence of self-esteem--a significant interaction between cumulative risk and self-esteem was detected ($\underline{b}$ = -.41, $p < .000$). The plotted interaction is depicted in Figure 10. As the graph displays, for every one-unit increase in risk the average change in internalizing problems is .78 for youth with high self-esteem. The corresponding figure for youth with low self-esteem is 1.26. A three-way interaction term between cumulative risk, self-esteem, and gender was examined in light of the significant two-way interaction between self-esteem and gender. The beta coefficient for this interaction was not significant. It is noteworthy that although self-esteem offers protection against environmental risk, this buffer is not sufficient in and of itself to

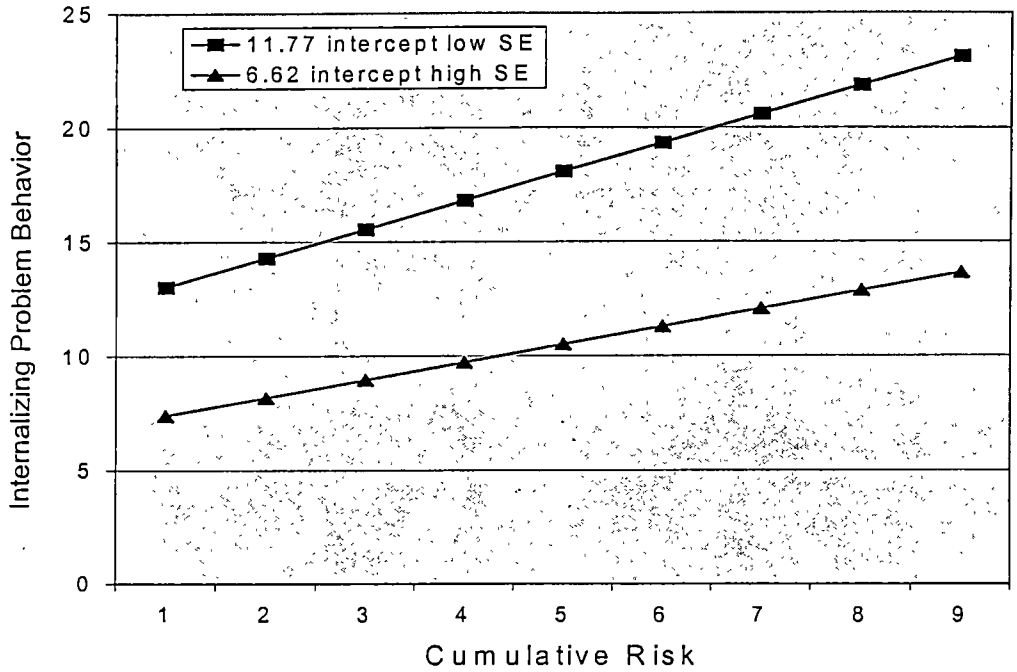

Figure 10. Cumulative risk at low and high levels of self-esteem for Time 1 internalizing problem behavior.

counteract completely the harmful effects of high risk. Regardless of their high self-esteem, youth with the greatest amount of risk (i.e., a score of 9) displayed higher levels of depressive affect than low-risk youth with low, average, and high self-esteem.

Longitudinal findings (without covariate for Time 1 problem behavior). Replicating cross-sectional findings, significant main effects for IQ (Beta = .05, $p < .05$), cognitive-problem solving ability (Beta = -.05, $p < .01$), and self-esteem (Beta = -.11, $p < .001$) were found for Time 2 externalizing problem behavior.

(See Table 15.) Demographic control variables did not modify these associations. Thus, the stronger effect of cognitive problem behavior on the older group of youth did not remain significant over time. Significant main effects for IQ (Beta = -.14, p <.001) and self-esteem (-.27, p < .000) were evident for Time 2 internalizing problem behavior. These variables accounted for 7% of variance in this outcome measure. Unlike the cross-sectional analysis, the direct association between self-esteem and internalizing problem behavior was not modified by gender; nor was the interaction between cognitive-problem solving ability and race significant. None of the interactions between cumulative risk and child attributes were significant in the longitudinal analysis, suggesting that buffering effects of youth attributes are short-lived.

Longitudinal findings (with covariate for Time 1 problem behavior). Among the child attributes, only self-esteem emerged as a significant predictor of change in externalizing over time (Beta = -.05, p < .05). As indicated by Table 16, none of the demographic control variables modified this association. Replicating findings from the longitudinal analysis without a Time 1 covariate, significant main effects for IQ (Beta = -.06, p < .01) and self-esteem (Beta = -.09, p < .001) were evident for Time 2 internalizing problem behavior. Variance accounted for by these variables was 1%. These associations were not moderated by the demographic control variables. As was the case in the longitudinal model without a covariate for early problem behaviors, none of the interactions between cumulative risk and child attributes were significant.

Table 15

Regression of Time 2 Externalizing and Internalizing Problem Behavior on Cumulative Risk and Positive Youth Attributes without Covariate for Time 1 Problem Behavior

	Time 2 Externalizing Problem Behavior				Time 2 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1:				.01				.05
Missing parent data	.19	.35	.01		.49	.47	.02	
Youth gender	-.88***	.16	-.08***		1.38***	.24	.15***	
Youth grade	.09	.19	.02		.84**	.30	.08**	
Youth race (all others)	.60*	.25	.04*		.98*	.42	.08*	
Youth race (black)	-.20	.23	-.05		.58	.38	.03	
Block 2:				.02				.08
Cumulative risk	.25***	.04	.15***		.72***	.07	.30***	
Block 3:				.03				.07
IQ (PPVT-R)	.10*	.01	.05*		-.28**	.01	-.14***	
Cognitive problem-solving	-.40**	.13	-.09**		.15	.19	.01	
Self-esteem	-.75***	.14	-.11***		-3.23***	.23	-.27***	
Total R^2				.06				.20
F				136.87				726.58

Note. Weighted n = 14,517,306. Analysis includes a mechanism variable for missing parent data at Time 1.
*p ≤ .05 **p ≤ .01 ***p ≤ .001

Table 16

Regression of Time 2 Externalizing and Internalizing Problem Behavior on Cumulative Risk and Positive Youth Attributes with Covariate for Time 1 Problem Behavior

	Time 2 Externalizing Problem Behavior				Time 2 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1:				.31				.34
Time 1 problem behavior	.49***	.04	.55***		.50***	.02	.48***	
Block 2:				.003				.02
Missing parent data	-.24	.29	-.02		.35	.41	.01	
Youth gender	-.17	.14	-.02		.99***	.21	.07***	
Youth grade	-.32*	.15	.04*		.51*	.25	.03*	
Youth race (all others)	.34	.19	.03		.76**	.31	.04**	
Youth race (black)	-.22	.18	-.02		.30	.32	.01	
Block 3:				.001				.02
Cumulative risk	.01	.04	.00		.28***	.07	.07***	
Block 4:				.02				.02
IQ (PPVT-R)	.06	.01	.02		-.13**	.01	-.06**	
Cognitive problem-solving	-.03	.12	.00		.07	.19	.01	
Self-esteem	-.28*	.14	-.05*		-1.03***	.23	-.09***	
Total R^2				.33				.40
F				231.20				975.06

Note. Weighted n = 14,517,306. Analysis includes a mechanism variable for missing parent data at Time 1.
*p ≤ .05 **p ≤ .01 ***p ≤ .001

Alternative Risk Model - Independent Additive Relationships

Although advocates of cumulative risk indices, Jessor et al. (1995) have noted that the use of such measurement devices results in treating risk factors as equally weighted and, essentially, "mutually substitutable." Despite their theoretical soundness, analyses employing cumulative risk indices obscure the relative importance of individual risk factors as they relate to youth maladjustment. To address this issue, regression analyses were conducted to examine the unique relationships between risk factors and youth problem behaviors. Consequently, this allowed for the determination of the extent of attenuation that occurred by collapsing risk factors into a single index. Consistent with previous analysis, block entry of variables proceeded in the following order: demographic control variables (including missing data mechanism variables), the 13 risk factors measured on their original scales, and the three youth attributes. Only findings related to the risk factors themselves are discussed. Most of the significant relationships between youth attributes and problem behaviors were replicated by this set of analyses. The one exception is that the main effect of IQ on externalizing problem behavior was not significant. It is noted that the variance attributable to these variables is slightly lower in the models that examined individual risk factors.

Cross-sectional findings. As indicated in Table 17, five risk factors were significant predictors of externalizing problem behavior. These represent single marital status of parent, lack of parental warmth, lack of parental involvement, low peer support, and neighborhood safety. The beta coefficients reflect

Table 17

Regression of Time 1 Externalizing and Internalizing Problem Behavior on Individual Risk Factors

	Time 1 Externalizing Problem Behavior				Time 1 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1				.03				.05
Missing parent data	.46	.30	.03		.12	.37	.01	
Missing Time 2 data	-.15	.26	-.01		.42	.39	.02	
Youth gender	-1.44	.17	-.14		1.76	.22	.07***	
Youth grade	.64	.17	.07		.76	.26	.03*	
Youth race (all others)	.82	.26	.07		1.50	.43	.04**	
Youth race (black)	-.05	.28	.00		1.18	.36	.01	
Block 2				.13				.26
Parent's marital status	.91***	.23	.08***		.61*	.27	.05*	
Parental education	.07	.29	.03		.85*	.40	.05*	
Family poverty	.34	.28	.01		1.01*	.45	.05*	
Household size	.07	.08	.02		.27*	.12	.05*	
Marital functioning	.12	.10	.02		.05	.11	.00	
Parental warmth	2.62***	.21	.30***		3.85***	.28	.30***	
Parental involvement	.06**	.02	.05**		.02	.04	.01	
Peer support	.07	.16	.01		2.00***	.23	.16***	
Trouble with peers	.76***	.10	.15***		1.30***	.12	.18***	
Neighborhood quality	.08	.08	.02		.05	.12	.01	
Neighborhood problems	.25	.18	.03		.16	.26	.01	
Neighborhood satisfaction	.02	.10	.00		1.04***	.11	.09***	
Neighborhood safety	.63*	.34	.05*		2.26***	.40	.10***	
Block 3				.02				.09
IQ (PPVT-R)	.05	.01	.02		-.11***	.01	-.21***	
Cognitive problem-solving	-.57***	.16	-.07***		.35	.16	.03	
Self-esteem	-.56***	.16	-.07***		-3.47***	.22	-.30***	
Total R^2				.18				.40
F				136.96				514.32

Note. Weighted n = 14,589,539. Analysis includes a mechanism variable for missing parent data at Time 1 and subject attrition

*p ≤ .05 **p ≤ .01 ***p ≤ .001.

strongest relationships for parent's marital status and lack of parental warmth. As a group, the individual risk factors accounted for 13% of variance in externalizing problem behavior, roughly twice as much as that accounted for by cumulative risk.

Nine of the thirteen risk factors were significant predictors of internalizing problems, including all of the family demographic variables, low parental warmth, the two peer context variables, and youth perceptions of neighborhood satisfaction and safety. The strongest predictors were parental warmth and neighborhood safety, followed by peer support and trouble with peers. Family poverty also emerged as a predictor of internalizing problem behaviors. As a set, the individual risk factors accounted for 26% of unique variance in this outcome measure, accounting for an additional 11% of variance beyond the cumulative risk index.

Longitudinal findings (without covariate for Time 1 problem behavior). A fairly consistent pattern of findings emerged for externalizing problem behavior when subsequent problem behavior was examined. (See Table 18.) However, as was the general pattern with cumulative risk, the relationships between individual risk factors and this outcome measure attenuated between time intervals. Marital status, parental warmth, parental involvement, and trouble with peers retained their significant associations to externalizing problem behavior. The beta coefficient for neighborhood safety lost its significance and those for parental education and peer support became significant. The increment in variance added by the risk factors was 8%.

Table 18

Regression of Time 2 Externalizing and Internalizing Problem Behavior on Individual Risk Factors without Covariate for Time 1 Problem Behaviors

	Time 2 Externalizing Problem Behavior				Time 2 Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1				.01				.05
Missing parent data	-.06	.32	.00		.60	.48	.02	
Youth gender	-.94	.15	-.14		2.02	.23	.07***	
Youth grade	-.09	.18	.07		.77	.31	.03*	
Youth race (all others)	.90	.26	.07		1.83	.44	.04**	
Youth race (black)	-.26	.25	.00		1.20	.41	.01	
Block 2				.08				.14
Parent's marital status	.51**	.21	.05**		.49	.34	.03	
Parental education	.65*	.27	.02*		.91*	.42	.06*	
Family poverty	.26	.26	.05		.73	.50	.04	
Household size	.14	.09	.04		.11	.14	.02	
Marital functioning	.14	.09	.03		.18	.14	.02	
Parental warmth	2.01***	.22	.25***		3.07***	.31	.23***	
Parental involvement	.05*	.03	.03*		.02	.04	.01	
Peer support	.34*	.14	.05*		1.66***	.25	.13***	
Trouble with peers	.55***	.10	.12***		.76***	.16	.10***	
Neighborhood quality	.04	.08	.01		.07	.13	.01	
Neighborhood problems	.18	.17	.02		.11	.26	.01	
Neighborhood satisfaction	.05	.10	.01		.09	.17	.01	
Neighborhood safety	.34	.26	.03		.90*	.52	.06*	
Block 3				.01				.05
IQ (PPVT-R)	.03	.01	.01		-.09***	.01	-.17***	
Cognitive problem-solving	-.30*	.13	-.04*		.40	.20	.04	
Self-esteem	-.49***	.14	-.07***		-2.40***	.26	-.20***	
Total R^2				.10				.24
F				95.24				430.98

Note. Weighted n = 14,517,306. Analysis includes a mechanism variable for missing parent data at Time 1.
*p ≤ .05 **p ≤ .01 ***p ≤ .001.

For internalizing problem, three of the four family demographic variables lost their influence over time. Only parental education remained significant. Fairly consistent with cross-sectional analysis, important sources of risk to youth included low parental warmth, lack of peer support, trouble with peers, and the perception of an unsafe neighborhood. The set of risk factors accounted for 14% of variance in internalizing problem behavior.

Longitudinal findings (with covariate for Time1 problem behavior). The introduction of a statistical control for early levels of externalizing problem exerted little change with respect to the general pattern of findings that resulted in the longitudinal model without a covariate for Time 1 problem behaviors. (See Table 19.) Once again, frequent troubles with peers and low levels of parental education, parental warmth, and peer support posed risks for increases in externalizing problems. Marital status diminished in importance; however, neighborhood safety became a significant predictor as was the case in the cross-sectional analysis. As a whole, the set of individual predictor variables accounted for 1% of variance in externalizing problem behavior. Only the family process variables of parental warmth and involvement predicted average change over time in internalizing problem behavior. They accounted for 2% of variance.

Table 19

Regression of Time 2 Externalizing and Internalizing Problem Behavior on Individual Risk Factors with Covariate for Time 1 Problem Behavior

	Time 2 Externalizing Problem Behavior				Time 2Internalizing Problem Behavior			
	B	SE	Beta	R^2	B	SE	Beta	R^2
Block 1				.31				.34
Time 1 problem behavior	.47	.04	.53		.51	.02	.50	
Block 2				.003				.01
Missing parent data	-.34	.27	-.02		.40	.42	.02	
Youth gender	-.24	.13	-.14		1.17	.20	.07***	
Youth grade	-.39	.14	.07		.39	.27	.03*	
Youth race (all others)	.51	.20	.07		1.07	.31	.04**	
Youth race (black)	-.28	.20	.00		.59	.34	.01	
Block 3				.01				.02
Parent's marital status	.10	.17	.05		.20	.33	.03	
Parental education	.56**	.21	.02**		.45	.41	.04	
Family poverty	.30	.21	.05		.29	.43	.04	
Household size	.11	.08	.04		.02	.13	.02	
Marital functioning	.10	.08	.03		.19	.14	.02	
Parental warmth	.76***	.19	.25***		1.16***	.31	.23***	
Parental involvement	.02	.02	.03		.04	.03	.01	
Peer support	.32**	.13	.05**		.64***	.24	.13***	
Trouble with peers	.18*	.09	.12*		.12	.16	.10	
Neighborhood quality	.07	.07	.01		.02	.11	.01	
Neighborhood problems	.05	.15	.02		.03	.22	.01	
Neighborhood satisfaction	.04	.09	.01		.01	.16	.01	
Neighborhood safety	.67*	.26	.05*		.20	.48	.05	
Block 4				.001				.01
IQ (PPVT-R)	.05	.01	.00		-.04***	.01	-.07***	
Cognitive problem-solving	-.03	.12	-.00		.20	.19	.02	
Self-esteem	-.22	.15	-.03		-.72**	.25	-.06**	
Total R^2				.32				.38
F				155.18				593.95

Note. Weighted n = 14,517,306. Analysis includes a mechanism variable for missing parent data at Time 1.
*p ≤ .05 **p ≤ .01 ***p ≤ .001.

CHAPTER IV

DISCUSSION

The primary objectives of this investigation were to test the usefulness of a cumulative risk approach for predicting aspects of youth maladjustment in a nationally representative sample of adolescent children and to examine how personal attributes modify the risk-maladjustment relationship. Bronfenbrenner's (1977) ecological framework served as a useful framework for conceptualizing risk at various levels of organization including the family and extrafamilial environment (i.e., peer and neighborhood context). Additionally, this approach allowed the perspective that developmental outcomes are shaped by the interaction between characteristics of the individual and his or her surrounding environment.

The results of this study highlight the need for greater specificity in studies of cumulative risk and psychosocial protection. Although an accumulation of stressors has deleterious consequences for adolescents, study findings indicate that the relation between cumulative risk and maladjustment varies as a function of youth background factors. Likewise, this study provides evidence that positive youth attributes assume important roles in the risk-adjustment relationship; however, these associations are quite complex, differing by outcome measure and various contextual factors. Using the research questions guiding this study as general headings, major findings are discussed with attention given to applied implications and/or recommendations for future research. Noted strengths and limitations of the study and a brief summary statement follow this discussion.

Qualifying the Relationship between Cumulative Risk and Youth Problem Behaviors

Present findings indicate that an accumulation of environmental risk is associated with linear increases in maladaptive behavior. This is consistent with an additive model of risk rather than a multiplicative model as demonstrated by Rutter in an investigation of familial risk (1979). In his study, it was noted that an accumulation of stressors seems to have a potentiating effect so that the interaction of two or more stressors is greater than their sum. When depicted graphically, his data suggest a curvilinear influence of risk such that small amounts of risk are tolerable but when a critical level of risk is reached problem behaviors accelerate. This critical point was four risk factors in his research. However, what has often gone unnoted in citing Rutter's work is the finding that when environmental risk exceeded this critical point, risk factors exerted little influence on behavior (i.e., a threshold effect). In contrast, results from this study indicate that the influence of risk does not cease at increasingly higher levels, a finding consistent with the notion of "stressor pileup". According to stress theorists, chronic multiple stressors lead to the depletion of positive psychological resources and increase the individual's likelihood of engaging in patterns of coping that are ineffectual (Boss, 1988; Pearlin et al., 1981).

In light of this finding, an important goal for intervention is to work with troubled youth and their families in reducing levels of risk to alleviate its influence and facilitate adolescent coping. Efforts also should consist of preventative measures aimed at reducing the likelihood of further sources of stress from

entering these families' lives. Additional stressors have the potential to increase youths' maladjusted behavior; thus, teaching families how to anticipate and proactively deal with future sources of stress may serve children well in the long run by preventing harmful influences from reaching their path.

It is worth noting, however, that Gerard and Buehler (1999a) also found a threshold effect of risk on youth maladjustment. What their study has in common with the Rutter study is that they both focused on risk stemming from a particular domain--the family. Such findings hint at the possibility that a linear relationship might be more likely when risk from other socialization domains are taken into account. Risk stemming from multiple ecologies might pose a threat to youth that is greater than risk contained within a particular social context. Future studies of multiple risk exposure should address the question of whether within-domain risk factors compound the effects of one another or reach a point of maximum influence. To the author's knowledge, tests of this nature have not been conducted outside of studies that consider familial risk. Future research also should continue to address the question of how domains of risk covary and operate in conjunction with one another. This information is necessary to clarify the empirical relationships between the varied social contexts of youth and to aid the development of theoretical models of stress and coping among children.

Although this investigation demonstrated that cumulative risk has negative consequences for adolescents as a whole, young women and Caucasian youth were shown to be particularly susceptible to this influence when internalizing problem behavior was the criterion. The finding of gender differences is

consistent with other investigations on coping and stress. For example, Rossman (1992) discovered that with increasing age girls are less inclined to use anger and aggression in situations that call for coping. Rather, they tend to rely more often on emotion-focused coping strategies that are internal in nature such as worry and distress. Speculating on this finding, Rossman argued that the higher endorsement of distress expressions among girls relative to boys reflects possible gender differences in socialization processes wherein anger and aggression are less acceptable forms of coping for females than males, but depressive and worry affect are permissible behaviors.

The slightly stronger influence of cumulative risk for Caucasian youth might stem from culturally based differences in living standards and general quality of life. Comparatively speaking, Caucasian youth are not as well represented at the higher end of the risk dimension as youth in the mixed ethnic group. As such, high-risk Caucasian youth might experience higher rates of depression resulting from their prominence among more advantaged counterparts. Social comparison theory emphasizes relative deprivation and status-organizing processes (Wood, 1989). Models of relative deprivation assume that young people evaluate themselves by drawing comparisons to others around them and that unfavorable comparisons can lead to emotional distress and feelings of low self-worth. This is especially important during the period of adolescence when youth become increasingly conscious of environmental inequalities (Rosenberg & Pearlin, 1978). Since risk and socioeconomic disadvantage are more common among the minority group, these

youth may have less variety in their references for social comparisons than Caucasian youth and, consequently, less emotional distress. Although speculatory, findings seem to support this perspective. A similar pattern emerged when whites were compared with non-Hispanic black youth; however, the beta associated with this finding did not reach the criterion for significance.

An alternative explanation offered by Gonzales and Kim (1997) is that ethnic minority adolescents may be less vulnerable to psychological distress because of ethnic-specific coping strategies or cultural influences that buffer the negative effects of stress. At the present time, the literature reflects an obvious need for studies that examine risk and protection against the backdrop of ethnicity to identify common and culturally-specific sources of stress and resources in the adolescent population.

Cumulative Risk and its Specificity in Predicting Youth Problem Behaviors

This study demonstrated the value of incorporating statistical tests that determine whether a risk factor(s) has an equivalent effect across outcome variables of interest. Although cumulative risk was significantly related to both externalizing and internalizing problem behaviors, it had a significantly larger effect on the latter. Information of this nature is useful for guiding intervention efforts and applied research with populations of high-risk youth. Luthar (1997) has articulated concern over the fact that the most likely recipients of child mental health services are high-risk youngsters who present management problems (i.e., disruptive behavior, and aggression) for authority figures. This potentially overlooks treatment of those adolescents who likewise experience serious

adversities in their lives but struggle with this reality through negative forms of coping that are internal in nature such as depression and anxiety.

Thus, the stronger association between cumulative risk and internalizing problem behavior suggests that clinicians, teachers and educators should be attentive to possible emotional problems among high-risk youth and steep their efforts to identify children with such difficulties. Risk researchers can facilitate these efforts by determining whether risk factors of interest show selectivity in the outcomes they predict. This information could serve as a useful criterion for intervention by directing program resources to aspects of adolescent development that warrant the most need for direct intervention.

The Role of Youth Attributes in the Cumulative Risk-Maladjustment Relationship

Finally, this study highlights the complex associations between youth attributes and maladjustment. Findings indicate that the same attribute might offer protection against high amounts of risk in regard to one aspect of behavior but might function as a risk factor or neutral influence for another. The roles of IQ, cognitive-problem solving ability, and self-esteem are considered individually.

It was hypothesized that IQ would serve either a compensatory or protective influence on youth externalizing problem behavior, and a vulnerability influence with respect to internalizing problem behavior. Results from this study suggest an opposite pattern of findings. For externalizing problem behavior, the negative influence of cumulative risk was slightly stronger when youth intelligence was high (a vulnerability effect). For internalizing problem, IQ assumed a compensatory role in the risk-maladjustment relationship.

The finding for externalizing problem behavior is contrary to most studies, which have found compensatory or protective effects for IQ. Because this finding is weak and limited to the cross-sectional analysis, the negative influence of high IQ should be interpreted with caution. However, it is possible that the cognitive assets of highly intelligent youth promote a heightened sensitivity to poor environmental surroundings and, perhaps, a sense of social injustice. This might compel youth to react with nonconformist behavior. It has been noted in the literature that antisocial activity can be considered an adaptive response of children living in highly stressful environments (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995). Acts of defiance against mainstream society and its values might mitigate negative self-evaluations of disadvantaged groups (Gonzales and Kim, 1997). Despite any immediate benefits, however, these unsanctioned actions are maladaptive in the long run as they deny the individual access to the reward structure of the dominant society and hurt rather than help the individual's cause.

Demonstrating how a variable can introduce risk for one outcome and counter risk against another, IQ exerted a compensatory influence in the risk-internalizing behavior relationship. The positive influence of this variable remained stable across time, reflecting the importance of this variable as an inhibitory factor in the development of internalizing problem behavior. This effect generalizes across all subgroups of youth, regardless of amounts of environmental risk. At the present time, little theory and empirical work is available to draw inferences about the compensatory role IQ plays with respect

to internalizing problem behavior. This fact comes as a surprise given the prominence of IQ in studies of risk and resilience. Block and Gjerde (1990), who have examined the association between IQ and depression through longitudinal analyses, have suggested that high intellectual ability is an early personal child competence that influences the probability of depressive symptoms in late adolescence. Yet, these researchers do not elaborate on how individuals use IQ as an internal resource to achieve satisfactory development. A question that arises is whether there is something intrinsic about IQ that serves to lessen the risk for internalizing problems outcome or whether IQ is a marker variable indicative of outside behavior(s) that ward off the risk for this developmental outcome. It stands for future research to address this question.

Cognitive problem-solving ability was shown to offer slight protection against externalizing problem behaviors in the context of high amounts of risk. It appears that adolescents are able to utilize their problem-solving skills to cope with an accumulation of stressors, and this resource may temper the impulsivity that often drives aggressive and delinquent behavior. The detection of a marginally significant three-way interaction between this youth attribute, cumulative risk, and grade level raises the possibility that the buffering quality of this variable is more beneficial to older adolescents. The mean level of cognitive problem-solving ability was similar for 7th-8th graders and 9th-10th graders, indicating that older youth do not possess a greater amount of this skill. However, these youth may be more effective in making sound judgments and utilizing their reasoning abilities in situations that call for such skills. The protection this asset

offers is immediate rather than long-term as the interaction between cognitive problem-solving ability and cumulative risk was not significant in the longitudinal analysis. Cognitive problem-solving ability did demonstrate a weak compensatory effect in the longitudinal analysis without a statistical control for initial levels of externalizing problem behaviors, yet lost its predictive ability when early problem behaviors were introduced into the regression model. Speculating on a similar set of findings, Dubow et al. (1991) have suggested that it might be more useful to examine adolescents' use of specific types of cognitive problem-solving strategies in relation to specific types of stressors or risk factors.

In contrast to its protective influence with respect to externalizing problem behavior, cognitive problem-solving ability placed non-Hispanic black youth at significant risk for internalizing problem behavior and had a relatively neutral effect on non-Hispanic white youth. It is interesting that the possession of cognitive problem-solving flexibility operates to the detriment of black youth irrespective of risk status, increasing this group's risk for depressive symptoms. A possible explanation for this finding is that higher reasoning and perspective-taking skills compete with the reality of being a member of a highly stigmatized group, consequently causing inner distress. Additional theory and research is necessary to understand why cognitive problem-solving ability demonstrates selectivity as a risk factor. At the very least, this finding further reinforces the need to include ethnicity as a primary factor in studies of risk and psychosocial protection. Such efforts hold promise for more sophisticated theory about the role

of ethnicity in the transmission of risk and also the development of culturally sensitive intervention programs for minority and adolescent youth.

Among the youth attributes that were considered in this study, self-esteem was the most salient predictor of problem behavior. It was hypothesized that self-esteem would buffer the relationship between cumulative risk and both externalizing and internalizing problem behaviors. These predictions were confirmed in the cross-sectional analysis. It is likely that positive feelings of self-worth act as a safeguard against negative evaluations by self and others that often result from being a member of a disparaged group. Youth may derive inner strength from this psychological resource in the face of chronic adversity. High self-esteem may allow the individual to separate negative nuances of his or her life from any personal responsibility (Harter, 1986). The protective nature of this asset is more influential in warding off depressive affect than conduct-disordered behavior. Given the close link between feelings of poor self-worth and depression, this should come as no surprise. As is the case with the protective effect of cognitive problem-solving ability, the buffering effect of self-esteem is short-lived and, moreover, does not completely shield against the detrimental effect of high amounts of risk. Yet, the influence of this youth attribute remains significant over time and counteracts the risk for problem behaviors albeit in a broader sense. The main effect associated self-esteem in the longitudinal analyses suggests that self-esteem provides general immunity against the development of problem behaviors regardless of the amount of risk in children's lives. Thus, programs designed to boost adolescents' self-esteem and build on

individual competencies appear to be a fruitful avenue for promoting better psychosocial outcomes among youth.

The Role of Individual Risk Factors

The emphasis on the amount of risk in adolescents' lives was useful in determining the extent to which cumulative risk exposure plays an etiological role in the development of problem behavior and also the extent to which youth attributes compensate or offer protection against high-risk exposure. However, this approach obscures the relative importance of individual risk factors. When risk factors were examined individually a more lucid picture emerged. Although shared variance influences which risk measure reaches statistical significance at the expense of another, important sources of risk were found at each conceptualized risk domain. Particularly salient risk factors common to both externalizing and internalizing included low parental warmth and problems in the peer domain (low perceived peer support and frequent trouble with peers). The influence of these variables is stable across time, highlighting the importance of the family and peer ecology in the socialization process and the degree to which proximal sources of risk interfere with positive psychosocial development during adolescence.

From a practical standpoint, these findings offer guidance to professionals working with high-risk children and families, suggesting that positive benefits to children are most likely to be derived through intervention efforts that enhance the quality of youths' interpersonal relationships. The prominence of unsupportive family relationships as a risk factor to youth underscores the importance for

practitioners to assess carefully the quality of parental caregiving practices when families seek intervention for a child-focused problem. The salience of low peer support and rejection by peers reflects the need for programs that teach adolescents strategies for coping with problematic peer relationships. Zakriski, Jacobs, and Coie (1997) recommend intervention programs that combine positive skill training for bolstering children's prosocial behavior (e.g., initiating friendship, communication, being supportive of others, perspective-taking) and cognitive strategies that target the individual's social awareness of peer difficulty and his or her attributional system (e.g., motivations and intent attributed to peers).

This examination of individual risk factors also revealed the relative importance of subjective measures of neighborhood context over objective measures, particularly when internalizing problem behavior was the criterion. The finding that youth perceptions of unsafe and dissatisfying neighborhoods constitute risk factors for maladjustment indicate that adolescents are indeed sensitive to aspects of the larger, more distal environment. Dangerous neighborhood conditions--crime, violence, drug-dealing, and gang activity--have been shown to threaten the personal safety of children and also to exert a strong influence on children's behaviors and attitudes through direct modeling, pressure, and encouragement to engage in deviant activity (Guerra et al., 1995; Sampson & Laub, 1994). This study adds to the growing body of literature on neighborhood conditions and child development. As this literature develops, it becomes increasingly valuable with respect to public policy and community intervention

programs that are geared toward making neighborhoods safer and more desirable places for children to live.

Study Strengths and Limitations

Before concluding this discussion, several strengths and limitations of the study are noted. To its advantage, this study capitalized on data derived from multiple sources. The availability of Census tract data to measure neighborhood risk and parent report data to assess both neighborhood and family risk potentially reduces bias that is likely to occur when multiple measures are derived solely from a single-informant. Given the youth outcomes under consideration, the importance of this issue becomes evident. Children who are outwardly hostile or depressed may view their world through negative eyes, which might distort their perceptions of the surrounding environment.

An additional strength of this study is its utilization of a large national sample, which not only allows for broader generalizations of findings but also assured adequate numbers of minority youth to determine whether group differences exist in the covariation of cumulative risk and maladjustment. The common practice among researchers of using race as a statistical control variable only yields information as to whether or not ethnic status accounts for variation in a particular outcome. This approach is limited in the sense that it reveals nothing about whether there are racial differences in etiological processes leading to maladjustment (Deater-Deckard et al., 1998). This is critical to studies of environmental risk, particularly when one considers variations in the

social ecologies of minority youth and racial differences in rates of poverty, access to resources, and cultural norms for behavior.

A final strength of the study is its focus on youth attributes that are, for the most part, relatively independent of the risk factors comprising the study. In other studies of risk and protection, child risk factors are included that seemingly confound with protective factors of interest. For instance, Jessor and colleagues (1995) used low grade point average to represent a child behavioral system risk factor in their cumulative risk index; yet, these researchers also conceptualized adolescents' positive orientation to school as a protective factor. Likewise, having friends that model problem behavior was conceptualized as a risk agent; yet a similar measure assessing the degree to which adolescents have friends that model conventional behavior was among the measures of protection included in their protective factor index. To their credit, however, the researchers provided sufficient information to support the independence of these risk and protective factors. In contrast, the present study focused on protection in the context of high risk by looking at how the possession of particular attributes interacts with characteristics of the external environment that children have little control over.

Turning to limitations, although the risk variables comprising the cumulative risk index are fairly representative of other multiple risk investigations and those commonly cited in the broader risk literature, several variables deemed important by social scientists were not considered. The unavailability of items assessing parental psychopathology (e.g., depression, mental illness, criminality), parental monitoring, and child maltreatment and/or overly harsh

parental disciplinary techniques constitute important exclusions (Cohen et al., 1990; Deater-Deckard; Farrington, 1991; Patterson & Stouthamer-Loeber, 1984; Sameroff & Siefer, 1983). (An attempt was made to form a parental monitoring scale with items that assessed various times of the day parents were in the home; however, the measure was unreliable and, moreover, did not tap actual monitoring behaviors such as parents' knowledge of children's whereabouts and who they spend time with). Additionally, the study focus on environmental risk versus risk stemming from the child precluded the examination of factors that may predispose youth to conduct disordered behavior and depression such as constitutional factors (e.g., youth temperament or personality traits) and biological factors (e.g., genetic makeup). It is difficult to say whether the inclusion of these variables would have enhanced the predictive power of the cumulative risk index. In a related vein, some of the measured risk factors (i.e., marital functioning, peer rejection) were represented with too few items or global items that may only indirectly tap the constructs of interest. Yet, the amount of variance accounted for by the index utilized in the present study is consistent with other investigations of cumulative risk (Deater-Deckard et al., 1998; Jessor et al., 1995), a point worth mentioning given the aggregation of vastly different measures and differential representation of risk domains.

The issue of predictive ability, however, warrants attention given the reduction in variance attributable to cumulative risk in the longitudinal analyses. Findings generated by this study indicate that cumulative risk is a better predictor of concurrent problem behavior than subsequent problem behavior risk. The

consistency of this finding across studies of cumulative risk (Deater-Deckard et al., 1998; Jessor et al., 1995) and the occurrence of an identical pattern of findings when cumulative risk was replaced with individual risk factors should alleviate possible concerns about the validity of the cumulative risk index. Thus, it may genuinely be the case that environmental risk poses more immediate rather than long-term threats to coping. It is noted however, that this study relied on a narrow (but important) conceptualization of psychosocial well-being. A broader definition of adjustment may have yielded stronger findings. On the other hand, the use of a covariate for controlling initial levels of problem behaviors constitutes a stringent test for examining the long-term influence of risk because it necessarily restricts variability in one's outcome measure. Given the short time span between data collection points and evidence of little change in problem behaviors over this brief period, the fact that cumulative risk added a significant increment in variance to the prediction of subsequent internalizing problem behaviors is nonetheless noteworthy.

And finally, because the Add Health data are derived from a school-based population it is probable that adolescents at greatest risk (i.e., high school dropouts, homeless youth, and incarcerated youth) were not represented adequately in the study. This limits the generalizability of present findings to the national population of school-attending youth. Nonetheless, study findings provide baseline information on environmental risk and maladjustment for adolescents in the general population. This information can be used for comparative purposes in future studies of risk.

Conclusions

Despite these limiting factors, the study offers insights into the role of risk and youth attributes in the development of adolescent problem behavior. The contextualization of several findings speaks to the importance of background factors in carrying out the influence of risk and factors that promote better outcomes. Additional theory is needed to explain why the influence of risk is felt more strongly by particular groups of adolescents and, likewise, why the possession of certain traits is beneficial to some and harmful to others. In terms of intervention, the cumulative effects of risk exposure suggest that efforts be targeted at minimizing current sources of stress to youth stemming from various ecological contexts. Such efforts should address the psychological assets adolescents bring to their environment and how these can be enhanced to foster better outcomes among high-risk youth.

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Appendix

Factor Analytic Results

Neighborhood Constructs

Item	Factor 1	Factor 2	Factor 3
Modal race Black	**.56**	.15	.30
Proportion Hispanic	**.42**	.07	.08
Modal marital status never married	**.43**	.14	.31
High % persons under poverty line	**.80**	.23	.39
High % persons over 25 no high school	**.60**	.12	.26
High unemployment rate	**.66**	.18	.35
Trash and litter on streets	.32	**.60**	.20
Drug dealers and users	.32	**.75**	.24
Happy living in neighborhood	.12	.20	**.90**
Happy to move	.13	.13	**.51**
Feel safe in neighborhood	.23	.28	.30

Appendix

Factor Analytic Results

Youth Attribute Variables

Item	Factor 1	Factor 2	Factor 3
PPVT-R	.16	-.06	-.02
Research solutions to problems	-.09	**.69**	.24
Generate multiple approaches	-.06	**.68**	.23
Rational decision-making	-.11	**.62**	.26
Evaluate outcome of decisions	-.06	**.60**	20
Possess lots of good qualities	.32	.33	**.64**
Have a lot to be proud of	.30	.32	**.75**
Like self as are	-.06	.25	**.76**
Doing everything right	-.13	.27	**.71**

Appendix

Factor Analytic Results

Time 1 Outcome Measures

Item	Factor 1	Factor 2
Paint graffiti	**.49**	.12
Damage property	**.61**	.12
Lie to parents	**.51**	.26
Shoplift	**.65**	.18
Serious physical fight	**.60**	.21
Run away from home	**.51**	.16
Steal a car	**.39**	.23
Steal worth more than $50	**.47**	.12
Burglarize a building	**.60**	.12
Threaten with a weapon	**.54**	.12
Sell drugs	**.51**	.09
Steal worth less than $50	**.62**	.11
Take part in group fight	**.54**	.20
Loud or rowdy in public	**.53**	.22
Bothered by things	.15	**.56**
Poor appetite	.13	**.45**
Had the blues	.18	**.68**
Felt just as good as others	.04	**.41**
Trouble keeping focused	.26	**.53**
Felt depressed	.19	**.75**
Too tired to do things	.15	**.45**
Hopeful about the future	.11	**.36**
Felt life had been a failure	.19	**.59**
Felt fearful	.12	**.48**
Felt happy	.14	**.46**
Talked less than usual	.09	**.43**
Felt lonely	.14	**.64**
People unfriendly to you	.14	**.42**
Enjoyed life	.15	**.50**
Felt sad	.15	**.70**
People dislike you	.14	**.55**
Hard to start doing things	.14	**.42**
Felt life not worth living	.16	**.59**

Appendix

Factor Analytic Results

Time 2 Outcome Measures

Item	Factor 1	Factor 2
Paint graffiti	**.58**	.06
Damage property	**.63**	.09
Lie to parents	**.45**	.19
Shoplift	**.61**	.11
Serious physical fight	**.38**	.10
Run away from home	**.32**	.31
Steal a car	**.59**	.07
Steal worth more than $50	**.69**	.08
Burglarize a building	**.62**	.02
Threaten with a weapon	**.55**	.12
Sell drugs	**.55**	.09
Steal worth less than $50	**.62**	.06
Take part in group fight	**.48**	.17
Loud or rowdy in public	**.48**	.18
Bothered by things	.12	**.55**
Poor appetite	.08	**.48**
Had the blues	.12	**.73**
Felt as good as others	.07	**.35**
Trouble keeping focused	.17	**.51**
Felt depressed	.10	**.80**
Too tired to do things	.16	**.51**
Hopeful about the future	.06	**.33**
Felt life had been a failure	.18	**.65**
Felt fearful	.17	**.35**
Felt happy	.09	**.51**
Talked less than usual	-.07	**.34**
Felt lonely	.09	**.64**
People unfriendly to you	.09	**.39**
Enjoyed life	.11	**.55**
Felt sad	.03	**.72**
People dislike you	.10	**.49**
Hard to start doing things	.13	**.38**
Felt life not worth living	.15	**.56**

VITA

Ms. Gerard has presented her research findings through various professional organizations and publications. Jean has co-authored several articles with Dr. Cheryl Buehler in the areas of family risk, marital conflict, and child custody legislation. She is a student member of the American Psychological Association, National Council on Family Relations, Society for Research on Adolescence, and Society for Research in Child Development. Jean recently accepted an Assistant Professor of Family Studies position at Bowling Green State University in northern Ohio where she will teach family studies courses and continue research in the area of psychosocial risk and protection in adolescence.