

The author(s) shown below used Federal funds provided by the U.S. Department of Justice and prepared the following final report:

Document Title: Good Kids in Bad Circumstances: A Longitudinal Analysis of Resilient Youth

Author(s): Michael G. Turner Ph.D.

Document No.: 188263

Date Received: 06/18/2001

Award Number: 98-IJ-CX-0026

This report has not been published by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federally-funded grant final report available electronically in addition to traditional paper copies.

Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

188263

**Good Kids In Bad Circumstances:
A Longitudinal Analysis of Resilient Youth**

PROPERTY OF
National Criminal Justice Reference Service (NCJRS)
Box 6000
Rockville, MD 20849-6000

A Report Submitted to the
National Institute of Justice

Michael G. Turner, Ph.D.
417 Churchill Hall
Northeastern University
360 Huntington Avenue
Boston, MA 02115

(Dissertation)
FINAL REPORT

Approved By: *Archue*
J. Tom

Date: *9/13/00*

The results of this study were supported under award 98-IJ-CX-0026 from the National Institute of Justice. Points of view in this document are those of the authors and do not necessarily represent the official position of the U.S. Department of Justice.

**Good Kids In Bad Circumstances:
A Longitudinal Analysis of Resilient Youth**

TABLE OF CONTENTS

CHAPTER ONE

I.	Life-Course Criminology and the Role of Resiliency	1
II.	Rise of Life-Course Criminology	6
	Criminal Career Perspective: A Historical Review	8
	Contemporary Criminal Career Research: Revisiting Classic Debates	11
	Developmental or Life-Course Criminology	15
III.	Risk Factor Research	19
	The Origin of Risk Factor Research	20
	The Dynamic Nature of Risk Factors	24
	The Effects of Risks and Age	25
	The Effects of Risks From Different Domains	28
	Intrapersonal Risk Factors	29
	Family Risk Factors	33
	Peer Risk Factors	38
	Neighborhood Risk Factors	40
	Delayed Effects of Risk Factors	44
	The Detrimental Effects of Multiple Risk Factors	46
IV.	The Conceptual Foundation of Resiliency:	
	Successful Adaptation Among High-risk Youths	50
	Defining Resiliency	51
	Historical Origins of Resiliency Research	53
	The Role of Protective Factors in Instigating Resiliency	56
	Stages of Protective Factor Research	62
	Empirical Research Investigating Resiliency	63
	Individual Factors	64
	Family Factors	67
	External Support Systems	69
V.	Research Strategy	72

CHAPTER TWO

I.	Methods	80
II.	NLSY Data	83
	Retention Rates	84
	Methods of Data Collection	84
	Major Data Elements	86

III.	NLSY Child-Mother Data	87
	Retention Rates	88
	Methods of Data Collection	89
	Major Data Elements	90
	Advantages of the NLSY Child-Mother Data Set	91
IV.	Sample	93
	Sampling Weights	95
	Sample Attrition	98
	Sample Characteristics	99
V.	Measurement of Core Concepts	102
	Dependent Variables	103
	Resiliency to Involvement in Delinquency and Drugs	103
	Measure of Depression	105
	Independent Variables	106
	Risk Factors	107
	Adolescent Motherhood	108
	Large Family Size	110
	Parental Deviance	111
	Non-Intact Marriage	112
	Persistent Poverty	113
	Maternal Smoking During Pregnancy	114
	Low Birth Weight	115
	Protective Factors	116
	Self-Esteem	116
	Self-Perceived Scholastic Competence	117
	Self-Perceived Global Self-Worth	118
	Academic Competence	119
	Positive School Environment	121
	Cognitive Stimulation	122
	Emotional Support	123
	Religiosity	123
	Control Variables	125
VI.	Statistical Analysis	126

CHAPTER THREE

I.	Findings	131
II.	The Cumulative Effects of Risk on Delinquency and Drug Use	131
III.	The Cumulative Effects of Protection on Delinquency and Drug Use	134
IV.	Differences in Protection Between Resilient and Non-resilient Individuals: Self-reported Delinquency	136
V.	Predicting Resiliency For Self-Reported Delinquency	139

Examining the Cumulative Effects of Protection on Resiliency Against Self-Reported Delinquency	141
Examining the Effects of Protection in Different Domains: Resiliency Against Self-Reported Delinquency	145
Examining Whether Protective Factors Are Invariant Across Categories of Race: Resiliency Against Self-Reported Delinquency	146
Examining Whether Protective Factors Are Invariant Across Categories of Gender: Resiliency Against Self-Reported Delinquency	152
VI. Differences in Protection Between Resilient and Non-resilient Individuals: Self-reported Drug Use	158
VII. Predicting Resiliency For Self-Reported Drug Use	161
Examining the Cumulative Effects of Protection on Resiliency Against Self-Reported Drug Use	165
Examining the Effects of Protection in Different Domains: Resiliency Against Self-Reported Drug Use	167
Examining Whether Protective Factors Are Invariant Across Categories of Race: Resiliency Against Self-Reported Drug Use	167
Examining Whether Protective Factors Are Invariant Across Categories of Gender: Resiliency Against Self-Reported Drug Use	173
VIII. Examining the Cumulative Effects of Risk and Protection on Delinquency and Drug Use	177
IX. Internal Behavioral Problems of Resilient Youths	182
 CHAPTER FOUR 	
I. Discussion	185
II. Major Findings	186
III. Implications of Findings	194
IV. Limitations of the Current Research	199
V. Future Research on Protective Factors and Resiliency	202
References	214

LIST OF TABLES

Table 2.1	Comparison of Characteristics in Unweighted Sample and Attrition Subsample	100
Table 2.2	Descriptive Statistics of Unweighted Young-Adult Analytic Sample	101
Table 2.3	Distribution of Risk and Protective Factors Among Total and High-Risk Samples	109
Table 2.4	Correlation Matrix	129
Table 3.1	Relationship Between the Number of Risk Factors and Prevalence in Self-Reported Delinquency and Drug Use	132
Table 3.2	Relationship Between the Number of Protective Factors and Prevalence in Self-Reported Delinquency and Drug Use	135
Table 3.3	Mean Comparisons Between Levels of Protective Factors of Resilient and Non-Resilient Youths for Self-Reported Delinquency	138
Table 3.4	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency	140
Table 3.5	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Independent Effects of Protective Factors	142
Table 3.6	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Cumulative Effects of Protective Factors	144
Table 3.7	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Categorization of Protective Factors	147
Table 3.8	Mean Comparisons of Protective Factors For Resilients Across Categories of Race	149

Table 3.9	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Race-Specific Models	151
Table 3.10	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Race-Specific Parsimonious Models	153
Table 3.11	Mean Comparisons of Protective Factors For Resilients Across Categories of Gender	154
Table 3.12	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Gender-Specific Models	156
Table 3.13	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Gender-Specific Parsimonious Models	159
Table 3.14	Mean Comparisons Between Levels of Protective Factors of Resilient and Non-Resilient Youths for Self-Reported Drug Use	160
Table 3.15	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use	162
Table 3.16	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Independent Effects of Protective Factors	164
Table 3.17	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Cumulative Effects of Protective Factors	166
Table 3.18	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Categorization of Protective Factors	168
Table 3.19	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Race-Specific Models	170

Table 3.20	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Race-Specific Parsimonious Models	172
Table 3.21	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Gender-Specific Models	174
Table 3.22	Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Gender-Specific Parsimonious Models	176
Table 3.23	Logistic Regression Coefficients Predicting Self-Reported Delinquency	178
Table 3.24	Logistic Regression Coefficients Predicting Self-Reported Drug Use	181
Table 3.25	Mean Comparisons Between Levels of Depression of Resilient and Non-Resilient Youths for Self-Reported Delinquency and Drug Use	183

LIST OF APPENDICES

Appendix 2.1 Measurement of Variables and Descriptive Statistics 207

Appendix 2.2 Items Included in the Measurement of Variables 210

CHAPTER 1

LIFE-COURSE CRIMINOLOGY AND THE ROLE OF RESILIENCY

In partial response to research on criminal careers (Blumstein, Cohen, Roth, and Visher 1986; Blumstein, Cohen, and Farrington 1988a, 1988b), a theoretical interest has recently emerged in explaining the nature of offending over the life course (Le Blanc and Loeber 1993; Loeber and Le Blanc 1990; Loeber and Stouthamer-Loeber 1996; Moffitt 1993, 1997; Patterson and Yoerger 1993; Sampson and Laub 1993). Often called “developmental” or “life-course” criminology, this perspective has led to an intense interest in the factors that place youths at risk for engaging in delinquency or crime at different stages of development—childhood, adolescence, and adulthood—and across various domains of development—the individual, family, school, and neighborhood (Loeber and Stouthamer-Loeber 1986; Moffitt 1993; Patterson and Yoerger 1993). Moreover, this perspective has prompted attempts to identify the causal factors that account for various dimensions of offending—such as its onset, persistence, and desistence (Loeber and Le Blanc 1990). Notably, the developmental or life-course approach has become perhaps the most dominant contemporary paradigm directing theory and research in criminology (Le Blanc and Loeber 1993; Loeber and Le Blanc 1990; Loeber and Stouthamer-Loeber 1996).

A central concern of the life-course perspective has been to demarcate the factors—often called “risk factors”—that place an individual *at risk* for criminal activity at various points of development. This perspective, however, has resulted in only limited investigation of the factors—often called “protective factors”—that *prevent* an individual

from becoming involved in these problem behaviors (Pulkkinen 1988). As Garmezy (1985, p. 213) observes, "the concept of risk has a centuries-old history; by contrast, the importance of 'protective factors' has only come into prominence in recent years." Similarly, Smith, Lizotte, Thornberry, and Krohn (1995, p. 218) remark, "although risk factor research in criminology is well-developed, developmental research in criminology has only recently begun to focus on protective factors related to resilience among youth at risk for delinquency."

It is particularly noteworthy that researchers have only infrequently investigated the effects that protective factors have on *high-risk* youths—individuals exposed to multiple criminogenic risks as opposed to an isolated risk. Work in this area is often called "resiliency" research because the focus is on high-risk youths who refrain from serious involvement in delinquency—that is who are "resilient"—despite the multiple adversities that they face. In short, researchers have rarely explored the question, why do at-risk or high-risk youths *not* manifest problem behaviors? What factors make these youths resilient in the face of adversity? Why are some at-risk or high-risk youths able to withstand or cope with the effects of multiple criminogenic risk factors while others succumb to these same pressures?

Research addressing these questions has both theoretical and policy implications. Theoretically, scholars have recently attempted to explain the existence of multiple pathways in offending behavior (Huizinga, Esbensen, and Weiher 1991; Loeber and Le Blanc 1990; Moffitt 1993; Patterson and Yoerger 1993). For example, Moffitt (1993) argues that two distinct types of offenders, which she calls "life-course-persistents" and "adolescence-

limiteds" follow two different pathways to offending. Although receiving much less attention, Moffitt also recognizes that not all youths follow one of these pathways. In fact, as she observes (Moffitt 1997, p. 32) "some youths commit less delinquency than others, and a small minority abstains completely." As such, the challenge theoretically is to explain why some youths exposed to risk pursue delinquent developmental pathways while others choose to follow more conventional pathways of development.

The policy implications of this research involve improving our knowledge of what factors should be targeted for intervention. The early intervention literature suggests that multi-faceted strategies—those programs targeting multiple risk factors as opposed to only one factor—are the most successful in reducing criminality (Johnson and Walker 1987; Lally, Mangione, and Honig 1988; Schweinhart, Barnes, and Weikart 1993; Seitz, Rosenbaum, and Apfel 1985). While programs targeting the reduction of criminogenic risks have earned success, intervention strategies may perhaps be improved by strengthening protective factors. Jessor's (1993, p. 121) sentiments support this claim: "a social policy agenda should be concerned not only with the reduction of risk but with the strengthening of protection." Sroufe and Rutter (1984, p. 19) make a similar argument, "By thoroughly understanding factors that pull subjects toward or away from increased risk at various age periods," they argue, "one not only acquires a deeper understanding of development but also gains valuable information for primary prevention."

Research from developmental psychopathology (Garmezy and Masten 1986; Pulkkinen 1988), from psychology (Kolvin, Miller, Fleeting, and Kolvin 1988a; Jessor, Van Den Bos, Vanderryn, and Turbin 1995; Werner and Smith 1982), and from criminology

(Lösel 1994; Lösel and Bliesener 1990, 1994; Smith, Lizotte, Thornberry, and Krohn 1995) has furnished beginning insights into the factors that differentiate between resilient and non-resilient youths. This research has generally found that protective factors emerging over the life course from many different domains play an integral role in insulating or buffering youths from the effects of multiple risk factors. The existing research on resiliency, however, has often been limited by one or more considerations: the use of cross-sectional research designs; approaching research hypotheses in an atheoretical manner; relying on small samples that are not nationally representative; generally focusing on a narrow period of the life course; and failing to investigate alternative (i.e., internalizing) behavioral responses to a high-risk environment (Kolvin, Miller, Fleeting, and Kolvin 1988a; Jessor, Van Den Bos, Vanderryn, and Turbin 1995; Lösel 1994; Lösel and Bliesener 1990, 1994; Luthar and Zigler 1991; Smith et al. 1995; Werner and Smith 1982).

Given these limitations, this report proposes to extend our understanding of why high-risk youths refrain from, or only are involved in minor forms of, problem behaviors. Specifically, this research will: (1) use the National Longitudinal Survey of Youth, Child-Mother data set, a prospective national longitudinal study; (2) investigate youths placed at risk early in the life course; (3) examine resiliency over an extended period of time—from adolescence into adulthood; (4) be grounded in a developmental framework; and (5) investigate whether resilient youths suffer from increased levels of internalizing behavioral responses (i.e., depression).

The remainder of this introductory chapter proceeds as follows. First, an effort is made to trace the traditional and contemporary versions of the criminal careers perspective.

In doing so, I briefly discuss the relevance that criminal career research has to crime control policy and contemporary theoretical developments. Subsequent to this discussion, the theoretical extension to the criminal career perspective—research on developmental or life-course criminology—is presented. Notably, this section reviews the basic tenets underlying the developmental or life-course perspective and discusses how this area of research has become a prominent contemporary theoretical paradigm.

In the following section, the literature on risk factors—one of the core concepts in resiliency research—is reviewed. Three substantive areas are covered in this section. The first section will include a discussion tracing the scholarly origin of risk-factor research. Second, research investigating *where* (i.e., personal, family, school, and neighborhood) and *when* (i.e., childhood, adolescence, and adulthood) different risk factors emerge will be reviewed. Finally, the cumulative effects that criminogenic risk factors have on the probability of engaging in delinquency will be discussed. This last issue is particularly relevant because of the focus that resiliency research has on high-risk individuals.

In the next section, I trace the origins of the concept of resiliency and review the relevant empirical research. In doing so, I present the research on protective factors and discuss their influence on ameliorating criminogenic risks. In addition, I review the three substantive areas in which protective factors have been found in resilient youths: (1) the personality dispositions of the child; (2) a supportive family environment; and (3) the availability of external support systems that encourage and reinforce a child's coping efforts. Attention will also be given to alternative behavioral problems experienced by resilient youth (i.e., depression and anxiety).

In the final section, I outline the research strategy. As noted previously, this research uses waves 1 through 6 (1986 - 1996) of the National Longitudinal Survey of Youth, Child-Mother data set (hereinafter referred to as the NLSY). This data set is appropriate for several reasons. First, because the NLSY is a prospective longitudinal study, it is possible to examine resilient youth over several years and developmental periods (i.e., adolescence through adulthood). Second, because the NLSY oversamples economically disadvantaged youths, it is possible to analyze a large number of high-risk youths. Third, the NLSY includes measures of risk and protective factors from several different domains. Therefore, in the analyses I can investigate the effects of many possible risk and protective factors that individuals may experience over the life course. Finally, because the NLSY is a national data set, it represents a cross-section of individuals born to a nationally representative sample of women between the ages of 29 and 36 years of age as of January 1, 1996. In the final portion of this section, I present the research hypotheses.

RISE OF LIFE-COURSE CRIMINOLOGY

It is often noted that, given time, history has a tendency to repeat itself. Take, for example, the clothing fads that dominated the lifestyles of much of our culture throughout the seventies. From the platformed shoes and bell-bottomed jeans of the "hippie" culture to the wide-collared shirts and leisure suits worn by the everyday business person. While our present-day male corporate heads rarely don their favorite dark blue suit in public, platformed shoes and bell-bottomed jeans have recently re-emerged as the vogue garb for much of our nation's youthful culture.

The field of criminology is no exception to historical revivals. Most notably, criminological research is often guilty of rehashing issues and resurrecting debates that were once deliberated among the most influential scholars in the field. The criminal career paradigm is perhaps the most prominent and disputed example of such a criminological rebirth. In fact, few topics in traditional and contemporary criminology have invoked more attention empirically than research in the area of criminal careers. Even so, and similar to recent clothing trends, the issues and debates raised nearly five decades ago are similar to those waged in the contemporary versions (see Laub and Sampson 1991). Thus, issues relating to the value of longitudinal data, the influence that criminal career research has on crime control policy, the dispute over the stability of problem behavior, and the existence and explanation of the age-crime relationship have each received attention in the past and are debated frequently at present (see, for example, Blumstein et al. 1988a, 1988b; Glueck and Glueck 1937, 1950; Gottfredson and Hirschi 1987, 1988, 1990; Hirschi and Gottfredson 1983; Laub and Sampson 1991; Nagin and Land 1993; Wilson and Herrnstein 1985). The distinctive feature of contemporary scholarship, however, is that it does not seek only to identify empirically the dimensions of offending. Instead, scholars have attempted to *explain* theoretically the nature of offending behavior (Moffitt 1993; Patterson and Yoerger 1993; Sampson and Laub 1993). In short, while traditional criminal career research fell short of developing theoretical explanations of various offending trajectories, theorists in its contemporary counterpart have made significant efforts—an area that will be discussed in the pages to follow.

In the following sections, I trace the historical and contemporary versions of the criminal career paradigm. The purpose of this discussion is not to side with any particular scholar in the various criminal career debates. Rather, this review is intended to provide a foundation for which our current understanding and interest has evolved in the theoretical explanation of crime over the life course.

Criminal Career Perspective: A Historical Review

Despite its recent rise to criminological importance, the foundation of criminal career research can be traced to the pioneering work of Sheldon and Eleanor Glueck (1937, 1950). Although receiving extensive criticism for being atheoretical and eclectic in their approach, the Gluecks' research on individual criminality over the life course provided insight into the many factors that influence various dimensions of offending. Most commonly referred to as a "multiple-factor" approach, their research largely involved the interdisciplinary investigation of individual-level correlates—both biological and psychological—of the study of delinquency and crime. Moreover, this approach minimized the influence of traditional sociological variables (i.e., stratification, peer group, and community characteristics). As stated by Glueck and Glueck (1950, p. 281), "the separate findings, independently gathered, integrate into a dynamic pattern which is not exclusively biologic nor exclusively socio-cultural, but which derives from an interplay of somatic, temperamental, intellectual, and socio-cultural forces."

To establish a more precise understanding of the nature of offending, the Gluecks directed a few of the most labor-intensive prospective longitudinal data collection efforts

ever undertaken. In these studies, extensive information was accumulated on individuals as they developed over the life course (Glueck and Glueck 1937, 1950; also see Laub, Sampson, and Kiger 1990). But, as noted previously, the Gluecks did not use their empirical studies to develop a systematic theory of crime and delinquency. Instead, they were interested in the policy implications which were associated with identifying dimensions of an individual's active involvement in offending (see Laub and Sampson 1991). In particular, their efforts to address two interrelated policy-oriented alternatives guided much of their research agenda. These goals included: (1) to improve the process of decision making by criminal justice officials; and (2) to identify potential delinquents at early ages to aid in the provision of therapeutic interventions (Laub and Sampson 1991). In short, the Gluecks were concerned with improving crime control policy through the development of objective means by which to differentiate offenders from non-offenders.

In making progress towards each of these goals, the Gluecks designed prediction scales that gave special consideration to the influence of family-related variables—specifically parenting factors. The Gluecks found that a range of parent-related factors placed youths at an increased risk for engaging in problem behaviors: inconsistent discipline habits, overly harsh and threatening punishment techniques, inappropriate supervision of children's behavior, and poor parent-child relationships (Glueck and Glueck 1950). Based on the application of their prediction instruments to a sample of 500 delinquent and 500 nondelinquent white boys age 10 to 17, they claimed that youths experiencing a greater number of these family-related factors had higher rates of participation in offending than those not exposed to such detrimental circumstances. Despite these empirical findings,

Sheldon or Eleanor Glueck did not advance a theoretical explanation of participation in offending.

Factors distinguishing an offender's involvement in or initiation of offending, however, were not the only focus of the Gluecks' research agenda. Similar to contemporary versions of the criminal career perspective, the Gluecks believed that the study of other dimensions of offending—for example, persistence and desistance—were also worthy of attention. In fact, the Gluecks (1937) were perhaps the most influential scholars in generating much of this research. Their interest in different dimensions of offending in part stemmed from their belief that the causes of one dimension of offending (i.e., onset) differed from the causes of separate dimensions of offending (i.e., persistence and desistance)—a viewpoint, I might add, that is debated critically in contemporary criminal career research (see Blumstein et al. 1986, 1988a, 1988b; Gottfredson and Hirschi 1988). Again, the Gluecks did not advocate for a multidisciplinary theoretical perspective to explain these dimensions. In fact, they refused to be wedded to any *one* theoretical framework and, in turn, opted to allow the data to explain empirically what is known about the causes of delinquency and crime. As the Glueck's (1951, p. 762) argued, "Neither 'hunches' nor theoretical speculations can conjure away the facts, even though those facts may not fit neatly into various preconceptions about human nature and crime causation."

Despite the Gluecks' efforts to understand empirically an offender's involvement in and progression into further offending over the life course, they were severely criticized and fundamentally dismissed by prominent criminologists—particularly Edwin Sutherland (Sutherland 1937; also see Laub and Sampson 1991 for an in-depth account of the

Sutherland-Glueck debate). In part, this criticism can be attributed to Sutherland's methodological differences with the Gluecks and to his efforts to place the field of criminology solely within a sociological framework. In light of his critical writings, contemporary reference to the Gluecks' research is often made to identify their methodological shortcomings and question their substantive findings (Laub et al. 1990). Nevertheless, the criminal career perspective remains indebted to the work of Sheldon and Eleanor Glueck and their research into the factors that are correlated with various dimensions of criminal behavior.

***Contemporary Criminal Career Research:
Revisiting Classic Debates***

Despite Sutherland's success in undermining the Gluecks' research on crime over the life course, research in the area of criminal careers was only temporarily stymied. As crime and incarceration rates began to rise in the late 1960s and the general public grew increasingly distrustful of the correctional system's ability to rehabilitate offenders (Cullen and Gilbert 1982), the criminal career perspective regained prominence. This contemporary era of research, however, was almost solely restricted to studies that sought to change and improve crime control policy. Notably, much of this research aimed to improve the extent to which offenders committing crimes at high rates could be identified and selectively incapacitated. In short, longitudinal studies on criminal careers provided the data by which scholars could assess individual offending careers and the characteristics that differentiated various types of offenders. The avenues of research in this area can be traced to a few divergent sources.

First, while the Gluecks were completing their data collection, Wolfgang, Figlio, and Sellin (1972) were only beginning their renowned birth cohort research in Philadelphia. In tracking 9,945 individuals from age ten to adulthood, Wolfgang and his colleagues found that roughly 35 percent of the individuals came into police contact at some point in their lives. More importantly, however, the Wolfgang et al. (1972) research revealed that a small percentage of individuals were responsible for a majority of the arrests. In particular, approximately 6 percent of the cohort, identified as "chronic" offenders, accounted for over half (52 percent) of all offenses. Similar findings were apparent in a cohort born in 1958 (Tracy, Wolfgang, and Figlio 1990).

While considering the findings in the Wolfgang et al. study, Wilson (1975) suggested that crime would be significantly reduced if correctional policies could identify early and then isolate chronic offenders. In arguing for strategies to incapacitate offenders, Wilson (1975, pp. 172-173) suggests:

We would view the correctional system as having a very different function—namely, to isolate and to punish. It is a measure of our confusion that such a statement will strike many enlightened readers today as cruel, even barbaric. It is not. It is merely a recognition that society at a minimum must be able to protect itself from dangerous offenders and to impose some costs (other than the stigma and inconvenience of an arrest and court appearance) on criminal acts; it is also a frank admission that society really does not know how to do much else.

Accordingly, using the knowledge on individual offending behaviors generated from the Wolfgang et al. birth cohort studies, Wilson advocated for conservative crime control policies that were intended to incapacitate chronic offenders.

Avi-Itzhak and Shinnar (1973) were also influential scholars in revitalizing the study of criminal careers. As concern grew over increasing rates of offending, Avi-Itzhak and Shinnar (1973) developed mathematical models to estimate the effects that selective incapacitation policies would have on crime. As Nagin and Land (1993, p. 329) point out, Avi-Itzhak and Shinnar's research addressed two questions: "How much crime was avoided by the physical isolation of criminals in prison (i.e., incapacitation)? How sensitive was this incapacitation effect to variables susceptible to manipulation by public policy (e.g., sentence length)?"

In developing their models, Avi-Itzhak and Shinnar (1973) conceived of a criminal career as having a period of active offending that was preceded by a point of onset and followed by a point of termination. This conception of a criminal career not only created questionable policy implications (Greenberg 1991), but also the classification of individuals as offenders and non-offenders became a point of theoretical dispute (Nagin and Smith 1990). This issue is covered more thoroughly in the pages to follow.

Perhaps the most influential contribution to the contemporary criminal career perspective is Blumstein and his colleagues' report to the National Research Council on criminal careers (Blumstein et al. 1986). Based on longitudinal research, one major finding was that the activities of individual offenders were not adequately captured by assessing crime rates. As a result, Blumstein et al. (1986) partitioned aggregate rates into two component parts: (1) the percentage of the population that is involved in criminal activities; and (2) the nature and extent of criminal behavior of those actively involved in offending. Within the active offending group, researchers could then assess the various dimensions of

offending, such as: (1) the frequency at which they commit crimes; (2) the seriousness of their activities; and (3) the duration of their offending career.

In defining these dimensions, Blumstein and his colleagues argued that crime control policies should differ depending on the contributions that each of these dimensions has on the aggregate rate of offending. For example, policy recommendations should differ if the aggregate crime rate is a function of a large number of individuals participating in crime as opposed to a function of a small group of chronic offenders who commit crimes frequently. As Blumstein et al. (1986, p. 1) elaborate, "the first—participation—is associated with efforts to prevent individuals from ever becoming involved in crime; the second—frequency, seriousness, and career length—is central to the decisions of the criminal justice system."

In addition to the crime control policy ramifications inherent in this contemporary round of criminal career research, a scholarly interest has emerged that seeks to discern and explain the existence of different types of offenders and various dimensions of offending (Blumstein et al. 1986; Moffitt 1993; Patterson and Yoerger 1993; Simons, Wu, Conger, and Lorenz 1994). Disaggregating the crime rate into component parts implies that offenders could be typologized according to their age of onset or initiation into delinquent or criminal behavior (i.e., early starters versus late starters), the extent to which they persisted following onset, the point at which they desisted from delinquent or criminal behavior, and the extent to which they specialized or were versatile in the types of offenses committed. Despite empirical research showing the existence of distinct offender types and offending dimensions (Blumstein et al. 1986), criminal career researchers were hesitant to offer theoretical explanations of these divergent taxonomies of offender types. Developmental or life-course

theorists, however, have recently begun to advance innovative theoretical perspectives that consider the dynamic nature of individual offending (Agnew 1997; Moffitt 1993, 1997; Patterson and Yoerger 1993; Thornberry 1987). The following section includes a brief review of the assumptions underlying a developmental perspective as it relates to criminological theory.

Developmental or Life-Course Criminology

Loeber and Le Blanc (1990, p. 377) have provided an informative summary of the basic tenets underlying the developmental perspective as it relates to criminology:

Developmental criminology is the study, first, of the development and dynamics of problem behaviors and offending with age; this approach is largely descriptive and concerns the processes of behavioral development. The second focus of developmental criminology is the identification of explanatory or causal factors that predate, or co-occur with, the behavioral development and have an impact on its course. These two foci make it possible to shed light on the causes of individuals' initiation into offending, how their offense pattern may become more frequent and more serious over time, and how it may cease. Such inquiry also may attempt to explain individual differences among offenders in these respects.

A number of assumptions made by proponents of the developmental framework are concealed within this summary. First it is assumed that behaviors, and their many different manifestations, develop in a progressive manner over the life course and are affected by various biological, psychological, and sociological factors. Specifically, age and the emergence of certain behaviors are highly correlated with one another; individuals often take their first steps, learn their first words, enter into formal education, and attain puberty at approximately the same age periods. As it relates to criminology, this assumption can be extended to the nature and extent of an individual's delinquent or criminal behavior. Thus,

it is implied that changes in delinquency and crime are related to age in an orderly fashion. Longitudinal research demonstrates this point clearly; prevalence rates of criminal behavior are extremely low in early childhood, increase rapidly in late childhood and early adolescence, peak in middle to late adolescence, and decline markedly in late adolescence and into adulthood (Blumstein et al. 1986; Farrington 1986; Wolfgang, Thornberry, and Figlio 1987). One of the many challenges for developmentalists is to account theoretically for the continuities and systematic within-individual changes in these behaviors that are empirically observed over the life course.

A second assumption made by developmentalists, and also reflected in the criminal career literature, is that unique causes or causal processes account for different dimensions of offending. In other words, proponents of the developmental framework assume that different causal processes *explain* different offending dimensions. This assumption, however, is not accepted by all scholars. Notably, critics of the developmental perspective, such as Gottfredson and Hirschi (1990) and Wilson and Herrnstein (1985), argue that variations in offending propensity is sufficient to explain why individuals engage in crime *and* why they desist from offending; those individuals that desist from offending have a lower offending propensity than those persisting in these behaviors. Nevertheless, theoretical formulation from a developmental framework must account for why the factors that predict or explain the onset of delinquency or crime are different from those that predict persistence in or desistance from these problem behaviors.

Third, and relatedly, is the assumption that the causal or explanatory factors initiating onset at an earlier period of life are fundamentally different from those initiating onset at

later periods of the life course (Loeber and Le Blanc 1990). In rejecting the assumption of general causality, developmentalists assume that the causal processes accounting for the timing of delinquency and crime are uniquely complex; one factor or constellation of factors would fail to account for the emergence of offending behaviors at different periods of development. In making this assumption, developmental criminologists are faced with the complexities of verifying that offenders vary in *kind* rather than in *degree*.

This assumption informs the work of Moffitt (1993, 1997) and of Patterson and his colleagues (Patterson, Capaldi, and Bank 1991; Patterson and Yoerger 1993). Despite minor differences, these theories each contend that the age-crime curve conceals the existence of two qualitatively distinct types of offenders. Moffitt and Patterson each propose that a small cohort of individuals manifests antisocial behavior early in life and persists in delinquent and criminal behavior through adolescence and into adulthood. Moffitt refers to this group as "life-course-persistents"; Patterson acknowledges them to be "early starters." A second, much larger cohort of individuals begins offending in adolescence, only to cease their criminal activities as they enter adulthood. Moffitt refers to this group as "adolescence-limiteds"; Patterson uses the terminology "late starters." Although both groups are technically identified as "offenders," as will be discussed below, the causal mechanisms initiating their onset are theorized to be qualitatively distinct. Accordingly, they argue that each group of offenders is in need of their own theoretical explanation.

Distinguishing between early and late starters and the duration of offending careers relates to a fourth challenge for developmentalists: theoretically accounting for the stability and change in offending over the life course. Although it is accepted that most antisocial

adults were also antisocial children, as Robins points out in her review of four longitudinal studies (1978, p. 61), "most antisocial children do not become antisocial adults" (see also Gove 1985). Therefore, criminological theory from a developmental perspective must account for the substantial stability of offending behavior exemplified by some individuals *and* the substantial change in offending behavior exhibited by others.

In sum, developmental approaches to understanding the etiology of delinquency and crime offer a number of advantages over non-developmental or static approaches. They recognize the importance of age and its relationship to the nature of delinquency and crime, they acknowledge the significance that distinct causes or causal processes have unique effects on dimensions of offending *and* the onset of these behaviors, and they address the reality that theoretical formulation must account for the stability *and* change in offending behavior. In short, developmentalists accept the position that multiple pathways to offending may exist; whereas one individual might begin offending early and persist into adulthood, another might begin much later only to quickly escape the process and lead a law-abiding life.

The observation that there may exist multiple pathways to delinquency and crime has important implications for the study of resilient youths—individuals from high-risk or multiple-risk settings that cope with and overcome the adversities of their environments. Notably, resilient youths may follow a developmental pathway that is distinct from those outlined above. That is, instead of following the pathway that leads to serious involvement in delinquency, resilient youths overcome the odds and refrain from a developmental pathway characterized by serious criminality. As will be discussed more thoroughly in the

pages to follow, although an understanding of resiliency is grounded within a developmental perspective, criminologists have only recently begun to examine the many factors that promote it. Before turning to the resiliency literature, however, a discussion is presented of the core concepts of resiliency research: risk and protective factors.

RISK FACTOR RESEARCH

A number of studies have suggested that individuals exposed to a variety of biological, psychological, and social risk factors have a higher probability or an increased likelihood of engaging in an array of problem behaviors. Often referred to as "risk factor" or "deficit-oriented" research (see Lösel and Bliesener 1990), it is the goal of these studies to delineate the way in which risks amalgamate to increase the likelihood of conduct disorders, delinquency, crime, and other psychological disturbances (i.e., schizophrenia and other mental disorders).

Despite scholarly disagreement regarding the measurement of these factors (compare Kandel, Mednick, Kirkegaard-Sorenson, Hutchings, Knop, Rosenberg, and Schulsinger 1988; Rae-Grant, Thomas, Offord, and Boyle 1989; Richters and Weintraub 1990; Rutter 1987; Stouthamer-Loeber, Loeber, Farrington, Zhang, Van Kammen, and Maguin 1993; White, Moffitt, and Silva 1989), researchers have agreed on the influence a variable must have on behavior to be considered a criminogenic risk. Accordingly, Lösel (1994, p. 284) has observed that criminogenic risk factors "should have the highest possible correlation to the particular problem behavior without taking protective factors into account." Masten,

Best, and Garnezy (1990, p. 426) echo these sentiments in suggesting that “risk factors are statistical correlates of poor or negative behaviors.”

In the next several pages, I review the literature on risk factors. I begin by tracing the historical origins of risk factor research. Second, I highlight the importance of the timing in which criminogenic risks emerge—that is, I examine the differential effects that risk factors have on criminal behavior depending on *when* they are present. Third, I discuss the importance of investigating the domain (i.e., intrapersonal, family, peer, and neighborhood) in which risk factors emerge. Fourth, I review the research addressing the disagreement over the operationalization of risk factors. Finally, I examine the literature suggesting that youths in high-risk settings are most susceptible to engaging in criminal activity over the life course.

The Origin of Risk Factor Research

The concept of risk can be traced to the field of marine insurance. Centuries ago, individuals assessed and bargained over the potential dangers of a sea voyage to agree upon the payment made for the possibility of losses related to an unsuccessful journey. Assessments predominantly involved the outcomes of two interrelated questions: (1) What was the possibility of failure due to disaster?; and (2) what factors affected the possibility of such a failure? Payments were then made according to the likelihood that natural and mechanical risk factors would affect the success of the sea voyage.

In the twentieth century, epidemiological research borrowed the concept of “risk” and applied it to the hazards of health and disease. As Garnezy (1985, p. 213) points out, research in epidemiology focuses on the “incidence and distribution of diseases and the

determination of factors that control the presence or the absence of such conditions." The financial losses of an unsuccessful voyage for the marine insurance industry became synonymous with loss of health through debilitating diseases in epidemiology; the term "possibility" was replaced with the more statistically relevant and actuarial term of "probability"; and "natural" and "mechanical" factors were replaced with "biological" or "genetic" predispositions and "pathogenic" environments. Notwithstanding terminology differences, it is clear that the interest in outcomes associated with a particular risk or set of risks has spanned a number of different areas.

Much like the marine insurance and epidemiological research related to risk factors, efforts to understand youths' involvement in delinquency and crime have also been primarily risk or deficit-oriented. That is, both traditional and contemporary criminological perspectives have predominantly focused on identifying the factors that place an individual at an increased risk of engaging in a number of problem behaviors, including conduct disorders in childhood (Loeber 1982; Loeber and Stouthamer-Loeber 1987), fighting (Fitzpatrick 1997), delinquency (Jessor 1992, 1993; Jessor et al. 1995; Smith et al. 1995), and drug and alcohol use (Hawkins, Catalano and Miller 1992; Hawkins, Catalano, Morrison, O'Donnell, Abbott, and Day 1992; Smith et al. 1995).

Traditional criminological theorists have used risk or deficit-oriented models to make sense as to why individuals engage in delinquency and crime. This is evidenced in the work of: cultural deviance theorists who stress the importance of a youth's exposure to delinquent peers (Sutherland, Cressey, and Luckenbill 1992) or exposure to delinquent role models and the reinforcement received for such behavior (Akers 1985; Bandura 1982); strain theorists

who traditionally focus on the extent to which opportunities to achieve success through legitimate channels are blocked (Cloward and Ohlin 1960; Cohen 1955; Merton 1938); labeling theorists who lend credence to society's reaction to a delinquent event (Lemert 1972); and disorganization theorists who attribute high rates of delinquent and criminal activity to the instability of neighborhoods because of the intersection of rapid population growth, persistent poverty, and cultural heterogeneity (Shaw and McKay 1942). In short, regardless of the specific factor or constellation of factors that are proposed within a theory, traditional theorists placed an inordinate emphasis on the causes of, or risk factors related to, delinquency and crime (but see Hirschi 1969 for a possible exception).

Despite the added complexities attributed to the dynamic nature of the developmental perspective, research in this area has also predominantly focused on the concept of risk and the effect of risk factors on problem behaviors. Distinct from the traditional perspective, however, developmentalists use risk factors to explain the various dimensions of, or pathways to, offending as opposed to explaining only participation in offending. The work of Moffitt (1993, 1997) and of Patterson and Yoerger (1993) demonstrate clearly the extent to which risk factors explain the existence of two distinct types of offenders. Discussed briefly in the preceding section, Moffitt asserts that neuropsychological deficits of the child interacting with poor parental socialization experiences combine to place a small group of children ("life-course persistents") at risk for engaging in early conduct disorders and persistent delinquency and crime over the life course. Alternatively, a much larger cohort of individuals ("adolescence-limiteds") are theorized to begin offending in adolescence as a result of their experiencing a "maturity gap" and through mimicking the delinquent

behaviors of their life-course persistent counterparts. In short, Moffitt contends that different risk factors account for the explanation of and variation in offending of distinct offender types.

Patterson and Yoerger (1993) offer a compatible explanation of these two types of offenders. Similar to Moffitt's explanation of life-course persistents, Patterson characterizes the "early starter" as an individual expressing behavioral problems (i.e., temper tantrums and aggression) at a young age. These persistent problem behaviors are seen to interact with poor parenting practices, leading to difficulties in school and peer relations (also see Simons et al. 1994). Complementary to Moffitt, in his explanation of a second, less serious group of offenders, Patterson recognizes the importance of peers and their role as models for delinquent behavior. Patterson adds, however, that these "late starters" also experience disruptors within the family (i.e., parental conflict and parental unemployment) that increase the likelihood of their engaging in delinquent behavior. Regardless of the theoretical stance, it is clear that both Moffitt and Patterson recognize the importance that risk factors have on participation and persistence in offending.

This discussion suggests that risk-oriented research, both in criminology and other related fields, has traditional and contemporary roots. Moreover, it is noteworthy that a number of studies identifying criminogenic risk factors have been conducted in different cultural contexts. Thus, longitudinal research completed in England (Farrington and West 1990; Kolvin et al. 1988a) in the United States (Elliott, Huizinga, and Menard 1989; Loeber, Stouthamer-Loeber, Van Kammen, and Farrington 1991; McCord 1979; Robins 1978; Wolfgang, Figlio, and Sellin 1972) in Canada (Le Blanc and Fréchette 1989; Tremblay,

Loeber, Gagnon, Charlebois, Larivée, and Le Blanc 1991) in Scandanavia (Magnusson 1988; Pulkkinen 1988; Wikstroem 1987) and in New Zealand (Moffitt and Silva 1988) have each contributed to the knowledge base of risk factors in the field of criminology. This research has been particularly important in: (1) highlighting the dynamic nature of criminogenic risks, and (2) isolating the effects of risk factors over time. These two issues are briefly discussed below.

The Dynamic Nature of Risk Factors

An important contribution of the developmental perspective involves the investigation of the differential effects that risk factors may have over time and across different domains. Risk factors often possess static attributes and occur at a single point in time—such as having a criminal parent. Criminogenic risks may also, however, *change* throughout the life course—such as in a child who experiences parental marital discord in adolescence but not during his or her childhood years. Because risks can be dynamic, it is likely that individuals could be exposed to risks at one point in development yet not at others. In addition, risk factors could potentially function differently depending on the point at which they are measured or are present. Accordingly, the timing of a particular risk potentially becomes integral in understanding its effects on problem behaviors.

In addition to the timing of risk factors, developmentalists have investigated the variation in influence that criminogenic risks might have from different domains of development. Of particular interest, scholars have examined the effects of risks emerging within the intrapersonal, family, peer, and neighborhood domains. In short,

developmentalists' scholarly interest in the timing and domain in which risks emerge has produced important insights into three critical attributes of risk factors: (1) risk factors are age-graded; (2) risk factors vary in importance according to the domain in which they emerge; and (3) risk factors may have long or short-term effects.

The Effects of Risk and Age. The first point recognizes that the timing of a risk is important in formulating our understanding of its effects. Developmental psychologists refer to the variability in the influence of criminogenic risks as "sensitive periods" in development in which vulnerability to the causal influences of a risk factor is heightened compared with other periods in the life course (Bateson and Hinde 1987). In other words, individuals would have a greater susceptibility to the risk if it were to occur during the "sensitive period" as opposed to some other point in time.

It has been argued that early childhood is one particular developmental period in which vulnerability to risk is magnified (Loeber 1990). In fact, research has revealed that risk factors emerging throughout early childhood place individuals at the greatest risk for an early onset of problem behaviors and a persistent career in delinquency and crime (Glueck and Glueck 1950; Gottfredson and Hirschi 1990; Hutchings and Mednick 1974; Moffitt 1993; Patterson and Yoerger 1993; Rutter 1977; West and Farrington 1973; Wilson and Herrnstein 1985). For example, Gottfredson and Hirschi (1990) argue that low self-control, a major predictor of criminality, is the product of poor parenting practices occurring in the early formative years of development. In accounting for the individual differences in self-control, Gottfredson and Hirschi (1990, p. 119-120) observe that "the mechanism producing these differences has been described as differences in child-rearing practices, with close

attention to the behavior of the child at one extreme and neglect of the behavior of the child at the other.”

Kolvin, Miller, Fleeting, and Kolvin (1988b) discover similar parenting risks emerging in early childhood. Notably, in a longitudinal analysis of 847 youths, they found that the mother's poor care of the home and inadequate quality of parenting during the early years of life was highly correlated with participation in delinquency. Similarly, McCord (1979) found that parental conflict, poor parental supervision, and low levels of maternal affection measured early in life were linked to adult criminality. In short, the evidence reveals that youths in early childhood are particularly vulnerable to risks related to parental socialization.

The development of the central nervous system is also susceptible to risk factors that may be present in early childhood. In fact, research has shown that children exposed to small amounts of lead before the age of six are susceptible to developing impulsivity and lower intelligence and to exhibiting greater behavioral problems (Bellinger, Needleman, Bromfield, and Mintz 1984; Needleman and Bellinger 1981). These findings suggest that early childhood is a developmental period in life to which vulnerability to various risks is particularly enhanced.

Although vulnerability to risk is substantial during early childhood, other developmental periods exhibit their own “sensitive periods” in which susceptibility to risk is magnified. The difference, however, involves the type of risk to which an individual is exposed. For example, as Warr (1993, p. 35) points out, adolescence is a period in which youths are highly vulnerable to the influence of delinquent peers: “recent rather than early

friends have the greatest effect on delinquency.” These results suggest that associating with delinquent peers in adolescence makes one more susceptible to criminality than association with them early in life.

Lipsey and Derzon’s (1998) meta-analysis¹ of the predictors of serious delinquency in adolescence and adulthood also suggests that the effects of risks depend on when they emerge. Examining 793 effect sizes from 34 independent prospective longitudinal studies of the development of antisocial behavior, Lipsey and Derzon report differences in the strongest predictors of serious delinquency between two age groups: criminogenic risks measured between the ages of 6 and 11 and risks measured between the ages of 12 and 14. Specifically, for the younger (6 to 11) age group, involvement in general offenses and substance use emerged as the strongest predictors. Alternatively, a lack of social ties and having antisocial peers were strongest for the older (12 to 14) age group. As Lipsey and Derzon (1998, p. 98) conclude, “for the age 6 to 11 period, *early* substance use and delinquent offending are highly predictive, but the same behaviors are less predictive at a later age, especially in the case of substance abuse.”

In summary, developmental research investigating the effects of risks over the life course has revealed that individuals are more susceptible to certain risks at various points in development. Early childhood is one developmental period during which susceptibility to risk might be particularly enhanced. In fact, criminologists have increasingly turned their attention towards studying the factors explaining antisocial behavior in individuals during

¹ A meta-analysis integrates the results of many study outcomes while controlling for differences in their methodological approaches and sample sizes. This approach permits the comparison of the effects of similar factors across studies to better understand the substantive importance of each predictor.

the early childhood years (Gottfredson and Hirschi 1990; Moffitt 1993; Patterson and Yoerger 1993; Wilson and Herrnstein 1985). Nevertheless, it is important to note that although youths' level of vulnerability to risks changes over the life course, the presence of a criminogenic risk during *any* stage of development is likely to increase their likelihood of criminality. Therefore, identification of the domain in which these risks might emerge becomes particularly important in understanding criminality. In the following section, I review the research investigating risks from different domains that increase the probability of criminality.

The Effects of Risks From Different Domains. In addition to examining how risks differ according to *when* they emerge over the life course, research has also documented the variability in importance associated with *where* risks develop. In other words, scholars have investigated the different domains—for example, intrapersonal, family, peer, and neighborhood—from which risks develop and have assessed their effects as they influence the likelihood of criminality. Despite the abundance of research investigating the effects of risks on criminal activity from each of these domains, the ability of any single factor to predict problem behavior is limited. As will be discussed in a subsequent section, risk factors become more powerful predictors of problem behavior as they co-occur with one another (Rutter 1990).

In the following section, research investigating the effects of risk factors on criminality is reviewed. Notably, this review will assess four different domains: (1) intrapersonal; (2) family; (3) peer; and (4) neighborhood. This review is not intended to cover *every* possible risk associated with criminality from each of these domains. Rather,

it is intended to highlight a number of the important criminogenic risks that researchers have identified as being associated with criminal behavior. Factors from each domain are discussed, in turn, below.

Intrapersonal Factors. Research suggests that intrapersonal factors—from birth through adulthood—have consistently contributed to the explanation of criminality. Namely, factors with a genetic element—such as psychophysiological, biochemical, and neurological factors—have been found to be important influences of severe and persistent offending (Eysenck and Gudjonsson 1989; Mednick, Moffitt, and Stack 1989; Moffitt, Lynam, and Silva 1994; Tibbetts and Piquero 1999). For example, in assessing a prospective longitudinal data set of a New Zealand birth cohort, Moffitt et al. (1994) found that measures of neuropsychological functioning at age 13 predicted subsequent delinquency. Moreover, the 12 percent of the cohort experiencing poor neuropsychological scores and who rated high on delinquency measures accounted for over half of the officially recorded crimes. In addition to having direct effects on criminality, the effects of neuropsychological deficits on delinquency have also been mediated by school performance and educational attainment—both of which have been identified as risk factors of offending (Cernkovich and Giordano 1992).

Individuals who experience perinatal stress—such as being born premature, having a low birth weight, or suffering from anoxia—have also been found to possess increased levels of behavioral problems in early childhood (between the ages of 5 and 7) and officially recorded violent and non-violent delinquency at age 18 (McGee, Silva, and Williams 1984; Mednick, Brennan, and Kandel 1988; Tibbetts and Piquero 1999; Werner 1987). Studies

have also consistently revealed how perinatal factors interact with family-related factors. Specifically, based on separate longitudinal studies, McGee et al. (1984) and Werner (1987) have found that those individuals experiencing perinatal risks *and* instability or adversity in their early family experiences were more likely to exhibit conduct disorders and delinquency than those only enduring the perinatal risks.

An individual's cognitive development has additionally been linked to a higher likelihood of participating in criminal activity. It is difficult to interpret this research, however, because studies measure an individual's cognitive ability in a number of different ways. For example, research has defined cognitive development as ratings of IQ scores (McGee et al. 1984), educational achievement (Farrington 1987), and deficient or under-developed verbal abilities (McGee, Williams, Share, Anderson, and Silva 1986). In spite of these differences in measurement, results have provided insight into the relationship between cognitive functioning and criminality.

In a longitudinal analysis, Farrington (1987) has found that low school achievement is associated with delinquency in adolescence. Similarly, antisocial behavior and delinquency were more prevalent among individuals with a low IQ (McGee et al. 1984; Ward and Tittle 1994) and those evidencing under-developed verbal abilities (McGee et al. 1986). Similarly, in a sample of Black youths followed from age 4 through 17, Schonfeld, Schaffer, O'Connor, and Portnoy (1988) found that deficits in cognitive functioning at the beginning of elementary school lead to antisocial behavior at age 17.

Although cognitive functioning has been found to increase the probability of criminality, research has suggested that behavioral problems precede cognitive deficits. For

example, studies have revealed that early conduct problems predict poor school achievement (Farnworth, Schweinhart, and Berrueta-Clement 1985; Hawkins and Lishner 1987; Huesmann, Eron, and Yarmel 1987). In extending the analyses over time, Hawkins and his colleagues have reported that the variables might have reciprocal relationships over the life course. That is, conduct problems in early elementary school lead to poor school achievement in later grades, which in turn, contributed to delinquency (Hawkins and Lishner 1987).

Results from meta-analytic reviews, however, have consistently found that cognitive deficits increase delinquency. For example, Lipsey and Derzon (1998) reported that poor school attitude/performance (estimated correlation of .19) measured at ages 12 through 14 emerged as the fourth most powerful predictor of violent or serious delinquency in adolescence and early adulthood. Likewise, in a meta-analytic review of the predictors of male delinquency, Loeber and Dishion (1983) found that three different measures of cognitive ability measured in *childhood* were strong predictors of delinquency in *adolescence*: (1) low school achievement, (2) limited vocabulary, and (3) poor verbal reasoning. These results strongly suggest that cognitive deficits increase the likelihood of individuals engaging in criminality.

Exhibiting antisocial behavior or conduct disorder early in life also places an individual at an increased risk for subsequent criminality (Farrington 1985, 1989; Loeber and Dishion 1983; White, Moffitt, Earls, Robins, and Silva 1990). In assessing the predictive power of behavior at age 3 on antisocial outcomes at ages 11 and 13, White et al. (1990) found that behavioral measures of hyperactivity at age 3 and early onset of problem

behaviors at age 5 predicted later antisocial outcomes. As such, early misbehavior and general difficulty among children signifies later problem behavioral outcomes.

Research has also suggested that early antisocial behavior is one of the *most important* risk factors in predicting subsequent criminality. For example, Farrington (1985) used the Cambridge Study of Delinquent Development to develop an index to predict delinquent behavior. Using factors measured in middle childhood—ages 8 to 10—Farrington (1985) identified seven factors that were the most powerful predictors of delinquency. Three of the factors were related to youthful involvement in antisocial behaviors: (1) teacher ratings of troublesomeness, (2) teacher and parent ratings of conduct disorders, and (3) a composite of acting-out behavior. Loeber and Dishion's (1983) meta-analysis revealed similar findings. In fact, in developing a ranking of the most serious risk factors predicting official and self-reported recidivism, Loeber and Dishion found that childhood antisocial behaviors—exhibited as aggression, stealing, lying, and truancy—were the strongest predictors.

Factors measuring the many dimensions of the personality have also been linked to criminality. Hyperactivity, impulsivity, and low frustration tolerance, which are often used to define the concept of "antisocial personality," have explained persistent involvement in delinquency (Farrington, Loeber, and Van Kammen 1991; Loeber 1990). In addition, the temperamental traits of individuals have also been associated with childhood, adolescent, and adult behaviors over the life course (Block, Block, and Keyes 1988; Steinberg 1985; Thomas and Chess 1986). For example, data from the New York Longitudinal Study revealed that individual differences in temperamental traits of nonadaptability and negative mood

measured in early childhood were related to externalizing problems in late childhood (Thomas and Chess 1986).

In summary, the previous research has highlighted the effects that individual differences—revealed through intrapersonal risk factors—have on delinquency. Generally, these studies suggest that differences in personality, cognitive development, antisocial involvement, and neuropsychological impairments developed early in life contribute to increasing the likelihood of criminality over the life course. In the following section, I review the research investigating the relationship between family-related risks and criminal activity.

Family Factors. Criminogenic risks emerging within the family make up the second domain of risk factors which will be discussed. A substantial literature base exists on the influence that the family has on problem behaviors such as delinquency and crime (Glueck and Glueck 1950; Hirschi 1983; Laub and Sampson 1988; Loeber and Stouthamer-Loeber 1986). In general, this research suggests that factors related to the structural make-up of the family and processes that occur within the family have independent direct effects on the likelihood of offending. Research has also documented, however, that family processes mediate the relationship between family structure and criminality (Sampson and Laub 1994). Regardless of the nature of the relationship to criminality, this review will highlight how family-related risk factors increase the probability of participating in criminal activity.

Loeber and Stouthamer-Loeber (1986), using a meta-analytic methodological strategy, have produced perhaps the most extensive review on the effects of family-related risks on crime. They categorized family-oriented risk factors into four paradigms: (1)

parental neglect, (2) parental conflict, (3) parental deviance, and (4) parental disruption. The “neglect” paradigm includes measures of parental involvement in the activities of their children and parental supervision of their children. The “conflict” paradigm includes measures of parental inconsistent or erratic disciplinary practices and the reciprocal rejection between parent/child and child/parent. The “deviance” paradigm includes measures of parental criminal values and parental criminal behavior. Finally, the “disruption” paradigm includes measures of structural factors, such as absence of a parent(s) through death, divorce, or marital discord and temporary absence of a parent due to health reasons. Factors within each paradigm are discussed, in turn, below.

In determining which set of family factors are the most important predictors of criminality, Loeber and Stouthamer-Loeber’s (1986) review revealed that factors within the “neglect” paradigm were the most powerful predictors of juvenile conduct problems and delinquency. Specifically, 85 percent of the cross-sectional analyses investigating the effects of parental neglect on children’s behavioral problems revealed a significant relationship. This finding was consistent for officially reported delinquency—median Relative Improvement Over Chance (RIOCI)² = 63.9 percent—and self-reported delinquency where the median RIOCI was 17.7 percent (Loeber and Stouthamer-Loeber 1986). Although somewhat lower, longitudinal studies investigating the relationship between parental neglect

² A Relative Improvement Over Chance (RIOCI) index is used to “summarize how well a categorical variable concurrently or predictively distinguishes between delinquent or non-delinquent youth” (Loeber and Stouthamer-Loeber 1986, p. 36). A RIOCI score of 100 would indicate that the factor perfectly predicts the outcome. Alternatively, a RIOCI score of 0 indicates that the power of prediction is equal to chance. Values between 0 and 100 indicate the improvement over chance that the factors predict the outcome behavior.

and behavioral problems also reported significant associations (median RIOC was 31 percent for poor parent-child involvement and 36.4 percent for poor parental supervision).

Poor parenting practices—reflected in parental monitoring and supervision—have also been found to increase the probability of experiencing a range of criminogenic risks outside of the family. For example, poor parental supervision during adolescence has been found to increase the likelihood of associating with delinquent peers (Patterson 1980; Patterson and Stouthamer-Loeber 1984; Snyder and Patterson 1987). As such, the relationship between unsatisfactory parenting practices and delinquency could be direct—by positively increasing the likelihood of delinquency—and indirect—through the association with delinquent peers.

Loeber and Stouthamer-Loeber's (1986) review also reported significant associations between conflicts within the family and problem behaviors. Notably, 62 percent of the parental conflict analyses assessing the associations between parental discipline and delinquency were significant (Loeber and Stouthamer-Loeber 1986). The analysis also showed that parental conflicts and limited resources occurring early in children's lives increased their odds of experiencing externalizing problems. For example, factors such as marital dissatisfaction, perceived parenting hassles, and parental conflict have been linked to externalizing problems in early childhood (Block, Block, and Gjerde 1986; Crnic and Greenberg 1990; Emery 1988; Jouriles, Murphy, Farris, Smith, Richters, and Waters 1991).

Support for associations between family-related risk factors and delinquency can also be found in investigations of parental deviance factors. In particular, a number of studies have assessed whether deviant parents influence the antisocial behavior of their adolescent

offspring. For example, Loeber and Stouthamer-Loeber (1986) report that 79 percent of the analyses examining the relationship between parental deviance and delinquency were significant. Relatedly, Robins, West, and Herjanic (1975) found that parental antisocial behavior was found to precede the behavior problems of young adolescents.

Studies have also revealed, however, that parental deviance influences the behavior of their offspring at early stages in the life course. For example, Shaw and his colleagues reported that when mothers scored above the mean on a self-report instrument assessing aggression and suspiciousness, their three-year-old children exhibited higher externalizing behaviors (Shaw, Vondra, Hommerding, Keenan, and Dunn 1994). Likewise, research has also documented the increase in conduct disorders among children whose parents are hospitalized for unipolar and bipolar disorders (Zahn-Waxler, Mayfield, Radke-Yarrow, McKnew, Cytryn, and Davenport 1988).

Finally, research has investigated how disruptions within the family function to increase the likelihood of delinquency. Of particular interest has been the relationship between "broken homes" and criminality. Despite the simplicity of the research question, however, studies have produced mixed results. For example, while research has documented direct effects between single-parent families and criminality (Matsueda and Heimer 1987; Rankin 1983; Rutter 1971), a number of studies have failed to report such a relationship (Farnworth 1984; Rosen 1985; Van Voorhis, Cullen, Mathers, and Garner 1988). In a survey of 152 high school students, Van Voorhis et al. (1988) reported that the quality of life within the family, not family structure, was one of the most important predictors of delinquency.

In observing this relationship, Van Voorhis et al. (1988, p. 258), conclude, "bad homes not broken homes place youths at risk."

Meta-analytic reviews have also highlighted the relationship between "broken homes" and delinquency. For example, in examining the findings of 50 studies, Wells and Rankin (1991) report that single-parent families have delinquency rates between 10 to 15 percent higher than intact families. Similarly, Loeber and Stouthamer-Loeber (1986) report that 81 percent of the analyses examining the association between family disruption—resulting from poor marital relations or parental absence—and delinquency revealed significant relationships.

In summary, family-related criminogenic risk factors have been documented to influence delinquency in a number of different ways. Which family-related factors, however, are the most important predictors of delinquency? Findings from Loeber and Stouthamer-Loeber's (1986, p. 29) meta-analysis has provided some beginning insights:

socialization variables, such as lack of parental supervision, parental rejection, and parent-child involvement, are among the most powerful predictors of juvenile conduct problems and delinquency. Medium-strength predictors include background variables such as parents' marital relations and parental criminality. Weaker predictors are lack of parental discipline, parental health, and parental absence.

Therefore, Loeber and Stouthamer-Loeber conclude that parents influence the behaviors of their children mainly through the socializing experiences of supervision and involvement. Research has also documented, however, that poor socialization by parents occurring in the early formative years can also potentially have adverse effects on the child's social and academic skills (Loeber and Dishion 1985). Therefore, youths may experience difficulties

with peer relations and eventual academic failure—each considered to place a youth at risk for criminality. The following section reviews the research on peer-related risk factors.

Peer Factors. The correlation between associating with delinquent peers and delinquent behavior is one of the strongest and most consistent findings in criminological research (Andrews and Bonta 1994). For example, the Gluecks' research on 500 delinquents and 500 non-delinquents demonstrated that 98 percent of the delinquents had delinquent peers, while only 8 percent of the non-delinquents associated with delinquent peers (Glueck and Glueck 1950). Recent research applying more sophisticated statistical techniques has supported the Gluecks findings. Notably, research by Elliott, Huizinga, and Ageton (1985) has indicated that when the variable "delinquent peers" is included in path models predicting delinquency, other risk factors have only weak or indirect effects.

Despite consistent findings of the relationship between delinquent peers and delinquency, theoretical approaches explaining delinquency have interpreted the effects of this important risk differently (see Matsueda and Anderson 1998; Thornberry et al. 1994). That is, theoretical approaches differ in *how* this risk factor functions to heighten the probability of criminality. For example, research on delinquent peers has been categorized into three general perspectives: (1) a socialization perspective; (2) a selection perspective; and, (3) an interactional perspective. Each are discussed, in turn, below.

Research from a socialization perspective explains delinquent behavior as resulting from youths possessing delinquent beliefs and delinquent peers (see Thornberry et al. 1994). Namely, differential association and social learning theories hypothesize that delinquent peer affiliations create an environment in which delinquent behavior and beliefs can be learned

and reinforced. Once these are learned, individuals are more likely to participate in delinquent behavior. Therefore, the causal process of the socialization perspective would be defined as antisocial behavior of the youth preceding associations with delinquent peers and acquisition of delinquent beliefs.

The selection perspective, however, reverses the causal relationships of the variables (see Hirschi 1969). Research from this perspective argues that individuals become delinquent before associating with delinquent peers and acquiring such beliefs. Suggesting that "birds of a feather flock together," the selection perspective argues that delinquents seek out other delinquents to learn the "tricks of the trade" and receive support for their behavior. Therefore, delinquent behavior exists prior to associating with antisocial peers and acquiring delinquent beliefs.

Finally, the interactional perspective emphasizes the inter-relationship of the variables included in the socialization and selection perspectives. That is, instead of giving causal priority to either delinquent behavior or the possession of delinquent beliefs and association with delinquent peers, the interactional perspective views that these risks have reciprocal relationships over the life course (Thornberry et al. 1994). Therefore, participation in delinquency may be accompanied by the reinforcement of antisocial peers which leads to subsequent delinquency. As delinquency increases, the individual becomes more likely to associate with delinquent peers. In short, delinquent behavior and delinquent peers become interrelated over the life course.

Notwithstanding differences in causality, studies have consistently revealed that associating with antisocial peers has been found to be one of the strongest and most

consistent predictors of delinquency (Elliott and Menard 1996; Thornberry, Lizotte, Krohn, Farnworth, and Jang 1994; Warr and Stafford 1991). Moreover, recent meta-analyses have further lent support to the link between associating with delinquent peers and delinquency. In particular, Lipsey and Derzon's (1998) meta-analysis found that problematic social ties (estimated correlation of .39) and antisocial peers (estimated correlation of .37) measured at ages 12 through 14 emerged as the most powerful predictors of violent or serious delinquency in adolescence and early adulthood. Moreover, using the National Youth Survey to test competing hypotheses from the aforementioned perspectives, Matsueda and Anderson (1998, p. 299) observe:

contrary to control theories, and consistent with social learning theories, we find that delinquent peer associations exert a nontrivial effect on delinquent behavior. This finding is consistent with some previous research, but we have found that it also persists after controlling for measurement error correlations, background characteristics, and prior levels of delinquency (and thus, low self-control).

Neighborhood Factors. The adolescent surge in the juvenile crime rate occurring in the early ninety's has generated a renewed interest in understanding the risks of growing up in a low-income urban neighborhood (Office of Juvenile Justice and Delinquency Prevention 1993; Wilson 1987). This interest has generated questions such as, does living in a neighborhood marked with poverty influence youthful antisocial behavior? Do neighborhood risk factors influence criminogenic risks in other domains (i.e., factors within the family or peer group)? And, what are the effects of developing in a neighborhood with high rates of violence? In this last section, I review the criminogenic risks that develop within the neighborhood domain and discuss their influence on criminality.

It is important to recognize that studies investigating the relationship between neighborhood-level risks and criminality generally fall into two categories: (1) community-level, and (2) individual level. Community-level studies assess the relationship between neighborhood risks and *rates* of delinquency. On the other hand, individual-level studies examine whether neighborhood-level risk factors influence the *individual* behaviors of those residing within the community.

At the community level, assessing the relationship between rates of delinquency and the socioeconomic status of neighborhoods has long been a research interest in criminology. For example, early studies reported that rates of delinquency were highest among low socioeconomic status neighborhoods characterized by concentrated poverty, residential mobility, and ethnic heterogeneity (Sampson 1986; Schuerman and Kobrin 1986; Shaw and McKay 1942). Results from meta-analyses have supported these findings linking neighborhood-level risks to rates of delinquency. Specifically, Loeber and Dishion's (1983) meta-analysis revealed that low socioeconomic status had modest effects in predicting both self-reported and officially reported delinquency.

Research investigating the influence of intervening variables that potentially mediate the relationship between neighborhood-level risks and rates of delinquency has further advanced knowledge of the effects of community-level risks on antisocial behavior (Byrne and Sampson 1986; McLoyd 1990; Sampson and Groves 1989; Sampson, Raudenbush, and Earls 1997). For example, research has suggested that low socioeconomic status is related to large family size, family discord, perinatal complications, parental mental illness, parental education, and parental socialization factors (Conger, Conger, Elder, Lorenz, Simons,

Whitbeck 1992; Larzelere and Patterson 1990; McLoyd 1990). Recently, Sampson et al. (1997) have also generated research suggesting that the social cohesion among neighbors combined with their willingness to intervene—referred to as “collective efficacy”—mediates the relationship between concentrated disadvantage, residential mobility and violence. Finally, using data from the British Crime Survey, Sampson and Groves (1989) examined how the effects of community-level correlates on crime were mediated by measures of informal social control. In observing this relationship, Sampson and Groves (1989, p. 799) concluded:

our empirical analysis established that communities characterized by sparse friendship networks, unsupervised teenage peer groups, and low organizational participation had disproportionately high rates of crime and delinquency. Moreover, variations in these dimensions of community social disorganization were shown to mediate in large part the effects of community structural characteristics (i.e., low socioeconomic status, residential mobility, ethnic heterogeneity, and family disruption) in the manner predicted by our theoretical model.

Research has also suggested, however, that neighborhood contextual factors influence involvement in delinquency after controlling for other family influences. For example, Peeples and Loeber (1994) have reported that living in lower socioeconomic status neighborhoods has an influence on boys' self-reported delinquency even after taking into account individual and family-level factors. In observing this relationship, Peeples and Loeber (1994, p.154) conclude:

while the effects of neighborhood in this study were not strong, this does not necessarily mean that the effects are not meaningful. Our inclusion of important individual and family factors that theoretically could ‘explain away’ neighborhood effects bolsters our modest findings.

Investigating the effects of neighborhood-level risks on individual behavior has also earned the interest of scholars. In relation to their effects on rates of delinquency, however, the impact of neighborhood-level risks on individual behavior is comparatively meager (Gottfredson, McNeil, and Gottfredson 1991; Simcha-Fagan and Schwartz 1986). For example, Simcha-Fagan and Schwartz (1986) reported that four dimensions of neighborhood effects (residential stability, economic level, community organization participation, and criminal subculture) were found to explain substantial amounts of between-community variance—between 26 and 80 percent—in three different measures of *rates* of delinquency. These same four dimensions, however, only explained between 2 and 4 percent of the variance in individual levels of offending.

Neighborhood levels of crime have also been found to affect individuals within the community. In general, studies have reported a positive relationship between exposure to community violence and a range of problematic outcomes, including family conflict, child maltreatment, antisocial behavior, and delinquency (Bell and Jenkins 1993; Cicchetti and Lynch 1993). For example, DuRant, Cadenhead, Pendergrast, Stevens, and Linder (1994), using a sample of African-American adolescents, found that self-reported frequency of exposure to community violence was positively related to delinquency and antisocial behavior. Similarly, Schwab-Stone, Ayers, Kaspro, Voyce, Barone, Shriver, and Weissberg (1995) reported that exposure to violence and feelings of being unsafe in one's neighborhood were positively related to antisocial behavior among a sample of 6th, 8th, and 10th graders. Despite differences in levels of measurement, the preceding studies suggest

that criminogenic risks at the neighborhood level have consistently predicted criminal activity.

In summary, the literature documenting the adverse effects of risks reveals that factors from many different domains contribute to raising the likelihood of participating in criminality. Longitudinal research, however, suggests that criminogenic risks may not only have immediate effects, but their effects may be delayed until some later point in development. Therefore, an individual may be involved in delinquency in adolescence because of poor parenting practices during their childhood. The following section reviews the research documenting the delayed effects of risk factors.

Delayed Effects of Risk Factors. An investigation into the effects of risk factors raises two important questions regarding the importance of the risk over time. First, what is the immediate effect of the risk? That is, how is behavior affected when a particular risk emerges? And, second, what is the long-term effect of the risk? In other words, how might behavior in the future be affected by the present emergence of the risk? In general, the majority of risk factor research has addressed the short-term effects, while research on the long-term effects has been relatively sparse. In part, the rarity of this research can be attributed to the limited availability of data sets that investigate individuals over the life course. Longitudinal data on individuals for an extended period of time are necessary because investigation of long-term effects would require assessment over several periods of development. Notwithstanding these methodological complexities, research has provided some beginning insights.

Because of the delay in their impact, risk factors that do not immediately moderate behavior are often referred to as "sleeper effects" (Kagan and Moss 1962). In the extreme case, factors could require several years before their effects are exhibited in problem behaviors. One example of a sleeper effect can be found in research on parenting. Parental socialization variables—that is, supervision and rejection—were found to have stronger associations with conduct problems in the long-term as opposed to the short-term (Loeber and Stouthamer-Loeber 1986). Notably, the median RIOC scores of parental supervision between cross-sectional and longitudinal studies were 14.6 and 36.4, respectively. Likewise, median RIOC scores of parental rejection between cross-sectional and longitudinal studies were, respectively, 24.0 and 35.8. These results suggest that certain parenting factors have greater long-term effects than short-term.

The delayed effects of criminogenic risks may also be evident in the investigation of the relationship between neighborhood factors—specifically living in poverty—and criminality. There are several reasons why neighborhood-related risks might have delayed effects: (1) it is likely that as youths develop, they increasingly engage in unsupervised involvement in peer groups; (2) youths are increasingly involved in neighborhood activities; and (3) youths are increasingly involved in employment. Research has documented how involvement in each of these activities is associated with delinquent behavior (Farrington, Loeber, Elliott, Hawkins, Kandel, Klein, McCord, Rowe, and Tremblay 1990; Fine, Mortimer, and Roberts 1990; Cullen, Williams, and Wright 1997). Therefore, the long-term effects of living in poverty may be more detrimental than experiencing poverty in the short-term.

Until this point, the review of criminogenic risks has been presented as if they occurred in isolation. That is, the focus has primarily been on the influence of one particular risk factor and its effect on raising the probability of engaging in conduct disorders, delinquency, and crime. Individuals, however, rarely experience the effects of *only* one particular risk factor. In fact, risk factors often emerge concurrently, with one risk factor being accompanied by a host of others. As Masten and her colleagues (1990, p. 426) note, "risk factors often co-occur, and when they do, they appear to carry additive and possibly exponential risk." Therefore, individuals are often faced with having to balance and cope with multiple adversities from a variety of environments as opposed to one particular risk.

The Detrimental Effects of Multiple Risk Factors

Despite the variety of domains from which criminogenic risks can emerge to positively correlate with criminal activity, the literature fails to account for the existence of a single robust predictor. For instance, while associating with delinquent peers has been found to be correlated with an increased likelihood of participating in criminal activity, the existence of this factor *alone* is not a powerful predictor of these same behaviors. Rather, research has documented that criminality is more highly predictive when individuals experience *multiple* risk factors. That is, the prevalence of criminal activity increases as individuals exposure to risk increases (Rutter 1979). This section reviews the research investigating the detrimental circumstances experienced by youths from high-risk environments.

Research has revealed that the likelihood of engaging in delinquency and other problem behaviors is directly associated with the number of risk factors to which an individual is exposed (Barocas, Seifer, and Sameroff 1985; Coyne and Downey 1991; Dubow and Luster 1990; Newcomb, Maddahian, and Bentler 1986; Rutter 1979, 1990; Sameroff and Seifer 1990; Thomas and Chess 1984; Werner 1985). For example, in assessing the prevalence of psychiatric disorders in children, Rutter (1979) isolated six family variables: marital discord, low socioeconomic status, large family size, paternal criminality, maternal psychiatric disorder, and child welfare intervention. He concluded that the rates of disorder were a function of the number of risks to which the child had been exposed. Namely, children exposed to an isolated familial risk were no more likely to suffer from psychiatric illness than those not exposed to any risk factor. The presence of two or three factors occurring in collaboration, however, produced a four-fold increase in the prevalence rates. Four or more risk factors generated a ten-fold increase.

Kolvin et al. (1988b) found similar results using a sample of 847 children from a birth cohort in Newcastle, England. Using a list of risk factors comparable to the list employed by Rutter, Kolvin et al. (1988b) investigated how exposure to criminogenic risk affected the number of criminal offenses committed. When assessed at the age of 33, individuals with no risk factors present had a mean number of 0.7 criminal offenses. Individuals with one or two risk factors had a mean number of 2.9 criminal offenses; individuals with three or more had a mean number of 5.1 criminal offenses. Moreover, in assessing *convictions* over the life course (from age 10 through 33), individuals experiencing a higher number of risk factors consistently had higher mean levels of convictions than those

with fewer risk factors (Kolvin et al. 1988b). This latter finding suggests that the effects of exposure to multiple risks is not sensitive to developmental periods; high-risk individuals at all age ranges have a greater likelihood of engaging in criminal activity.

Smith et al. (1995) found comparable detrimental effects of multiple-risk environments on the outcomes of delinquency and drug use. Based on a sample of 772 high-risk adolescents from the Rochester Youth Development Study, Smith and her colleagues observed a relatively linear effect between the number of risks to which an individual exposed and the prevalence of delinquency and drug use. Prevalence rates of serious delinquency for those with no risk factors was 11.9 percent, with one to four risk factors was 23.1 percent, and five to nine was 34.0 percent. For serious drug use, prevalence rates were 16.8 percent for individuals experiencing zero risk factors, 13.8 percent for those with one to four risk factors, and 30.7 percent for individuals with five to nine risk factors.

Similar findings emerge when investigating predictors of chronic offending. Using a prediction index consisting of seven risk factors developed from the Cambridge Study of Delinquent Development, Farrington (1985, 1987) found that children with four or more factors measured during middle childhood (ages 8 through 10) represented 65.2 percent of the chronic offenders. Research has also investigated how multiple risk factors accumulating within a specific domain have increased the likelihood of delinquent involvement. Loeber and Stouthamer-Loeber (1986, p. 92) suggest for example, that the likelihood of delinquent offending increases when certain family factors "interlock." That is, individuals are more likely to be delinquent if they experience the co-occurrence of familial risks. Therefore, despite minor differences in outcomes across studies, the research detailed above

demonstrates clearly that exposure to increased risk results in a greater likelihood of involvement in criminal activity.

The cumulative effect that risks have on delinquent behavior is also found in studies investigating their effect on drug use. Newcomb et al. (1986), in a study investigating the role of risk factors among 994 high school adolescents, found that the frequency of substance use increased in a linear fashion. While marijuana use substantially increased with each additional risk factor, significant increases in hard drugs were not found until adolescents experienced at least six risks. The moderate ineffectiveness of risks on substance abuse at lower levels is consistent with research investigating the effects of risk on the prevalence of serious drug use. For example, Smith et al. (1995) found that prevalence rates of serious drug use were higher among individuals experiencing zero risks versus those experiencing between one and four risks. For those with five or more risk factors, however, prevalence rates of drug use were substantially higher. Therefore, it would appear that the effects of risk on drug use may be slightly different from their effect on delinquency and crime.

It would appear that a scholarly interest in examining the effects of criminogenic risks has dominated our understanding of the etiology of delinquency. Empirical investigations examining risks within the intrapersonal, familial, peer, and neighborhood domains as well as across different developmental periods has provided valuable insight as to why individuals become delinquent. In short, this research has generally suggested that although different risks have unique influences on the explanation of delinquency, it is the cumulative effects of multiple criminogenic risk factors that place an individual at the greatest risk of becoming delinquent.

THE CONCEPTUAL FOUNDATION OF RESILIENCY: SUCCESSFUL ADAPTATION AMONG HIGH-RISK YOUTHS

In spite of the increased likelihood of succumbing to the detriments associated with multiple or high-risk environments, a substantial portion of individuals overcome the odds and develop into competent human beings (Rutter and Giller 1983; Smith et al. 1995; Werner 1989a). For example, Rutter and Giller (1983) found that roughly 50 percent of youths that are labeled high-risk do not go on to become delinquent. Relatedly, Smith et al. (1995), in their study of 1,006 seventh and eighth graders in Rochester, New York found that approximately two-thirds of the youths living in high-risk family environments were resilient to serious negative outcomes. These individuals, for the most part, develop stable and healthy personalities, interact with their parents in a positive manner, function successfully in school, and refrain from involvement in serious forms of delinquency and crime. A critical question that follows from these findings is simply, why? What prevents high-risk individuals from relenting to the many adversities they face? What factors differentiate high-risk youths functioning competently with those behaving in a maladaptive manner? In short, how might the inclusion of factors that ameliorate such behaviors improve our understanding of individual responses to risk?

In the following pages, I review the literature on protective factors and investigate how they function to enhance resiliency among high-risk youths. I begin by briefly reviewing the variety of definitions of the term resiliency and trace the historical origins of resiliency research. Next, I discuss the theoretical role that protective factors play in promoting resiliency and address the methodological approaches in understanding these

processes. Finally, I present the findings from empirical research investigating resiliency and conclude with a discussion of the limitations of this research and the research strategy taken in this report.

Defining Resiliency

In reviewing the methodological issues of resiliency research, Kinard (1998, p. 670) observes "operational definitions of resilience seem to be as numerous as studies examining this construct." That is, the relatively recent proliferation of studies examining resiliency have been accompanied by a lack of consensus regarding its conceptualization (Kaufman, Cook, Arny, Jones, Pittinsky 1994; Luthar 1993; Rutter 1993). For example, early conceptualizations have been synonymous with the terms "invulnerable" and "invincible" which essentially imply the absence of psychopathology or maladaptive behavior in individuals (Rutter and Quinton 1984). These definitions appear to structure the operationalization process on the individual's avoidance of negative behaviors such as psychopathology or delinquency without recognizing their ability to exhibit positive types of behavior. Individuals not manifesting these problem behaviors were considered resilient while those expressing these behaviors were considered not to be resilient. Unfortunately, these definitions also imply that despite the extent of risk, resilient individuals are completely resistant or unaffected.

More contemporary definitions of resilience have incorporated measures of competency and success in meeting developmental tasks (Luthar and Zigler 1991). This recent research has focused on the individual's ability to successfully navigate a variety of

developmental stages in light of coming from a high-risk environment. As Kimchi and Schaffner (1990, p. 478) explain "resiliency is a summary concept implying a track record of successful adaptation following exposure to biological and psychosocial risk factors and/or stressful life events, and implying an expectation of continued lower susceptibility to future stressors." In this fashion, high-risk individuals are considered resilient if they are functioning within normal bounds on academic, behavioral, social, and cognitive measures (Kinard 1998). Masten et al. (1990) further clarify this view by distinguishing between three types of resiliency: (1) positive outcomes despite being from a high-risk environment, (2) competency despite experiencing acute or chronic major life stressors, and (3) successful recovery from trauma. Relying on these conceptualizations has turned the focus of resiliency research from absence of negative behaviors to the manifestation of positive conduct.

Because criminological research inherently focuses on the explanation of negative behaviors such as delinquency and crime, scholars investigating resiliency in this area have fundamentally conceptualized it in the more traditional fashion through the absence or limited involvement in these types of problem behaviors. For example, in their study of resilient adolescents, Smith et al. (1995) identify resilient youths as those individuals who had no involvement in serious or moderate forms of delinquency. Similarly, researchers distinguished resilient youths as those individuals without any official record of delinquency (Farrington, Gallagher, Morley, Ledger, and West 1988; Kandel et al. 1988; Werner 1989). These definitions each assume that resilient individuals will participate in minor forms of delinquency and crime, however, their ability to avoid serious involvement is what characterizes them as being resilient.

Regardless of the conceptualization of resiliency used, each definition points to the individual adaptation that occurs in the face of adversity. That is, while risk and protective factors can develop within and outside of the individual, (i.e., the family, school, or community environments), resiliency is entirely an individual characteristic. More specific, resilient behavior is generally conceptualized as an individual's adaptation to extensive levels of risk. Therefore, by examining resiliency we can begin to understand how *individuals* overcome challenges to development over time and across a variety of circumstances. A discussion of the roots of resiliency provides a foundation for the basis of these assertions.

Historical Origins of Resiliency Research

A variety of literatures have contributed to formulating the foundation of resiliency research. Similar to the origin of risk-related research, the investigation of resiliency in part emerged in epidemiological research where studies occurred relating to individuals' vulnerability to coronary heart disease. For example, Hinkle (1972) examined individuals over a twenty-year period and found that more serious patterns of illness evolved from individuals with higher susceptibilities while resilient individuals experienced lower levels of illness. It was also observed that a small proportion of individuals survived major changes in relationships and deprivations without exhibiting any overt illness. In a follow up to this research, Hinkle (1974) concluded that this resilient behavior was associated with two general factors: (1) no history of pre-existing vulnerabilities, and (2) the presence of personality characteristics that buffered the individual from a variety of negative life circumstances.

Research on schizophrenia, poverty, and responses to trauma have also contributed to our understanding of how individuals adapt to stressful or adverse situations (Cicchetti and Garnezy 1993). Scholars examining the effects of schizophrenia had been primarily interested in the majority of individuals evidencing maladaptive behavior. Early studies generally addressed the precursors and correlates of schizophrenic behavior while in part ignoring the small subset of patients exhibiting recovery and adaptive patterns. During the early seventies, however, Garnezy (1970) embarked on a research mission to formulate an explanation of how a small portion of individuals, despite their schizophrenic diagnosis, functioned competently in work, social situations, and their capacity to fulfill a variety of responsibilities. Although the term resilience was not extended to the characterization of such behavior, the patterns of adaptation and recovery clearly provided a foundation for future resiliency research.

The particular stresses associated with chronic poverty exemplified an additional area of research that led to studies investigating resiliency. Despite the substantial number of social and economic deprivations associated with chronic poverty, a considerable proportion of youths have been identified to exhibit positive behaviors over the life course (Elder 1974). In examining 167 adolescents who experienced the Great Depression, Elder (1974) found that individuals who survived and functioned competently sought out the companionship and advice among individuals outside of the family. Personal assets also played an important role in the manifestation of resiliency. For example, Pavenstedt (1965) found that a substantial number of youths successfully adapted to the adversities they faced within very

low-lower socioeconomic environments. These studies each suggest that escape from risky environments is possible if individuals possess certain traits.

A fourth area of research that has contributed to the foundation of resiliency are studies that have investigated adaptive functioning in individuals exposed to a variety of life traumas (Clark 1983; Gallagher and Ramey 1987). The nature of the traumas experienced could be a function of the natural environment (i.e., earthquakes or hurricanes) or those that are socially constructed (i.e., wars and revolutions). For example, Clark (1983) provides a detailed account of how poor minority children succeed in school and in raising a family despite traumas experienced throughout the course of their development. Relatedly, Epstein (1979) has documented the successful life histories of adults experiencing the Holocaust as children. Again, while expectations of maladaptive behavior are relatively high among these populations, it was observed that some individuals overcome and virtually thrive in such situations (Garmezy 1985).

Despite the historical significance of these diverse areas of research in providing a foundation to study resilient youth, the more contemporary roots of resilience can be traced to work by developmental psychopathologists (Garmezy 1971; Garmezy and Streitman 1974). While observing that some individuals, though equally exposed to high-risk environments, failed to manifest psychopathological behavior, Garmezy (1985) and others (Garmezy and Masten 1986; Rutter 1979, 1987; Werner 1989a, 1989b) organized a research agenda to investigate variables that might ameliorate the effects of various risks. In other words, scholars began to embrace the idea that competence and maladjustment are best studied in concert—the study of one informing and improving the study of the other. As

such, developmental psychopathologists initiated a systematic effort to investigate factors that produced successful outcomes in children and adolescents at risk (Cicchetti 1984; Masten and Braswell 1991; Sroufe and Rutter 1984). Recognizing that previous researchers were mainly interested in explaining problem behavior through variations in risk alone, this more contemporary developmental approach placed the effects of protective factors at the forefront of analytical models. As Rutter (1979, p.49) observed,

there is a regrettable tendency to focus gloomily on the ills of mankind and on all that can and does go wrong. It is equally unusual to consider the factors or circumstances that provide support, protection or amelioration for the children reared in deprivation. Would our results be better if we could identify the nature of protective influences? I do not know, but I think they would. The potential for prevention surely lies in increasing our knowledge and understanding of the reasons why some children are not damaged by deprivation.

In short, the increasingly prominent role of the developmental perspective has fostered an interest in the diversity of developmental outcomes and the complexities of different pathways of human behavior. These literatures appropriately suggest that successful adaptation despite extensive adversity is one developmental pathway that is worthy of empirical understanding. As such, investigators began to explore the many possibilities through which protective factors theoretically influenced resiliency.

The Role of Protective Factors in Instigating Resiliency

While the contemporary focus on protective factors is primarily rooted in developmental psychopathology, traditional criminological research also directed attention to the potential influence of protective factors. For example, traditional criminological research has examined the effects that variables might have in reducing the likelihood for

youths to be delinquent (Dinitz, Scarpitti, and Reckless 1962; Hirschi 1969; Reckless and Dinitz 1967; Reckless, Dinitz, and Kay 1957; Reckless, Dinitz, and Murray 1956). While investigating white boys aged 12 to 16 who lived in high delinquency areas, Dinitz, Scarpitti, and Reckless (1962) found that boys with good self-concepts were less likely to be delinquent than those having poor self-concepts. The more favorable projections of the self possessed by the non-delinquents were argued to be a product of their early socialization experiences. As Dinitz and his colleagues (1962; p. 517) point out, "our operational assumptions are that a good self-concept is indicative of a residual favorable socialization and a strong inner self, which in turn steers the person away from bad companions and street corner society, toward middle class values, and to awareness of the possibility of upward movement in the opportunity structure." Although not necessarily considered protective factor research, these studies appear to have provided the theoretical foundation in criminology through which protective factors potentially ameliorate the effects of residing within a high-risk environment.

The theoretical foundation of the impact that protective factors might have in fostering resiliency is rooted in their ability to counteract the effects of high-risk environments. Briefly, protective factors are those variables that serve to buffer, moderate, or insulate individuals from high-risk status. Rutter (1985, p. 600) supports this notion as he conceptualizes protective factors as "influences that modify, ameliorate or alter a person's response to some environmental hazard that predisposes them to a maladaptive outcome." Rutter's conceptualization suggests that protective factors take effect following the establishment of some level of risk and function to moderate an individual's likelihood of

developing problems. Accepting this framework, Rutter (1985) suggests that a factor can only be considered protective if it differentiates between adapted and maladapted groups who are both exposed to comparably high risk. It is also important that the effects of the protective factor be assessed at a later stage of development than the risk (Rutter 1987).

Werner and Smith (1982) further clarify a theoretical framework for the study of resiliency in their balance models. Briefly, this approach views the balance between biological risk factors and stressful life events that enhance an individual's vulnerability to problem behavior and the protective factors available to counteract these influences as important in the explanation of resiliency. In cases where the balance between these dichotomies is relatively manageable, an individual can cope or adapt successfully. Alternatively, individuals manifesting maladaptive behaviors are theorized to have encountered an imbalance in favor of a variety of risks.

While the theoretical role of protective factors has been generally accepted among scholars working in this area, little consensus exists surrounding the conceptualization and operationalization of these factors (see Lösel and Bliesener 1990). These differences particularly center on the separation of risk from protective factors during the investigation of their independent effects on problem behaviors (Stouthamer-Loeber et al. 1993). That is, some scholars support the operationalization of protective factors as the absence of risk or the opposite ends of a risk factor (Kandel et al. 1988; White et al. 1989). In this conceptualization, low IQ could be considered a risk that enhances or increases the probability of manifesting problem behaviors, while an individual's high IQ buffers or reduces the likelihood of such behaviors. Similarly, the presence of a caring emotional

reference person has been considered an important protective factor against psychopathology, while the absence of such an individual is viewed as a substantial risk (Tress, Reister, and Gegenheimer 1989). This conceptualization makes it difficult to disentangle which factors should be considered risk and which should be protective.

Rutter (1987), however, has advanced an argument in support of the view that risk and protective factors be conceptually distinct from one another as opposed to opposite ends of a single dimension. According to this framework, protective factors are considered independent variables that have both direct effects on problem behaviors or can moderate the relationship between risk factors and behavior (Jessor et al. 1995). This conceptualization also allows factors to be protective only if they differentiate between maladapted and adapted (i.e., delinquents and non-delinquents) individuals who both experience equal levels of high risk (see Rutter 1985).

In light of these methodological issues, research indicates that the effects of protective factors should not be viewed equally across various populations. That is, similar to the impact of risk (see Yoshikawa 1994), the effects of protective factors appear to vary according to a variety of demographic characteristics including age, sex, and race (see Masten et al. 1990). Not only does vulnerability shift in accordance with these characteristics, but the availability and reliance on factors insulating against risk also change (Caspi and Elder 1988). As Kimchi and Schaffner (1990: p. 479) suggest "different factors assume different degrees of importance at different developmental stages." Elder's (1995) research is consistent with these contentions where he finds that the importance and reliance on protective factors varies across different life stages (Elder 1995). For example, while the

availability of and dependence on social support is important during late childhood and early adolescence, this factor can serve to elevate the risk of delinquency during middle to late adolescence during which time teens potentially associate with delinquent peers (Jessor, Donovan, and Costa 1991). Apparently as individuals move beyond the family sphere and increasingly associate with their peers, their opportunities for protection against risk change accordingly. The age of the individual additionally affects how they appraise stressful experiences and the coping resources available (Compas 1987). As such, it is important to investigate which protective factors are important at different stages of development.

Studies additionally point to how susceptibilities and adaptations differ according to an individual's sex. Findings suggest that under high-stress situations, boys are typically more likely to manifest disruptive or aggressive behavior while girls experience higher levels of anxiety or depression (Masten et al. 1990). Relatedly, studies have suggested that girls have been found to be more resilient than boys during childhood, however, they are more vulnerable during adolescence (Compas 1987). In reference to protective effects, Werner's (1993) research also directs attention to how protective factors within the individual (i.e., temperament, cognitive skills, and self-esteem) positively impacted the coping abilities for high-risk females whereas outside sources of support were more important in the lives of high-risk boys. These findings suggest that sex differences affect the vulnerabilities and the protective resources for both males and females.

Although more limited, studies investigating the impact of protective factors according to race have also lent insight into the variable influence of these factors across demographic characteristics. For example, using a sample of African-American adolescents,

Spencer, Cole, DuPree, Glymph, and Pierre (1993) found that individuals' academic self-esteem served as an important protective factor in instigating resiliency. Examination of whether individuals of different races rely on similar protective factors, however, has not been adequately addressed because studies of resiliency are rarely based on large racially diverse samples. That is, studies have rarely investigated the importance of protective factors across races in the same sample. As Spencer et al. (1993, p. 721) point out, resiliency research "has either entirely focused on non-minority youth, or, when minorities are included, their unique ethnicity-linked situations and cognitive schema have seldom been considered in either the design of research or in the interpretation of findings."

Although protective factor research, as it relates to resiliency, has documented the benefits these factors have in promoting resiliency, studies suggest that individuals are not necessarily normal (Luthar, Doernberger, and Zigler 1993). That is, although behaviorally competent, resilient individuals have been found to score significantly lower on indices of emotional adjustment. For example, based on a sample of inner-city adolescents, Luthar (1991) reports that resilient youths (high-risk, high-competence) experienced significantly higher levels of depression than youths who were highly competent but from lower risk backgrounds. Likewise, results from Werner's (1992) longitudinal study of resiliency suggest that adults who were considered resilient suffered higher levels of depression than non-resilient adults. This research suggests that the benefits of protective factors in preventing external problem behaviors may come at the expense of higher levels of emotional problems.

Stages of Protective Factor Research

The proliferation of studies assessing the effects of protective factors has generally evolved in three stages. Scholars first investigated at-risk children who demonstrated good coping abilities (Garmezy 1985). Based primarily on the epidemiological work of Rutter and his colleagues (Rutter 1979; Rutter, Maughan, Mortimore, and Ouston 1979) on the Isle of Wight, these researchers investigated the effects that protective factors had in reducing the likelihood of psychiatric disorders. Specifically, isolating six family-related risks which were found to be positively associated with the prevalence of psychiatric disorder, Rutter (1979) uncovered a number of protective factors that functioned as risk reducers. These factors included positive temperamental factors, the presence of a parent-child relationship characterized by warmth, affection, and the absence of severe criticism, and a positive school environment (Rutter et al. 1979).

The second stage of protective factor research centered on the search for correlates of such adaptive behavior in the child, the family, and the various situational contexts in which the behavior is observed (Garmezy 1985). As such, the goals of research in this stage were twofold: (1) investigate high-risk individuals who both successfully and unsuccessfully overcome risk, and (2) distinguish the assortment of factors that promoted adaptive behavior. Therefore, while the goal of stage one studies primarily involved the identification of children who successfully coped, stage two studies began to investigate the variety of potential correlates that predicted this behavior.

The third stage of protective factor research has involved a systematic search for the processes or mechanisms that underlie the manifestations of stress-resistant behavior in

children (Rutter 1985, 1987). That is, this third generation of research seeks to gain a more thorough understanding of *how* protective factors buffer the effects of risk. While efforts to examine questions related to this third stage have been relatively limited, beginning insights have suggested that protective processes include: (1) the reduction of the level or impact of the risk by reducing or altering the individual's exposure, (2) the reduction of the negative chain reactions accompanied from the accumulation of risks, (3) the promotion of self-esteem or self-efficacy through the availability of supportive relationships, and (4) the development of opportunities in society (Rutter 1990). Studies categorized in each of these three stages have provided the insight into the protective factors that instigate resiliency. The findings from many of these studies are summarized below.

Empirical Research Investigating Resiliency

Research investigating the effects of protective factors in instigating resiliency have been based on both cross-sectional and longitudinal research designs. This research has produced a substantial number of personal and social factors that serve a protective function for high-risk youths. Garmezy (1985) and others (see Rutter 1985; Werner 1989) have condensed these factors into three broad categories: (1) individual attributes of the child or adolescent, (2) the climate and resources within the family, and (3) the availability and dependence on support systems existing within the community. In the pages to follow, the empirical research investigating the protective factors promoting resiliency will be discussed in accordance with Garmezy's conceptualization.

Individual Factors. Resiliency research has placed a substantial emphasis on the traits that individuals possess in assisting them to overcome high levels of risk and subsequently instigate resiliency. Many of these studies have found that an individual's temperament or disposition, particularly measured early in life, has been found to promote resiliency in adolescence and later adulthood (Kolvin et al. 1988b; Werner and Smith 1992). That is, children characterized with "easy" temperaments had more success in coping than those who were depicted as "slow to warm up" (Thomas and Chess 1984). In addition, individuals who expressed greater sociability to others also possessed the ability to seek out sources of emotional support in times of adversity (Werner and Smith 1992). In fact, resilient adolescents were rated as having a higher level of social maturity and scored higher on the sociability scale of the California Psychological Inventory (CPI) (Lewis and Looney 1983; Werner and Smith 1992). Their higher level of sociability also provided resilients with the opportunity to elicit a larger social support network (Anthony and Cohler 1987). Therefore, parents often appear to be more receptive and provide a warmer care giving environment to children with likeable individual dispositions.

Protective factors related to the individual's intelligence or cognitive ability have been found to foster resiliency (Fergusson and Lynskey 1996; Kandel, et al. 1988; Masten, Best, and Garmezy 1990; Seifer, Sameroff, Baldwin, and Baldwin 1992; Smith et al. 1995). For example, Garmezy, Masten, and Tellegen (1984) found that, when faced with increasing levels of stress, declines in social competence among more intelligent individuals were much lower in comparison to less intelligent individuals. In a prospective longitudinal study of a New Zealand birth cohort, White et al. (1989) found that a very high IQ was particularly

protective for high-risk boys in avoiding delinquency. In addition, Smith et al. (1995) reported that measures of intelligence were among the most salient protective factors that distinguished resilient from non-resilient adolescents. Relatedly, Lösel and Bliesener (1990) also found that resilient individuals scored higher on measures of verbal intelligence, reasoning, and technical intelligence than non-resilients. Finally, studies have indicated that those manifesting resiliency have significantly higher aspirations and are more motivated to succeed in school (Lösel 1994; Lösel and Bliesener 1990; Smith et al. 1995).

Scholars have hypothesized that higher levels of intelligence or cognitive ability may lead to more effective coping strategies or to enhance an individual's self concept. For example, Lewis and Looney (1983) found that adolescents with higher IQ scores described themselves as having higher degree of self-confidence, a greater sense of self-worth, being better socialized, and more flexible. Each of these factors have also been found to act as buffers against risk (Cicchetti, Rogosch, and Holt 1993).

Often related to intelligence, and also found to possess a protective function, is an individual's ability to actively engage in problem-solving (Rutter 1985; Werner 1993). This research has suggested that by taking an active versus a passive problem-solving approach, individuals are more likely to effectively manage stressful situations. According to Werner (1993) active problem-solving skills at age 10 were one of the best predictors of adaptation in early adulthood. This relationship, however, was only found among females suggesting that the effects of problem-solving skills may be dependent on the gender of the individual.

Resiliency research has also documented how individuals' beliefs in managing their lives serves a protective role among those at-risk. Namely, this research has found that an

internal locus of control serves a protective function among children, adolescents, and adults (Murphy and Moriarity 1986; Luthar 1991; Werner 1989). For example, Werner (1989) reported that resilient youths had a substantial degree of faith in their control over the environment while high-risk individuals not manifesting resiliency perceived the environment as random and uncontrollable. Heller, Larrieu, D'Imperio, and Boris (1999) suggest, however, that support networks, academic and cognitive skills, and social skills might mediate the relationship between an individual's locus of control and resiliency.

Self-esteem is an individual resource that has been consistently linked to resiliency across a variety of different samples (Cicchetti and Rogosch 1997; Lösel 1994; Lösel and Bliesener 1990; Werner 1989). Lösel's (1994) study of institutionalized German adolescents revealed that the resilient individuals scored significantly higher on a self-esteem measure than non-resilients. In addition, results suggested that an individual's self-esteem has a direct positive effect on their self-efficacy. It appears that an individual's self-esteem, which includes components of personal confidence, acceptance, and optimism, is important in maintaining their ability to actively view the world as favorable.

The effects of self-esteem, however, may be gender and age-specific. For example, in Werner's (1989) longitudinal study of the children of Kauai, she found that self-esteem was a better discriminator for high-risk resilient women than high-risk resilient men. The individual's self-esteem, however, was not as strong as a predictor for boys or girls in earlier periods of development (i.e., adolescence). This finding is consistent with the non-significant differences in the self-esteem measure between resilient and non-resilient adolescents in the Rochester Youth Development Study (Smith et al. 1995).

Another salient protective factor implicated in promoting resiliency is the belief in one's effectiveness, particularly in terms of self-efficacy, self-confidence, and self-worth (Cicchetti et al. 1993; Garmezy 1985; Werner 1990). Higher levels of self-efficacy may enhance the individual's motivation to adapt to risk in positive ways. Werner (1993) has found that among resilient adults, their degree of self-efficacy was found to have a stronger protective effect than parental competency and social support within the family. Similarly, Lösel and Bliesener (1990, p. 305) point out that resilient adolescents "experienced themselves as being less helpless and had stronger beliefs in their self-efficacy."

Family Factors. As previously discussed, the importance of the family to individual development has long been the interest of scholars examining how risks occurring within this context affect delinquency and crime (Loeber and Stouthamer-Loeber 1986). According to Garmezy (1995), however, it has also been the interest of researchers examining the impact of protective factors in fostering resiliency. Importantly, familial factors that center on the supportive and caring relationships occurring between the parent and child have emerged as meaningful protective factors in the lives of resilient youths (Weinraub and Wolf 1983; Werner 1993). For example, In examining the effects of support within the family, Lösel and Bliesener (1990) report that resilient individuals' satisfaction with their support is more important than the frequency of support (also see Berndt 1989). As Dubow and Tisak (1989) point out, support can improve an individual's self-esteem, aid in problem-solving, provide needed resources, or enhance a sense of companionship.

An individual's attachment to a parent is often examined in accordance with the emotional support provided by that parent or within the family. Research has documented

that a quality parent-child relationship buffers the effects of early risk by offering warmth and support especially in times of severe adversity (Egeland, Carlson, and Sroufe 1993; Hirschi 1969; Werner 1993). For example, Rutter (1979) has found that a good relationship with at least one parent protects against family discord. Likewise, in a review of protective factors enhancing resiliency, Kimchi and Schaffner (1990) observed that the establishment of a secure attachment with at least one stable adult care giver during infancy resulted in a higher likelihood of resiliency. Smith et al. (1995) noted that the parent-child attachment can occur in both directions. That is, the perceived parent-child attachment from the parents' and the child's view was correlated with resiliency.

Although attachment to a parent and the emotional support provided within the family are vital to instigating resiliency, individuals found to be resilient were also raised in families with greater levels of parental supervision (Smith et al. 1995). That is, in addition to different types of support, parents who monitored their children and addressed maladaptive behavior before serious problems could develop produced children who withstood the effects of multiple risks. Parental supervision can be characterized as those who establish consistent expectations, rules, and consequences for behavior and developed a system for supervising their children (Snyder and Patterson 1987). Research investigating the effects of parental supervision have noted its importance to instigating resiliency. For example, individuals who were resilient against delinquency and drug use experienced greater mean levels of parental supervision (Smith et al. 1995). As such, factors related to support *and* control are important for high-risk individuals.

Relatedly, Werner and Smith (1992) found that parental competence, measured by their level of education, functioned to protect youth's from risk experienced early in life. The nature of this relationship, however, is not clearly understood. For example, Werner and Smith's (1992) research suggested that parents who are better educated produce children with higher cognitive development and problem-solving skills. Moreover, these better educated parents had more positive interactions with their children early in life and provided more emotional support during middle childhood (Werner 1993). Amato and Ochiltree (1986), however, suggest that effective parents model prosocial behavior, provide opportunities for their children to experience mastery, and verbally persuade their children in their own effectiveness.

External Support Systems. The social environment beyond the family has also provided significant sources of protections that instigate resiliency. Perhaps most important, research has documented how supportive relationships with individuals outside of the family function to provide individuals with coping alternatives in times of adversity (Werner 1993). In observing sources of external support for resilient youths, Werner (1982, p. 70) notes, "resilient children seem to be especially adept at actively recruiting surrogate parents." These relationships have been found to develop with parents' friends, adults within the extended family, teachers, or religious figures (Kellam, Ensminger, and Turner 1977; Smith et al. 1995; Werner and Smith 1992). For example, Smith et al. (1995) reported that adolescents who were resilient against delinquency and drug use experienced a stronger attachment to their teacher than non-resilient adolescents. Similarly, Werner and Smith (1992) found that the most frequently cited positive role model and confidante was a teacher.

These studies suggest that although emotional support within the family may be minimal or absent, individuals who have an emotional reference person, or the opportunity and sources of support beyond the family, have a higher probability of manifesting resiliency.

Positive school environments, evidenced by those offering high academic standards, feedback, praise, incentives, rewards, and opportunities for individual responsibility, appear to provide a protective function for high-risk individuals (Rutter 1990; Werner 1990). Rutter (1979), in his study investigating students attending school in a poor section of London, found that a positive school environment mitigated the effects of stress within the family. It appears that this relationship, however, could potentially be mediated by influences or protective factors possessed by the individual. For example, Herrenkohl et al. (1994) reported that resilient individuals attending higher quality or more effective schools displayed higher levels of self-worth and control over their destiny. Research has also found that the protective effects of the school environment vary by categories of gender. A school environment that was characterized as providing structure and control was more protective for boys while those that provided nurturing and individual responsibility was more protective for girls (Hetherington, Cox and Cox 1982).

Investigating how religion functions to buffer the effects of risk has attracted substantial attention among scholars. Studies have suggested that affiliation with and active involvement in a religious denomination provides stability and meaning in the lives of resilient individuals (Anthony and Cohler 1987; Werner and Smith 1992). "Participation in their communal activities" as Werner (1993, p. 512) notes of resilient individuals, "provided structure for their lives and assured them salvation, security, and a sense of mission in an

'alien world.'" Involvement in the religious community also potentially provides individuals with a larger support network with whom individuals faced with adversity could turn (Anthony 1987). Therefore, religion might influence additional protective factors which also benefit high-risk individuals. As Masten et al. (1993, p. 430) remark, "religion may influence appraisals of stressful situations or fears of death, availability of social support resources, or choices of coping behavior (e.g., prayer vs. alcohol consumption)."

While studies have furnished findings in support of religion, scholars have also found religion to have a negligible or minor effect on resiliency. In fact, although non-significant, adolescents' involvement in religious activities was higher for those who were non-resilient versus resilient (Smith et al. 1995). The disparity in findings might suggest that the effects of religion are specific to certain populations. That is, religion may function to protect against risk only at certain ages, for certain racial groups, or for certain sexes. Among a sample of inner-city minority youths, Baldwin et al. (1990), found that membership in a church community was particularly important for youths evidencing resiliency. In addition, Werner and Smith (1992) reported that religion was important in the lives of resilient adults but not necessarily in the lives of adolescents.

In short, studies examining resiliency have suggested that a variety of intrapersonal, familial, and extrafamilial sources of protective factors have been found to distinguish resilient from non-resilient. The previous discussion serves as an overview of those factors that have consistently emerged as insulators against at-risk populations. In light of these findings, I have included eight research questions to be addressed in this report. Each of these questions are discussed below.

RESEARCH STRATEGY

Despite the progress made in understanding the protective factors that insulate high-risk youths, resiliency research is limited in several ways. First, with few exceptions (Werner and Smith 1982), many studies only examine a narrow period—for example, childhood, adolescence, or adulthood—over the life course. Restricting the analyses to one period in life potentially fails to reveal the dynamic nature of resiliency. As such, an individual could exhibit resilient behavior in childhood, yet succumb to the pressures associated with cumulative risks and engage in criminality during adolescence or adulthood (Cicchetti and Toth 1995; Egeland, Carlson, and Sroufe 1993). As Rutter (1987, p. 317) observes, “those people who cope successfully with difficulties at one point in their life may react adversely to other stressors when their situation is different.” In addition, the protective factors that individuals are dependent on could perhaps vary according to the age of the individual (Masten et al. 1990).

Second, and related, a number of the resiliency findings have been based on cross-sectional research designs or data analyzed cross-sectionally (Kandel et al. 1988; Lösel and Bleisener 1988; Lösel et al. 1989). The limitation with a cross-sectional research design is that risk factors, protective factors, and resiliency are each measured at the same time period. In addition to causal relationships becoming difficult to disentangle, a number of empirical questions remain unanswered. For example, are individuals actually resilient if they are only measured at one time point? Do protective factors have a long-term effect on insulating high-risk youths from participating in delinquency? Again, research based on cross-sectional research designs is limited in its ability to address these questions. Using prospective

longitudinal data, Smith and her colleagues, however, have furnished beginning insights into the cumulative effects of protective factors. Notably, youths with eight or more protective factors were four times more likely to be resilient against delinquency than youths with fewer than six protective factors (Smith et al. 1995).

Third, many of the resiliency studies examine criminogenic risks from a single domain. For example, Smith et al. (1995) investigated youths that were placed at risk because of the adversities faced within the family. Likewise, Musik, Stott, Spencer, Goldman, and Cohler (1987) examined youths at-risk because of severely disturbed mothers. Risks in other domains—for example, the intrapersonal, the school, or the community—were not included in establishing whether youths were high-risk. This is an important limitation because youths may react differently to the risks experienced from different environments. Notably, research by Farrington (1985) and Loeber and Dishion (1983) have each revealed that risk factors differ in their power to predict delinquent involvement.

Fourth, and related, many studies only assess protective influences from a single domain. Similar to risks, however, protective factors that insulate youths from engaging in delinquency can develop in multiple sources. While some individuals may rely on supports within the community to cope with adversity, others may depend on family members to survive. Thus, it is important to investigate the effects of protective factors from different areas in an individual's life.

Fifth, no research investigating resiliency has used a national sample of American youths. In fact, many studies have been based on small convenience samples drawn from clinical or institutional populations (Cicchetti and Rogosch 1997; Lösel and Bliesener 1990).

These findings, however, are only representative of the isolated populations from which they were drawn. Even Werner and Smith's (1982) research, which is arguably the most extensive study on resiliency, was based on a sample of youths from the island of Kauai in the State of Hawaii. Most youths in this sample were of ethnic origins—that is, Japanese, Filipino, and Hawaiian—that are generally uncharacteristic of those comprising the majority of youths in the United States. As such, the protective factors that function to insulate high-risk youths on the island of Kauai may be qualitatively different than those insulating African-Americans, Hispanics, and Caucasians who comprise the majority of individuals on the mainland.

Sixth, and related, few studies on resiliency have assessed whether protective factors have differential effects across categories of race and gender. In other words, research has not adequately investigated whether individuals of different racial backgrounds or different sex rely on similar protective factors in being resilient. Again, because sample sizes in studies of resilience have been generally small, sub-group analyses by these groups have been problematic. To examine these differences, research would have to use data sets that over-sample for different races and sex and then subsequently compare the predictors across these groups.

Seventh, research has not operationalized resiliency consistently across studies. For example, Smith et al. (1995, p. 230) measure resiliency as “no involvement in serious delinquency or moderate delinquency during the time period covered in the particular analysis.” Werner (1989) and Farrington et al. (1988), however, measure resiliency as an absence of officially recorded delinquent or criminal behavior. This latter measurement

strategy could be problematic because resilient individuals might be participating in serious forms of delinquency or crime without ever being officially identified by a law enforcement agency. Thus, whether individuals in these studies are truly resilient becomes a legitimate question.

Finally, many studies do not investigate the internal behavioral problems—for example, depression—in which resilient youth may be susceptible. It is often assumed that resilient youths are functioning successfully because participation in serious criminal behavior is not present. Previous research, however, has offered beginning insights to the intrinsic personality of the resilient youth. Notably, individuals identified as resilient often lack intrapersonal skills, are socially isolated, are overcontrolled, and emotionally constricted (Luthar 1993; Luthar and Zigler 1991; Moffitt 1997; Werner and Smith 1982, 1992). Further empirical verification using national data would add support to these initial findings.

Through analyzing a national sample of youths, this report attempts to surmount these limitations and extend research on resilient youth. Notably, listed below are the eight research questions that will be addressed in this report:

Research Question #1: Is there a positive relationship between the number of risk factors an individual is exposed to and his/her involvement in self-reported delinquency and drug use?

As noted above, research has consistently indicated the cumulative effects of multiple risks are more predictive of problem behavior than is the effect of an isolated risk (Rutter 1979). That is, individuals experiencing at least three to four risk factors are at a substantially higher

risk of manifesting problem behaviors than those exposed to two or fewer risks. This question seeks to verify this empirical relationship by examining whether individuals experiencing a greater number of risk factors have higher prevalence rates in offending.

Research Question #2: Is there an inverse relationship between the number of protective factors an individual is exposed to and his/her involvement in delinquency and drug use?

Past research has indicated that protective factors reduce the likelihood of delinquency and crime (Jessor et al. 1995; Smith et al. 1995). In fact, Smith et al. (1995) found that the accumulation of protective factors is consistent with increasing the probability of being resilient. These findings would suggest that interventions for problem youths might be more effective if they were broad-based and targeted multiple areas of the youth's life. This research question seeks to verify this relationship by examining whether high-risk individuals experiencing a greater number of protective factors have higher prevalence rates of resilient behavior.

Research Question #3: Do resilient youths exhibit greater mean levels of protective factors than non-resilient youths?

Research has suggested that individuals exhibiting resilient behavior retain higher levels of protective factors than non-resilient youths. For example, Smith et al. (1995) found that resilient adolescents possessed greater mean levels of educational, peer, and family-related protective factors than non-resilient adolescents. Similarly, Lösel and Bliesener (1990)

reported significantly greater mean differences for resilient adolescents in individual and family-based protective factors. This question seeks to add to this literature by investigating the mean differences in protective factors encompassed within a variety of domains between resilient and non-resilient individuals.

Research Question #4: Of those identified as high-risk, what are the protective factors that increase their probability of being resilient?

Previous research has sought to identify the most important protective factors that instigate resiliency (Garmezy 1985; Masten et al. 1990). As discussed above, Garmezy (1985) has categorized those protective factors into: (1) personality dispositions, (2) supportive family environments, and (3) external support systems. Subsequent research has further supported Garmezy's categorization (Werner 1989). Further examination of these factors is necessary so as to extend the generalizability beyond rather homogeneous samples. This question seeks to add to this literature and identify the protective factors that are important in resilient individuals.

Research Question #5: Are protective factors instigating resiliency invariant across racial groups?

Although previous studies have identified the protective factors that are associated with resiliency, research has not systematically investigated whether these factors differ according to the individual's racial background. It might be that resilient individuals of different races

rely on or utilize unique resources to avoid being delinquent. This question addresses whether protective factors that cause one to be resilient are different for certain racial groups.

Research Question #6: Are protective factors instigating resiliency invariant across gender?

Similar to the question investigating racial differences, this question is concerned with examining whether there are differences in the protective factors causing resilient behavior according to one's gender. Werner's (1993) research has offered some beginning insights into the significance of protective factors across categories of gender, however, as noted above, this research is based primarily on a sample not generalizable to African-American's, Hispanic's, and Caucasians. This question will address whether male and female resilient individuals utilize different protective factors.

Research Question #7: Do protective factors moderate the effects of risk in relation to self-reported delinquency and drug use?

As suggested above, the expected influence of protective factors in relation to delinquency and drug use is to reduce their likelihood of occurrence. It is also possible, however, that protective factors serve to modify the relation between risk and illegal behaviors. When protective factors function as moderators they modify the relation between risk and problem behavior. As Jessor et al. (1995: 924) point out, "that relationship, linear and positive when

protection is low or absent, is markedly attenuated when protection is high." This question will examine whether this relationship is found in the NLSY.

Research Question #8: Do resilient youths experience higher rates of internalizing behavioral problems (i.e., depression) than non-resilient youths?

The adversity associated with being at-risk or high-risk often manifests itself through different types of behavior (Luthar 1993). While many individuals express their behavior externally, a substantial percentage internalize their problems and suffer illnesses that may be difficult to assess (Luthar and Zigler 1991; Luthar 1993; but see Neighbors, Forehand, and McVicar 1993). Previous research has suggested that resilient individuals are not necessarily healthy individuals. By investigating levels of depression, this question examines whether resilient individuals have a higher likelihood of internalizing versus externalizing their problems.

CHAPTER 2

METHODS

It is proposed that this study will investigate the effects of protective factors on insulating high-risk youths from participating in serious delinquency. Despite the relatively simplistic and straightforward nature of the research questions presented in Chapter 1, a number of complex methodological issues must be addressed that ultimately affect the research design. First, because the concept of resiliency implies that individuals do not exhibit, or only moderately exhibit, maladaptive behavior despite being at-risk for delinquency, the sample must consist of a substantial number of high-risk individuals. Little consistency exists, however, in how high-risk populations are conceptually defined (compare Smith et al. 1995; Lösel 1994). As identified in the previous chapter, some research investigating resiliency have separated high-risk populations through the effects of an isolated but intense risk such as the effects of chronic poverty (Elder 1974). Others, however, have focused on the cumulative nature of multiple risk factors in targeting a high-risk population (Farrington et al. 1988; Smith et al. 1995; Werner 1989). Because it has been well documented that the likelihood of delinquency and maladaptive behavior substantially increases with the number of risks youths experience (Rutter 1979), a high-risk cohort in this study will be defined by the accumulation of risks an individual experiences.

Second, and related, the dynamic nature of being resilient suggests that an individual might be resilient at one point in time, yet succumb to similar pressures at a later point in the life course. As such, scholars have noted that being resilient does not imply that an

individual is *invulnerable* at high levels of risk over the life course (Garmezy 1985; Luthar 1993). Rather, being resilient is envisioned as a day to day process through which individuals successfully or unsuccessfully escape the adversity associated with multiple risks. Therefore, the measurement of resiliency at a single time period, as in cross-sectional research designs, may inaccurately reflect the true extent that an individual exhibits resiliency (see Lösel 1994). Therefore, longitudinal data measured over multiple time periods are necessary to more precisely understand who is resilient and at what periods during the life course. As will be discussed below, this report takes advantage of a longitudinal research design to assess resiliency over the course of an individual's development.

Third, the literature examining the effects of risk and protective factors reviewed in the previous chapter highlights the significance of these factors across a variety of contexts. This suggests that individuals may be susceptible to adversity from multiple sources and rely on protective factors from many of those identical sources to overcome these risks. Since risk and protective factors can emerge from a variety of different domains, a study investigating the relationship of these factors would require a data set that measures these variables from a variety of contexts (i.e., the intrapersonal, family, peer, and neighborhood).

Finally, as recognized in Chapter 1, little consensus exists surrounding the conceptualization and measurement of resiliency. Scholars have used a number of operational definitions of resiliency ranging from complete abstention from delinquency based on officially reported acts to involvement in minor forms of delinquent and criminal activity to subjective judgments of identified experts (Farrington et al. 1988; Lösel and Bliesener 1990; Smith et al. 1995). Using a wide range of measurement strategies is likely

to produce results that vary or are dependent on the measurement strategy. Since there is little consensus surrounding the operationalization of the core concepts in resiliency research, efforts must be made to consider multiple measurement strategies (Kaufman, Cook, Army, Jones, and Pittinsky 1994) to investigate the potential differences in study outcomes.

In addressing the challenges outlined above, and also taking into consideration the limitations in resiliency research noted in Chapter 1, two data collection alternatives are available: (1) engage in an extensive primary data collection effort of a large high-risk sample over multiple time periods; or (2) identify a secondary data set of high-risk individuals in which observations were made over multiple time points and investigate their behavior over an extended period of time. The present study takes advantage of the second alternative to empirically examine resilient youths over the life course. Specifically, this study uses the National Longitudinal Survey of Youth (hereafter referred to as the NLSY) Child-Mother data set. This data set has been used in numerous studies investigating the effects of labor force participation, job mobility, educational attainment, and behavioral adjustment.

Because data are used from the NLSY and the NLSY Child-Mother data files, this chapter begins by describing in detail the methods by which data were collected for each of the two data sets. In the second section, I discuss how the sample was selected for the analysis and present the characteristics of the sample. Third, I discuss how each of the core concepts of resiliency research and the variables used to measure those concepts are measured. The final section will present the statistical approaches used to address the research questions presented in Chapter 1.

NLSY DATA

As noted, to examine resiliency over the life course, this study uses the merged child-mother data set of the NLSY. The NLSY, a prospective longitudinal study supported by the United States Department of Labor, was first administered in 1979 to 12,686 individuals ages 14 to 21 so as to assess their labor market experiences as they completed high school and entered the workforce (Center for Human Resource Research 1994).³ More precisely, the NLSY is comprised of three subsamples: (1) a sample of 6,111 youths, aged 14 to 21 as of January 1, 1979, who were representative of the noninstitutionalized civilian cohort of American youths; (2) a sample of 5,295 youths designed to oversample, Hispanic, black, and economically disadvantaged white youths; and (3) a sample of 1,280 individuals who were representative of the population aged 17 to 21 as of January 1, 1979 but were enlisted in the military as of September 30, 1978 (Baker, Keck, Mott, and Quinlan 1993). Oversampling Hispanic, black, and economically disadvantaged individuals is particularly noteworthy for this study because it permits the subgroup analysis of these populations which have not previously received extensive isolated attention in resiliency research.

The sampling design of the NLSY required that all individuals living in a selected household who were aged 14 to 21 in 1979 be interviewed at yearly intervals. As a result, the 12,686 individuals who were interviewed originated from only 8,770 unique households

³ Design, collection, and dissemination of the data are completed by The Center for Human Resource Research (CHRR) at the Ohio State University in conjunction with the National Opinion Research Center (NORC) at the University of Chicago.

(NLS Handbook 1995). In other words, 2,862 households comprised two or more respondents.⁴

Retention Rates

In any longitudinal panel research design, concern must be given to the retention rates of the panel participants because any significant loss of respondents is likely to introduce bias in the study findings. For the NLSY, the retention rate was calculated by dividing the number of respondents interviewed by the number of eligible respondents. The retention rate for those respondents eligible to complete the interview has fluctuated between a low of 89.2 percent in 1994 and a high of 96.3 percent in 1983 (NLS Handbook 1995). Given these small levels of attrition, it is unlikely that non-participants have significantly biased estimates produced using the NLSY.

Methods of Data Collection

With the exception of the year 1987, when interviews were conducted by telephone, respondents have been interviewed through face-to-face techniques. There are a number of advantages of interviewing individuals face-to-face versus other data collection efforts (i.e.,

⁴ As will be discussed below, within the sample (n = 711) selected there were 132 mothers that had more than one sibling. The number of siblings within the sample ranged from 2 to 5 with over 84 percent of them with only two. To assess whether there was a sibling effect, three models were estimated for each multivariate regression discussed below: (1) a full model that included all individuals within the sample, (2) a reduced model that included only the siblings, and (3) a reduced model that included all individuals except the siblings. The log likelihoods of the two reduced models were summed and compared to the log likelihood of the full model. The absolute value of this difference follows a chi-square distribution at degrees of freedom equal to the number of independent variables plus the constant. Comparison of these differences across models never reached conventional levels of significance. As such, the siblings were retained in each of the analyses.

telephone and mail surveys). First, face-to-face interviews typically yield the highest response rates (Singleton and Straits 1999). This is important because higher response rates generally mean that less bias is introduced into the data as a result of nonparticipation of sampled individuals. Second, face-to-face interviews also permit the interviewer to collect information on a variety of unobtrusive observations (Kerlinger 1986). For example, interviewers of the NLSY were able to gather information about the quality of the home environment without having to question the respondents. Third, face-to-face interviews allow for the use of visual aids in presenting questions (Singleton and Straits 1999). NLSY interviewers used this approach in administering the Peabody Picture Vocabulary Test to measure a child's receptive vocabulary. During this part of the interview, children nonverbally selected a picture which best described a particular word's meaning. Finally, because the interviewer is in the physical presence of the respondent, face-to-face interviews are most appropriate for lengthy data collection efforts such as the NLSY.

Despite the advantages discussed above, face-to-face interviewing does have a number of disadvantages. First, this type of data collection effort is typically the most costly in comparison to telephone and mail surveys. In fact, cost has been a concern in the NLSY because a portion of the economically disadvantaged white women ($n = 901$) were dropped from the survey in 1990 due to financial constraints. Second, because this is a national sample, which necessitates many interviewers, supervision of these individuals becomes substantially difficult. As a result, questions associated with the coding of particular items must often be delayed until interviewers are able to consult with supervisors. Interviewer training sessions and pilot testing occurring prior to the implementation of the instrument

into the field, however, are methods by which questions related to coding are often addressed. Finally, the personal nature of the face-to-face interview has the potential to introduce biases associated with the characteristics of the interviewer and the sensitive nature of particular questions. In other words, respondents may be reluctant to answer sensitive questions in an honest manner. Nevertheless, face-to-face interviews have traditionally been considered one of the most effective methods through which social science data have been collected (Kerlinger 1986).

Two methods of face-to-face interviewing have guided the collection of the NLSY data. First, the data collection initially was administered through paper and pencil interview (PAPI) instruments. In 1989 and 1990, however, data collected on a small portion of the original NLSY sample was administered through computer-assisted interviewing techniques (CAPI). In response to the documented improvements in data quality of this second method, the CAPI method has been used on all participants in the NLSY since the 1993 survey year (NLS Handbook 1995).

Major Data Elements

The face-to-face interviews included questions on a variety of experiences of the participants. Specifically, despite minor changes in the survey instruments over the years, the NLSY has consistently included sets of questions in the following areas: (1) work experience and attitudes; (2) military service; (3) schooling; (4) marital history; (5) household composition; (6) income and assets; (7) jobs and employer information; (8) health

limitations; (9) military service; (10) fertility; (11) current labor force status; (12) gaps in employment; and (13) geographic residence (NLS Handbook 1995).

Additional questions have been included during select survey years that fall within the following topical areas: (1) job search methods; (2) migration; (3) attitudes toward work; (4) educational/occupational aspirations and expectations; (5) school discipline; (6) self-esteem; (7) child care; (8) pre- and post-natal health behaviors; (9) drug and alcohol use; (10) delinquency; (11) childhood residences; and (12) neighborhood problems (NLS Handbook, 1995). The Center for Human Resource Research (CHRR), who is mainly responsible for disseminating the data, additionally creates a number of variables that are frequently used by researchers. These variables include: (1) total net family income; (2) family poverty status; (3) highest grade completed; (4) marital status; (5) employment status; (6) region of current residence; (7) school enrollment status; (8) whether current residence is urban or rural; and (9) whether current residence is in an SMSA (NLS Handbook 1995). In short, the NLSY offers a rich source of data on a panel of individuals collected over a 15 year period.

NLSY CHILD-MOTHER DATA

Of the original 12,686 individuals in the NLSY, approximately half ($n = 6,283$) were female. These females included the 456 individuals who were in the military at that time and the 901 economically disadvantaged white individuals; each; were dropped from the survey in 1984 and 1990, respectively. Of the remaining 4,926 female respondents eligible to be

interviewed, approximately 91 percent of them (n = 4,480) completed an interview; seventy-seven percent (n = 3,464) of these females were mothers.

In 1986, a separate data collection effort began that included detailed assessments of each child born to the female youths in the original 1979 cohort. Unlike the yearly assessments made of the youth cohort, however, the children of the NLSY mothers have been interviewed in two-year intervals beginning in 1986 and ending the most current wave in 1996 (6 total waves). To be included in the most recent wave, the child had to be born by December 31, 1996. As of 1996, these children (n = 7,103) represent a cross-section of individuals born to a nationally representative sample of women between the ages of 29 and 36 years of age as of January 1, 1996 (Center for Human Resource Research 1997). In addition, the age distribution of the children in the 1996 data set indicates that 76.5 percent (n = 5,431) are below the age of 15 (as of the end of 1996), and 23.5 percent (n = 1,672) were 15 years or older (Center for Human Resource Research 1998). This latter group, which will be discussed later, are referred to as the "young adults."

Retention Rates

As will be discussed below, the NLSY child-mother data set is actually comprised of a series of instruments completed by mothers, children, and interviewers. For at least two reasons, the instruments were disaggregated into multiple components. First, many of the questions in each of the sections are age-specific. In other words, the instruments are precisely designed to be completed by individuals between certain ages. Second, the instruments were disaggregated in efforts to maintain high retention or completion rates.

Arguably, individuals are more likely to complete a series of smaller instruments as opposed to a single lengthy questionnaire. Examining the retention rates of children in the NLSY child-mother data files reveals slight variabilities that are dependent on the type of assessment instrument. Specifically, in 1990 these rates varied from a low of 82.9 percent to a high of 97.6 percent (Baker et al. 1993). Again, with low rates of attrition, differences between those completing the survey and non-respondents are likely to be minimal.

Methods of Data Collection

The purpose of the NLSY child-mother data collection effort is to measure several dimensions of the child's cognitive abilities, health, socio-emotional attributes, behavior, and home environment. Similar to the NLSY, these data are primarily collected using the face-to-face interviewing technique. The advantages and disadvantages of this data collection method are discussed in the previous sections. The interviews with the children were generally conducted simultaneously with the mother interviews. In households with more than one child, however, the interviewer often had to schedule the interview for additional days. The total field period to collect the child-mother data was approximately 5 to 6 months (Center for Human Resource Research 1997).

Because children are interviewed as early as age two, potential interviewers must attend a special training session. Specifically, several months before the fielding of the instruments, potential interviewers are provided extensive training on learning how to gain parental cooperation, build rapport with the children, function during extensive distractions, administer the variety of instruments uniformly, and balance respondent burden with the

objectives of the survey. Following this training period, interviewers pretested the instruments to assess questionnaire wording; isolate potential problems for respondents and interviewers; and time the length of the various questionnaires. Throughout the pretesting, field managers made periodic observations of interviewers to evaluate their performance (Center for Human Resource Research 1997).

Major Data Elements

The NLSY child-mother data set is actually comprised of two separate survey instruments: (1) a mother supplement; and (2) a child supplement. The mother supplement is designed to be completed by the mother for each of her children and includes five separate sections. First, mothers are requested to respond to items in the Home Observation for Measurement of the Environment (HOME) inventory, developed by Bradley and Caldwell, to measure the nature and quality of the child's home environment. The second section, completed only for children below the age of seven, includes a set of items measuring the temperamental or behavioral style of the child during the two-week period prior to the interview. Third, for children below the age of four, a section is completed in which mothers respond to a set of questionnaire items measuring the motor and social development of the child. The fourth area includes items from Zill and Peterson's condensed version of the Child Behavior Checklist originally developed by Achenbach and Edelbrock. Completed for children over the age of four, this section includes items tapping problem behaviors such as hyperactivity, anxiety, dependency, depression, and aggression. Finally, for children over

the age of nine, mothers complete a section which assesses their school behavior, peer relations, and religious attendance and training.

While the mother supplement is to be only completed by the child's mother, the child supplement is comprised of a series of sections in which the child, the mother, and the interviewer each participate in its completion. Notably, these sections include: (1) the child's background or demographics; (2) the health of the child; (3) parts of the body; (4) memory for location; (5) verbal memory; (6) child's self-competence in academic skills; (7) memory for digit span; (8) math, reading comprehension, and verbal recognition section measured through the Peabody Individual Achievement Test (PIAT); and (9) a HOME inventory completed by the interviewer.

In 1996, individuals age 15 and over ($n = 1,672$) were designated as "young adults" and no longer received the child assessment instruments (Center for Human Resource Research 1997). Rather, similar to the original 1979 youth cohort, these individuals completed a one hour long personal interview which assessed their education, employment, and family-related experiences and attitudes. In addition, respondents complete a self-administered paper questionnaire that covers a variety of more personal attitudes and behaviors (i.e., sex, delinquency, and drug use) and the quality of their neighborhood.

Advantages of the NLSY Child-Mother Data Set

The benefits of using the NLSY, specifically the child-mother data set, to explore the issue of resiliency are threefold. First, the NLSY collects extensive information on both the mother and each of her offspring. Specifically, through separate assessments, data are

gathered on the mother and her child's intelligence, the support that youths receive from his/her parent(s), the relationships youths have with individuals within and outside of the family environment, the structure of the family, the quality of the home environment, employment status of the parent(s), youths' involvement in community organizations, and the quality of the neighborhood in which the family resides. Stated differently, the NLSY child-mother data includes a variety of the known risk and protective factors identified in prior resiliency studies.

Second, since the NLSY child-mother data are a longitudinal, panel data set, both risk and protective factors can be examined over the course of youths' development. As such, the temporal dimension or timing of the emergence of various risk and protective factors can be explored. Specifically, the impact of risks occurring early in life can be assessed on problem behaviors in early childhood and later in adolescence. Assessments can also be made of the unique protective functions that occur in early adolescence—that is, association with non-delinquent peers—and their effects on resilient behavior. Exploration of the extent to which risk and protective factors have either long-term or short-term effects on behavior can also be examined with the NLSY. Consequently, the merged child-mother data of the NLSY provides rich information from many environments (i.e., the family and the community) over an extensive and critical period of youths' development.

Third, by virtue of the sampling strategy, the NLSY, child-mother data set is a sample that represents a significant number of high-risk youths. As previously mentioned, the NLSY sample is representative of American mothers 30 to 38 years old in 1996. Although not nationally representative, the children of these women are generalizable of American

children born to such a sample of women. Therefore, the sample includes an over-representation of children born to mothers who are younger, less educated, more disadvantaged, and of minority status.

SAMPLE

Although wave 6 (1996) of the NLSY child-mother data set includes information on 7,103 individuals and their mothers, this report will restrict the analyses to a subsample of the entire cohort. Two conditions guided the selection of the sample. First, the sample was restricted to only those individuals who were classified as eligible to be interviewed as a "young adult" in Waves 5 and 6 (1994 and 1996). This condition reduced the child-mother cohort from the original 7,103 to a subsample of 1,080 young individuals. Second, the sample was restricted to the "young adults" who completed a valid interview in each of the six waves (1986 to 1996). The combined affect of these conditions resulted in a final sample of 711 individuals who were between the ages of 16 and 23 in wave 6 of the survey administration.

Three factors influenced the decision to use this cohort of individuals. First, as reflected in a number of studies assessing the distribution of age and crime, the "young adults" are at or near the peak ages at which individuals are most likely to be delinquent (Blumstein et al. 1986; Loeber et al. 1991). In addition, it is at this period of development that individuals are faced with a number of stresses associated with attending high school, securing gainful employment, and potentially associating with other delinquent peers (Warr 1993). Therefore, during this period individuals will most likely have to rely on potential

protective factors to insulate themselves against the adversities associated with multiple risks.

Second, because the “young adults” are the oldest youths in the child-mother data set, they have the greatest likelihood of coming from a younger mother, particularly giving birth during the adolescent period. Research has suggested that adolescent motherhood is a factor that has been identified as placing their children at risk for various problem behaviors (Nagin, Farrington, and Pogarsky 1997). For example, adolescent mothers are more likely to participate in problem behaviors (Elster, Ketterlinus, and Lamb 1990; Passino, Whitman, Borkowski, Schellenbach, Maxwell, Keogh, and Rellinger 1993), live in a single-parent household (Butler 1992), fail to complete high school (Ahn 1994), and live in poverty (Grogger and Bronars 1993). Research has also linked these maternal experiences to the problem behaviors—that is, stealing and fighting—of their offspring (Moore 1986). Therefore, as Nagin and his colleagues (1997, p. 158) observe, “the onset of early childbearing is not a cause of children’s subsequent problem behavior but rather a marker for a set of behaviors and social forces that give rise to adverse consequences for the life chances of children.” Although research is not consistent on the definition of an adolescent mother—some use the age cutoff of 18 and below while others use 19 and below—the findings suggest that children of adolescent mothers are at an increased likelihood of participating in problem behaviors such as delinquency and crime.

In the “young adult” sample of the NLSY child-mother data set, 29.7 percent ($n = 497$) had mothers below the age of 18 and 46.2 percent ($n = 773$) had mothers below the age of 19. In comparison, of the remaining 5,431 individuals in the NLSY child-mother data set,

less than 1 percent (n = 16) of the remaining sample had mothers below the age of 18 and 1.3 percent (n = 70) had mothers below the age of 19. Therefore, because of the substantial percentage of adolescent mothers in the "young adult" cohort, these youths are likely to be faced with the multiple adversities associated with this important criminogenic risk.

Third, because the "young adult" cohort consists of the oldest youths within the child-mother data set, they were the only group of individuals to receive a detailed assessment instrument that focused on their experiences in the transition to adulthood (Center for Human Resource Research 1997). This assessment included detailed questions examining their education, employment, training, health, family experiences, and attitudes. In addition, the "young adults" received a separate self-report questionnaire that collected information on interactions with family members, substance use, sexual activity, pro-social behavior, and delinquent involvement. The younger children did not receive this latter assessment instrument because of the sensitive nature of the items. In short, the young adults were subjected to perhaps the most rigorous delinquency and crime measures making the investigation of resilient behavior particularly noteworthy.

Sampling Weights

Sampling weights are often used in large national samples to correct for the sampling strategy and the loss of potential respondents. For two reasons, the Center for Human Resource Research (CHRR) includes sampling weights for each child and his or her mother.⁵

⁵ The child's sampling weight is equal to the mother's 1979 weight times and adjustment factor that is reciprocal of the rate at which children in a particular age, sample-type, and sex cell are assessed. Sampling weights are computed only for children who have been assessed. Those youths not assessed were given a value of zero.

First, the sample weights adjust the unweighted data due to the sample attrition of mothers and children between the initial wave of the youth data (1979) and the most recent wave (1996). Case attrition for the NLSY child-mother data set is primarily attributed to two main sources: (1) natural attrition that has occurred as a result of the death of a respondent or unknown residential change; and (2) manufactured attrition of the military and economically disadvantaged white youths who were no longer interviewed because of financial constraints.

Second, because the research design required the oversampling of various demographic groups, the sample weights adjust the sample for the over-representation of black and Hispanic youths. Applying these sample weights would transform the unweighted sample of children into one that is approximately representative of all children born by a particular survey date to a nationally representative sample of women who were 14 to 21 years of age on January 1, 1979. In short, the sampling weights account for case attrition and the differences in sampling of certain populations to insure the accuracy of population estimates based on a national sample.

The weights produced for the NLSY child-mother data set are calculated by taking the mother's 1979 weight and multiplying it by a factor that is contingent on the child's placement in a cell defined by the child's age, sample-type, and sex (Baker et al. 1993). More specifically, this factor is computed as the reciprocal of the rate at which children in these cell groupings are assessed. If these cells yield few cases, which is often the case for older children, weights are then derived by grouping across ages and sample types to avoid large differences in the weighting scheme (Baker et al. 1993). Finally, weights are only

calculated for children who have been assessed during a particular period. Individuals who were not interviewed received a weight of "zero" for that assessment year.

Despite the benefits of using weighted data discussed above, the sampling weights will not be used in the analyses for the present study based on the following reasons. First, the nature of the research questions demand that analyses of data occur longitudinally versus cross-sectionally. That is, since assessments will be made on high-risk youths, the effects of risks are expected to temporally precede potential protective factors. The CHRR, however, cautions users of the data who are comparing weighted populations across survey points because of the change in the composition of the sample from year to year. As such, the weighted samples investigated across assessment periods would not accurately reflect the population because of differential sample attrition between Wave 1 and Wave 6.

Second, as will be discussed below, the nature of the analytic procedures will require the estimation of multivariate statistical models. Again, because of the methodological weighting procedures, the CHRR advises users who are estimating regression models not to use the weighted data in their analytic procedures (Baker et al. 1993). An alternative to compensate for these weighting complexities is to employ weighted least squares and examine the average estimates across the groups (i.e., those groups that were oversampled) that are expected to have different regression coefficients. In this analytic procedure, groups that were oversampled would be prevented from having a disproportionate effect on the study results. A concern with this technique, however, is that the standard errors from the pooled, weighted regression are unlikely to be the true standard errors. As such, estimates using this technique will be biased and inefficient.

Sample Attrition

Inevitably, as with any longitudinal panel design, individuals will fall out of the sample at one or more of the survey's administration. The NLSY child-mother data set is no exception to sample attrition. As identified above, 34.2 percent of the eligible participants failed to complete at least one of the interviews between Wave 1 and Wave 6 and were therefore excluded from the sample. When the effects of attrition are investigated at each wave separately, the data reveal that 65 respondents (6.0 percent) were not interviewed in Wave 1, 65 respondents (6.0 percent) were not interviewed in Wave 2, 88 respondents (8.1 percent) were not interviewed in Wave 3, 107 respondents (9.9 percent) were not interviewed in Wave 4, 100 respondents (9.3 percent) were not interviewed in Wave 5, and 109 respondents (10.1 percent) were not interviewed in Wave 6. Therefore, although the sample selected represents only 65 percent of the eligible participants, the yearly attrition never exceeded 11 percent. The rate of sample attrition exemplified here is consistent with similar longitudinal research designs investigating adolescent problem behavior (see Jessor et al. 1995; Smith et al. 1995).

The effects of the attrition of the 369 eligible participants since Wave 1 of the survey were examined. Six characteristics of the youth were chosen to identify the potential differences in conventionality between the sample completing each of the six waves ($n = 711$) and the attrition subsample ($n = 369$). Similarly, six characteristics of the youth's mother were chosen to identify potential differences of the youth's household between the sample completing each of the six waves and the attrition subsample. Mean differences were

then examined so as to identify any significant differences between the groups. Table 2.1 reports the results of these comparisons.

As Table 2.1 indicates, the attrition subsample was significantly more conventional on three measures, less conventional on one measure, and were no different on six measures. The sample of individuals selected for the analysis were more likely to be involved in delinquency (78 percent versus 57 percent) and involved in drug related offenses (47 percent versus 31 percent). In addition, the attrition subsample was more likely to have an adolescent mother (67 percent versus 58 percent) but less likely to have a mother who was involved in prior criminal activity (62 percent versus 69 percent). Demographically, the attrition subsample was older, more educated, and consisted of fewer whites. Therefore, the sample of 711 young adults selected for subsequent analyses were generally more likely to manifest problem behaviors, however, were not at a significantly greater risk than the attrition subsample.

Sample Characteristics

Again, for the reasons noted above, the analyses will be limited to the 711 individuals who were considered "young adults" since Wave 5 and who completed an interview for each of the six waves. Table 2.2 lists the demographic characteristics of the unweighted "young adult" sample and their mothers at Wave 1 (1986) and Wave 6 (1996). As indicated in Table 2.2, the mean age of the youths in Wave 1 was 7.7 years compared to 17.9 years in Wave 6. Just over half (51.2 percent) of the sample were males and approximately one-third (33.2 percent) were white. Although not presented in Table 2.2, the non-whites within the sample

Table 2.1 Comparison of Characteristics in Unweighted Sample and Attrition Subsample

Characteristic	Sample ⁶		Attrition Subsample ⁷		t value
	\bar{x}	sd	\bar{x}	sd	
YOUTH					
Sex (1 = Male)	0.51	0.50	0.52	0.50	0.29
Race (1 = White)	0.33	0.47	0.25	0.43	-2.71*
Age (Wave 6)	17.97	1.58	18.80	2.07	5.94*
Years of Education (Wave 6)	10.83	1.40	11.07	1.53	2.01*
Delinquent Involvement (1 = Involved)	0.78	0.41	0.57	0.50	-7.61*
Drug Involvement (1 = Involved)	0.47	0.50	0.31	0.46	-5.01*
MOTHER					
Adolescent Mother (1 = Under 19)	0.58	0.49	0.67	0.47	2.71*
Large Family Size (1 = 4 or More Children)	0.15	0.36	0.18	0.38	1.06
Persistent Poverty (1 = Poverty)	0.59	0.49	0.60	0.49	0.26
Parental Deviance (1 = Criminal)	0.69	0.46	0.62	0.49	-2.32*
Non-Intact Marriage (1 = Not Intact)	0.44	0.50	0.49	0.50	1.54
Smoking During Pregnancy (1 = Smoked)	0.35	0.48	0.40	0.49	1.30

*p < .05

⁶ The sample size fluctuated between (n = 711) and (n = 659) because some individuals did not complete every assessment instrument.

⁷ The attrition subsample size fluctuated between (n = 369) and (n = 188) because some individuals did not complete every assessment instrument.

Table 2.2 Descriptive Statistics of Unweighted Young-Adult Analytic Sample

Variable Description	\bar{x}	sd	Range	n
YOUTH				
Age of Youth (Wave 1)	7.746	1.575	6 - 13	709
Age of Youth (Wave 6)	17.972	1.581	16 - 23	711
Sex (1 = Male)	0.512	0.500	0 - 1	711
Race (1 = White)	0.332	0.471	0 - 1	711
Number of Years Education	10.833	1.403	6 - 16	708
Marital Status (1 = Married)	0.028	0.166	0 - 1	709
Prevalence of Delinquent Involvement (Wave 3 - Wave 6)	0.785	0.411	0 - 1	711
Prevalence of Drug Involvement	0.466	0.499	0 - 1	711
MOTHER				
Age of Mother (Wave 6)	36.560	1.730	31 - 39	711
Age of Mother at Birth of Child	18.080	1.930	13 - 22	711
Poverty (Wave 1)	0.397	0.040	0 - 1	610
Family Size (Wave 6)	4.436	1.680	1 - 12	711
Education (1 = H.S. Degree)	0.253	0.435	0 - 1	711
Prevalence of Criminality (1980)	0.690	0.463	0 - 1	659

were distributed as 49.2 percent black and 17.6 percent Hispanic. The mean number of years of education was just under 11 years (10.8), less than 3 percent were married (2.8 percent) and over four-fifths (81.3 percent) of the sample were living with one or both of their parents.

Descriptive statistics are also presented for the youths' mothers. The mean age of the youths' mothers in Wave 6 was 35.6 years and the mean age at which they gave birth to this youth was 18.1 years. Just under four-tenths (39.7 percent) of the families reported living in poverty during Wave 1 and the average family size during Wave 6 was 4.4 members. Finally, approximately one-quarter (25.3 percent) of the mothers had a high school degree by Wave 6 and just over two-thirds (69.0 percent) of the mothers self-reported involvement in a criminal offense during 1980.

MEASUREMENT OF CORE CONCEPTS

The measurement of the independent and dependent variables are discussed in detail in the following pages. Since the conceptualization and operationalization of these terms has been a source of controversy in resiliency research (see Kaufman et al. 1994; Luthar 1993), analytic models will be presented using a variety of measurement strategies. This is particularly true in the measurement of resiliency where it is operationalized in two ways; both of which are consistent with previous research (compare Smith et al. 1995 and Werner 1983).

Dependent Variables

The research questions presented in Chapter 1 necessitate the assessment of a number of outcome variables. Two dependent variables will be assessed for the young adult sample: (1) resiliency, and (2) depression. Each of the measurement strategies are discussed in detail below.

Consistent with previous research, this report will assess resilience to delinquency/crime and resilience to drug-related offenses (Smith et al. 1995). Resiliency to delinquency/crime in this report will be operationalized as no involvement in *serious* criminal behavior during Wave 3 through Wave 6. Similarly, resiliency to drug-related offenses will be operationalized as no prior self-reported involvement in drug-related behaviors. In line with measures employed in previous resiliency studies, each of these measures allows for the involvement in minor forms of problem behaviors. The items that were used to construct these measures are discussed in detail below.

Resiliency to Involvement in Delinquency and Drugs. The young adults who reached the age of 15 by December 31, 1996 took part in a separate one-hour interview. During this interview, individuals received a set of confidential assessment forms in which they self-reported involvement in a variety of activities. One assessment form in particular, the Young Adult Self-Report Booklet (YASRB), collected extensive information on family interactions, risk taking attitudes, substance abuse, sexual activity, computer use, emotional problems, and involvement in delinquency (Center for Human Resource Research 1997). With respect to delinquency, individuals were asked to identify their involvement over the

past 12 months in a number of property and violent delinquent activities. In addition, individuals also responded a set of items that investigated their drug use over the life course.

The delinquency and crime items in the YASRB represent several domains of property, and violent behavior. Of the property crimes, one item measures vandalism, one item measures the sale of stolen goods, and six items measure theft or burglary-related activities. Of the violent crimes, one item measures the use of force to obtain money or goods (robbery) and four items measure violent attacks for non-instrumental purposes. The specific terminology used for these items were "in the last year (last 12 months), have you ever...". If the individual reported involvement they received a score of "1" and individuals not reporting involvement in the delinquent behaviors received a score of "0."

Because the YASRB has only been implemented since Wave 5, involvement in delinquent offenses occurring earlier in the life course are not captured with this instrument. The NLSY has, however, included similar delinquency items on the child self-administered supplement which is completed by individuals age 10 and over. Three items were included in calculating a youths self-reported involvement in delinquency: (1) hurt someone badly enough to need bandages or a doctor, (2) taken something from a store without paying for it, and (3) damaged school property on purpose. The specific terminology used for these items were "in the last year, about how many times have you ...". Items were recoded so that any involvement was coded as "1" and non-involvement was coded as "0."

To measure resiliency, each of the dichotomous variables capturing involvement in delinquency over the preceding 8 years (4 waves) were reverse coded so that involvement was coded as "0" and non-involvement was coded as "1." Again, consistent with previous

research, this measure of resiliency allows for involvement in minor forms of delinquency (see Smith et al. 1995; Werner 1989).

The drug-related behaviors were measured in a separate section of the YASRB and included items measuring involvement with (1) marijuana, (2) glue, gas, and other fluids, (3) cocaine, (4) crack cocaine, and (5) LSD, uppers, and downers. The specific terminology used for these items were "in your lifetime, on how many occasions have you used ...". Possible responses were "100 times or more" equals 1, "50 to 99 times" equals 2, "11 to 49 times" equals 3, "6 to 10 times" equals 4, "3 to 5 times" equals 5, "1 to 2 times" equals 6, and "never used" equals 7. These variables were coded so that "any involvement" equals one and "non-involvement" equals zero. Similar to measuring resiliency to involvement in delinquency, each of the drug involvement items were reverse coded so that any drug involvement equaled "0" and non-involvement equaled "1."

Measure of Depression. Research has suggested that youths exhibiting resiliency are not necessarily healthy individuals. For example, Werner (1989) reported that resilient individuals were more likely to be depressed. Relatedly, Shedler and Block (1990, p: 618) found that individuals abstaining from drug use were "relatively tense, overcontrolled, emotionally constricted, somewhat socially isolated and lacking in interpersonal skills." Moffitt (1997, p. 34) has recently supported these findings and noted that "research is beginning to suggest that abstaining from delinquency is not necessarily a sign of good adolescent adjustment." Thus, investigating whether resilient individuals experience significantly higher levels of depression than non-resilient individuals becomes particularly noteworthy.

The measure of depression was constructed using a 6-item version of the CES-D depression scale which has been used in the main Youth survey since 1992 (Radloff 1977; Rosenberg 1965). For each item, respondents were asked to indicate "how often in the past week they" Responses were "rarely, none of the time, 1 day" equals 0, "some, a little of the time, 1 to 2 days", equals 1, "occasionally, a moderate amount of time, 3 to 4 days" equals 2, and "most, all of the time, 5 to 7 days" equals 3. Individual items were summed across all variables resulting in a possible range of scores from 0 to 18. Higher scores on the depression scale will therefore correspond with individuals being more depressed. The measure of reliability is satisfactory (Cronbach's $\alpha = .72$) and it forms a unitary factor (KMO = .78). The items comprising the depression scale for the young adult sample are listed in Appendix 2.1.

Independent Variables

The independent variables used in this report are placed into two categories: (1) risk factors, and (2) protective factors. Risk factors are those variables that are hypothesized to be positively correlated with an individual's likelihood of being delinquent. In studies of resiliency, these factors are typically measured in time periods prior to the measurement of protective factors (see Smith et al. 1995; Werner 1989). This methodological strategy permits the researcher to better control for the causal ordering of risks and protections. Protective factors are those variables that are hypothesized to inhibit or insulate youths from these behaviors. As Garmezy (1985) indicates, these factors are not just the opposite ends of the continuum of risk factors. Rather, protective factors are hypothesized to have an effect

on the outcome behavior that is over and above the inclusion of risk factors alone. The choice and measurement of each of these factors are discussed below.

Risk Factors. The preceding discussion on the operationalization of resiliency is based on the assumption that the individuals under investigation are of "high-risk" status. Although relatively straightforward, at least two issues must be considered in determining what factors will be used to isolate a high-risk cohort. First, the researcher must consider the time period in which the individual is exposed to the risk. That is, individuals must be exposed to the risk at a point prior to investigating the effects of protective factors. This method has been used in previous resiliency research. For example, Werner and others focused on the risks occurring early in the lifecourse—generally by the age of 2 (Born et al. 1997; Werner 1989; Werner and Smith 1992). Likewise, Smith and her colleagues (1995) have isolated high-risk individuals based on the risks experienced within the familial environment during childhood. Regardless of the developmental period at which the risk emerges, it is important that the temporal ordering of risks precedes those of protection.

A second risk-related issue developing in resiliency research involves the isolation of a high-risk cohort. As discussed in Chapter 1, scholars investigating resiliency have operationalized a high-risk cohort in a variety of ways. Two related methods, however, have been used in the majority of studies assessing the effects of risk and protective factors. First, a summative index of the dichotomized scores on a variety of risk factors has been computed so as to isolate the individuals who scored in the top quartile or 30th percentile of the risk index (see Jessor et al. 1995). This method allows for a large number of risk factors to be considered because the high-risk cohort is bounded by the percentile chosen versus the

number of risks experienced. A limitation or concern with this method, however, is that individuals who would be considered high-risk using alternative methodologies (see below) could be excluded because they do not fall on the extreme upper portion of the risk index.

To account for this limitation, a second method is derived by counting the dichotomized scores on each of the risks and isolating those individuals experiencing at least two (Tiet, Bird, Davies, Hoven, Cohen, Jensen, and Goodman 1998), three (Farrington et al. 1988), four (Smith et al. 1995), or five (Werner 1989) risk factors. This methodology is consistent with the research produced by Rutter (1979) suggesting that those individuals with at least four risk factors were significantly more likely to suffer from a psychiatric illness. While both methods are acceptable in classifying high-risk cohorts, this report will use the latter method and define a high-risk cohort as those individuals experiencing at least three risk factors. In short, each risk factor was dichotomized to represent the presence or absence of that factor. Consistent with previous research, dichotomization of the scores on each risk factor was done so as to yield the extreme 30 percent of the sample on each measure (see Jessor et al. 1995). In sum, the risk factors selected have been found to be positively correlated with delinquency and drug use. The measurement of each of these factors is described below and their distribution presented in Table 2.3.

Adolescent Motherhood. Research has suggested that mothers who give birth during adolescence place their children at a greater risk of engaging in delinquent and criminal activity (Furstenberg, Brooks-Gunn, and Morgan 1987; Moore 1986; Morash and Rucker 1987; Nagin et al. 1997) and are more likely at some point in their life to be incarcerated (Grogger 1997). Although there has been consistency across research findings, the process

Table 2.3 Distribution of Risk and Protective Factors Among Total and High-Risk Samples

Variables	Total Sample (n = 711)			High-Risk Sample (n = 426)		
	\bar{x}	sd	Range	\bar{x}	sd	Range
<u>Risk Factors</u>						
Adolescent Motherhood	.58	.49	0 - 1	.73	.44	0 - 1
Large Family Size	.15	.36	0 - 1	.21	.41	0 - 1
Parental Deviance	.69	.46	0 - 1	.83	.37	0 - 1
Non-Intact Marriage	.44	.50	0 - 1	.68	.47	0 - 1
Persistent Poverty	.59	.49	0 - 1	.84	.36	0 - 1
Maternal Smoking	.35	.48	0 - 1	.46	.50	0 - 1
Low Birth Weight	.12	.32	0 - 1	.18	.39	0 - 1
<u>Protective Factors</u>						
Self Esteem	32.67	4.30	20.00 - 40.00	32.62	4.26	20.00 - 40.00
Religiosity	.00	1.71	-2.97 - 2.81	.00	1.70	-2.97 - 2.81
Positive School Environment	14.56	2.63	6.00 - 20.00	14.44	2.59	6.00 - 20.00
Self-Perceived Scholastic Competence	16.92	4.01	6.00 - 24.00	16.56	4.07	6.00 - 24.00
Self-Perceived Global Self-Worth	19.97	3.52	6.00 - 24.00	19.81	3.65	6.00 - 24.00
Cognitive Stimulation	95.22	15.17	43.30 - 124.50	92.54	14.89	43.30 - 124.50
Emotional Support	96.60	14.69	39.10 - 122.10	93.95	14.94	39.10 - 122.10
Academic Competence	.00	1.00	-1.86 - 2.37	-.23	.96	-1.86 - 2.16

through which adolescent motherhood heightens the risk of her children becoming delinquent has not been clearly understood. For example, Nagin and his colleagues (1997) found that the relationship between adolescent motherhood and delinquency may be mediated by the availability of resources and the parenting practices of these young mothers. Despite the complexity of this relationship, the association between delinquency and having an adolescent mother has been found to be consistently positive. Similar to previous research, adolescent motherhood is measured according to the age at which the mother gave birth to the study child (see Nagin et al. 1997). That is, the variable "adolescent mother" is dummy coded, with one equal to "a mother giving birth while they are below the age of 19" and zero equal to "a mother giving birth when they were 19 years of age or older."

Large Family Size. Hirschi and Gottfredson (1994) have observed that the size of a family is a positive and consistent predictor of the delinquency of youths within the family. The theoretical interpretation of this relationship, however, is not as clearly understood. For example, control theorists argue that the ability for parents or guardians to supervise the behavior of their offspring is reduced as a family's size increases (Hirschi 1983). In turn, youths are more likely to engage in problem-related behaviors absent the controls imposed by parental figures. Alternatively, Wright (1995) interprets family size as weakening the social capital of parents and reducing their ability to provide youths with effective social supports. Absent support, youths' propensity to participate in delinquent activities is heightened (Cullen 1994).

During each wave of the NLSY, the interviewer reported the number of children that were living in the household at the time of the interview. "Large family size" is a

dichotomous dummy variable assessed at Wave 1 of the child-mother dataset. Consistent with previous research investigating the effects of risk and protective factors, this variable is measured as "four or more children" equals one and "less than four children" equals zero (Dubow and Luster 1990). Therefore, youths coming from larger families are at a greater risk of being delinquent than those coming from smaller families.

Parental Deviance. For a variety of reasons, youths coming from families which one or more parents were arrested or convicted of criminal activity are more likely to be delinquent than youths from families where their parents were not criminals (Glueck and Glueck 1950; Kandel et al. 1988; McCord 1979; West and Farrington 1973). For example, in the Cambridge Study of Delinquent Development, Farrington, Barnes, and Lambert (1996) found that over half of all the convictions were concentrated in only six percent of the families. In observing these findings, Farrington et al. (1996, p. 61) conclude that "offending is transmitted from one generation to the next and is strongly concentrated in families."

While a number of studies have observed this empirical relationship, the influence that genetic and environmental contributors might have is less understood. For example, Grove, Eckert, Heston, Bouchard, Segal, and Lykken (1990) have reported that roughly 30 percent of the variation in child conduct disorder and 40 percent of the variation in adult antisocial personality disorder is attributed to genetic factors. Sampson and Laub (1988), however, attribute more emphasis to processual factors occurring within the family. That is, parents who are criminal disturb the family's social control mechanisms through their reduced ability to provide effective supervision and discipline of their children. Despite the disagreement over the mediating factors in the relationship between parental criminality and

their offspring's criminality, the previous literature has repeatedly found empirical verification of its existence.

In the 1980 survey year, individuals (mothers) in the main NLSY were asked about the number of times they had participated in a variety of illegal activities over the course of the previous year. These behaviors included seventeen items that investigated their use and sale of illegal substances, theft-related activities, and use of physical violence. These items were recoded so as to reflect "participation" equals one and "non-participation" equals zero. Thus, parental deviance is measured as the maternal involvement in any of the seventeen illegal behaviors.

Non-Intact Marriage. Criminologists have frequently investigated the effects that the structural composition of the family has on the behavior of youths within it. Research has generally found that children developing in single-parent families are at an increased risk of becoming delinquent (Wells and Rankin 1991). These children also have a higher likelihood of experiencing poverty, being poorly socialized, and experiencing inadequate supervision (Matsueda and Heimer 1987; McLanahan and Booth 1989; Van Voorhis et al. 1988). As such, the relationship between coming from a single-parent family and being delinquent is both indirect and cumulative; the family structure affects the family processes which influence delinquency and these variables accumulate with other risk factors over time.

The NLSY includes a variable at each wave indicating the marital status of the respondent. This variable is operationalized as "never married" equals zero, "married" equals one, "separated" equals two, "divorced" equals three, and "widowed" equals six. From 1979 to 1986, this variable was recoded so that "separated," "divorced," and

"widowed" equals one and "married" and "single" equals zero. Accordingly, non-intact marriage is measured dichotomously as "mother was experienced a separation, divorce or lost her husband between 1979 and 1986" equals one and "parents were married from 1979 to 1986" equals zero. Therefore, this variable represents a household in which the parents of the child terminated or are in the process of terminating their marriage.

Persistent Poverty. Children living in poverty is a condition that is unfortunately quite common. For example, at the initial administration of the NLSY, approximately one-fifth of children under the age of 13 were living in poverty (Bane and Ellwood 1989). A number of negative factors are associated with poverty including low maternal education, poor schools, father absence, and household density (Furstenberg, et al. 1987; Rutter 1985). Research has found that individuals developing in an environment where the family experiences persisting financial trouble are at an increased risk of teenage pregnancy, single parenthood, delinquency, and drug use (Auletta 1982; Wilson 1987).

Previous research investigating the effects of resiliency have used measures of persistent poverty when identifying a high-risk cohort (see Born et al. 1997). In past research, persistent poverty has been measured as the number of years on welfare (Bane and Ellwood 1986). A similar measurement strategy is used in this report. In each wave of the NLSY, the CHRR developed a variable that classified whether individuals were living in poverty at the time of the interview. This measure is based on the amount of income a household earns which changes from year to year. For these variables, "living in poverty" equals one and "not living in poverty" equals zero. Consistent with previous research,

persistent poverty is measured as the youth's family "living in poverty for two or more years" equals one and "not living in poverty for two or more years" equals zero (Born et al. 1997).

Maternal Smoking During Pregnancy. Recent research has linked maternal behaviors during pregnancy and immediately after birth to a variety of problem behaviors of her offspring. For example, studies have documented the association between maternal smoking during pregnancy and her offsprings' conduct disorder (Wakschlag, Lahey, Loehner, Green, Gordon, and Leventhal, 1997), attention deficit hyperactivity disorder (Milberger, Biederman, Faraone, Chen, and Jones 1996), juvenile delinquency (Rantakallio, Läärä, Isohanni, and Moilanen 1992), and adult criminality (Räsänen, Hakko, Isohanni, Hodgins, Järvelin, and Tiihonen 1999). This research also suggests that when risks occur in combination with maternal smoking the probability of exhibiting these behaviors substantially increases. Notably, Räsänen et al. (1999) reported that the odds ratios for violent and persistent offending increased between nine and fourteen-fold when maternal smoking during pregnancy was combined with maternal age of less than 20 years, single-parent family, unwanted pregnancy, and the youth's developmental lag in walking or talking.

The maternal smoking during pregnancy measure is based on one item drawn from the main NLSY. Each woman who was pregnant was asked whether they had smoked during the twelve months before the birth of the child. The response set was "no" equals zero and "yes" equals one. Therefore, this variable captures the smoking behaviors of the mother during the preceding year before giving birth.

Low Birth Weight. Research has found that babies born at low birth weight—measured at five pounds eight ounces or less—are more likely than full-term babies

to have mental as well as physical problems in childhood. The problems experienced by these low birth weight individuals often lead them to have a higher propensity for neuropsychological disorder and subsequently engage in conduct disorder and delinquency. For example, Botting, Powls, Cooke, and Marlow (1997) found that low birth weight babies were four times more likely to have attention deficit hyperactivity disorders than babies born above the five pound eight ounce threshold. Similarly, Tibbetts and Piquero (1999) found that individuals from disadvantaged environments born below six pounds had a higher likelihood of beginning delinquent careers before the age of fourteen. In short, an individual's low birth weight is an early risk factor that increases a youth's likelihood of being delinquent. Consistent with previous literature, low birth weight is measured as "individuals weighing five pounds eight ounces or less" equals one and "individuals weighing more than five pounds eight ounces" equals zero.

In sum, a number of risk factors that have been found to be predictive of juvenile delinquency and drug use have been drawn from a variety of domains to isolate a high-risk cohort. Again, this cohort represents individuals who are at the greatest likelihood of participating in delinquent activities and related problem behaviors. Previous research suggests, however, that despite exposure to the accumulation of risks a substantial number of these individuals will be resilient to the adversities and not become involved in serious delinquency. Instead, these youths will draw on a variety of protective factors to cope with the multiple problems experienced over the course of development. I turn now to a discussion of the protective factors that are examined in this report to promote resiliency.

Protective Factors. Previous resiliency research has identified a substantial number of protective factors that are theorized to buffer the effects of risk factors. As discussed in Chapter 1, these protective factors have been generally categorized into three areas: (1) the dispositional attributes of the individual, (2) the cohesion and warmth provided within the familial environment, and (3) the availability and dependence on external support systems by parents and children. The selection of the protective factors used in this report are consistent with the categories previously described.

Similar to previous resiliency research, the measurement of protective factors in this report will occur at time periods subsequent to the measurement of risk (see for example Smith et al. 1995). Therefore, isolation of a high-risk cohort has occurred before investigating the effects that protective factors might have in promoting resilient behavior. The following list of protective factors have been identified in previous research to be inversely correlated with delinquency and drug use. The measurement of each of these factors is described below and their distribution presented in Table 2.3.

Self-Esteem. An individual's level of self-esteem has been found to moderate or buffer the effects of multiple risk factors. It appears that despite the accumulation of risks, those individuals who retain more positive self-directed regulations are perceived to more adequately negotiate the stresses associated with being high-risk (Werner 1983). For example, in the Rochester Youth Development Survey, Smith et al. (1995) found that resilient adolescents exhibited significantly greater levels of self-esteem than those who were not resilient from delinquency. Likewise, Cicchetti and Rogosch (1997) found that maltreated children who exhibited resilient behavior possessed higher levels of self-esteem

than non-maltreated children. The importance of an individual's self-esteem to function as a protective factor has been consistently identified in a variety of other studies examining resilient behavior (see Lösel and Bliesener 1994; Werner 1983).

A measure of the youth's self-esteem is based on the summed responses to a series of ten items from the Rosenberg self-esteem scale administered at Wave 6. In short, this scale is designed for adolescents and adults and measures the self evaluation that an individual makes (Rosenberg 1965). The scale has been found to be highly internally consistent with reliability coefficients that range from .84 to .87 (Baker, Keck, Mott, and Quinlan 1993). Individuals were asked to rank on a four point likert scale the level with which they agree with five statements of self-approval and five statements of self-disapproval. The response categories were "strongly disagree" equals one, "disagree" equals two, "agree" equals three, and "strongly agree" equals four. The items of self disapproval were reverse coded so that higher scores reflect higher levels of self-esteem. The reliability measure for this scale is strong (Cronbach's $\alpha = .86$) and factor analyses indicate that it forms a unitary factor (KMO = .78).

Self-Perceived Scholastic Competence. Research has indicated that a youth's positive self-perception operates as an important protective factor in fostering resiliency (Garmezy 1985; also see Reckless et al. 1956). For example, Lösel (1994) found that resilient individuals possessed a more positive self-image in comparison to deviant individuals. In addition, Radke-Yarrow and Brown (1993) found that compared to troubled youth, resilient individuals were socially and academically more competent and somewhat more self-confident. Theoretically, a more positive self-concept serves as a personal

resource through which an individual can draw upon in times when susceptibility to risk is greatest. That is, individuals rely on positive self-evaluations to buffer the effects of adversity. Competent individuals attract additional sources of protection in which less competent youths may not experience. As Werner (1993, p. 509) reports, "scholastic competence at age 10 was positively linked with a number of sources of help that the teenager attracted, including support from teachers and peers as well as from family members."

Two measures of an individual's self-perception are included as protective factors: (1) self-perceived scholastic competence and (2) self-perceived global self-worth. Self-perceived scholastic competence is a six-item measure taken from the Self-Perception Profile for Children (SPPC) developed by Harter (1982). For each youth, the interviewer first read a short statement describing two individuals and asked the youth which type of person they most resembled. For example, "some kids forget what they learn but other kids remember things easily." Following their response, youths were then asked whether this was "sort of true for you" or "really true for you." The self-perceived scholastic competence scale was computed by summing the scores on each item. Higher scores on this scale correspond with greater levels of scholastic competence. The reliability measure for this scale is solid (Cronbach's $\alpha = .76$) and factor analyses indicate that it forms a unitary factor ($KMO = .82$).

Self-Perceived Global Self-Worth. Similar to the self-perceived scholastic competence measure, the self-perceived global self-worth measure is based on six-items taken from the SPPC. Again, the interviewer read a series of short statements in which youths were asked to first identify which individual they were most similar to and then

indicated whether this was “sort of true for you” or “really true for you.” For example, “some kids are happy with themselves as a person but other kids are often not happy with themselves.” The self-perceived global self-worth scale was computed by summing the scores on each item. Higher scores on this scale correspond with greater levels of global self-worth. The reliability measure for this scale is solid (Cronbach’s $\alpha = .75$) and factor analyses indicate that it forms a unitary factor (KMO = .82).

Academic Competence. Educational factors, particularly during the adolescent period of development, have been consistently found to mitigate the detrimental effects of risk factors (Smith et al. 1995). Investigating the influence of educational factors to moderate high-risk family environments led Smith et al. (1995, p. 237) to conclude “the most salient factors for resilience to both delinquency and drug use were school factors.” These findings contribute to the growing research revealing the persistent and influential role of positive school experiences during adolescence (Maughan 1988; Van der Wolf 1988). In light of these findings, three measures of a youth’s academic achievement are combined to measure an individual’s academic competence: (1) mathematics ability, (2) reading recognition ability, and (3) reading comprehension ability.

To measure a youth’s mathematics ability, I use a single-item continuous measure of the youth’s age-specific percentile score on the Peabody Individual Achievement Test (PIAT) mathematics section extracted from Wave 4. This section of the PIAT consists of forty-eight multiple choice items of increasing difficulty beginning with recognizing numerals and progressing to advanced concepts in geometry and trigonometry. Briefly, each child establishes a “basal” by achieving five consecutive correct responses. A “ceiling” is obtained

when the youth incorrectly answers five of seven items. The youth's raw score is calculated by subtracting the number of incorrect responses obtained between the "basal" and "ceiling" from the "ceiling." This raw score is then used to derive the age-specific percentile score used for this measure. Thus, higher scores on this measure reflect a higher mathematics ability as taught in mainstream education.

To measure a youth's level of reading recognition and pronunciation ability, I use a single-item continuous measure of the youth's percentile score on the PIAT reading recognition section extracted from Wave 4. This section of the PIAT consists of eighty-four multiple choice items which increase in difficulty from preschool to high school levels. The methods of scoring this section of the PIAT are identical to those described in the mathematics segment. Again, higher scores on this measure reflect a higher level of reading recognition.

To measure a youth's level of reading comprehension, I use a single-item continuous measure of the youth's percentile score on the PIAT reading comprehension section extracted from Wave 4. This section of the PIAT consists of sixty-six multiple choice items which increase in difficulty. The youth is asked to read a sentence silently once and subsequently select one of four pictures which best portrays the meaning of the sentence. The methods of scoring this section of the PIAT are identical to those described in the two preceding sections. Again, higher scores on this measure reflect a higher level of reading comprehension.

Finally, to measure a youth's academic competence, the mathematics, reading recognition, and reading comprehension scores were standardized and summed. The

variables were standardized so as to give equal weight to each variable despite different response sets. Thus, higher scores on the academic competence scale correspond with individuals having higher levels of performance across three standard scholastic measures. The reliability measure for this scale is solid ($\alpha = .83$) and factor analyses indicate that it forms a unitary factor ($KMO = .71$).

Positive School Environment. In addition to the personal educational resources youths depend on to overcome adversity, research has also suggested that the educational climate itself is an important protective factor for resilient youth. For example, Lösel and Bliesener (1990, p. 313) report that resilient adolescents “experience a more open, cohesive, autonomous, and less conflict-ridden educational climate than the deviant group.” Apparently, educational environments that intellectually challenge youths in a supportive way without exposing them to peer conflicts provides youths with positive alternatives from the adversity experienced in other domains of their lives. Particularly for boys in late adolescence, an open educational climate also offers individuals the opportunity to be exposed to positive role models and mentors which have been found to be important in instigating resiliency (Werner 1993).

Positive school environment is a five-item measure taken from the child self-administered supplement at Wave 4 of the child-mother data set. Youths age ten and over were asked to rank on a four-point likert scale the level of truth of each of the five statements about the environment of their school. Items included assessing the level of the youth’s perceived safety at the school, the level of teacher involvement in solving problems, and the level of interest the youth has in the school. Response categories were “very true” equals

one, "somewhat true" equals two, "not too true" equals three, and "not true at all" equals four. One item was recoded so that a higher score corresponded with a more positive school environment. The positive school environment scale was computed by summing the scores on each item. Higher scores on this scale correspond with a more positive school environment as perceived by the youth. The reliability measure for this scale is moderate (Cronbach's $\alpha = .56$) and factor analyses indicate that it forms a unitary factor (KMO = .71).

Cognitive Stimulation. Individuals experiencing more intense levels of cognitive stimulation and who are more rigorously challenged intellectually appear to exhibit greater levels of resilient behavior. For example, Werner (1993) reports that individual dispositions, such as advanced cognitive skills, function to protect resilient individuals from high-risk environments. It appears that additional protective factors, such as an individual's intellectual development, is influenced by the cognitive stimulation experienced by the youth (Rutter 1985). A measure of the youth's cognitive stimulation within the home is included as a protective factor.

The cognitive stimulation measure is taken from the Home Observation of the Environment Short Form (HOME-SF) which is an assessment instrument used to measure the quality of the youth's home environment (Bradley and Caldwell 1980). The cognitive stimulation measure is comprised of twelve items taken from maternal reports and interviewer observations. CHRR dichotomizes and sums each item to create one variable representing the youths' emotional stimulation raw score. Using standard normal curve assumptions, the raw scores were then transformed into standard scores with a mean of 100 and a standard deviation of 15. I use the standard scores as the cognitive stimulation

measure. Higher scores on this measure correspond with home environments that provide a greater degree of cognitive stimulation for the youth.

Emotional Support. Emotionally supportive familial environments are characterized by parents who love, care for, compliment, and appreciate their children. Previous resiliency research has isolated the effects of support for high-risk youths. In particular, Werner (1989) reports that the emotional support provided by the family was particularly instrumental in fostering resiliency for high-risk boys. Emotional support, however, is not restricted to being provided within the familial environment. As Werner (1993, p. 505) observes, resilient individuals “sought and found emotional support outside of their own family.”

To examine the influence that emotional support within the family has on instigating resiliency, I include a measure taken from a subset of items in the HOME-SF. Similar to the cognitive stimulation measure, the emotional support measure is comprised of thirteen items taken from maternal reports and interviewer observations. CHRR dichotomizes and sums each item to create one variable representing the emotional support raw score. Again, using standard normal curve assumptions, the raw scores were then transformed into standard scores with a mean of 100 and a standard deviation of 15. I use the standard scores as the emotional support measure. Higher scores on this measure correspond with home environments that provide a greater degree of emotional support for the youth.

Religiosity. Research investigating resiliency has identified the importance that an individual’s religious commitment and involvement have in inhibiting delinquency (Werner 1993). Participation in religious activities provides structure to resilient youth’s lives and also offers an additional source of support or reference person with whom the youth could

turn to in times of crisis. While observing the religious involvement and commitment of resilient adults, Werner (1993, p. 512) notes, "their (resilient youths) faith enabled them to perceive the traumatic experiences of their childhood or youth constructively, even if they caused pain and suffering."

To capture the effects of religion in promoting resilient behavior, I include a two-item measure that assesses the importance of religion to the youth and the frequency with which youths attend religious services. For the first variable, youths were asked to rate the level of importance of religion in their lives. Response items were "very important" equals one, "fairly important" equals two, "fairly unimportant" equals three, and "not important at all" equals four. These response categories were reverse coded so that higher scores corresponded with a greater importance of religion. The second variable measured the frequency with which youths attended religious services. The response items were measured on a six-point likert scale where "more than once a week" equals one, "about once a week" equals two, "two or three times a month" equals three, "about once a month" equals four, "several times a year or less" equals five, and "not at all" equals six. Again, response categories were recoded so that higher scores corresponded with a higher frequency of attending religious services. The religiosity measure was computed by standardizing both variables and summing their values. The variables were standardized so as to give equal weight to each variable despite different response sets. Thus, higher scores on the religiosity scale correspond with individuals who consider religion to be important in their lives and who frequently attend religious services. The reliability measure for this scale is moderate ($\alpha = .64$) and factor analyses indicate that it forms a unitary factor ($KMO = .50$).

In sum, protective factors from a variety of domains have been selected to be included in the subsequent analyses. Using previous resiliency research as a guide to understanding hypothesized relationships, these factors should function to reduce the likelihood of individual involvement in and conviction of moderate to serious delinquent activities. Moreover, these same effects should be observed for involvement in and conviction of drug-related offenses. Again, these relationships are theorized to occur on a cohort of high-risk individuals.⁸

Control Variables

To control for the effects that demographic variables have on instigating resiliency, I include four control variables traditionally used in resiliency research. These variables include age, number of years of education, race, sex. The age and number of years of education variables are taken from Wave 6 and are measured at the interval level. Race and sex are dummy variables where for race zero equals "non-white" (African-American and Hispanic) and one equals "white," and for sex zero equals "female" and one equals "male."

⁸ Because of the sampling strategy discussed earlier, missing values on variables does not appear to be a major problem. Only two risk factors ever exceed greater than one percent of missing cases: maternal smoking during pregnancy (n = 25 missing cases [3.5 percent]) and parental deviance (n = 52 missing cases [7.3 percent]). Examining the distribution of missing values across the protective factors indicates that six of the eight factors exceed greater than one percent: cognitive stimulation (n = 41 missing cases [5.8 percent]), self-perceived school competence (n = 50 missing cases [7.0 percent]), self-perceived global self-worth (n = 50 missing cases [7.0 percent]), academic competence (n = 71 missing cases [10.0 percent]), positive school environment (n = 102 missing cases [14.3 percent]), and emotional support (n = 148 missing cases [20.8 percent]). A number of techniques were used to investigate the effects of missing values: (1) mean replacement, (2) linear interpolation, and (3) linear trend at that point. The results of the models did not substantively differ depending on the method applied. Therefore, missing values were replaced using the linear interpolation method.

In the following discussion, I present the analytical strategy by which each of the research questions listed in Chapter 1 will be addressed.

STATISTICAL ANALYSIS

Although the research questions will each require different statistical approaches, the set of analyses will comply with the following analytical strategy. First, bivariate analyses will be conducted to examine the relationships between the risk factors, protective factors, and each of the dependent variables. Individuals will be placed into categories of increasing levels of risk and protection and separate chi-square tests will be used to examine whether relationships exist between these factors and delinquency and drug use. In addition, difference of means tests will be used to examine whether the mean levels of protective factors differ between resilient and non-resilient individuals and the mean levels on the depression scale between resilient and non-resilient individuals.

Second, a series of multivariate logistic regressions will be conducted to test the unique contribution of protective factors on the different operationalizations of resiliency among the high-risk cohort. Logistic regression is an appropriate statistical tool for these questions because resiliency is a dichotomous dependent variable. Results of this analysis will reveal the probability or likelihood that is associated with each protective factor in predicting resilient behavior (Hanushek and Jackson 1977). The logistic regressions analyses will be completed for each dependent variable.

Third, to examine whether the influence of protective factors varies by certain characteristics (i.e., age, gender, and race), a subset of analyses will be conducted comparing regression coefficients across a series of multivariate models. That is, I will first estimate an "equal effects" model which will constrain the effects of each of the protective factors to be equal across each category of the characteristic examined. Specifically, this model assumes that the effects of the protective factors are invariant across age periods, gender categories, and racial categories. Each of the "equal effects" models will then be contrasted against two "separate effects" models. The "separate effects" models involve dichotomizing the age, gender, and race variables so that the influences of the protective factors will be examined for each characteristic (i.e., adolescents versus adults, males versus females, and whites versus non-whites). Empirical support for these models are found by comparing the sum of the -2 log likelihoods in the "separate effects" models to the -2 log likelihood in the "equal effects" model. The absolute difference between the -2 log likelihoods follows a chi-square distribution at the observed degrees of freedom. If empirical support is found for separating models it would suggest that the processes giving rise to resiliency differ across categories of age, sex, and race. Comparison of the effects of coefficients across groups using the formula presented by Clogg, Petkova, and Haritou (1995) will be conducted in the event that model differences are empirically verified. This statistical approach has been used in investigations of the age invariance hypothesis to delinquent involvement (see Mazerolle 1997) and it will be followed for each of the operational definitions of resiliency.

Before estimating the multivariate equations discussed above, it is important to investigate the intercorrelations among the independent variables to identify any potential

collinearity problems. If multicollinearity exists among the independent variables, estimates of the regression coefficients become more sensitive to sampling and measurement errors (Hanushek and Jackson 1977). To assess whether multicollinearity is problematic, I computed a correlation matrix and present the results in Table 2.4. These results suggest that all but two correlations fall within acceptable margins ($r < .70$). These correlations are between the youth's self-esteem and coping style ($r = .72$) and the youth's reading comprehension and reading recognition percentile scores ($r = .71$). Nevertheless, all of the other correlations are acceptable and multicollinearity does not appear to be a problem.

This analytical strategy presented above has several advantages. First, the logistic regressions will identify the significant predictors of resilient behavior while controlling for the influences of each of the protective factors included in the models. Accordingly, this method moves beyond isolating mean differences of protective factors possessed by resilient and non-resilient individuals and examines the overall influence of each individual protective factor. Second, the strategy involving comparison of logistic regression models according to characteristics of youths offers a parsimonious, yet empirical, method of examining differences of predictors in various subgroups. Therefore, identification of significant predictors can be obtained across gender, race, and age so as to assess the variety of sources that different individuals draw upon to remain resilient despite being high-risk.

Table 2.4 Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	1.00																
2	.01	1.00															
3	.01	-.08*	1.00														
4	-.07	.05	.43**	1.00													
5	-.05	-.13**	.44**	.16**	1.00												
6	-.01	-.09*	.08*	-.15**	.03	1.00											
7	.04	-.01	.01	-.01	.10*	.02	1.00										
8	.03	-.30**	.09*	-.09*	.15**	-.01	.13**	1.00									
9	.03	-.36**	.04	-.22**	.18**	.21**	.08*	.50**	1.00								
10	-.02	.15**	-.01	-.03	-.06	-.04	.18**	.05	.06	1.00							
11	-.05	-.10*	.08*	-.03	.07	.07	.06	.08*	.09*	.06	1.00						
12	.03	-.05	-.04	.20**	-.02	-.08*	.08	.02	-.05	-.02	.02	1.00					
13	-.03	.00	-.01	.21**	-.04	-.11**	-.05	-.01	-.09*	-.04	-.06	.24**	1.00				
14	.13**	.01	-.02	.06	-.06	-.01	-.01	-.03	-.02	-.07	-.01	.26**	.32**	1.00			
15	-.10**	-.05	-.08*	-.02	-.01	-.05	-.11**	-.04	-.02	-.03	.05	.11**	.16**	.18**	1.00		
16	-.04	.27**	-.19**	.16**	-.18**	-.15**	.05	-.20**	-.28**	-.04	-.11**	.13**	.15**	.09*	.04	1.00	
17	.09*	.24**	-.10*	.10**	-.13**	-.18**	-.02	-.28**	-.22**	-.01	-.03	.01	.14**	.16**	.04	.33**	1.00
18	-.02	.28**	-.11**	.27**	-.15**	-.20**	-.02	-.16**	-.31**	-.01	-.11**	.15**	.44**	.14**	.03	.24**	.24**
19	-.14**	-.19	-.03	.07	-.02	.04	-.05	.02	.01	-.11**	.05	.08*	.10**	.07	.07	.12**	.03
20	.12**	-.03	-.01	-.13**	.01	.03	.15**	.12**	.07	.13**	-.01	-.07	-.14**	-.12**	-.11**	-.09*	-.10*
21	.10**	.09*	.14**	-.09*	.12**	.07	.09*	.02	.01	.09*	.02	-.08*	-.12**	-.09*	-.10*	.10**	-.03

*p < .05 P** < .01

129

Table 2.4 Correlation Matrix (continued)

	18	19	20	21
18	1.00			
19	-.03	1.00		
20	-.11**	-.12**	1.00	
21	-.06	-.21	.29**	1.00

*p < .05 **p < .01

1 = Sex
 2 = Race
 3 = Age
 4 = Number of Years of Education
 5 = Adolescent Motherhood
 6 = Large Family Size
 7 = Parental Deviance

8 = Non-Intact Family
 9 = Persistent Poverty
 10 = Maternal Smoking During Pregnancy
 11 = Low Birth Weight
 12 = Self-Esteem
 13 = Self-Perceived Scholastic Competence
 14 = Self-Perceived Global Self-Worth

15 = Positive School Environment
 16 = Cognitive Stimulation
 17 = Emotional Support
 18 = Academic Competence
 19 = Religiosity
 20 = Delinquent Involvement
 21 = Drug Involvement

CHAPTER 3

FINDINGS

The following chapter presents the findings for each of the research questions outlined in Chapter 1. The first section presents the data on the relationship between risk and self-reported delinquency and drug use. In section two, findings will be presented on the relationship between protection and delinquency and drug use. In the next several sections, the bivariate and multivariate findings related to research questions 3 through 6 for resiliency against self-reported delinquency will be outlined. The following sections will present these same analyses for resiliency against self-reported drug use. Finally, the last two sections will report the effects that protective factors have in moderating delinquency and drug use and identify whether resilient experience greater levels of depression than non-resilient. Together, these data will provide insight into the importance of protective factors in the nature of resiliency.

THE CUMULATIVE EFFECTS OF RISK ON DELINQUENCY AND DRUG USE

The findings begin by examining whether the accumulation of risk increases the prevalence of delinquency and drug use. Table 3.1 presents the data addressing this relationship.⁹ As expected, each of these relationships are in the positive direction and are

⁹ Risk factors were categorized using the cutoffs presented in Table 3.1, because as will be discussed below, the high-risk cohort is defined as those individuals experiencing three or more risks. Therefore, this categorization permits assessment of those individuals who would not fall in the high-risk cohort in addition to those that will fall in this cohort.

Table 3.1 Relationship Between the Number of Risk Factors and Prevalence in Self-Reported Delinquency and Drug Use (n = 711)

Number of Risk Factors ^c	Delinquency ^a	Drug Use ^b
	Prevalence (n)	Prevalence (n)
Zero	.592 (29)	.265 (13)
1 - 2	.729 (172)	.432 (102)
3 - 7	.840 (358)	.507 (216)
Chi-Square Significance	.000	.003

^a Chi-square value equaled 23.076

^b Chi-square value equaled 11.899

^c Risk factors include low birth weight, maternal smoking during pregnancy, persistent poverty, non-intact marriage, parental deviance, large family size, and adolescent motherhood.

significant. Beginning with delinquency, just over half (59.2 percent) of the sample having zero risk factors were delinquent, nearly three-quarters (72.9 percent) having between one and two risk factors were delinquent, and nearly six out of every seven (84.0 percent) having over three risk factors were delinquent. Examination of the chi-square statistic of 23.076 suggests that the differences in prevalence of self-reported delinquency at different levels of risk are significant. Therefore, as risk accumulates, individuals are at a significantly higher likelihood of being delinquent.

A similar relationship is found when examining the relationship between risk and the prevalence of drug use. Specifically, just over one-quarter (26.5 percent) of the sample having zero risk factors reported drug use, approximately four-tenths (43.2 percent) having between one and two risk factors used drugs, and just over half (50.7 percent) having over three risk factors reported drug use. Again, the chi-square statistic of 11.899 suggests that the differences in prevalence of self-reported drug use at different levels of risk are significant. Consistent with Rutter's (1979) research, these data appear to suggest that as risks accumulate the prevalence of delinquency and drug use correspondingly increase.¹⁰ Therefore, at least for the sample used in this report, support is found for the first research question.

¹⁰ Each of these relationships were also examined without categorizing risks. Similar to the data presented above, as risks accumulated the prevalence of self-reported delinquency and drug use increased. Again, each of these were significant (chi-square = 26.006 for delinquency; chi-square = 22.973 for drug use).

THE CUMULATIVE EFFECTS OF PROTECTION ON DELINQUENCY AND DRUG USE

Table 3.2 presents the data on the relationship between protection and self-reported delinquency and drug use. In direct contrast to the accumulation of risk, Table 3.2 suggests that as the number of protective factors increase, the prevalence of delinquency decreases.¹¹ Beginning with delinquency, all (100 percent) of the individuals with zero protective factors were delinquent, just under nine-tenths (89.7 percent) of the individuals possessing between one or two protective factors were delinquent, approximately four-fifths (79.4 percent) possessing three or four protective factors were delinquent, just over three-quarters (77.9 percent) of those possessing five or six protective factors were delinquent, and just over half (54.3 percent) of the sample having seven or eight protective factors were delinquent. Examination of the chi-square statistic of 36.954 suggests that the differences in prevalence of self-reported delinquency at different levels of protection are significant.

The relationship between the accumulation of protective factors and the prevalence of self-reported drug use paints a similar picture. That is, three-quarters (75.0) of those having zero protective factors used drugs, approximately six-tenths (60.3 percent) of the sample possessing one or two protective factors used drugs, just under half (46.8 percent) of the sample with three or four protective factors used drugs, just over four-tenths (43.4 percent) possessing five or six protective factors used drugs, and just over one-quarter (27.1 percent) with seven or eight protective factors reported using drugs. Again, the chi-square

¹¹ Sensitivity analyses were conducted by dichotomizing protective factors at their median and one standard deviation above their mean. This procedure revealed no significant differences in the results presented.

Table 3.2 Relationship Between the Number of Protective Factors and Prevalence in Self-Reported Delinquency and Drug Use (n = 711)

Number of Protective Factors ^c	Delinquency ^a	Drug Use ^b
	Prevalence (n)	Prevalence (n)
Zero	1.00 (8)	.750 (6)
1 - 2	.897 (122)	.603 (82)
3 - 4	.794 (197)	.468 (116)
5 - 6	.779 (194)	.434 (108)
7 - 8	.543 (38)	.271 (19)
Chi-Square Significance	.000	.000

^a Chi-square value equaled 36.954

^b Chi-square value equaled 24.539

^c Protective factors include self-esteem, religiosity, positive school environment, self-perceived scholastic competence, self-perceived global self-worth, cognitive stimulation, emotional support, and intelligence. To categorize, each protective factor was dichotomized at their mean and those above the mean were assigned a value of '1' and those below the mean were assigned a value of '0'.

statistic of 24.539 suggests that the differences in prevalence of self-reported drug use at different levels of protection are significant.¹² In support of the second research question, these data appear to suggest that the accumulation of protective factors has an inverse effect on the prevalence of self-reported delinquency and drug use. That is, as protection increases, the prevalence of self-reported delinquency and drug use correspondingly decreases.

DIFFERENCES IN PROTECTION BETWEEN RESILIENT AND NON-RESILIENT INDIVIDUALS: SELF-REPORTED DELINQUENCY

The next set of analyses isolates the high-risk sample (those with three or more risks) and examines the mean differences between each of the eight protective factors for those identified as resilient and non-resilient. As discussed in Chapters 1 and 2, there is a lack of consistency across research in defining what is meant by "high-risk." The choice of three or more factors used in this research was made for four reasons. First, using the three-factor cutoff yielded significant differences in the predicted direction of the prevalence rates of delinquency (chi-square = 18.546; $p = .000$) and drug use (chi-square = 7.357; $p = .007$) between those above and below this threshold. Second, each of the three measures of central tendency hovered near or at the three-factor cutoff ($\bar{x} = 2.854$; median = 3; mode = 3). Third, the three-factor and above definition has been used by previous researchers (see Farrington et al. 1988). Finally, this cutoff provided a high-risk cohort that allowed for enough cases in which the investigation of sub-group differences and the influence of

¹² Similar to the findings presented on risk, each of these relationships were also examined without categorizing protective factors. Identical to the risk/delinquency relationship, as protective factors accumulated, the prevalence of self-reported delinquency and drug use decreased. Again, each of these were significant (chi-square = 41.565 for delinquency; chi-square = 25.823 for drug use).

protective factors could be adequately assessed. Taken together, the three-factor cutoff appeared to be the most logical point at which to define this sample as "high-risk."¹³

As Table 3.3 reveals, compared to non-resilient individuals, resilient individuals experienced greater mean levels of all eight of the protective factors included in this research. Although each of these differences are in the expected direction, however, only four exceeded conventional levels of significance. That is, resilient individuals possessed greater levels of religiosity ($t = -2.010$; $p < .01$, one-tailed), positive school environment ($t = 1.666$; $p < .05$, one-tailed), self-perceived scholastic competence ($t = -1.777$; $p < .05$, one-tailed), and self-perceived global self-worth ($t = -2.031$; $p < .01$, one-tailed).¹⁴ Consistent with previous research (see Smith et al. 1995), these data show some support for the differences in protective factors for those identified as resilient against self-reported delinquency. That is, resilient youths generally possess greater levels of the protective included in this research than those individuals who were not resilient.

¹³ Analyses were also conducted for different cutoffs (i.e., four or more factors and five or more factors) used by previous researchers to investigate whether the effects found below varied by the definition of a high-risk cohort. Aside from smaller samples, however, the results did not substantively change.

¹⁴ Similar to previous research (Jessor et al. 1995), a protective factor index (PFI) was also created by dichotomizing each of the protective factors at their mean and assigning a value of '1' to those above the mean and a value of '0' to those below the mean. Examination of the mean differences on the PFI between those who were resilient ($\bar{x} = 4.559$) and those who were not resilient ($\bar{x} = 3.693$) was significant ($t = -3.715$). Sensitivity analyses were conducted by dichotomizing protective factors at their median and one standard deviation above their mean. This procedure revealed no significant differences between the findings reported above.

Table 3.3 Mean Comparisons Between Levels of Protective Factors of Resilient and Non-Resilient Youths for Self-Reported Delinquency (n = 426)

Protective Factor	Resilient (n = 68)	Non-Resilient (n = 358)	t value
	\bar{x} (sd)	\bar{x} (sd)	
Self-Esteem	33.346 (4.36)	32.479 (4.23)	-1.541
Religiosity	0.315 (1.68)	-0.136 (1.70)	-2.010**
Positive School Environment	14.920 (2.78)	14.351 (2.55)	-1.666*
Self-Perceived Scholastic Competence	17.365 (4.05)	16.411 (4.06)	-1.777*
Self-Perceived Global Self-Worth	20.632 (3.42)	19.653 (3.68)	-2.031**
Cognitive Stimulation	94.269 (14.04)	92.208 (15.05)	-1.046
Emotional Support	95.542 (14.10)	93.644 (15.09)	-0.960
Academic Competence	0.001 (0.94)	-0.258 (0.97)	-1.283

* $p < .10$; ** $p < .05$

PREDICTING RESILIENCY FOR SELF-REPORTED DELINQUENCY

The following section presents the findings of a series of multivariate models predicting resiliency for self-reported delinquency. In each of the models presented in Tables 3.4 to 3.7 and 3.10 to 3.13, the dependent variable is resiliency for self-reported delinquency (0 = not resilient, 1 = resilient). Also presented in each table are the log odds of the coefficients, located in column Exp (*b*), in which a value greater than 1 indicates that variable increases the likelihood of resiliency, a value less than 1 indicates that the variable decreases the likelihood of resiliency, and a value equal to 1 suggests no effect on resiliency. This statistic is particularly informative because it provides an indication of how much change in the likelihood of resiliency is produced by the possession of each independent variable. In other words, the log odds of the coefficients are included to compare magnitudes across explanatory variables.

Table 3.4 reports the results of the logistic regression analysis of resiliency on the demographic control variables of age, sex, race, and years education. As displayed in Table 3.4, the variables sex, race, and years education are significant predictors of resiliency against self-reported delinquency. The data show that males and those who are white (compared to black) are significantly less likely to be resilient, while those with more years of education are significantly more likely to be resilient. As reflected in the log odds of the coefficients, males had a 48 percent chance of being resilient while whites had a 42 percent chance of being resilient against self-reported delinquency. In other words, there are 48 males who are resilient for every 100 females who are resilient and there are 42 whites who are resilient for every 100 blacks who are resilient.

Table 3.4 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency (n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	-.06	.09	.29	.95
Sex	-.74	.28	6.98**	.48
Hispanic	.57	.37	2.41	1.77
White	-.87	.41	4.60**	.42
Years Education	.19	.11	2.97*	1.20
Constant	-2.25	1.61	2.14	
-2 log likelihood	351.846			
χ^2	18.539			
p	.002			
Model Prediction Rate	84.24%			

* $p < .10$; ** $p < .05$

Each of the eight protective factors were then included in the model with the demographic control variables to assess their relative impact in predicting resiliency against self-reported delinquency. As Table 3.5 reveals, although each of the protective factors, with the exception of self-perceived scholastic competence, were in the predicted direction, none had a significant influence in predicting resiliency.¹⁵ Consistent with the previous model, the only variables reaching conventional levels of significance were sex and being white. That is, males and those who were white (compared to black) were less likely to be resilient against self-reported delinquency. Again, compared to females, males had a 44 percent chance of being resilient and compared to blacks, whites had a 40 percent chance of being resilient. As such, Table 3.5 suggests that the independent effects of the protective factors in predicting resiliency against self-reported delinquency appear to be relatively trivial.

Examining the Cumulative Effects of Protection on Resiliency Against Self-Reported Delinquency

The next step in the analysis involved examining the cumulative effect that protective factors might possess in predicting resiliency against self-reported delinquency. As discussed above, each of the protective factors were dichotomized at their mean and made into dummy variables where individuals exceeding the mean were assigned a value of "1"

¹⁵ Each of the subsequent multivariate models which used the eight independent protective factors were also estimated using the dummy variables dichotomized at different cut-offs (i.e., at the mean, one standard deviation above the mean, at the median). The findings did not substantively change from the models included in this report.

Table 3.5 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Independent Effects of Protective Factors (n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	.01	.10	.02	1.01
Sex	-.83	.29	8.01**	.44
Hispanic	.47	.41	1.40	1.60
White	-.92	.45	4.20**	.40
Years Education	.05	.12	.17	1.05
Self-Esteem	.02	.04	.45	1.02
Religiosity	.09	.09	1.01	1.10
Positive School Environment	.05	.06	.89	1.06
Self-Perceived Scholastic Competence	-.01	.04	.02	.99
Self-Perceived Global Self-Worth	.07	.04	2.24	1.07
Cognitive Stimulation	.01	.01	.31	1.01
Emotional Support	.01	.01	.49	1.01
Academic Competence	.15	.17	.80	1.17
Constant	-6.08	2.48	5.99**	
-2 log likelihood			342.043	
χ^2			28.343	
p			.008	
Model Prediction Rate				84.24%

* $p < .10$; ** $p < .05$

and those below the mean were assigned a value of "0".¹⁶ A protective factor index (PFI) was created by summing the dichotomized values across each of these protective factors and ranged between 0 and 8 with the mean equal to 4.167 and a standard deviation of 1.806. The PFI was entered into the multivariate equation as an independent predictor. Table 3.6 reports the results of this analysis.

Similar to previous analyses, Table 3.6 suggests that the two demographic control variables, sex and white (compared to black), emerged as significantly related to resiliency against self-reported delinquency. That is, males and those who were white (compared to black) were significantly less likely to be resilient. As Table 3.6 also reveals, the addition of the PFI emerged as a strong predictor of resiliency and in the predicted direction. Individuals with a greater number of protective factors were more likely to be resilient against self-reported delinquency. In fact, examination of the log odds of the PFI suggests that each additional protective factor accounted for an additional 36 percent chance in being resilient. The results presented in Tables 3.5 and 3.6 together suggest that while protective factors might only have trivial independent effects, their cumulative effect is both significant and fairly robust.

Empirical support for the cumulative effect of the PFI raises a question related to the specific number of protective factors needed to significantly affect resiliency. That is, what is the threshold of protective factors that have a significant influence on positively influencing resiliency? To provide beginning insight into this question, eight dummy

¹⁶ Similar to preceding analyses, different cut-offs for the protective factors (i.e., at the median, one standard deviation above the mean) were used in constructing the PFI. Each method did not substantively change the results in the multivariate equations predicting resiliency against self-reported delinquency.

Table 3.6 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Cumulative Effects of Protective Factors (n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	.04	.10	.17	1.04
Sex	-.81	.28	8.07**	.45
Hispanic	.43	.38	1.28	1.54
White	-.96	.41	5.44**	.38
Years Education	.01	.12	.01	1.01
Protective Factor Index	.30	.09	11.30**	1.36
Constant	-3.27	1.64	3.69**	
-2 log likelihood			339.770	
χ^2			30.615	
<i>p</i>			.000	
Model Prediction Rate				84.24%

* $p < .10$; ** $p < .05$

variables were created, each reflecting an increasing number of dichotomous protective factors. Therefore, the first dummy variable equaled "1" for all of the individuals having *at least* one protective factor and "0" equaled those not having below one protective factor. Similarly, the second dummy variable equaled "1" for all of the individuals having *at least* two protective factors and "0" corresponded with those having fewer than two protective factors. Creation of the remaining dummy variables followed the same methodology until all eight protective factors were created.

Each of these new variables were independently entered into a logistic regression equation (eight total equations) that included the demographic control variables to examine the number of protective factors required to positively influence resiliency against self-reported delinquency. The data suggests that the threshold appears to be at three protective factors. That is, the variables reflecting having at least one and two protective factors were not significantly related to resiliency against self-reported delinquency. Significance was found, however, beginning with the dummy variable reflecting at least three protective factors. In addition, each of the subsequent protective factors in increasing order were found to be significantly and positively related to resiliency.

***Examining the Effects of Protection in Different Domains:
Resiliency Against Self-Reported Delinquency***

Finding support for the cumulative effect of protective factors on resiliency against self-reported delinquency led to the question of whether factors in one domain were more important in being resilient than other domains. The protective factors used in this report fell into three different domains: individual, family, and educational. Each protective factor was

standardized and summed with the remaining protective factors in their respective category. The individual protective index generally reflected how the individual thought of themselves and was comprised of self-esteem, self-perceived scholastic-competence, and self-perceived global self-worth. The family protective index reflected the support and values within the familial environment and included cognitive stimulation, emotional support, and religiosity. Finally, the educational protective index portrays the educational success and the environment in which it is achieved in and is comprised of positive school environment and academic achievement.

Table 3.7 reports the results of the logistic regression predicting resiliency against self-reported delinquency using the demographic control variables and the three summed protective indices. Similar to previous models, both sex and being white are inversely related to resiliency. That is, males and those who are white are significantly less likely to be resilient. Turning to the categorized protective factors, although each has a positive influence on being resilient, none of the factors reached conventional levels of significance. Therefore, at least with respect to resiliency against self-reported delinquency, no specific domain appeared to exert a significant influence.

***Examining Whether Protective Factors Are Invariant Across Categories of Race:
Resiliency Against Self-Reported Delinquency***

The following set of analyses focus on the question examining whether protective factors operate differently for individuals of various racial backgrounds. In other words, do individuals of different racial backgrounds use protective factors differently in maintaining resiliency against self-reported delinquency? Because of their small sample size in the high-

Table 3.7 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Categorization of Protective Factors (n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	.02	.09	.03	1.02
Sex	-.79	.28	7.69**	.46
Hispanic	.48	.38	1.62	1.62
White	-.89	.41	4.66**	.41
Years Education	.04	.12	.11	1.04
Individual Protective Index ^a	.11	.07	2.30	1.12
Family Protective Index ^b	.09	.06	2.19	1.10
Educational Protective Index ^c	.13	.11	1.38	1.14
Constant	-1.94	1.63	1.41	
-2 log likelihood	343.236			
χ^2	27.150			
<i>p</i>	.007			
Model Prediction Rate	84.00%			

* $p < .10$; ** $p < .05$

^a Includes self-esteem, self-perceived scholastic-competence, and self-perceived global self-worth.

^b Includes cognitive stimulation, emotional support, and religiosity.

^c Includes positive school environment and academic achievement.

risk cohort ($n = 54$), individuals of Hispanic origin were not examined. Therefore, the subgroup analyses will be restricted to blacks and whites.

As a first step in this analysis, Table 3.8 presents the mean differences between black and white resilient on each of the eight protective factors. As Table 3.8 reveals, white resilient scored significantly higher than black resilient on measures of cognitive stimulation ($t = -3.148; p < .05$), emotional support ($t = -2.160; p < .05$), and academic competence ($t = -1.999; p < .05$). Black resilient, however, scored significantly higher than white resilient on the positive school environment measure ($t = 2.132; p < .05$). Therefore, on four measures of the protective factors, there appears to be bivariate differences between black resilient and white resilient.

As discussed in Chapter 2, the analytic strategy to address the remainder of this question will proceed in two stages. First, a full model will be contrasted with two race-specific models by comparing the $-2 \log$ likelihoods. That is, if the absolute difference between the summed $-2 \log$ likelihoods of the race-specific models from the $-2 \log$ likelihood of the full model exceeds the critical chi-square value at degrees of freedom equal to the number of independent variables in the model plus the constant, then this would suggest that the processes giving rise to resiliency differ across categories of race. In the second stage, assuming that the null hypothesis is rejected, a comparison of coefficients test using the formula presented in Clogg et al. (1995)¹⁷ will be conducted to identify where the differences

¹⁷ The formula presented in Clogg et al. (1995) is:

$$z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}$$

Table 3.8 Mean Comparisons of Protective Factors For Resilients Across Categories of Race

	Resilient Against Delinquency			Resilient Against Drug Use		
	Blacks ^a \bar{x} (sd)	Whites ^b \bar{x} (sd)	t value	Blacks ^c \bar{x} (sd)	Whites ^d \bar{x} (sd)	t value
Self-Esteem	33.339 (4.42)	33.390 (4.20)	-0.032	33.130 (4.09)	32.565 (4.08)	0.729
Religiosity	0.331 (1.73)	0.207 (1.40)	0.204	0.437 (1.58)	-0.513 (1.80)	3.101**
Positive School Environ.	15.193 (2.66)	13.135 (2.94)	2.132**	14.766 (2.63)	14.075 (2.76)	1.375
Self-Pcvd. Sch. Comp.	17.285 (4.12)	17.889 (3.69)	-0.414	17.155 (4.03)	17.173 (3.60)	-0.024
Self-Pcvd. Global Self-Worth	20.626 (3.41)	20.667 (3.67)	-0.033	20.250 (3.47)	20.389 (3.07)	-0.216
Cognitive Stimulation	92.301 (13.70)	107.167 (8.72)	-3.148**	92.998 (14.42)	102.518 (16.97)	-3.383**
Emotional Support	94.137 (14.15)	104.748 (10.11)	-2.160**	92.141 (14.35)	105.567 (12.08)	-5.049**
Academic Competence	-0.181 (0.90)	0.476 (1.06)	-1.999**	-0.325 (0.87)	0.342 (1.17)	-3.799**

* $p < .10$; ** $p < .05$ ^a $n = 59$; ^b $n = 9$; ^c $n = 177$; ^d $n = 33$

exist. This analysis will be conducted using each protective factor and the PFI presented earlier.¹⁸

Table 3.9 reports the results of the logistic regression predicting resiliency against self-reported delinquency using the demographic control variables and each of the eight protective factors.¹⁹ In the full model, only sex and race emerge as being significantly and inversely related to resiliency against self-reported delinquency. That is, males and individuals who are white are less likely to be resilient. In addition, although each of the protective factors are in the predicted direction, none of them reaches conventional levels of significance. Again, this finding reflects the relatively trivial influences that these protective factors independently have in predicting resiliency against self-reported delinquency.

Turning to the race-specific models, Table 3.9 suggests that for blacks, only sex is found to be inversely and significantly related to resiliency, while no significant predictors emerge in the model using only whites. As such, black males are significantly less likely to be resilient against self-reported delinquency. The absolute difference between the summed -2 log likelihoods of the race-specific models from the full model (8.699) fails to exceed the critical chi-square value at 13 degrees of freedom ($\chi^2 = 22.36$) suggesting that differences do not exist between blacks and whites in the predictors of resiliency.

¹⁸ It should be noted that a different equation for comparison between coefficients has been used in previous research (see Smith and Paternoster 1987) which factors the sample size and degrees of freedom into the denominator. Research (see Paternoster, Brame, Mazerolle, and Piquero 1998), has shown, however, that the equation used by Smith and Paternoster (1987) negatively biases the estimate of the standard error of the difference which increases the likelihood of rejecting the null hypothesis that $b_1 = b_2$. To reduce the likelihood of making a Type I error, this research will only use the equation presented by Clogg et al. (1995).

¹⁹ The results in the full model presented in Table 3.9 are only slightly different from those presented in Table 3.5 because Hispanics have been excluded from the full model presented in Table 3.9.

Table 3.9 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Race-Specific Models

Variables	Full Model				Race-Specific Models							
	(n = 372)				Blacks (n = 273)				Whites (n = 99)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	.04	.10	.14	1.04	.09	.11	.73	1.10	-.41	.47	.78	.66
Sex	-.70	.32	4.72**	.50	-.95	.37	6.71**	.39	.29	.89	.11	1.34
Race ^a	-.85	.46	3.45*	.43	---	---	---	---	---	---	---	---
Years Education	.01	.13	.01	1.01	.04	.15	.06	1.04	-.03	.48	.01	.98
Self-Esteem	.01	.04	.01	1.01	.01	.04	.03	1.01	.01	.10	.05	1.01
Religiosity	.15	.10	1.98	1.16	.08	.12	.52	1.09	.15	.26	.33	1.17
Positive School Environ.	.06	.06	1.12	1.07	.10	.07	2.18	1.11	-.07	.15	.24	.93
Self-Pcvd. Sch. Comp.	.00	.05	.00	1.00	-.01	.05	.05	.99	.09	.13	.46	1.09
Self-Pcvd. Global Self-Worth	.08	.05	2.24	1.08	.08	.06	1.88	1.08	.08	.14	.34	1.09
Cognitive Stimulation	.01	.01	1.23	1.01	.01	.01	.54	1.01	.03	.04	.60	1.03
Emotional Support	.01	.01	.05	1.00	.01	.01	.02	1.00	.01	.03	.01	1.00
Academic Competence	.16	.19	.73	1.18	.21	.22	.88	1.23	-.02	.47	.01	.98
Constant	-6.26	2.78	5.08**		-7.43	3.04	5.99**		-.73	8.66	.01	
-2 log likelihood	286.013				230.131				47.183			
χ^2	21.855				17.478				8.234			
<i>p</i>	.039				.095				.690			
Model Prediction Rate	85.44%				83.15%				91.84%			

* $p < .10$; ** $p < .05$

^a Because of their small proportion in the high-risk group ($n = 54$), Hispanics were eliminated from the race-specific models. Therefore, race is dummy coded where blacks equal 0 and whites equal 1.

Table 3.10 reports the results of the logistic regression predicting resiliency against self-reported delinquency using the demographic control variables and the PFI. In the full model, sex, race, and the PFI appear to be the only significant predictors of resiliency. These data suggest that being male and being white correspond with a reduction in an individual's likelihood of being resilient. As expected, having more protective factors corresponds with an increase in an individual's likelihood of being resilient.

When the race-specific models are examined, sex and the PFI are significant for the black sample, while only the PFI is significant for the white sample. In other words, for blacks, being male significantly decreases an individual's likelihood of being resilient, while having more protective factors significantly increases their likelihood. For the white sample, only having more protective factors significantly increases their likelihood of being resilient. The absolute difference between the summed -2 log likelihoods of the race-specific models from the full model (10.373) fails to exceed the critical chi-square value at 6 degrees of freedom ($\chi^2 = 12.59$), thus suggesting that differences do not exist between blacks and whites in the predictors of resiliency.

Examining Whether Protective Factors Are Invariant Across Categories of Gender: Resiliency Against Self-Reported Delinquency

As a first step in this analysis, Table 3.11 presents the mean differences between female and male resilient on each of the eight protective factors. As Table 3.11 reveals, male resilient scored significantly higher than female resilient on measures of cognitive stimulation ($t = -1.960$; $p < .05$), emotional support ($t = -1.825$; $p < .10$), and academic competence ($t = -1.819$; $p < .10$). Female resilient, however, scored significantly higher

Table 3.10 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Race-Specific Parsimonious Models

Variables	Full Model				Race-Specific Models							
	(n = 372)				Blacks (n = 273)				Whites (n = 99)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	.05	.10	.25	1.05	.10	.11	.85	1.10	-.34	.38	.82	.71
Sex	-.72	.31	5.41**	.48	-.95	.35	7.63**	.39	.52	.82	.40	1.68
Race ^a	-.96	.41	5.46**	.38	---	---	---	---	---	---	---	---
Years Education	-.02	.13	.03	.98	.03	.14	.04	1.03	-.23	.46	.24	.80
Protective Factor Index	.33	.10	10.86**	1.39	.26	.11	5.94**	1.30	.90	.40	5.07**	2.46
Constant	-3.28	1.79	3.36*		-4.31	1.96	4.83**		1.26	5.41	.05	
-2 log likelihood	284.955				231.903				42.679			
χ^2	22.913				15.706				12.738			
p	.000				.003				.013			
Model Prediction Rate	85.44%				83.15%				91.84%			

* $p < .10$; ** $p < .05$

^a Because of their small proportion in the high-risk group (n = 54), Hispanics were eliminated from the race-specific models. Therefore, race is dummy coded where blacks equal 0 and whites equal 1.

Table 3.11 Mean Comparisons of Protective Factors For Resilients Across Categories of Gender

	Resilient Against Delinquency			Resilient Against Drug Use		
	Male ^a	Female ^b	t value	Male ^c	Female ^d	t value
	\bar{x} (sd)	\bar{x} (sd)		\bar{x} (sd)	\bar{x} (sd)	
Self-Esteem	33.520 (3.83)	33.238 (4.71)	-0.257	33.190 (4.06)	32.911 (4.11)	-0.495
Religiosity	-0.323 (1.89)	0.709 (1.43)	2.555**	0.148 (1.72)	0.409 (1.58)	1.147
Positive School Environ.	13.763 (3.13)	15.636 (2.27)	2.853**	14.086 (2.90)	15.158 (2.33)	2.970**
Self-Pcvd. Sch. Comp.	18.222 (3.13)	16.834 (4.48)	-1.383	16.971 (3.85)	17.321 (4.06)	0.639
Self-Pcvd. Global Self-Worth	20.880 (3.29)	20.478 (3.52)	-0.469	20.802 (2.93)	19.808 (3.72)	-2.127**
Cognitive Stimulation	98.424 (13.75)	91.696 (13.76)	-1.960**	96.472 (14.58)	92.763 (15.60)	-1.772*
Emotional Support	99.439 (13.84)	93.129 (13.87)	-1.825*	98.108 (13.51)	90.876 (15.16)	-3.628**
Academic Competence	0.165 (1.01)	-0.255 (0.87)	-1.819*	-0.118 (0.98)	-0.310 (0.92)	-1.460

* $p < .10$; ** $p < .05$

^a $n = 26$; ^b $n = 42$; ^c $n = 98$; ^d $n = 112$

than male resilients on the religiosity measure ($t = 2.555$; $p < .05$) and the positive school environment measure ($t = 2.853$; $p < .05$). Therefore, on five measures of the protective factors, there appears to be bivariate differences between female resilients and male resilients.

Identical to the analyses focusing on whether protective factors operate differently for individuals of different racial backgrounds, the subsequent analyses apply the same analytic procedure to examine whether protective factors operate differently for categories of gender. Table 3.12 reports the results of the logistic regression predicting resiliency against self-reported delinquency using the demographic control variables and each of the eight protective factors.²⁰

Turning to the gender-specific models, Table 3.12 suggests that three protective factors for females emerge as significantly increasing resiliency and each is in the predicted direction. That is, religiosity, positive school environment, and self-perceived global self-worth are all positively related to being resilient against self-reported delinquency. Examination of the model using only males reveals no significant predictors. In addition, although not significant, three of the protective factors for males—self-esteem, religiosity, and positive school environment—are not in the predicted direction. The absolute difference between the summed $-2 \log$ likelihoods of the gender-specific models from the full model (19.972) fails to exceed the critical chi-square value at 14 degrees of freedom ($\chi^2 = 23.68$),

²⁰ Because the full model presented in Table 3.12 is identical to the model presented in Table 3.5, the reader should refer to the previous discussion for interpretation of the findings in the full model.

Table 3.12 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Gender-Specific Models

Variables	Full Model				Gender-Specific Models							
	(n = 426)				Females (n = 203)				Males (n = 223)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	-.01	.10	.02	1.01	.03	.13	.06	1.03	-.01	.17	.01	.99
Sex	-.83	.29	8.01**	.44	---	---	---	---	---	---	---	---
Hispanic	.47	.40	1.40	1.60	.85	.56	2.32	2.33	.03	.71	.01	1.03
White	-.92	.45	4.20**	.40	-1.12	.72	2.41	.33	-.46	.61	.57	.63
Years Education	.05	.12	.17	1.05	-.03	.16	.04	.97	.19	.21	.83	1.21
Self-Esteem	.02	.04	.45	1.02	.03	.05	.37	1.03	-.01	.06	.01	1.00
Religiosity	.09	.09	1.01	1.10	.32	.14	5.00**	1.38	-.17	.14	1.48	.85
Positive School Environ.	.05	.06	.89	1.06	.17	.09	3.92**	1.19	-.07	.09	.68	.93
Self-Pcvd. Sch. Comp.	.01	.04	.02	.99	-.06	.05	1.28	.94	.10	.07	1.82	1.10
Self-Pcvd. Global Self-Worth	.07	.04	2.24	1.07	.10	.06	2.78*	1.10	.01	.08	.01	1.00
Cognitive Stimulation	.01	.01	.31	1.01	-.01	.01	.19	.99	.03	.02	1.76	1.03
Emotional Support	.01	.01	.49	1.01	.01	.01	.26	1.01	.01	.02	.32	1.01
Academic Competence	.15	.17	.80	1.17	.15	.24	.37	1.16	.14	.27	.28	1.15
Constant	-6.08	2.48	5.99**		-6.23	3.56	3.06*		-8.20	4.02	4.16**	
-2 log likelihood	342.043				178.655				143.416			
χ^2	28.343				28.330				12.847			
p	.008				.005				.380			
Model Prediction Rate	84.24%				79.80%				88.74%			

* $p < .10$; ** $p < .05$

thus suggesting that differences do not exist between females and males in the predictors of resiliency.

Notably, the data appear to suggest that the minor differences are driven, at least in part, by the reversal of signs for these protective factors between the females and males. That is, while resilient females tend to have significantly higher levels of religiosity and attend school in a more positive environment, these protective factors do not seem to be important for males. In fact, although not significant, each of these factors is inversely related to the likelihood of being resilient for males. Examination of the log odds for these two protective factors across gender suggests that each unit change in religiosity corresponds with a 38 percent increase in being resilient for females and a 15 percent decrease in the odds of being resilient. Similarly, each unit change on the positive school environment scale corresponds with a 19 percent increase in being resilient for females but a 7 percent decrease in the likelihood of being resilient for males.

A similar relationship is found for self-perceived scholastic competence and cognitive stimulation. Again, although not significant, each of these protective factors is positively related to being resilient for males but inversely related to resiliency for females. Examination of the log odds of the coefficients, however, suggests that these differences are relatively minor. That is, each unit change in the self-perceived scholastic competence scale corresponds with a 10 increase in the odds of being resilient for males but a 6 percent decrease for females. Likewise, each unit change in the cognitive stimulation scale corresponds with only a 3 percent increase in the odds of being resilient for males and only a 1 percent decrease for females. Therefore, at least in this sample, although empirical

support was not found for the differential effects of protective factors across categories of gender, there appears to be some support that these factors vary in degree across gender.

Table 3.13 reports the results of the logistic regression predicting resiliency against self-reported delinquency using the demographic control variables and the PFI.²¹ Examination of the gender-specific models reveals two significant predictors for the female model and one significant predictor for the male model. For females, being white (compared to black) is inversely related to being resilient against self-reported delinquency while having more protective factors is positively related to being resilient. For the male sub-group, only higher levels of the PFI corresponded with a higher likelihood of being resilient. The absolute difference between the summed -2 log likelihoods of the gender-specific models from the full model (5.297) fails to exceed the critical chi-square value at 7 degrees of freedom ($\chi^2 = 14.07$), thus suggesting that differences do not exist between females and males in the reduced models.

DIFFERENCES IN PROTECTION BETWEEN RESILIENT AND NON-RESILIENT INDIVIDUALS: SELF-REPORTED DRUG USE

While the preceding set of analyses assessed those who were resilient against self-reported delinquency, the focus now will turn to those who are resilient against self-reported drug use. The first set of findings examine the mean differences between those who are resilient and non-resilient across each of the eight protective factors. As Table 3.14 reveals,

²¹ Because the full model presented in Table 3.13 is identical to the model presented in Table 3.6, the reader should refer to the previous discussion for interpretation of the findings in the full model.

Table 3.13 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Delinquency: Full Model and Gender-Specific Parsimonious Models

Variables	Full Model				Gender-Specific Models							
	(n = 426)				Females (n = 203)				Males (n = 223)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	.04	.09	.17	1.04	.08	.13	.50	1.09	-.03	.15	.07	.96
Sex	-.81	.28	8.07**	.45	---	---	---	---	---	---	---	---
Hispanic	.43	.38	1.28	1.54	.52	.48	1.15	1.68	.39	.64	.39	1.48
White	-.96	.41	5.44**	.38	-1.62	.64	6.46**	.20	-.21	.56	.14	.81
Years Education	.01	.12	.01	1.01	-.09	.15	.35	.92	.16	.19	.70	1.18
Protective Factor Index	.30	.09	11.29**	1.36	.29	.12	5.84**	1.33	.33	.14	5.26**	1.39
Constant	-3.27	1.64	3.95**		-2.89	2.30	1.58		-4.55	2.43	3.50*	
-2 log likelihood	339.770				188.751				145.722			
χ^2	30.615				18.234				10.541			
p	.000				.003				.061			
Model Prediction Rate	84.24%				79.31%				88.74%			

* $p < .10$; ** $p < .05$

Table 3.14 Mean Comparisons Between Levels of Protective Factors of Resilient and Non-Resilient Youths for Self-Reported Drug Use (n = 426)

Protective Factor	Resilient (n = 210)	Non-Resilient (n = 216)	t value
	\bar{x} (sd)	\bar{x} (sd)	
Self-Esteem	33.041 (4.08)	32.205 (4.40)	-2.033**
Religiosity	0.287 (1.65)	-0.406 (1.69)	-4.293**
Positive School Environment	14.658 (2.66)	14.232 (2.51)	-1.701*
Self-Perceived Scholastic Competence	17.158 (3.95)	15.986 (4.10)	-3.001**
Self-Perceived Global Self-Worth	20.272 (3.41)	19.360 (3.84)	-2.592**
Cognitive Stimulation	94.494 (15.21)	90.634 (14.36)	-2.693**
Emotional Support	94.251 (14.83)	93.651 (15.08)	-0.414
Academic Competence	-0.220 (0.96)	-0.243 (0.97)	-0.240

* $p < .10$; ** $p < .05$

resilient individuals experienced greater mean levels of all eight of the protective factors than non-resilient individuals. Although each of these differences are in the expected direction, only six exceed conventional levels of significance. That is, resilient individuals possessed greater levels of self esteem ($t = -2.033; p < .05$), religiosity ($t = -4.293; p < .05$), positive school environment ($t = 1.701; p < .05$, one-tailed), self-perceived scholastic competence ($t = -3.001; p < .05$), self-perceived global self-worth ($t = -2.592; p < .05$), and cognitive stimulation ($t = -2.693; p < .05$).²² Together, these findings suggest that six protective factors appear to significantly differentiate resilient and non-resilients.

PREDICTING RESILIENCY FOR SELF-REPORTED DRUG USE

The following section presents the findings of a series of multivariate models predicting resiliency for self-reported drug use. In each of the models presented in Tables 3.15 to 3.22, the dependent variable is resiliency for self-reported drug use (0 = not resilient, 1 = resilient). Similar to the previous multivariate models, the log odds of the coefficients are presented, located in column Exp (*b*), in which a value greater than 1 indicates that variable increases the likelihood of resiliency, a value less than 1 indicates that the variable decreases the likelihood of resiliency, and a value equal to 1 suggests no effect on resiliency.

Table 3.15 reports the results of the logistic regression analysis of resiliency on the demographic control variables of age, sex, race, and years education. As displayed in Table

²² Examination of the mean differences of the PFI between resilient ($\bar{x} = 4.176$) and non-resilient ($\bar{x} = 3.495$) was significant ($t = -3.996$). Sensitivity analyses were conducted by dichotomizing protective factors at their median and one standard deviation above their mean. This procedure revealed no significant differences between the findings reported above.

Table 3.15 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use
(n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	-.26	.07	13.14**	.77
Sex	-.48	.21	5.51**	.62
Hispanic	-.92	.33	8.05**	.40
White	-1.17	.26	21.01**	.31
Years Education	.24	.08	9.03**	1.27
Constant	2.73	1.21	5.06**	
-2 log likelihood	540.280			
χ^2	48.780			
<i>p</i>	.000			
Model Prediction Rate	65.65%			

* $p < .10$; ** $p < .05$

3.15, each of the control variables appear to be a significant predictor of resiliency against self-reported drug use. The data show that older individuals, males, those who are Hispanic (compared to black), and those who are white (compared to black) are significantly less likely to be resilient. Alternatively, those with more years of education are significantly more likely to be resilient.

Each of the eight protective factors were then included in the model with the demographic control variables to assess their independent effects in predicting resiliency against self-reported drug use. As displayed in Table 3.16, with the exception of years education, each of the demographic control variables were inversely related to resiliency. Again, older individuals, males, those who are Hispanic (compared to black) and those who are white (compared to black) are significantly less likely to be resilient.

Turning to the eight protective factors, Table 3.16 also suggests that all but two of the protective factors, self-esteem and academic competence, were in the predicted direction. More importantly, three of the protective factors were significantly related to resiliency in the predicted direction. Individuals with higher levels of religiosity, self-perceived global self-worth, and cognitive stimulation were more likely to be resilient against self-reported drug use. Unlike the trivial effects that the protective factors had on resiliency against self-reported delinquency, the results for the model predicting resiliency against self-reported drug use appear to suggest that certain protective factors have significant effects and in the predicted direction.

Table 3.16 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use:
Independent Effects of Protective Factors (n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	-.22	.08	8.06**	.80
Sex	-.57	.22	6.66**	.56
Hispanic	-1.02	.35	8.74**	.36
White	-1.17	.29	16.12**	.31
Years Education	.15	.09	2.53	1.16
Self-Esteem	-.01	.03	.05	1.00
Religiosity	.12	.07	3.29*	1.13
Positive School Environment	.03	.04	.50	1.03
Self-Perceived Scholastic Competence	.04	.03	1.54	1.04
Self-Perceived Global Self-Worth	.07	.03	4.07**	1.06
Cognitive Stimulation	.02	.01	4.25**	1.02
Emotional Support	.01	.01	.19	1.00
Academic Competence	-.10	.13	.57	.91
Constant	-1.04	1.83	.33	
-2 log likelihood	518.158			
χ^2	70.902			
<i>p</i>	.000			
Model Prediction Rate	67.53%			

* $p < .10$; ** $p < .05$

Examining the Cumulative Effects of Protection on Resiliency Against Self-Reported Drug Use

Identical to the analyses presented for resiliency against self-reported delinquency, each of the individual protective factors were removed from the model and the PFI was added as an independent variable to assess the cumulative effects of protection. Table 3.17 presents the results of this analysis. As reflected in Table 3.17, four of the demographic control variables are each significantly and inversely related to resiliency. That is, older individuals, males, Hispanics (compared to blacks), and whites (compared to blacks) are less likely to be resilient. In addition, the PFI had a positive effect on resiliency. Therefore, individuals were more likely to be resilient as protective factors accumulated. Similar to the models predicting resiliency against self-reported delinquency, these data suggest that while protective factors might only have trivial independent effects, their cumulative effects are both significant and fairly robust.

Support for the PFI raised the question related to the specific number of protective factors needed to significantly affect resiliency. Again, each of these new variables were independently entered into a logistic regression equation (eight total equations) that included the demographic control variables to examine the number of protective factors required to positively influence resiliency against self-reported drug use. Similar to the previous analyses on resiliency against self-reported delinquency, the data suggest that the threshold appears to be at three protective factors. That is, the variables reflecting having at least one and two protective factors were not significantly related to resiliency against self-reported drug use. Significance was found, however, beginning with the dummy variable reflecting

Table 3.17 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Cumulative Effects of Protective Factors (n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	-.20	.07	7.91**	.82
Sex	-.52	.21	6.21**	.59
Hispanic	-1.06	.33	10.08**	.35
White	-1.26	.26	23.17**	.28
Years Education	.12	.09	1.96	1.13
Protective Factor Index	.22	.07	11.07**	1.24
Constant	2.22	1.23	3.26*	
-2 log likelihood	528.824			
χ^2	60.236			
<i>p</i>	.000			
Model Prediction Rate	67.29%			

* $p < .10$; ** $p < .05$

at least three protective factors. In addition, each of the subsequent protective factors in increasing order were found to be significantly and positively related to resiliency.

***Examining the Effects of Protection in Different Domains:
Resiliency Against Self-Reported Drug Use***

Using the identical categorization of protective factors as described above, the analysis now turns to investigating the effects of the protective factor indices on being resilient against self-reported drug use. As presented in Table 3.18, four of the demographic control variables were inversely related to resiliency against self-reported drug use. Again, older individuals, males, Hispanics, and whites were each less likely to be resilient. Unlike the model investigating the influence of these indices of protection on resiliency against delinquency, however, two of the protective indices were positively related to resiliency against self-reported drug use. Specifically, individuals scoring higher on the personal and family protective indices were significantly more likely to be resilient against self-reported drug use. Combined with the analysis presented above, this finding would appear to suggest that personal and family factors are important for being resilient against drug use but not to be resilient against delinquency.

***Examining Whether Protective Factors Are Invariant Across Categories of Race:
Resiliency Against Self-Reported Drug Use***

As a first step in this analysis, please refer back to Table 3.8, which presents the mean differences between black and white resilient individuals on each of the eight protective factors. As Table 3.8 reveals, white resilient individuals scored significantly higher than black resilient individuals on

Table 3.18 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Categorization of Protective Factors (n = 426)

Variables	B	S.E.	Wald	Exp(b)
Age	-.20	.07	7.86**	.82
Sex	-.58	.21	7.20**	.56
Hispanic	-1.01	.33	9.06**	.37
White	-1.21	.26	20.76**	.30
Years Education	.12	.09	1.79	1.12
Individual Protective Index ^a	.12	.05	4.80**	1.13
Family Protective Index ^b	.13	.05	8.90**	1.15
Educational Protective Index ^c	-.01	.08	.01	1.00
Constant	3.20	1.25	6.55**	
-2 log likelihood	522.313			
χ^2	66.747			
<i>p</i>	.000			
Model Prediction Rate	66.82%			

* $p < .10$; ** $p < .05$

^a Includes self-esteem, self-perceived scholastic-competence, and self-perceived global self-worth.

^b Includes cognitive stimulation, emotional support, and religiosity.

^c Includes positive school environment and academic achievement.

measures of cognitive stimulation ($t = -3.383$; $p < .05$), emotional support ($t = -5.049$; $p < .05$), and academic competence ($t = -3.799$; $p < .05$). Black resilient, however, scored significantly higher than white resilient on the religiosity measure ($t = 3.101$; $p < .05$). Therefore, on four measures of the protective factors, there appears to be bivariate differences between black resilient and white resilient.

Identical to the sub-group analyses for resiliency against self-reported delinquency, the next set of analyses will examine whether protective factors function differently across categories of race and gender using resiliency against self-reported drug use as the dependent variable. Beginning with the race sub-group analyses, Table 3.19 presents the results of the logistic regression predicting resiliency against self-reported delinquency using the demographic control variables and each of the eight protective factors for the full model and separate models for blacks and whites. In the full model, three of the demographic control variables emerge as significant predictors of resiliency. Older individuals, males, and those who are white correspond with being less likely to be resilient. In addition, two protective factors have a significantly positive influence on the likelihood of being resilient against self-reported drug use. Individuals reporting higher levels of religiosity and cognitive stimulation are at a greater likelihood of being resilient.

Turning to the race-specific models, Table 3.19 suggests that two demographic control variables, age and sex, remain inversely related to resiliency for blacks. Again, older black males are less likely to be resilient against self-reported drug use. In addition, the two significant protective factors in the full model, religiosity and cognitive stimulation, were also positively related to resiliency for the black sample. Examination of the model for the

Table 3.19 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Race-Specific Models

Variables	Full Model				Race-Specific Models							
	(n = 372)				Blacks (n = 273)				Whites (n = 99)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	-.24	.08	8.52**	.79	-.19	.09	4.40**	.83	-.48	.23	4.08**	.62
Sex	-.63	.24	6.79**	.53	-.94	.29	10.78**	.39	.77	.52	2.20	2.16
Race ^a	-1.20	.30	15.90**	.30	---	---	---	---	---	---	---	---
Years Education	.13	.10	1.63	1.14	.12	.12	1.02	1.12	.08	.27	.09	1.08
Self-Esteem	-.01	.03	.07	.99	.01	.04	.10	1.01	-.09	.06	2.27	.91
Religiosity	.17	.07	5.35**	1.18	.19	.09	5.01**	1.21	-.13	.16	.63	.88
Positive School Environ.	.03	.04	.46	1.03	.02	.05	.17	1.02	.07	.11	.47	1.07
Self-Pcvd. Sch. Comp.	.03	.03	1.18	1.04	.03	.04	.53	1.03	.10	.08	1.54	1.11
Self-Pcvd. Global Self-Worth	.05	.04	1.75	1.05	.04	.04	1.06	1.04	.09	.08	1.29	1.10
Cognitive Stimulation	.02	.01	4.86**	1.02	.02	.01	4.17**	1.02	.01	.02	.29	1.02
Emotional Support	.01	.01	.81	1.01	.01	.01	.11	1.00	-.05	.02	4.79**	1.05
Academic Competence	-.12	.14	.73	0.88	-.15	.17	.71	.86	.04	.30	.02	1.04
Constant	-.61	1.97	.10		-1.17	2.26	.27		-1.30	4.90	.07	
-2 log likelihood	448.478				329.828				100.189			
χ^2	65.511				41.178				23.623			
p	.000				.000				.014			
Model Prediction Rate	68.19%				68.13%				74.49%			

* $p < .10$; ** $p < .05$

^a Because of their small proportion in the high-risk group (n = 54), Hispanics were eliminated from the race-specific models. Therefore, race is dummy coded where blacks equal 0 and whites equal 1.

whites suggests that age is inversely related, while emotional support within the family is positively related to resiliency. Again, older individuals are less likely to be resilient among whites; however, those with higher levels of emotional support are more likely to evidence resiliency against self-reported drug use. The absolute difference between the summed -2 log likelihoods of the race-specific models from the full model (18.461) fails to exceed the critical chi-square value at 13 degrees of freedom ($\chi^2 = 22.36$), thus suggesting that differences do not exist between blacks and whites in the predictors of resiliency.

The next step in the analysis was to examine whether these differences in the parsimonious model using the PFI differed across categories of race. Table 3.20 presents the full model and two race specific models using the demographic control variables and the PFI as predictors. Beginning with the full model, Table 3.20 suggests that age, race, and sex are significantly and inversely related to resiliency, while the PFI is significantly and positively related to resiliency. Consistent with previous models, older individuals, males, and whites are less likely to be resilient against self-reported drug use. Scoring higher on the PFI, however, increased the odds of being resilient. For the sample as a whole, a unit change in the PFI corresponded with a 26 percent increase in the likelihood of being resilient against self-reported drug use.

Examination of the race-specific models in Table 3.20 suggests that age, sex, and the PFI are significant for blacks; however, only age is significant for whites. Thus, older black and white individuals are less likely to be resilient against self-reported drug use. Moreover, black males are also less likely to be resilient. Finally, blacks scoring higher on the PFI were significantly more likely to be resilient. Notably, the positive impact of the PFI in the white

Table 3.20 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Race-Specific Parsimonious Models

Variables	Full Model				Race-Specific Models							
	(n = 372)				Blacks (n = 272)				Whites (n = 99)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	-.23	.08	9.17**	.79	-.18	.09	4.70**	.83	-.53	.21	6.37**	.59
Sex	-.60	.22	7.10**	.55	-1.00	.27	14.17**	.37	.65	.47	1.93	1.92
Race ^a	-1.29	.27	23.62**	.27	---	---	---	---	---	---	---	---
Years Education	.10	.09	1.24	1.11	.10	.11	.88	1.10	.23	.22	1.16	1.26
Protective Factor Index	.23	.07	10.86**	1.26	.24	.08	8.42**	1.27	.20	.14	2.01	1.22
Constant	2.94	1.31	5.02**		2.29	1.51	2.31		4.99	2.98	2.80*	
-2 log likelihood	460.044				338.575				109.237			
χ^2	53.945				32.432				14.575			
p	.000				.000				.006			
Model Prediction Rate	66.58%				67.40%				71.43%			

* $p < .10$; ** $p < .05$

^a Because of their small proportion in the high-risk group (n = 54), Hispanics were eliminated from the race-specific models. Therefore, race is dummy coded where blacks equal 0 and whites equal 1.

sample was not found to be significant. The absolute difference between the summed -2 log likelihoods of the race-specific models from the full model (12.232) fails to exceed the critical chi-square value at six degrees of freedom ($\chi^2 = 12.59$), thus suggesting that differences do not exist between blacks and whites in the predictors of resiliency.

Examining Whether Protective Factors Are Invariant Across Categories of Gender: Resiliency Against Self-Reported Drug Use

As a first step in this analysis, please refer back to Table 3.11, which presents the mean differences between male and female resilient on each of the eight protective factors. As Table 3.11 reveals, male resilient scored significantly higher than female resilient on measures of self-perceived global self-worth ($t = -2.127; p < .05$), cognitive stimulation ($t = -1.772; p < .10$), and emotional support ($t = -3.628; p < .05$). Female resilient, however, scored significantly higher than male resilient on the positive school environment measure ($t = 2.970; p < .05$). Therefore, on four measures of the protective factors, there appears to be bivariate differences between female resilient and male resilient.

Identical to the gender sub-group differences presented above, the next stage of the analysis investigates these differences using the resiliency against self-reported drug use dependent variable. Table 3.21 reports the results of the three logistic regressions predicting resiliency using the demographic control variables and each of the eight protective factors.²³ Examining the gender-specific models in Table 3.21 reveals four significant factors for the female model and two significant factors for the male model. Beginning with the female

²³ Because the full model presented in Table 3.21 is identical to the model presented in Table 3.16, the reader should refer to the previous discussion for interpretation of the findings in the full model.

Table 3.21 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Gender-Specific Models

Variables	Full Model				Gender-Specific Models							
	(n = 426)				Females (n = 203)				Males (n = 223)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	-.22	.08	8.06**	.80	-.28	.12	5.70**	.75	-.17	.11	2.75	.84
Sex	-.57	.22	6.66**	.56	---	---	---	---	---	---	---	---
Hispanic	-1.02	.35	8.74**	.36	-1.62	.54	9.01**	.20	-.66	.48	1.91	.52
White	-1.17	.29	16.12**	.31	-2.05	.49	17.70**	.13	-.65	.39	2.79*	.52
Years Education	.15	.09	2.53	1.16	.21	.14	2.10	1.23	.08	.13	.37	1.08
Self-Esteem	-.01	.03	.03	1.00	-.01	.04	.01	1.00	.01	.04	.04	1.01
Religiosity	.12	.07	3.29*	1.13	-.03	.12	.06	.97	.15	.09	2.76*	1.16
Positive School Environ.	.03	.04	.50	1.03	.13	.07	3.56**	1.14	-.04	.06	.52	.96
Self-Pcvd. Sch. Comp.	.04	.03	1.54	1.04	.07	.05	2.32	1.07	.02	.04	.18	1.02
Self-Pcvd. Global Self-Worth	.07	.03	4.07**	1.07	.07	.05	2.02	1.07	.05	.05	1.17	1.05
Cognitive Stimulation	.02	.01	4.25**	1.02	.02	.01	1.83	1.02	.02	.01	2.54	1.02
Emotional Support	.01	.01	.19	1.00	-.01	.01	.10	1.00	.01	.01	1.10	1.01
Academic Competence	-.10	.13	.57	.91	-.18	.21	.77	.83	.02	.18	.01	1.02
Constant	-1.04	1.83	.33		-1.64	2.98	.30		-1.59	2.49	.41	
-2 log likelihood	518.158				222.804				278.752			
χ^2	70.902				56.437				25.465			
<i>p</i>	.000				.000				.013			
Model Prediction Rate	67.53%				73.40%				65.32%			

* $p < .10$; ** $p < .05$

174

sample, three of the demographic control variables are significant in the inverse direction. Older individuals, Hispanics, and whites are each significantly less likely to be resilient. Females with school environments that are positive, however, have a greater likelihood of being resilient. Turning to the male model, similar to the results for females, whites are less likely to be resilient. One protective factor, religiosity, is positively related to resiliency for the male-specific model. That is, males scoring higher on the religiosity scale were more likely to be resilient against self-reported drug use. The absolute difference between the summed -2 log likelihoods of the gender-specific models from the full model (16.602) fails to exceed the critical chi-square value at 14 degrees of freedom ($\chi^2 = 23.68$), thus suggesting that differences do not exist between females and males in the predictors of resiliency.

Table 3.22 reports the results of the logistic regression predicting resiliency against self-reported drug use using the demographic control variables and the PFI.²⁴ Examination of the gender-specific models reveals four significant predictors for the female model and two significant predictors for the male model. For females, older individuals, being Hispanic (compared to black), and being white (compared to black) are each inversely related to being resilient against self-reported drug use. For males, older individuals were less likely to be resilient. Scoring higher on the PFI positively corresponded with being resilient for females and males. The absolute difference between the summed -2 log likelihoods of the gender-specific models from the full model (10.528) fails to exceed the critical chi-square value at

²⁴ Because the full model presented in Table 3.22 is identical to the model presented in Table 3.17, the reader should refer to the previous discussion for interpretation of the findings in the full model.

Table 3.22 Logistic Regression Coefficients Predicting Resiliency For Self-Reported Drug Use: Full Model and Gender-Specific Parsimonious Models

Variables	Full Model				Gender-Specific Models							
	(n = 426)				Females (n = 203)				Males (n = 223)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	-.20	.07	7.91**	.82	-.24	.11	4.59**	.79	-.20	.10	4.07**	.82
Sex	-.52	.21	6.21**	.59	---	---	---	---	---	---	---	---
Hispanic	-1.06	.33	10.08**	.35	-1.58	.49	10.29**	.21	-.62	.46	1.86	.54
White	-1.26	.26	23.18**	.28	-2.11	.40	27.63**	.12	-.51	.35	2.07	.60
Years Education	.12	.09	1.96	1.13	.18	.13	1.93	1.20	.09	.12	.59	1.09
Protective Factor Index	.21	.07	11.07**	1.24	.21	.10	4.21**	1.24	.23	.09	6.84**	1.25
Constant	2.22	1.23	3.26*		2.53	1.98	1.63		1.64	1.59	1.07	
-2 log likelihood	528.824				232.628				285.668			
χ^2	60.236				46.613				18.549			
p	.000				.000				.002			
Model Prediction Rate	67.29%				72.91%				64.41%			

* $p < .10$; ** $p < .05$

7 degrees of freedom ($\chi^2 = 14.07$), thus suggesting that differences do not exist between females and males in the predictors of resiliency against drug use.

EXAMINING THE CUMULATIVE EFFECTS OF RISK AND PROTECTION ON DELINQUENCY AND DRUG USE

At this point, the analysis has primarily focused on examining the independent and cumulative effects of protection on instigating resiliency against self-reported delinquency and drug use among the high-risk sample. The analysis now shifts to examining whether protective factors moderate the effects of risk of self-reporting delinquency and drug use. Using the entire sample, the analysis proceeds in three stages: 1) estimation of a base model predicting delinquency and drug use including demographic control variables and the risk factor index (RFI),²⁵ 2) estimation of models predicting delinquency and drug use with the demographic controls, the RFI, and the inclusion of the PFI, and 3) estimation of models predicting delinquency and drug use with the demographic controls, the RFI, the PFI, and the RFI x PFI interaction term. Again, a significant interaction between the two indices would demonstrate that the PFI has a moderator effect on risk (see Baron and Kenny 1986).

Table 3.23 reports the results of the three logistic regressions predicting self-reported delinquency. In the first model, delinquency was regressed on each of the demographic control variables and the RFI. As reflected in Table 3.23, two demographic control variables, sex and years education, were significant. Again, males were more likely to be delinquent

²⁵ Similar to the PFI described above, the risk factor index (RFI) was created by adding the seven risk factors together. The RFI has a mean of 2.854, a standard deviation of 1.487 and ranged from 0 to 7.

Table 3.23 Logistic Regression Coefficients Predicting Self-Reported Delinquency

Variables	Base Model With Risk Factor Index (n = 711)				Base Model With Risk and Protective Factor Indices (n = 711)				Base Model Adding RFI x PFI Interaction (n = 711)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	-.01	.07	.00	1.00	-.08	.08	1.08	.92	-.08	.08	1.06	.93
Sex	.55	.19	8.39**	1.74	.56	.19	8.27**	1.75	.55	.19	8.16**	1.74
Hispanic	-.21	.27	.60	.81	-.25	.27	.85	.78	-.25	.27	.86	.78
White	-.01	.23	.01	.99	.04	.23	.03	1.04	.04	.23	.04	1.05
Years Education	-.20	.08	6.12**	.82	-.11	.09	1.54	.90	-.11	.09	1.58	.90
Risk Factor Index	.25	.07	12.25**	1.29	.22	.07	8.78**	1.24	.19	.18	1.01	1.20
Protective Factor Index	---	---	---	---	-.24	.06	16.16**	.79	-.26	.11	5.60**	.77
RFI x PFI	---	---	---	---	---	---	---	---	.01	.04	.03	1.01
Constant	2.66	1.16	5.31**		4.13	1.22	11.54**		4.23	1.32	10.23**	
-2 log likelihood	693.274				676.334				676.300			
χ^2	37.972				54.912				54.946			
p	.000				.000				.000			
Model Prediction Rate	79.10%				79.94%				79.94%			

* $p < .10$; ** $p < .05$

while those with more education were less likely to be delinquent. In addition, the RFI emerged as significantly related to delinquency and in the predicted direction. That is, the accumulation of risk factors corresponds with an increase in the likelihood of reporting involvement in delinquency. As indicated in the log odds of the coefficients, each additional risk factor corresponded with a 24 percent increase in the likelihood of being delinquent.

In the second model, Table 3.23 again reveals that being male and scoring higher on the RFI corresponds with an increase in the likelihood of self-reporting delinquency. The addition of the PFI also surfaced as a significant predictor of delinquency and was also in the predicted direction. That is, individuals scoring higher on the PFI were less likely to report involvement in delinquency. Comparing the log odds of the coefficients for the RFI and the PFI, it is apparent that each additional risk factor accounts for a 24 percent increase in reporting delinquent involvement, while each additional protective factor accounts for a 21 percent decrease in this behavior. It is also noteworthy to point out that the inclusion of the PFI failed to counteract the effects of the RFI; the risk index remained significant following the inclusion of the PFI. This finding would appear to suggest that protective factors have a direct effect on delinquency over and above the effects of risk but do not counteract or weaken that relationship.

Finally, the third model in Table 3.23 adds the RFI x PFI interaction term into the equation predicting self-reported delinquency. Similar to the preceding analyses, males were more likely to report delinquent involvement. Interestingly, of the three variables of interest, only the PFI remains a significant predictor of delinquency. That is, individuals scoring high on the PFI were less likely to report delinquent involvement. A non-significant RFI x PFI

interaction suggests that the accumulation of protective factors has a direct effect on reducing the likelihood of delinquent involvement, however, they do not function to moderate the effects of risk.

The identical analytic procedure was applied using self-reported drug use as the dependent variable. Table 3.24 reports the results of the three logistic regressions. Beginning with the base model with the RFI, Table 3.24 reveals that each of the demographic control variables were significantly related to an individual's self-reported drug use. Older individuals, males, Hispanics, and whites were all more likely to use drugs. Alternatively, those with more years of education were significantly less likely to report using drugs. The RFI was also found to have a significant and positive effect on reporting drug use. Similar to the model predicting delinquency, the accumulation of risk factors corresponds with an increase in the likelihood of reporting involvement in drugs. As indicated in the log odds of the coefficients, each additional risk factor corresponded with a 25 percent increase in the likelihood of using drugs.

The second model in Table 3.24 adds in the PFI as an independent predictor of self-reported drug use. Again, each of the demographic control variables remained significant predictors in the directions described above. Examination of the RFI also suggests that it retained a positive and significant influence on drug use. Similar to the model predicting delinquency, the addition of the PFI also surfaced as a significant predictor of drug use and was also in the predicted direction. That is, individuals scoring higher on the PFI were less likely to report drug involvement. Comparing the log odds of the coefficients for the RFI and the PFI, it is apparent that each additional risk factor accounts for a 22 percent increase in

Table 3.24 Logistic Regression Coefficients Predicting Self-Reported Drug Use

Variables	Base Model With Risk Factor Index (n = 711)				Base Model With Risk and Protective Factor Indices (n = 711)				Base Model Adding RGI x PFI Interaction (n = 711)			
	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)	B	S.E.	Wald	Exp (b)
Age	.27	.06	19.03**	1.30	.23	.06	13.35**	1.25	.23	.06	13.34**	1.25
Sex	.38	.16	5.71**	1.46	.38	.16	5.59**	1.46	.39	.16	5.88**	1.48
Hispanic	.94	.23	16.12**	2.55	.93	.23	15.84**	2.54	.95	.23	16.34**	2.58
White	.95	.19	24.25**	2.59	.99	.20	25.90**	2.70	.99	.20	25.65**	2.69
Years Education	-.23	.07	11.94**	.79	-.17	.07	6.16**	.84	-.16	.07	5.51*	.85
Risk Factor Index	.22	.06	13.40**	1.25	.20	.06	10.56**	1.22	.33	.14	5.50*	1.39
Protective Factor Index	---	---	---	---	-.14	.05	7.95**	.87	-.05	.10	.30	.95
RFI x PFI	---	---	---	---	---	---	---	---	-.03	.03	1.02	.97
Constant	-3.73	.98	14.38**		-3.03	1.01	8.97**		-3.50	1.12	9.83**	
-2 log likelihood	907.574				899.516				898.490			
χ^2	70.666				78.724				79.749			
p	.000				.000				.000			
Model Prediction Rate	64.27%				63.28%				63.98%			

* $p < .10$; ** $p < .05$

drug involvement while each additional protective factor accounts for a 13 percent decrease in this behavior. Similar to the delinquency model, it is also noteworthy to point out that the inclusion of the PFI failed to counteract the effects of the RFI. Again, this finding would appear to suggest that protective factors have a direct effect on drug use over and above the effects of risk but did not counteract or weaken that relationship.

Finally, the third model in Table 3.24 adds the RFI x PFI interaction term into the equation predicting self-reported drug use. Again, each of the demographic control variables remained significant in the directions described above. Notably, however, of the three variables of interest, only the RFI remains a significant predictor of drug involvement. That is, individuals scoring high on the RFI were more likely to report delinquent involvement. A non-significant PFI and RFI x PFI interaction suggests that the accumulation of protective factors failed to produce a direct effect on reducing the likelihood of drug involvement and did not function to moderate the effects of risk.

INTERNAL BEHAVIORAL PROBLEMS OF RESILIENT YOUTHS

In the final set of analyses, the levels of depression between resilient and non-resilient youths for self-reported delinquency and drug use was investigated. As reflected in the top portion of Table 3.25, individuals who were identified as being resilient against delinquency scored significantly lower on the depression scale ($\bar{x} = 2.612$) than those who were not resilient ($\bar{x} = 3.955$; $p < .01$). These results were replicated when differences between resilients and non-resilients for self-reported drug use ($\bar{x} = 3.206$ vs. $\bar{x} = 4.264$; $p < .01$). Each of these findings is inconsistent with previous research investigating whether resilients

Table 3.25 Mean Comparisons Between Levels of Depression of Resilient and Non-Resilient Youths for Self-Reported Delinquency and Drug Use (n = 425)

Resiliency For Delinquency			
Variable	Resilient \bar{x} (sd)	Non-Resilient \bar{x} (sd)	t value
Depression	2.612 (3.53)	3.955 (3.37)	2.972*

Resiliency For Drug Use			
Variable	Resilient \bar{x} (sd)	Non-Resilient \bar{x} (sd)	t value
Depression	3.206 (3.10)	4.264 (3.64)	3.217*

* p < .01

experience greater levels of internal behavior problems (see Luthar 1991; Werner and Smith 1992). That is, while previous research has suggested that resilients appear to internalize their problems and suffer from higher levels of depression, these results were not supported using the present sample.

CHAPTER 4

DISCUSSION

As depicted in Chapter 1, although a considerable amount of research has focused on the concept of risk and the effects these factors have on increasing an individual's likelihood of being delinquent, much less attention has centered on the concept of protection and the influence these factors have on reducing delinquency and crime. More importantly, comparatively less research has demarcated the importance of how protective factors function to prevent high-risk individuals from involvement in serious criminal activities; in other words, to foster resiliency. The extant research examining resiliency has suffered from a number of limitations including the reliance on small, non-probability samples with limited generalizability to larger populations. In light of the limitations surrounding this literature, the present research extended the current knowledge base of resiliency by using a national probability sample of adolescents and by investigating the independent and cumulative effects that a variety of protective factors had on individuals' probability of being resilient against self-reported delinquency and drug use.

The final chapter of this report begins by summarizing the major findings of this research. Although the focus of this summary will center on the cumulative and general effects that protective factors have on resiliency, I will also address the findings related to each of the research questions presented in Chapter 1. Following this summary, a discussion of the theoretical and policy implications of this research will be presented in attempts to place these findings in their appropriate context. Notwithstanding the advances made on our understanding of resiliency by the present research, it is also noteworthy that several data-

related limitations exist. The third section of this chapter will discuss each of these limitations and how they potentially affect the interpretation of the findings. To conclude this chapter, a discussion of the potential future directions of resiliency research will be presented.

MAJOR FINDINGS

This report began by noting the scholarly emphasis placed on understanding the effects that risk factors have on influencing delinquency and crime. Notably, substantial criminological research has suggested that at one point or another over the life course, most individuals are faced with some type of risk—a factor or experience that increases the likelihood that an individual will be delinquent. Among the more important sources of risk are those that develop within the individual (i.e., low IQ), the family (i.e., child maltreatment), and the neighborhood (i.e., delinquent peers). Despite the variability in their individual importance, a long line of scholarly research has consistently suggested that experiencing risk increases the probability of involvement in delinquency and crime (see Loeber 1990).

As Rutter (1979) initially observed over three decades ago, however, the distribution of risk does not appear to be random and equally proportioned across the population. While some individuals experience a few risks, others are faced with a substantially larger number of risks. Observation of this distribution led Rutter (1979) to investigate the cumulative effects that multiple risk factors had on an individual's development. Rutter's (1979) research suggested that the accumulation of risk had a substantial effect on an individual's

developmental wellness. That is, individuals exposed to four or more risk factors were 10 times more likely to suffer from a psychiatric disorder compared to those experiencing zero risk factors. Therefore, while an isolated risk might only have relatively trivial effects on the likelihood of maladaptation, the cumulative effects were found to be significant and robust.

The data from this project provide additional support to Rutter's (1979) observations of the detrimental effects related to the accumulation of risk. As risks measured early in the life course accumulated within an individual, their likelihood of participating in illegal activities significantly increased. Notably, while approximately sixty percent of the sample having zero risk factors were delinquent, 84 percent of those having three or more risk factors—referred to as the “high-risk” group—were delinquent. Likewise, while approximately 27 percent of the sample having zero risk factors reported using drugs, 51 percent of the those experiencing three or more risk factors used drugs. The significant differences between the no-risk and the high-risk group is consistent with observations made by other scholars examining the relationship between risk and delinquent behavior and drug use (see Farrington et al. 1988; Kolvin et al. 1988b; Rutter 1979; Smith et al. 1995).

A pessimistic observer of the relationship depicted above might suggest that little hope exists for the high-risk population experiencing at least three risk factors. In other words, once individuals accumulate a substantial number of risks early in the life course, they are almost expected or predisposed to be involved in illegal activities. Indeed the evidence presented above empirically supports this observation. A close inspection of these data, however, provides an alternative, more optimistic, conclusion about the relationship between risk and delinquency and drug use. Namely, although individuals are exposed to a

substantial number of risks, some overcome their adversities and do not participate in illegal behaviors. In other words, some individuals remain resilient to the cumulative effects of multiple risk factors.

As Werner and her colleagues observed over the course of the preceding two decades, there is a portion of the high-risk population that does not fall prey to the detriments associated with an accumulated number of risks (Werner and Smith 1982; Werner and Smith 1992). Following a birth cohort for over three decades, Werner and her colleagues found that as many as two-thirds of the high-risk population refrained from involvement in illegal behaviors. More recent research using samples drawn from different cultures lend support to Werner's findings (see Lösel 1994; Lösel and Bliesener 1990; Rutter and Giller 1983; Smith et al. 1995). In short, it has been empirically verified that there exists a portion of the high-risk population that has the potential to avoid or escape involvement in delinquency and crime.

The data presented in this research project appear to be relatively consistent with previous resiliency research. That is, of those youths experiencing three or more risks, 16 percent did not self-report involvement in delinquency and 49.3 percent did not self-report involvement in drugs. In other words, roughly one-sixth of the high-risk cohort were resilient against delinquency and almost one-half of the high-risk cohort were resilient against drug use. From an optimists perspective, efforts must be made to more thoroughly understand why a small percentage of the high-risk group succeed in life and do not participate in delinquency and drug use. As discussed above, the main focus of the present

research involved identifying the important protective factors that were significant in preventing these high-risk individuals from involvement in delinquency and drug use.

In an effort to empirically investigate this issue, scholars have produced evidence suggesting that factors within the individual (i.e., self-esteem), the family (i.e., supportive milieu), and the community (i.e., organizational involvement) serve as important protective factors that promote resiliency (see Garnezy 1985; Garnezy and Masten 1986; Rutter 1985; Werner 1989). Including a substantial number of these factors, the evidence produced in this research project, however, would generally suggest that *individual* protective factors had only trivial effects on the likelihood of being resilient against self-reported delinquency and drug use. For example, beginning with the models predicting resiliency against self-reported delinquency, significant individual protective factors only emerged in the female-specific sample. The models predicting resiliency against self-reported drug use, however, provide a somewhat more promising picture of the effects of individual protective factors. Specifically, significant protective factors emerged in each of the models, however, there did not appear to be a consistent pattern within the results. That is, no single protective factor was found to be significant across all of the analyses. Therefore, similar to the effects of risk, these data would appear to suggest that no "magic" protective factor exists to promote resiliency against self-reported delinquency and drug use.

The absence of any consistently significant individual protective factor across the analytical models might appear to be somewhat inconsistent with previous resiliency research. Close inspection of the extant research, however, might yield two potential explanations for this finding. First, it can be argued that no previous resiliency research has

been undertaken on a population that is as heterogeneous and culturally diverse as the NLSY child-mother data. Because the NLSY is a national sample that oversamples African-Americans and Hispanics, it might be possible that the diversity makes it difficult to uncover consistency in protection similar to what was found in more homogeneous populations (Smith et al. 1995; Werner and Smith 1992).

Second, and related, no previous resiliency research has investigated in such a systematic manner the importance of each of the protective factors across the sample as a whole, the various sub-samples, and different definitions of resiliency (but see Werner 1993). Therefore it was actually expected that embarking on such an analytical strategy would likely yield differences in the importance of protective factors across these sub-samples and potentially across resiliency against delinquency and drug use (Smith et al 1995). While some differences were found across each of the dependent variables, the models were not found to be significantly different. Therefore, subsequent empirical examinations of these potential differences were not completed. Given the above evidence, these findings do not appear to be substantively inconsistent with prior investigations of resiliency.

Having established the absence of a "magic" protective factor, the analysis shifted to the potential cumulative effects of protective factors on influencing resiliency. In other words, following a similar logic in the examination of the effects of risk factors—the cumulative effect was more important than the independent effect—the analytic strategy turned to investigating whether higher levels of protection significantly influenced an individual's likelihood of being resilient. Similar to the effects of multiple risk factors, the accumulation of protective factors is strongly related to positively influencing resiliency. In

fact, only the white-specific multivariate model for resiliency against self-reported drug use failed to produce a statistically significant relationship between the PFI and resiliency. Combined with the data presented above, and consonant with previous research, the consistency of the PFI to emerge as a significant predictor of resiliency suggests that the cumulative effects of protection are substantially more important than the independent effects (see Jessor et al. 1995).

While the effects of the accumulation of protective factors remains important, this finding generates two subsequent questions. First, if the independent effects of protective factors are relatively trivial and the accumulation of protective factors is important, at what point does the accumulation of protection become important? In other words, how many protective factors are needed to significantly influence an individuals' likelihood of being resilient? The analyses suggested for both measures of resiliency that when individuals possessed three or more protective factors, they became significantly more likely to be resilient than those below this threshold. Therefore, an individual's likelihood of being resilient is not significantly affected until approximately three of the protective factors measured in this research are present. The implications of this finding are discussed below.

A second question that stems from the cumulative effect findings relates to the importance of the combination of specific protective factors in promoting resiliency. In other words, does a specific combination of protective factors exist that significantly influence an individual's likelihood of being resilient? That is, does the importance of the combination of protective factors vary according to where they exist (i.e., in the individual or in the family)? To examine this question, the protective factors were grouped into three relatively

distinct domains. Beginning with resiliency against self-reported delinquency, no clear evidence was found that suggests protective factors present in one domain were any more important than those within another domain. With respect to resiliency against self-reported drug use, however, the *individual* protective factor index and the *family* protective factor index both emerged as significant factors. Therefore, much like risk-related research, individual differences and family factors play an important role in the likelihood of an individual using drugs.

Few of the prior studies examining resiliency have attempted to investigate whether the importance of protective factors varies according to sex and racial background (but see Werner 1993). Investigation of this question becomes important because protective factors may operate differently across these groups which would lead to potentially different theoretical and policy implications. Namely, if differences were found across these categories, theoretical explanations of resilient behavior would be required to account for these empirical regularities. Further, policies that guided efforts to intervene might be more effective if they were gender or race-specified.

The evidence provided in this report does not appear to support the differential effects of protective factors across categories of race or gender and across the two measures of resiliency. While protective factors emerged for some groups but not for others, the reduced models were never found to be statistically different from the full model. Consistent with previous resiliency research examining similar hypotheses (see Grossman, Beinashowitz, Anderson, Sakuri, Finnin, and Flaherty 1992), these findings would appear to suggest that the differences in protective factors across categories of race and gender are only differences

in *degree*, but not in *kind*. Again, given the findings presented above, theoretical articulations of resilience and intervention strategies to promote resilience might be considerably more parsimonious.

In an effort to examine whether protective factors moderated the effects of risk, the analysis shifted to a focus on the interaction of the RFI and PFI. Again, if the protective factors in this research exhibited a moderator effect then their interaction with the risk index would have yielded a significant coefficient with additional explained variance (see Baron and Kenny 1986). As exhibited, the protective factors had a direct effect on delinquency and drug use, however, they did not appear to moderate the effects of risk. The absence of a moderator effect exhibited by the protective factors might seem somewhat inconsistent with previous research (see Jessor et al. 1995). The moderator effects found in the Jessor et al. (1995) research, however, were not substantial. As McClelland and Judd (1993, p. 377) observe, "moderator effects are notoriously difficult to detect in nonexperimental field studies." In fact, similar to the findings presented above, research examining resilient behavior for adolescents also failed to uncover moderator effects (Grossman, Beinashowitz, Anderson, Sakuri, Finnin, and Flaherty 1992). As such, the absence of moderator effects in this report is not completely inconsistent with previous research.

Finally, the evidence reviewed in Chapter 1 suggests that individuals abstaining from delinquent involvement were not necessarily "normal" individuals (Luthar 1993; Moffitt 1997). This evidence in favor of this position reveals that as non-resilient individuals externalize their problems through unconventional alternatives like delinquency and drug use, the resilient individuals internalize their problems and experience greater levels of

anxiety and depression. Research examining the resiliency of adolescents placed at risk because of interparental conflict have produced findings contrary to this position (Neighbors et al. 1993). In this research, Neighbors and his colleagues found that resilient individuals scored lower on anxiety and depression scales than the non-resilient group. Examining levels of depression between those identified as resilient and non-resilient, results from this project appear to support the findings of the latter position. That is, on both measures of resiliency, the non-resilients scored significantly higher on the depression scale than the resilients. Future research would be helpful in understanding the disparity in the findings related to the internal behavioral problems of individuals identified as resilient.

In light of these findings, the data in this project appear to suggest that the effects of protective factors appear to be general, operating across categories of race and gender, and across different types of behavior (i.e., delinquency and drug use). In addition, protective factors had a direct effect on delinquency and drug use; however, they failed to moderate the relationship between risk and these behaviors. Finally, the evidence generally suggests that resilient youths do not develop abnormally as reported in previous research. These findings have both theoretical and implications and each are discussed, in turn, in the following section.

IMPLICATIONS OF FINDINGS

One of the many unique qualities of social science research is that the results of studies have the capacity to potentially affect the lives of human beings. The means by which this impact occurs is typically through the advancement of theory and the development

of policies that are placed into action. The findings of this report have implications for a theoretical articulation of resiliency as well as the policies that might enhance the likelihood an individual maintains resiliency. Each of these implications is discussed in turn below.

As reviewed in Chapter 1, the utility of developmental theories is fundamentally based on their ability to explain the variety of dimensions—onset, persistence, and desistence—of delinquency and crime. Contrary to theories more general in nature (Gottfredson and Hirschi 1990; Wilson and Herrnstein 1985), current efforts to theoretically articulate the array of factors that cause an individual to begin, continue, and terminate an offending career have generally suggested that different variables account for distinct offending dimensions (Moffitt 1993; Patterson and Yoerger 1993; Sampson and Laub 1993; Thornberry 1987). In fact, empirical verification of the differences in these predictors is beginning to accumulate across a variety of longitudinal data sets (Jang 1999; Nagin and Farrington 1992; Simons et al. 1994; Smith and Brame 1994).

While developmental theorists have advanced theoretical explanations of delinquency and crime that recognize the divergent pathways into offending, the majority of these efforts appear to be noticeably silent about the small subset of individuals who develop in high-risk environments yet, for some reason, do not engage in illegal behaviors. That is, for the most part, scholars have theoretically ignored the cohort of high-risk individuals who refrain from involvement in delinquency and crime over the life course. Ironically, this omission has occurred despite optimistic viewpoints on the developmental perspective made by Lösel (1994, p. 282):

The focus of developmental sequences has not just resulted in research on the 'bad side' like escalation and criminal careers. The developmental

perspective has also strengthened the attention given to positive phenomena. This includes not only deescalation or desistence after a more or less severe period of offending but also the question why some individuals do not develop problem behavior despite their high risk (resilience).

As a potential exception to this omission, Moffitt (1993) has at least recognized the existence of such a cohort in her dual taxonomic theory of offending. As will be discussed below, however, Moffitt only attempts to explain the existence of this cohort of individuals through the absence of the factors used to explain the adolescence-limited pathway of offending; that is, the absence of risk. Specifically, Moffitt (1993) argues that individuals abstain from offending because they fail to experience the "maturity gap" or lack the exposure to delinquent peers. At no point are protective factors theorized to explain the existence of why these individuals do not participate in delinquent or criminal behavior. Given the findings presented in this report, inclusion of a number of protective factors into the explanation of the resilient cohort might provide a starting point for which theories of resiliency could evolve.

In terms of the advancement of a theory of resiliency, a few scholarly attempts have been made to explain antisocial and prosocial behavior using *both* risk and protective factors. For example, Catalano and Hawkins (2000) present a social development theoretical model. This model includes actual and perceived prosocial opportunities as well as attachment and commitment to prosocial others and activities as processually linked to a prosocial pathway of behavior. Similarly, Jessor and his colleagues (1991) have advanced a problem-behavior theory that includes three psychosocial explanatory systems—the personality system, the perceived environment system, and the behavior system—which encompass *both* risk and protective mechanisms. Although the inclusion of protective factors is a promising initial

effort to expand on Lösel's views described above, it is also noteworthy to point out that the intent of these theoretical approaches is in the explanation of *antisocial* and not *prosocial* behaviors. Although instructive, the focus on delinquent or criminal activities presupposes our general scholarly nature to focus on the negative behaviors at the expense of the positive behaviors.

The findings presented in this report would appear to suggest that scholars advancing a theory of resiliency would be wise to consider the cumulative effects of protective factors. Moreover, in the interest of parsimony, it might be prudent for researchers to further examine the array of mechanisms through which protective factors "interlock" so as to promote resiliency. Arguably, empirical literature uncovering the processes through which protective factors function to explain resiliency would provide the foundation for which theory construction could exist (Garmezy 1985).

Although the advancement of a theory of resiliency is relatively underdeveloped, traditional criminological theories might offer competing explanations for the manifestation of resiliency. For example, the coping mechanisms encompassed within Agnew's (1992) general strain theory are likely to offer partial explanation of resiliency. In addition, advocates of deterrence or rational choice theories might contend that the empirical models were misspecified in that individuals with higher levels of protective factors are also more likely to be deterred. Therefore, it is not the protective factors that instigate resilient behavior, but the increased likelihood of those possessing these factors to be deterred. Supporters of control theory might also suggest that resilient individuals possess higher levels of the social bonds (i.e., attachment, commitment, involvement, and belief) that are

theorized to prevent an individual from becoming delinquent (Hirschi 1969). Finally, advocates of social learning theories might contend that individuals evidencing resilient behavior are less likely to be exposed to antisocial definitions and models of delinquent behavior (Akers 1985; Bandura 1982). Accordingly, it would be expected that without exposure to these definitions favorable to law violation, few individuals would participate in delinquent behavior. In short, although these competing explanations were not examined in this report, it is presumed that a variety of traditional criminological theories offer potential explanations of resilient behavior.

From a policy perspective, the results of this research would suggest that strategies to intervene in the lives of adolescents should be broad-based and involve attention to modifying the dynamic risk *and* protective factors. Among the intervention strategies in the treatment literature, there is no uncertainty that the majority of programs target malleable risks (Andrews and Bonta 1994). As Jessor (1993, p. 121) argues, however, "a social policy agenda should be concerned not only with the reduction of risk but with the strengthening of protection as well." For example, the multisystemic therapy approach appears to be one family and community-based intervention strategy that combines treatment efforts within a variety of different domains (Henggeler 1999). Therefore, focusing on the positive aspects (protection) of the lives of individuals is likely to return additional benefits over and above the attention only to the negative aspects (risk).

Efforts to affect the accumulation of protection do not have to be delayed until the adolescent period as implied in this report; the methodological challenges described in Chapter 2 required that protection be measured subsequent to risk. Instead, it is argued that

attempts at accumulating protective factors should begin in the early formative years when the effects of risk have been found to be the most profound (Shaw, Owens, Vondra, Keenan, and Winslow 1996). As Yoshikawa (1994, p. 44) observes, "early family support and education may achieve long-term prevention of antisocial behavior and delinquency through short-term effects on multiple early risk factors such as parenting quality, child cognitive ability, parental educational status, family size, and family income level." In short, prevention efforts existing in multiple domains are likely to yield the greatest return if delivered early in the life course.

LIMITATIONS OF THE CURRENT RESEARCH

Although the findings presented above advance the current state of resiliency research, the reader should be aware of a number of limitations in the data. First, the delinquency measures—and consequently the resiliency measure—are left-censored. That is, because the NLSY does not request youths below the age of 15 to respond to the delinquency items, the measurement of resiliency was only examined at 2 consecutive points in time in mid-adolescence and into adulthood. This measurement strategy is problematic because it is possible that individuals may be involved in delinquency and crime either prior to or subsequently following the waves used in the analysis. Because of the left-censoring problem, individual's involvement in delinquent behavior before the age of 15 could not be identified and the reader should assume that at least a portion of the individuals participated in delinquent activities during their earlier ages. The extent of this problem, however, can not be articulated.

Second, and of equal concern, because of the methodological design of the survey—individuals were interviewed in *two-year* intervals but only asked about their delinquent involvement over the preceding year—there is a non-zero probability that individuals defined as resilient could have been involved in criminal activity following the preceding wave and prior to the bounding period of the delinquency items. Again, this measurement strategy could potentially be identifying individuals as resilient even though they were involved in delinquent or drug-related activities between the assessment time points. Given the secondary nature of the data, however, there is no way of examining the extent of this problem or a way of correcting for it. At the very least, it should be assumed that a portion of the individuals are incorrectly identified as being resilient.

Third, although it is recognized that exposure to risk occurs at each stage of development, the isolation of the high-risk cohort was based entirely on factors that occurred early in the life course. Utilization of these factors was partly determined by their availability in the data set and partly determined by an effort to be consistent with previous resiliency research and measure risks at a point prior to protection. As such, it can not discern whether the effects found in this research project would apply to risks experienced later in the life course. Future studies considering these risk factors (i.e., delinquent peers) would substantially contribute to our understanding of resiliency.

In a similar fashion, noticeably absent are individual-level risks (i.e., self-control or hyperactivity) that have been previously identified as increasing the likelihood of offending (Gottfredson and Hirschi 1990; Wilson and Herrnstein 1985). Although some of these measures were available in the NLSY, these factors were not included because of their

potential confounding effects in the isolation of the high-risk cohort. For example, because an individual's level of hyperactivity could be considered as both an outcome of early risk factors and a predictor of subsequent delinquency, inclusion of such a risk could potentially result in their being double-counted. Future efforts to understand the nature of resiliency, however, might benefit from the inclusion of these measures given their importance in the explanation of delinquency and crime over the life course.

Fourth, because of the small proportion of individuals in adulthood, investigation of whether protective factors were invariant across developmental periods could not be examined. Research examining the causes of delinquency and crime over the life course appears to suggest that factors possess different levels of influence depending on when they emerge (LeBlanc and Loeber 1998). For example, family factors retain stronger effects in early childhood while peer effects seem to increase in importance during adolescence (but see Jang 1999). Werner (1993) has made an initial attempt at distinguishing the importance of protective factors across developmental periods. Future research would only benefit Werner's initial findings.

Fifth, the data did not permit the investigation of the effects of a number of other protective factors that have been found to influence resiliency in previous research. For example, future studies should examine other potential protective factors that have been found to influence resiliency, such as an individual's problem solving skills, coping strategies, temperamental characteristics, locus of control, educational aspirations, and parental competence (Rutter 1990; Smith et al. 1995; Thomas and Chess 1984; Werner 1989). Advancement in the knowledge of these protective factors using samples from

diverse environments and investigating their influence at different stages of the life course would aid in attempts at articulating a theory of resiliency.

Finally, the measurement of delinquency was based solely on the youth's self-reports. While these measures have the advantage of capturing delinquent behavior that is not recorded by law enforcement officers, they suffer from inaccuracies associated with an individual failing to report a delinquent event. Efforts to cross-validate or triangulate these measures using teacher reports, parental reports, and official records would provide a more lucid picture on who is truly resilient. In short, efforts must be made to identify all of the potential environments in which individuals could manifest delinquent and criminal behaviors.

FUTURE RESEARCH ON PROTECTIVE FACTORS AND RESILIENCY

The advances made in this research are envisioned as only a starting point upon which future studies of resiliency could continue to build. A number of questions relating to a more in-depth understanding of resiliency have yet to be addressed in a systematic fashion. First, future research should investigate the processes or mechanisms that underlie the manifestations of stress-resistant behavior in children (Rutter 1985, 1987). The extant research has uncovered a number of different protective factors that appear to be correlated with resiliency in a bivariate and multivariate fashion. Efforts must now be made to understand how these factors fit together to improve the odds of an individual being resilient. Using a sample of institutionalized German youths, Lösel and his colleagues (1990) have begun to model these relationships and have found that individual, family, and environmental

protective factors interlock in promoting resilient behavior. Studies using longitudinal data collected in the United States would be a starting point for externally validating these initial findings.

Second, on a related theoretical front, future research would benefit from investigating Moffitt's (1993) hypotheses about those who abstain from delinquency. In articulating her theory, Moffitt (1993) predicted that the majority of offenders—the adolescence-limiteds—are involved in delinquency primarily for two reasons. First, these individuals experience a "maturity gap" in which they are biologically prepared to take on adult roles yet socially restrained from doing so. Second, these individuals are exposed to the delinquent behavior of their lifecourse persistent peers. Although not using the "resiliency" terminology, Moffitt (1993) also suggests that a small percentage of individuals do not participate in delinquent offenses. Moffitt (1997, p. 33) offers two hypotheses for this finding: "some youths may skip the maturity gap because of late puberty or early initiation into adult roles. Others may be excluded from opportunities for mimicking life-course-persistent delinquent models." As discussed above, investigation of the reasons why this latter group abstained from involvement in delinquency and crime over the life course could provide insight into confirming or disconfirming Moffitt's hypotheses.

Third, future studies should integrate more thoroughly the positive aspects of resilient behavior (Garmezy, Masten, and Tellegen 1984; Reynolds 1998). Abstention from serious forms of delinquency and crime are important starting points for an understanding of the effects of risk. Exclusively examining these behaviors, however, does not accurately characterize the positive aspects of the life of a resilient individual. For example, future

research could include the successes in the educational, family, and social environments that co-exist with the absence of involvement in unconventional behavior (see Reynolds 1998).

Fourth, future research should seek to examine the methodological issues, particularly in terms of measurement, related to the concepts of risk, protection, and resiliency (Kinard 1998). As Lösel (1994, p. 284) points out, "the major conceptual problem in resiliency research is the definition of a factor as protective." Considering that protective factors appear to be the most important concepts in resiliency research, it is essential that improvement be made to insure these factors are conceptually distinct from their risk counterparts. As clarity is gained in the measurement processes, it is hoped that resiliency research will become more uniform and comparable across studies.

Fifth, following the tradition of research investigating the causal factors associated with delinquency, future studies examining resiliency might advance the knowledge base by investigating the potential differential effects that protective factors of a social selection nature possess versus protective factors of a social causation nature. Although Garnezy (1985) has categorized important protective factors in the areas of the individual, the family, and the external support system—the individual encompassing social selective factors while the family and external support system representing social causation factors—subsequent research has not disentangled the relative influence that protective factors in these broader categories possess in enhancing resiliency. In addition, it would be useful to assess whether these factors within these broader domains are time invariant. Inclusion of each of these factors into models predicting resiliency would allow researchers to begin understanding these potential independent influences.

Finally, future research examining resiliency might advance the knowledge base by using life-history calendars to investigate the short-term or proximal effects that protective factors might possess in enhancing resiliency. Previous longitudinal research has applied such a methodology to a sample of adult prison inmates in efforts to understand how a variety of life-circumstantial risks increases the probability of offending (Horney et al. 1995). This same methodology could be applied to individuals in efforts to understand the protective factors that correspond with sustained resiliency. Results of this research might be informative in understanding the life circumstances—for example, a supportive relationship with a coach or teacher—that function in a protective manner to maintain resiliency. Moreover, this type of fine-grained analysis might also be helpful in elucidating why individuals who are resilient begin to participate in delinquent and criminal behavior.

In concluding this report, rarely is an individual in a position to modify the exposure to the large number of potential risk factors experienced early in the life course. Unfortunately, however, risks experienced early in the life course have a substantial effect in placing these individuals on trajectories that warrant a high likelihood of participation in delinquency and crime (Shaw et al. 1996). In fact, the likelihood of offending is exacerbated with each additional risk experienced (Rutter 1979). This pessimistic view, however, is counteracted by the effects that protective factors have throughout the life course. It is anticipated that the evidence presented in this report will provide an avenue of hope for high-risk youths—a hope that is embedded in the variety of protective factors that enable a youth to overcome the effects of risk and refrain from involvement in serious forms of delinquency

and crime; a hope that allows these youths to develop in a positive manner; a hope that we do not prohibit attempts at helping those who are most at-risk accumulate protection.

Appendix 2.1. Measurement of Variables and Descriptive Statistics

Variables	Description (type of variable, code, range)	Mean	Standard Deviation
Dependent Variables			
Resiliency From Delinquent Involvement	Dichotomous variable, 1 = no involvement in delinquent activities from Wave 3 to Wave 6.	0.78	0.41
Resiliency From Drug Involvement	Dichotomous variable, 1 = no involvement drugs from Wave 3 to Wave 6.	0.47	0.50
Depression	Continuous variable, scale ranging from 1 (low level of depression) to 6 (high level of depression); Cronbach's $\alpha = .72$.	3.61	3.36
Independent Variables			
RISK FACTORS			
Adolescent Motherhood	Dichotomous variable, 1 = mother giving birth below the age of 19.	0.58	0.49
Large Family Size	Dichotomous variable, 1 = four or more children.	0.15	0.36
Parental Deviance	Dichotomous variable, 1 = mother self-reported delinquent involvement.	0.69	0.46
Non-Intact Marriage	Dichotomous variable, 1 = mother was divorced, separated, or widowed between 1979 and 1986.	0.44	0.50
Persistent Poverty	Dichotomous variable, 1 = lived in poverty for at least two assessment periods.	0.59	0.49
Maternal Smoking During Pregnancy	Dichotomous variable, 1 = mother smoked during pregnancy.	0.35	0.48
Low Birth Weight	Dichotomous variable, 1 = individual born at or below 5.5 pounds	0.12	0.32

Appendix 2.1. Measurement of Variables and Descriptive Statistics (continued)

Variables	Description (type of variable, code, range)	Mean	Standard Deviation
PROTECTIVE FACTORS			
Self-Esteem	Continuous variable, scale ranging from 10 = low self-esteem to 40 = high self-esteem; Cronbach's α = .86.	32.68	4.32
Self-Perceived Scholastic Competence	Continuous variable, scale ranging from six = low scholastic competence to 24 = high scholastic competence; Cronbach's α = .76.	16.93	4.16
Self-Perceived Global Self- Worth	Continuous variable, scale ranging from six = low self-worth to 24 = high self-worth; Cronbach's α = .75.	19.99	3.65
Academic Competence	Continuous variable, scale ranging from -1.86 = low academic competence to 2.37 = high academic competence; Cronbach's α = .83.	0.00	1.00
Positive School Environment	Continuous variable, scale ranging from 5 equals less positive school environment to 20 = more positive school environment; Cronbach's α = .56.	14.57	2.84
Cognitive Stimulation	Continuous variable, standard scores ranging from 43.30 = low cognitive stimulation to 124.50 = high cognitive stimulation.	95.28	15.65
Emotional Support	Continuous variable, standard scores ranging from 39.10 = low emotional support to 122.10 = high emotional support.	96.61	16.50
Religiosity	Continuous variable, scale ranging from -2.97 = low religious involvement and commitment to 2.81 = high religious involvement and commitment; Cronbach's α = .64.	0.00	1.71

Appendix 2.1. Measurement of Variables and Descriptive Statistics (continued)

Variables	Description (type of variable, code, range)	Mean	Standard Deviation
Control Variables			
Age	Continuous variable, range from 16 to 23.	17.97	1.58
Race	Dichotomous variable, 1 = white.	0.33	0.47
Sex	Dichotomous variable, 1 = male.	0.51	0.50
Years of Education	Continuous variable, range from 6 to 16	10.83	1.40

Appendix 2.2. Items Included in the Measurement of Variables

Variables	Items in Measure
Dependent Variables	
Resiliency From Delinquent Involvement	<p>In the last year, have you ever...</p> <ol style="list-style-type: none"> 1. Intentionally damaged or destroyed property of others 2. Got in fight at school or work 3. Taken something without paying for it 4. Taken something worth under \$50 5. Taken something worth more than \$50 6. Used force to get money from someone 7. Hit or seriously threatened someone 8. Attacked someone with the idea of seriously hurting or killing them 9. Tried to con someone 10. Taken a vehicle without the owner's permission 11. Broken into a building or vehicle to steal something 12. Knowingly sold or held stolen goods 13. Helped in a gambling operation like running numbers or books <p>In the last year, have you ever...</p> <ol style="list-style-type: none"> 1. Hurt someone enough to need a doctor 2. Taken something without paying for it 3. Damaged school property on purpose
Resiliency From Involvement in Drug Behavior	<p>In your lifetime, on how many different occasions have you used...</p> <ol style="list-style-type: none"> 1. Marijuana or hashish 2. Glue, gas, or other fluids 3. Powder cocaine 4. Crack cocaine 5. LSD, uppers, and downers
Depression	<ol style="list-style-type: none"> 1. I did not feel like eating, my appetite was poor 2. I had trouble keeping my mind on what I was doing 3. I felt depressed 4. I felt that everything I did was an effort 5. My sleep was restless 6. I could not get going
Independent Variables	
RISK FACTORS	
Adolescent Motherhood	1 = Mother giving birth before the age of 19

Appendix 2.2. Items Included in the Measurement of Variables (continued)

Variables	Items in Measure
Large Family Size	1 = Four or more children at wave 1
Parental Deviance	1 = Self-reported involvement in at least one of 17 behaviors In the last year, have you ever... 1. Intentionally damaged or destroyed property of others 2. Got in fight at school or work 3. Taken something without paying for it 4. Taken something worth under \$50 5. Taken something worth more than \$50 6. Used force to get money from someone 7. Hit or seriously threatened someone 8. Attacked someone with the idea of seriously hurting or killing them 9. Tried to con someone 10. Taken a vehicle without the owner's permission 11. Broken into a building or vehicle to steal something 12. Knowingly sold or held stolen goods 13. Helped in a gambling operation like running numbers or books 14. Used marijuana or hashish 15. Sold marijuana or hashish 16. Used any drugs to get high or for kicks, other than marijuana 17. Sold hard drugs such as cocaine, LSD, or heroin
Non-Intact Marriage	1 = Mother was separated, divorced, or widowed between 1979 and 1986
Maternal Smoking During Pregnancy	1 = Mother smoked during the 12 months preceding the birth of her child
Persistent Poverty	1 = Living in poverty for at least two assessment periods between 1979 and 1986
Low Birth Weight	1 = Child Born Weighing 5.5 pounds or less

Appendix 2.2. Items Included in the Measurement of Variables (continued)

Variables	Items in Measure
PROTECTIVE FACTORS	
Self-Esteem	<ol style="list-style-type: none"> 1. I feel that I am a person of worth, at least on an equal basis with others 2. I feel that I have a number of good qualities 3. All in all, I am inclined to feel that I am a failure 4. I am able to do things as well as most people 5. I feel that I do not have much to be proud of 6. I take a positive attitude toward myself 7. I wish I could have more respect for myself 8. I certainly feel useless at times 9. At times I feel that I am not good at all 10. On the whole, I am satisfied with myself
Self-Perceived Scholastic Competence	<ol style="list-style-type: none"> 1. Some kids are very good at school work, others worry 2. Some kids feel they are smart, others wonder if they are 3. Some kids finish school work quickly, others finish slowly 4. Some kids forget things, others remember easily 5. Some kids do well at classwork, others don't do so well 6. Some kids have trouble figuring out answers, others don't
Self-Perceived Global Self-Worth	<ol style="list-style-type: none"> 1. Some kids are unhappy, others are pleased with themselves 2. Some kids like their life, others do not 3. Some kids are happy with themselves as a person, others aren't happy 4. Some kids like the person they are, others wish they were someone else 5. Some kids are happy the way they are, others wish to be different 6. Some kids aren't happy with the way they do things, others are
Academic Competence	Continuous measure based on 162 items
Positive School Environment	<ol style="list-style-type: none"> 1. Most teachers help with personal problems 2. Most of my classes are boring 3. I don't feel safe at this school 4. Most teachers don't know their subjects well 5. You can get away with almost anything at school
Cognitive Stimulation	12-item measure from the HOME Short Form
Emotional Support	13-item measure from the HOME Short Form

Appendix 2.2. Items Included in the Measurement of Variables (continued)

Variables	Items in Measure
Religiosity	1. How important in your life is religion? 2. How often do you attend religious services?
Control Variables	
Age	Continuous measure in years
Race	1 = White
Sex	1 = Male
Number of Years Education	Continuous measure in years

REFERENCES

- Achenbach, T. M. and C. S. Edelbrock (1983). Manual for the Child Behavior Checklist and Revised Child Behavior Profile. Burlington, VT: University of Vermont, Department of Psychology.
- Andrews, D. A. and J. Bonta (1994). The Psychology of Criminal Conduct. Cincinnati: Anderson.
- Ahn, N. (1994). "Teenage Childbearing and High School Completion: Accounting for Individual Heterogeneity." Family Planning Perspectives 26:17-21.
- Akers, R. L. (1985). Deviant Behavior: A Social Learning Approach. Belmont: Wadsworth.
- Anthony, E. J. (1987). "Children at High Risk for Psychosis Growing Up Successfully." In E. J. Anthony and B. J. Cohler (eds.), The Invulnerable Child. New York: Guilford Press.
- Anthony, E. J. and B. J. Cohler (1987). The Invulnerable Child. New York: Guilford Press
- Auletta, K. (1982). The Underclass. New York: Random House.
- Avi-Itzhak, B., and R. Shinnar (1973). "Quantitative Models in Crime Control." Journal of Criminal Justice 1:185-217.
- Baker, P. C., C. K. Keck, F. L. Mott, and S. V. Quinlan (1993). NLSY Child Handbook: Revised Edition. Columbus, OH: Center for Human Resource Research.
- Baldwin, A. L., C. Baldwin, and R. E., Cole (1990). "Stress Resistant Families and Stress Resistant Children." In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, and S. Weintraub (eds.), Risk and Protective Factors in the Development of Psychopathology. New York: Cambridge University Press.
- Bandura, Albert (1982). "Social Learning Theory, Self-Regulation, and Morality" Ethics 92:409-446.
- Bane, M. J., and D. T. Ellwood (1986). "Slipping Into and Out of Poverty." Journal of Human Resources 21: 1-23.
- _____ (1989). "One-fifth of the Nation's Children: Why Are They Poor?" Science 1047-1053.

- Barocas, R., R. Seifer, and A. Sameroff (1985). "Defining Environmental Risk: Multiple Dimensions of Psychological Vulnerability." American Journal of Community Psychology 13:433-447.
- Baron, R. M., and D. A. Kenny (1986). "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations." Journal of Personality and Social Psychology 51:1173-1182.
- Bateson, P. and R. A. Hinde (1987). "Developmental Changes in Sensitivity to Experience." In M. H. Bornstein (ed.), Sensitive Periods in Development: Interdisciplinary Perspectives. Hillsdale, NJ: Erlbaum.
- Bell, C. C., and E. J. Jenkins (1993). "Community Violence and Children in Chicago's South Side." Psychiatry 56:46-54.
- Bellinger, D. B., H. L. Needleman, R. Bromfield, and M. Mintz (1984). "A Follow-Up Study of the Academic Attainment and Classroom Behavior of Children With Elevated Dentine Lead Levels." Biological and Heavy Metal Research 6:207-223.
- Berndt, T. J. (1989). "Obtaining Support from Friends During Childhood and Adolescence." In D. Belle (ed.), Children's Social Networks and Social Supports. New York: Wiley.
- Block, J. H., J. Block, and P. F. Gjerde (1986). "The Personality of Children Prior to Divorce: A Prospective Study." Child Development 57:827-840.
- Block, J., J. H. Block, and S. Keys (1988). "Longitudinally Foretelling Drug Usage in Adolescence: Early Childhood Personality and Environmental Precursors." Child Development 59:336-355.
- Blumstein, A., J. Cohen, J. A. Roth, and C. A. Visher (1986). Criminal Careers and Career Criminals. Washington, DC: National Academy Press.
- Blumstein, A., J. Cohen, and D. P. Farrington (1988a). "Criminal Career Research: It's Value for Criminology." Criminology 26:1-35.
- _____ (1988b). "Longitudinal and Criminal Career Research: Further Clarifications." Criminology 26:57-74.
- Born, M., V. Chevalier and I Humblet (1997). "Resilience, Desistance and Delinquent Career of Adolescent Offenders." Journal of Adolescence 20:679-694.

- Botting, N., A. Powls, R. W. Cooke, and N. Marlow (1997). "Attention Deficit Hyperactivity Disorders and Other Psychiatric Outcomes in Very Low Birthweight Children at 12 Years." Journal of Child Psychology and Psychiatry 38:931-941.
- Byrne, J. M. and Sampson, R. J. (1986). "Key Issues in the Social Ecology of Crime." In J. M. Byrne and R. J. Sampson (eds.), The Social Ecology of Crime. New York: Springer-Verlag.
- Bradley, R. H. and B. M. Caldwell (1980). "The Relation of Home Environment, Cognitive Competence, and IQ Among Males and Females." Child Development 51: 1140-1148.
- Caspi, A. and G. H. Elder (1988). "Childhood Precursors of the Life Course: Early Personality and Life Disorganization." In E. M. Hetherington, R. M. Lerner, and M. Perlmutter (eds.), Child Development in Life-Span Perspective. Hillsdale, NJ: Lawrence Erlbaum.
- Cernkovich, S. A. and P. C. Giordano (1992). "School Bonding, Race, and Delinquency." Criminology 30:261-291.
- Cicchetti, D. (1984). "The Emergence of Developmental Psychopathology." Child Development 55:1-7.
- Cicchetti, D. and M. Lynch (1993). "Toward an Ecological/Transactional Model of Community Violence and Child Maltreatment: Consequences for Children's Development." Psychiatry 56:96-118.
- Cicchetti, D. and S. L. Toth (1995). "A Developmental Psychopathology Perspective on Child Abuse and Neglect." Journal of the American Academy of Child and Adolescent Psychiatry 34:541-565.
- Cicchetti, D. and F. A. Rogosch (1997). "The Role of Self-Organization in the Promotion of Resilience in Maltreated Children." Development and Psychopathology 9:797-815.
- Cicchetti, D., M. L. Rogosch, and K. D. Holt (1993). "Resilience in Maltreated Children: Processes Leading to Adaptive Outcome." Development and Psychopathology 5:626-647.
- Clark, R. M. (1983). Family Life and School Achievement: Why Poor Black Children Succeed or Fail. Chicago: University of Chicago Press.

- Clogg, C., E. Petkova, and A. Haritou (1995). "Statistical Methods for Comparing Regression Coefficients Between Models." American Journal of Sociology 100:1261-1293.
- Cloward, R. A. and L. Ohlin (1960). Delinquency and Opportunity: A Theory of Delinquent Gangs. New York: Free Press.
- Cohen, A. K. (1955). Delinquent Boys: The Culture of the Gang. New York: Free Press.
- Compas, B. E. (1987). "Stress and Life Events During Childhood and Adolescence." Clinical Psychology Review 7:275-302.
- Conger, R., K. Conger, G. H. Elder, F. Lorenz, R. Simons, L. B. Whitbeck (1992). "A Family Process Model of Economic Hardship and Adjustment of Early Adolescent Boys." Developmental Psychology 63:526-541.
- Coyne, J. C., and G. Downey (1991). Social Factors and Psychopathology: Stress, Social Support, and Coping Processes." Annual Review of Psychology 16:401-425.
- Crnic, K. A. and M. T. Greenberg (1990). "Minor Parenting Stresses with Young Children." Child Development 61:1628-1637.
- Cullen, F. T. (1994). "Social Support as an Organizing Concept for Criminology: Presidential Address to the Academy of Criminal Justice Sciences." Justice Quarterly 11:527-559.
- Cullen, F. T., and K. Gilbert (1982). Reaffirming Rehabilitation. Cincinnati: Anderson Publishing Company.
- Cullen, F. T., N. Williams, and J. P. Wright (1997). "Work Conditions and Juvenile Delinquency: Is Youth Employment Criminogenic?" Criminal Justice Policy Review 2-3:119-143.
- Currie, E. (1985). Confronting Crime: An American Challenge. New York: Pantheon Books.
- Dean, C. W., R. Brame, and A. R. Piquero (1996). "Criminal Propensities, Discrete Groups of Offenders, and Persistence in Crime." Criminology 34: 547-574.
- Dilulio, J. J. Jr., and J. B. Grossman (1997). Youth Crime and Substance Abuse: Act-Now Strategies for Saving At-Risk Children. Report Submitted to the Robert Wood Johnson Foundation.

- Dinitz, S., F. R. Scarpitti, and W. C. Reckless (1962). "Delinquency Vulnerability: A Cross Group and Longitudinal Analysis." American Sociological Review 27:515-517.
- Dubow, E. F., and T. Luster (1990). "Adjustment of Children Born to Teenage Mothers: The Contribution of Risk and Protective Factors." Journal of Marriage and the Family 52:393-404.
- Dubow, E. F. and J. Tisak (1989). "The Relation Between Stressful Life Events and Adjustment in Elementary School Children: The Role of Social Support and Social Problem-Solving Skills." Child Development 60:1412-1423.
- DuRant, R. H., C. Cadenhead, R. A. Pendergrast, G. Stevens, and C. W. Linder (1994). "Factors Associated With the Use of Violence Among Urban Black Adolescents." American Journal of Public Health 84:612-617.
- Egeland, B., E. Carlson, and L. A. Sroufe (1993). "Resilience as Process." Development and Psychopathology 5:517-528.
- Elder, G. H. (1974). Children of the Great Depression. Chicago: University of Chicago Press.
- _____ (1995). "Perspectives on the Life Course." In G. H. Elder (ed.), Life Course Dynamics: Transitions and Trajectories. Ithaca, NY: Cornell University Press.
- Elder, G. H., T. V. Nguyen, and A. Caspi (1985). "Linking Family Hardship to Children's Lives." Child Development 56:361-375.
- Elliott, D. S., D. Huizinga, and S. S. Ageton (1985). Explaining Delinquency and Drug Use. Beverly Hills, CA: Sage.
- Elliott, D. S. and S. Menard (1996). "Delinquent Friends and Delinquent Behavior: Temporal and Developmental Patterns." In J. D. Hawkins (ed.), Delinquency and Crime: Current Theories. New York: Cambridge University Press.
- Elliott, D. S., D. Huizinga, and S. Menard (1989). Multiple Problem Youth. New York: Springer.
- Elster, A. B., R. Ketterlinus, and M. E. Lamb (1990). "Association Between Parenthood and Problem Behavior in a National Sample of Adolescents." Pediatrics 85:1044-1050.
- Emery, R. E. (1988). Marriage, Divorce, and Children's Adjustment. Beverly Hills, CA: Sage.

- Epstein, H. (1979). Children of the Holocaust. New York: Penguin Books.
- Eysenck H. J. and G. H. Gudjonsson (1989). The Causes and Cures of Criminality. New York: Plenum Press.
- Farnworth, M. (1984). "Family Structure, Family Attributes, and Delinquency in a Sample of Low-Income, Minority Males and Females." Journal of Youth and Adolescence 13:349-364.
- Farnworth, M., L. J. Schweinhart, and J. R. Berrueta-Clement (1985). "Preschool Intervention, School Success, and Delinquency in a High-Risk Sample of Youth." American Educational Research Journal 22:445-464.
- Farrington, D. P. (1985). "Predicting Self-Reported and Official Delinquency." In David P. Farrington and R. Tarling (eds.), Prediction In Criminology. Albany, NY: State University Press
- _____ (1986). "Age and Crime." In M. Tonry and N. Morris (eds.), Crime and Justice: An Annual Review of Research. Chicago: University of Chicago Press.
- _____ (1987). "Early Precursors of Frequent Offending." In J. Q. Wilson and G. C. Lounsbury (eds.), From Children to Citizens: Families, Schools, and Delinquency Prevention. New York, Springer-Verlag.
- _____ (1989). "Childhood Aggression and Adult Violence: Early Precursors and Later Outcomes." In K. H. Rubin and D. Pepler (eds.), The Development and Treatment of Childhood Aggression. Hillsdale, NJ: Lawrence Earlbaum.
- Farrington, D. P., G. C. Barnes, and S. Lambert (1996). "The Concentration of Offending in Families." Legal and Criminological Psychology 1, 47-63.
- Farrington, D. P., B. Gallagher, L. Morley, R. J. St. Ledger, and D. J. West (1988). "Are There Any Successful Men from Criminogenic Backgrounds?" Psychiatry 51:116-130.
- Farrington, D. P., R. Loeber, D. S. Elliott, J. D. Hawkins, D. B. Kandel, M. W. Klein, J. McCord, D. C. Rowe, and R. E. Tremblay (1990). "Advancing Knowledge About the Onset of Delinquency and Crime." In B. B. Lahey and A. E. Kazdin (eds.), Advances in Clinical Child Psychology. New York: Plenum Press.

- Farrington, D. P., R. Loeber, and W. Van Kammen (1991). "Long-Term Criminal Outcomes of Hyperactivity-Impulsivity-Attention Defecit Disorder and Conduct Problems in Childhood. In L. N. Robins and M. R. Rutter (eds.), Straight and Devious Pathways to Adulthood. New York: Cambridge University Press.
- Farrington, D. P. and D. J. West (1990). "The Cambridge Study of Delinquent Development: A Long-Term Follow-Up of 411 London Males." In H. J. Kerner and G. Kaiser (eds.), Criminality: Personality, Behavior, and Life History. Berlin, Germany: Springer.
- Felix-Ortiz, M. and M. D. Newcomb (1992). "Risk and Protective Factors for Drug Use Among Latino and White Adolescents." Hispanic Journal of Behavioral Sciences 14:291-309.
- Fergusson, D. M. and M. T. Lynskey (1996). "Adolescent Resiliency to Family Adversity." Journal of Child Psychology and Psychiatry. 3:281-292.
- Fine, G. A., J. T. Mortimer, and D. F. Roberts (1990). "Leisure, Work, and the Mass Media." In S. S. Feldman and G. R. Elliott (eds.), At the Threshold: The Developing Adolescent. Cambridge, MA: Harvard University Press.
- Fitzpatrick, K. M. (1997). "Fighting Among America's Youth: A Risk and Protective Factors Approach." Journal of Health and Social Behavior 38:131-148.
- Furstenberg, F. F., J. Brooks-Gunn, and S. P. Morgan (1987). Adolescent Mothers in Later Life. New York: Cambridge University Press.
- Gallagher, J. J. and C. T. Ramey (1987). The Malleability of Children. Baltimore, MD: Paul Brookes.
- Garnezy, N. (1970). "Process and Reactive Schizophrenia: Some Conceptions and Issues." Schizophrenia Bulletin 2:30-74.
- _____ (1971). "Vulnerability Research and the Issue of Primary Prevention." American Journal of Oorthopsychiatry 41:101-116.
- _____ (1985) Stress-Resistant Children: The Search of Protective Factors. In J. E. Stevenson (ed.), Recent Research in Developmental Psychopathology. New York: Pergamon Press.
- Garnezy, N. and A. S. Masten (1986). "Stress, Competence, and Resilience: Common Frontiers for Therapist and Psychopathologist." Behavior Therapy 17:500-521.

- Garnezy, N. and S. Streitman (1974). "Children at Risk: The Search for Antecedents to Schizophrenia. Part I: Conceptual Models and Research Methods." Schizophrenia Bulletin 8:14-90.
- Garnezy, N., A. S. Masten, and A. Tellegen (1984). "The Study of Stress and Competence in Children: A Building Block for Developmental Psychopathology." Child Development 55:97-111.
- Gendreau, P., T. Little, and C. Goggin (1996). "A Meta-Analysis of the Predictors of Adult Offender Recidivism: What Works!" Criminology 34:575-607.
- Glueck, S. and E. Glueck (1937). Later Criminal Careers. New York: The Commonwealth Fund.
- _____ (1950). Unraveling Juvenile Delinquency. New York: The Commonwealth Fund.
- _____ (1951). "Note of Plans for Further 'Unraveling' Juvenile Delinquency." Journal of Criminal Law, Criminology, and Police Science. 41:759-762.
- _____ (1959). Predicting Delinquency and Crime. Cambridge, MA: Harvard University Press.
- Gottfredson, D. C., R. J. McNeil, and G. D. Gottfredson (1991). "Social Area Influences on Delinquency: A Multilevel Analysis." Journal of Research in Crime and Delinquency 28:197-226.
- Gottfredson, M., and T. Hirschi (1987). "The Methodological Adequacy of Longitudinal Research." Criminology 25:581-614.
- _____ (1988). "Science, Public Policy, and The Career Paradigm." Criminology 26:37-55.
- _____ (1990). A General Theory of Crime. Stanford: Stanford University Press.
- Gove, W. R. (1985). "The Effect of Age and Gender on Deviant Behavior: A Biopsychosocial Perspective." In A. S. Rossi (ed.), Gender and the Life Course. New York: Aldine.
- Greenberg, D. F. (1991). "Modeling Criminal Careers." Criminology 29:17-46.
- Greenwood, P. W., K. E. Model, C. P. Rydell, and J. Chiesa (1996). Diverting Children from a Life of Crime: Measuring Costs and Benefits. Santa Monica, CA: RAND.

- Grogger, J. (1997). "Estimating the Incarceration-Related Costs of Early Childbearing." In R. Maynard (ed.), Kids Having Kids. Washington: Urban Institute Press.
- Grogger, J. and S. Bronars (1993). "The Socioeconomic Consequences of Teenage Childbearing: Findings From a Natural Experiment." Family Planning Perspectives 25:156-174.
- Grossman, F. K., J. Beinashowitz, L. Anderson, M. Sakurai, L. Finnin, and M. Flaherty (1992). "Risk and Resilience in Young Adolescents." Journal of Youth and Adolescence 21:529-550.
- Hanushek, E. A. and J. E. Jackson (1977). Statistical Methods for Social Scientists. San Diego, CA: Academic Press, Inc.
- Harter, S. (1982). "The Perceived Competence Scale for Children." Child Development 53: 87-97.
- Hawkins, J. D. and D. M. Lishner (1987). "Schooling and Delinquency." In E. H. Johnson (ed.), Handbook on Crime and Delinquency Prevention. Westport, CT: Greenwood Press.
- Hawkins, J. D., R. Catalano, and J. Miller (1992). "Risk and Protective Factors for Alcohol and Other Drug Problems in Adolescence and Early Adulthood: Implications for Substance Abuse Prevention." Psychological Bulletin 112:64-105.
- Hawkins, J. D., R. Catalano, D. Morrison, J. O'Donnell, R. Abbott, and L. E. Day (1992). The Seattle Social Development Project: Effects of the First Four Years on Protective Factors and Problem Behaviors." In J. McCord and R. Tremblay (eds.), The Prevention of Antisocial Behavior in Children. New York: Guilford Press.
- Heller, S. S., J. A. Larrieu, R. D'Imperio, and N. W. Boris (1999). "Research on Resilience to Child Maltreatment: Empirical Considerations." Child Abuse and Neglect 23:321-338.
- Henggeler, S. (1999). "Multisystemic Therapy: An Overview of Clinical Procedures, Outcomes, and Policy Implications." Child Psychology and Psychiatry Review 4:2-10.
- Hetherington, E. M., M. Cox, and R. Cox (1982). "Effects of Divorce on Parents and Children." In M. E. Lamb (ed.), Nontraditional Families: Parenting and Child Development. Hillsdale, NJ: Erlbaum.

- Hinkle, L. E. (1972). "An Estimate of the Effects of Stress on the Incidence and Prevalence of Coronary Heart Disease in a Large Industrial Population in the United States." In Proceedings of the International Society on Thrombosis and Hemostasis. West Germany: Shattaur Verlag.
- _____ (1974). "The Effect of Exposure to Culture Change, Social Change, and Changes in Interpersonal Relationships on Health." In B. S. Dohrenwend and B. P. Dohrenwend (eds.), Stressful Life Events. New York: Wiley.
- Hirschi, T. (1969). Causes of Delinquency. Berkeley: University of California Press.
- _____ (1983). "Crime and the Family." In J. Q. Wilson (ed.), Crime and Public Policy. San Francisco, CA: Institute for Contemporary Studies.
- Hirschi, T. and M. R. Gottfredson (1983). "Age and the Explanation of Crime." American Journal of Sociology 89:552-584.
- Huesmann, L. R., L. D. Eron, and P. W. Yarmel (1987). "Intellectual Functioning and Aggression." Journal of Personality and Social Psychology 52:232-240.
- Huizinga, D., F. Esbensen, and A. W. Weiher (1991). "Are There Multiple Paths to Delinquency?" The Journal of Criminal Law and Criminology 82:83-118.
- Hutchings, B. and S. A. Mednick (1974). "Registered Criminality in Adoptive and Biological Parents of Registered Male Adoptees. In S. A. Mednick, F. Schulsinger, J. Higgins, and B. Bell (eds.), Genetics, Environment, and Psychopathology. Amsterdam, Holland: Elsevier Press.
- Jang, S. J. (1999). "Age-Varying Effects of Family, School, and Peers on Delinquency: A Multilevel Modeling Test of Interactional Theory." Criminology 37:643-685.
- Jessor, R. (1992). "Risk Behavior in Adolescence: A Psychosocial Framework for Understanding Action." Journal of Adolescent Health 12:597-605.
- _____ (1993). "Successful Adolescent Development Among Youth in High-Risk Settings." American Psychologist 48:117-126.
- Jessor, R. J., J. E. Donovan, and F. M. Costa (1991). Beyond Adolescence: Problem Behavior and Young Adult Development. New York: Cambridge University Press.
- Jessor, R., J. Van Den Bos, J. Vanderryn, F. M. Costa, and M. S. Turbin (1995). "Protective Factors in Adolescent Problem Behavior: Moderator Effects and Developmental Change." Developmental Psychology 31:923-933.

- Johnson, D. L., and T. Walker (1987). "Primary Prevention of Behavior Problems in Mexican-American Children." American Journal of Community Psychology 15:375-385.
- Jouriles, E. N., C. M. Murphy, A. M. Farris, D. A. Smith, J. E. Richters, and E. Waters (1991). "Marital Adjustment, Parental Disagreements About Child Rearing, and Behavior Problems in Boys: Increasing the Specificity of the Marital Assessment." Child Development 62:1424-1433.
- Kagan, J. and H. A. Moss (1962). Birth to Maturity. New York: Wiley.
- Kandel, E., S. A. Mednick, L. Sorenson-Kirkegaard, B. Hutchings, J. Knop, R. Rosenberg, and F. Schulsinger (1988). IQ as a Protective Factor for Subjects at High Risk for Antisocial Behavior." Journal of Consulting and Clinical Psychology 56:224-226.
- Kaufman, J., A. Cook, L. Army, B. Jones, and T. Pittinsky (1994). "Problems Defining Resiliency: Illustrations from the Study of Maltreated Children." Development and Psychopathology 6:215-229.
- Kellam, S., S. E. Ensminger, R. R. Turner (1977). "Family Structure and the Mental Health of Children." Archives of General Psychiatry 34:1012-1022.
- Kimchi, J. and B. Schaffner (1990). "Childhood Protective Factors and Stress Risk." In L. E. Arnold (ed.), Childhood Stress. New York: Wiley.
- Kinard, E. M. (1998). "Methodological Issues in Assessing Resilience in Maltreated Children." Child Abuse and Neglect 22:669-680.
- Kolvin, T., F. J. Miller, M. Fleeting, and P. A. Kolvin (1988a). "Risk/Protective Factors for Offending with Particular Reference to Deprivation." In M. Rutter (ed.), Studies of Psychosocial Risk: The Power of Longitudinal Data. New York: Cambridge University Press.
- Kolvin, T., F. J. Miller, M. Fleeting, and P. A. Kolvin (1988b). "Social and Parenting Factors Affecting Criminal-Offense Rates: Findings From the Newcastle Thousand Family Study." British Journal of Psychiatry 152:80-90.
- Lally, R. J., P. L. Mangione, and A. S. Honig (1988). "The Syracuse University Family Development Research Program: Long-Range Impact on an Early Intervention with Low-Income Children and their Families." In D. Powell (ed.), Parent Education as Early Childhood Intervention: Emerging Directions in Theory, Research and Practice. Norwood, NJ: Ablex.

- Larzelere, R. and G. R. Patterson (1990). "Parental Management: Mediator of the Affect of Socioeconomic Status on Early Delinquency." Criminology 28:301-323.
- Laub, J. H., and R. J. Sampson (1988). "Unraveling Families and Delinquency: A Reanalysis of the Gluecks' Data." Criminology 26:355-380.
- _____ (1991). "The Sutherland-Glueck Debate: On the Sociology of Criminological Knowledge." American Journal of Sociology 96:1402-1440.
- Laub, J. H., R. J. Sampson, and K. Kiger (1990). "Assessing the Potential of Secondary Data Analysis: A New Look at the Gluecks' Unraveling Juvenile Delinquency Data." In Kimberly Kempf (ed.), Measurement Issues in Criminology. New York: Springer-Verlag.
- Le Blanc, M. and M. Fréchette (1989). Male Criminal Activity From Childhood Through Youth: Multilevel and Developmental Perspectives. New York: Springer.
- Le Blanc, M. and R. Loeber (1993). "Precursors, Causes, and the Development of Offending." In D. F. Hay and A. Angold (eds.), Precursors and Causes in Development and Psychopathology. London, England: Wiley.
- _____ (1998). "Developmental Criminology Updated." In M. Tonry (ed.), Crime and Justice: A Review of Research. Chicago, IL: University of Chicago Press.
- Lemert, E. M. (1972). Human Deviance, Social Problems, and Social Control (2nd Edition). Englewood Cliffs, NJ: Prentice-Hall.
- Lempers, J. D., D. Clark-Lempers, and R. L. Simons (1989). "Economic Hardship, Parenting, and Distress in Adolescence." Child Development 60:25-39.
- Lewis, J. M. and J. G. Looney (1983). The Long Struggle: Well-Functioning Working Class Black Families. New York: Brunner and Mazel.
- Lipsey, M. W. and J. H. Derzon (1998). "Predictors of Violent or Serious Delinquency in Adolescence and Early Adulthood." In R. Loeber and D. P. Farrington (eds.), Serious and Violent Juvenile Offenders: Risk Factors and Successful Interventions. Thousand Oaks, CA: Sage.
- Loeber, R. (1982). "The Stability of Antisocial and Delinquent Child Behavior: A Review." Child Development 53:1431-1446.

- _____ (1990). "Disruptive and Antisocial Behavior in Childhood and Adolescence: Development and Risk Factors." In K. Hurrelmann and F. Lösel (eds.), Health Hazards in Adolescence. New York: De Gruyter.
- Loeber, R. and T. Dishion (1983). "Early Predictors of Male Delinquency: A Review." Psychological Bulletin 94:68-99.
- _____ (1985). "Contributions of Families and Peers to Delinquency." Criminology 23:63-79.
- Loeber, R. and M. Le Blanc (1990). "Toward a Developmental Criminology." In N. Morris and M. Tonry (eds.), Crime and Justice: An Annual Review of Research. Chicago: University of Chicago Press.
- Loeber, R. and M. Stouthamer-Loeber (1986). "Family Factors as Correlates and Predictors of Juvenile Conduct Problems and Delinquency." In M. Tonry and N. Morris (eds.), Crime and Justice: An Annual Review of Research (Volume 7). Chicago: University of Chicago Press.
- _____ (1987). "Prediction." In H. C. Quay (ed.), Handbook of Juvenile Delinquency. New York: Wiley.
- _____ (1996). "The Development of Offending." Criminal Justice and Behavior 23:12-24.
- Loeber, R., M. Stouthamer-Loeber, W. Van Kammen, and D. P. Farrington (1991). "Initiation, Escalation, and Desistance in Juvenile Offending and Their Correlates." Journal of Criminal Law and Criminology 82:36-82.
- Long, J. V. and G. E. Vaillant (1984). "Natural History of Male Psychological Health: Escape From the Underclass." American Journal of Psychiatry 141:341-346.
- Lösel, F. (1994). "Protective Effects of Social Resources in Adolescents at High Risk for Antisocial Behavior." In E. G. M. Weitekamp and H. Kerner (eds.), Cross-National Longitudinal Research on Human Development and Criminal Behavior. Boston: Kluwer Academic Publishers.
- Lösel, F. and T. Bliesener (1990). "Resilience in Adolescence: A Study on the Generalizability of Protective Factors." In K. Hurrelmann and F. Lösel (eds.), Health Hazards in Adolescence. Berlin, Germany: Walter de Gruyter and Co.

- _____ (1994). "Some High-Risk Adolescents Do Not Develop Conduct Problems: A Study of Protective Factors." International Journal of Behavioral Development 17:753-777.
- Luthar, S. S. (1991). "Vulnerability and Resilience: A Study of High-Risk Adolescents." Child Development 62:600-616.
- _____ (1993). "Methodological and Conceptual Issues In Research On Childhood Resilience." Journal of Child Psychology and Psychiatry 34:441-453.
- Luthar, S. S. and E. Zigler (1991). "Vulnerability and Competence: A Review of Research on Resilience in Childhood." American Journal of Orthopsychiatry 61:6-22.
- Luthar, S. S., C. H. Doernberger, and E. Zigler (1993). "Resilience is not a Unidimensional Construct: Insights from a Prospective Study of Inner-City Adolescents." Development and Psychopathology 5:703-717.
- Magnusson, D. (1988). Individual Development From an Interactional Perspective. Hillsdale, NJ: Erlbaum.
- Masten, A. S. (1989). "Resilience in Development: Implications of the Study of Successful Adaptation for Developmental Psychopathology." In D. Cicchetti (ed.), The Emergence of a Discipline: Rochester Symposium on Developmental Psychopathology (Volume 1). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Masten, A. S. and L. Braswell (1991). "Developmental Psychopathology: An Integrative Framework for Understanding Behavior Problems in Children and Adolescents." In P. R. Martin (ed.), Handbook of Behavior Therapy and Psychological Science: An Integrative Approach. New York: Pergamon Press.
- Masten A. S. and N. Garmezy (1985). "Risk, Vulnerability, and Protective Factors in Developmental Psychopathology." In B. B. Lahey and A. E. Kazdin (eds.), Advances in Clinical Child Psychology. New York: Plenum Press.
- Masten, A. S., K. M. Best, and N. Garmezy (1990). "Resilience and Development: Contributions From the Study of Children Who Overcome Adversity." Development and Psychopathology 2:425-444.
- Matsueda, R. and K. Anderson (1998). "The Dynamics of Delinquent Peers and Delinquent Behavior." Criminology 36:269-308

- Matsueda, R. and K. Heimer (1987). "Race, Family Structure, and Delinquency: A Test of Differential Association and Control Theories." American Sociological Review 52:826-840.
- Maughan, B. (1988). "School Experiences as Risk/Protective Factors." In Michael Rutter (ed.), Studies of Psychosocial Risk: The Power of Longitudinal Data. New York: Cambridge University Press.
- Mazerolle, P. (1997). "Delinquent Definition and Participation Age: Assessing the Invariance Hypothesis." Studies on Crime and Crime Prevention 6:151-168.
- McCord, J. (1979). "Some Child-Rearing Antecedents of Criminal Behavior in Adult Men." Journal of Personality and Social Psychology 37:1477-1486.
- McGee, R., P. A. Silva, and S. Williams (1984). "Perinatal, Neurological, Environmental, and Developmental Characteristics of Seven-Year-Old Children With Stable Behavioral Problems." Journal of Child Psychology and Psychiatry 25:573-586.
- McGee, R., S. Williams, D. L. Share, J. Anderson, and P. A. Silva (1986). "The Relationship Between Specific Reading Retardation, General Reading Backwardness, and Behavioural Problems in a Large Sample of Dunedin Boys: A Longitudinal Study From 5 to 11 Years." Journal of Child Psychology and Psychiatry 27:597-610.
- McLoyd, V. C. (1990). "The Impact of Economic Hardship on Black Families and Children: Psychological Distress, Parenting, and Socioemotional Development." Child Development 61:311-346.
- Mednick, S. A., P. Brennan, and E. Kandel (1988). "Predisposition to Violence." Aggressive Behavior 14:25-33.
- Mednick, S. A., T. E. Moffitt, and S. A. Stack (1989). The Causes of Crime: New Biological Approaches. Cambridge: Cambridge University Press.
- Merton, R. K. (1938). "Social Structure and Anomie." American Sociological Review 3:672-682.
- Milberger, S., J. Biederman, S. V. Faraone, L. Chen, and J. Jones (1996). "Is Maternal Smoking During Pregnancy a Risk Factor for Attention Defecit Hyperactivity Disorder in Children." American Journal of Psychiatry 153: 1138-1142.
- Moffitt, T. E. (1990). "Juvenile Delinquency and Attention Deficit Disorder: Boys' Developmental Trajectories from Age 3 to Age 15." Child Development 61: 893-910.

- _____ (1993). "'Life-Course-Persistent' and 'Adolescent-Limited' Antisocial Behavior: A Developmental Taxonomy." Psychological Review 100:674-701.
- _____ (1997). "Adolescence-Limited and Life-Course-Persistent Offending: A Complementary Pair of Developmental Theories." In T. Thornberry (ed.), Advances in Criminological Theory: Developmental Theories of Crime and Delinquency. New Brunswick, NJ: Transaction.
- Moffitt, T. E. and P. A. Silva (1988). "IQ and Delinquency: A Direct Test of the Differential Detection Hypothesis." Journal of Abnormal Psychology 97:330-333.
- Moffitt, T. E., D. R. Lynam, and P. A. Silva (1994). "Neuropsychological Tests Predicting Persistent Male Delinquency." Criminology 32:277-300.
- Moore, K. A. (1986). Children of Teen Parents: Heterogeneity of Outcomes. Final Report to the Center for Population Research, National Institute of Child Health and Human Development, Department of Health and Human Services.
- Morash, M. and L. Rucker (1989). "An Exploratory Study of the Connection of Mother's Age at Childbearing to Her Children's Delinquency in Four Data Sets." Crime and Delinquency 35: 45-93.
- Mungas, D. (1983). "An Empirical Analysis of Specific Syndromes of Violent Behavior." Journal of Nervous and Mental Disease. (171: 354-361.
- Nagin, D. S., and D. P. Farrington (1992). "The Onset and Persistence of Offending." Criminology 30: 501-523.
- Nagin, D. S., and K. C. Land (1993). "Age, Criminal Careers, and Population Heterogeneity: Specification and Estimation of a Nonparametric, Mixed Poisson Model." Criminology 31:327-362.
- Nagin, D. S., and D. A. Smith (1990). "Participation in and Frequency of Delinquent Behavior: A Test for Structural Differences." Journal of Quantitative Criminology 6:335-356.
- Nagin, D. S., D. P. Farrington, and G. Pogarsky (1997). "Adolescent Mothers and the Criminal Behavior of Their Children." Law and Society Review 31:137-162.
- Needleman, H.L. and D. B. Bellinger (1981). "The Epidemiology of Low-Level Lead Exposure in Childhood." Journal of the American Academy of Child Psychiatry 20:496-512.

- Neighbors, B., R. Forehand, and D. McVicar (1993). "Resilient Adolescents and Interparental Conflict." American Journal of Orthopsychiatry 63:462-471.
- Newcomb, M. D., E. Maddahian, and P. M. Bentler (1986). "Risk Factors for Drug Use Among Adolescents: Concurrent and Longitudinal Analyses." American Journal of Public Health 76: 525-531.
- Office of Juvenile Justice and Delinquency Prevention (1993). Comprehensive Strategy for Serious, Violent, and Chronic Juvenile Offenders: Program Summary. Washington, DC: U.S. Government Printing Office.
- Osgood, D. W., and D. C. Rowe (1994). "Bridging Criminal Careers, Theory, and Policy Through Latent Variable Models of Individual Offending." Criminology 32:517-554.
- Passino, A. W., T. L. Whitman, J. G. Borkowski, C. J. Schellenbach, S. E. Maxwell, D. Keogh, and E. Rellinger (1993). "Personal Adjustment During Pregnancy and Adolescent Parenting." Adolescence 28:97-122.
- Paternoster, R., R. Brame, P. Mazerolle, and A. Piquero (1998). "Using the Correct Statistical Test for the Equality of Regression Coefficients." Criminology 36:859-866.
- Patterson, G. R. (1980). "Children Who Steal." In T. Hirschi and M. Gottfredson (eds.), Understanding Crime: Current History and Research. Beverly Hills, CA: Sage.
- Patterson G. R. and M. Stouthamer-Loeber (1984). "The Correlation of Family Management Practices and Delinquency." Child Development 55:1299-1307.
- Patterson, G. R. and K. Yoerger (1993). "Developmental Models for Delinquent Behavior." In S. Hodgins (ed.), Mental Disorder and Crime. Newbury Park: Sage.
- Pavenstedt, E. (1965). "A Comparison of the Child Rearing Environment of Upper-Lower and Very Low-Lower Class Families." American Journal of Orthopsychiatry, 35:89-98.
- Pearlin, L. I. and C. Schooler (1979). "The Structure of Coping." Journal of Health and Social Behavior 19:2-21.
- Peebles, F. and R. Loeber (1994). "Do Individual Factors and Neighborhood Context Explain Ethnic Differences in Juvenile Delinquency." Journal of Quantitative Criminology 10:141-157.

- Pulkkinen, L. (1988). "Delinquent Development: Theoretical and Empirical Considerations." In Michael Rutter (ed.), Studies of Psychosocial Risk: The Power of Longitudinal Data. New York: Cambridge University Press.
- Radke-Yarrow M. and E. Brown (1993). "Resilience and Vulnerability in Children of Multiple-Risk Families." Development and Psychopathology 5:581-592.
- Radloff, L. S. (1977). "The CES-D Scale: A Self-Report Depression Scale for Research in the General Population." Applied Psychological Measurement 1:385-401.
- Rae-Grant, N., H. Thomas, D. R. Offord, and M. H. Boyle (1989). "Risk, Protective Factors, and Prevalence of Behavioral and Emotional Disorders in Children and Adolescents." Journal of the American Academy of Child and Adolescent Psychiatry 28:262-268.
- Rankin, J. H. (1983). "The Family Context of Delinquency." Social Problems 30:466-479.
- Rantakallio, P., E. Läärä, M. Isohanni, and I. Moilanen (1992). "Maternal Smoking During Pregnancy and Delinquency of the Offspring: An Association Without Causation?" International Journal of Epidemiology 21: 1106-1113.
- Räsänen, P., H. Hakko, M. Isohanni, S. Hodgins, M. Järvelin, and J. Tiihonen (1999). "Maternal Smoking During Pregnancy and Risk of Criminal Behavior Among Adult Male Offspring in the Northern Finland 1966 Birth Cohort." American Journal of Psychiatry 156: 857-862.
- Reckless, W. C. and S. Dinitz (1967). "Pioneering with Self-Concept as a Vulnerability Factor in Delinquency." Journal of Criminal Law, Criminology and Police Science 58:515-523.
- Reckless, W. C., S. Dinitz, and B. Kay (1957). "The Self Component in Potential Delinquency and Potential Non-Delinquency." American Sociological Review 22:566-570.
- Reckless, W. C., S. Dinitz, and E. Murray (1956). "Self Concept as an Insulator Against Delinquency." American Sociological Review 21:744-746.
- Reynolds, A. J. (1998). "Resilience Among Black Urban Youth: Prevalence, Intervention Effects, and Mechanisms of Influence." American Journal of Orthopsychiatry 68:84-100.

- Richters, J. and S. Weintraub (1990). "Beyond Diathesis: Toward an Understanding of High-Risk Environments." In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, and S. Weintraub (eds.), Risk and Protective Factors in the Development of Psychopathology. New York: Cambridge University Press.
- Robins, L. N. (1978). "Sturdy Childhood Predictors of Adult Antisocial Behavior: Replications From Longitudinal Studies." Psychological Medicine 8:611-622.
- Robins, L. N., P. West, and B. Herjanic (1975). "Arrests and Delinquency in Two Generations: A Study of Black Urban Families and Their Children." Journal of Child Psychology and Psychiatry 16:125-140.
- Rosen, L. (1985). "Family and Delinquency: Structure or Function." Criminology 23:553-573.
- Rosenberg, M. (1965). Society and the Adolescent Self-Image. Princeton: Princeton University Press.
- Rowe, D. C., D. W. Osgood, and W. A. Nicewander (1990). "A Latent Trait Approach to Unifying Criminal Careers." Criminology 28:237-270.
- Rutter, M. (1971). "Parent-Child Separation: Psychological Effects on the Children." Journal of Child Psychology and Psychiatry 12:233-260.
- _____ (1977). "Family, Area, and School Influences in the Genesis of Conduct Disorders." In L. A. Hersov and D. Schaffer (eds.), Aggression and Antisocial Behaviour in Childhood and Adolescence. New York: Pergamon Press.
- _____ (1979) Protective Factors in Children's Responses to Stress and Disadvantage. In M.W. Kent and J. Rolf (eds.), Primary Prevention of Psychopathology, Vol III: Social Competence in Children. Hanover, NH: University Press of New England.
- _____ (1985). "Family and School Influences on Cognitive Development." Journal of Child Psychology and Psychiatry 26: 683-704.
- _____ (1987). "Psychosocial Resilience and Protective Mechanisms." American Journal of Orthopsychiatry 57:316-331.
- _____ (1990). "Psychological Resilience and Protective Mechanisms." In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, and S. Weintraub (eds.), Risk and Protective Factors in the Development of Psychopathology. New York: Cambridge University Press.

- _____ (1993). "Resilience: Some Conceptual Considerations." Journal of Adolescent Health 14: 626-631.
- Rutter M. and H. Giller (1983). "Protective Factors." In Juvenile Delinquency: Trends and Perspectives. New York: Guilford.
- Rutter, M. and D. Quinton (1984). "Long Term Follow-Up of Women Institutionalized in Childhood: Factors Promoting Good Functioning in Adult Life." British Journal of Developmental Psychology 18: 225-234.
- Rutter, M., B. Maughan, P. Mortimore, and J. Ouston (1979). Fifteen Thousand Hours: Secondary Schools and Their Effects on Children. Cambridge, MA: Harvard University Press.
- Sameroff A. J., and R. Seifer (1990). "Early Contributors to Developmental Risk." In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, and S. Weintraub (eds.), Risk and Protective Factors in the Development of Psychopathology. New York: Cambridge University Press.
- Sampson, R. J. (1986). "Crime in Cities: The Effects of Formal and Informal Social Control." In A. J. Reiss and M. Tonry (eds.), Communities and Crime. Chicago: University of Chicago Press.
- Sampson, R. J. and W. B. Groves (1989). "Community Structure and Crime: Testing Social Disorganization Theory." American Journal of Sociology 94:774-802.
- Sampson, R. J. and J. H. Laub (1993). Crime in the Making: Pathways and Turning Points Through Life. Cambridge, MA: Harvard University Press.
- _____ (1994). "Urban Poverty and the Family Context of Delinquency: A New Look at Structure and Process in a Classic Study." Child Development 65:523-540.
- Sampson, R. J., S. W. Raudenbush, and F. Earls (1997). "Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy." Science 277:918-924.
- Schonfeld, I. S., D. Schaffer, P. O'Connor, and S. Portnoy (1988). "Conduct Disorder and Cognitive Functioning: Testing Three Causal Hypotheses." Child Development 59:993-1007.
- Schuerman, L. and S. Kobrin (1986). "Community Careers in Crime." In A. J. Reiss and M. Tonry (eds.), Crime and Justice: An Annual Review: Volume 8. Communities and Crime. Chicago: University of Chicago Press.

- Schwab-Stone, M. E., T. S. Ayers, W. Kaspro, C. Voyce, C. Barone, T. Shriver, and R. P. Weissberg (1995). "No Safe Haven: A Study of Violence Exposure in an Urban Community." Journal of the American Academy of Child and Adolescent Psychiatry 34:1643-1352.
- Schweinhart, L. J., H. V. Barnes, and D. P. Weikart (1993). Significant Benefits: The High/Scope Perry Preschool Study Through Age 27. Ypsilanti, MI: High/Scope Press.
- Seifer, R., A. J. Sameroff, C. P. Baldwin, and A. Baldwin (1992). "Child and Family Factors that Ameliorate Risk Between 4 and 13 Years of Age." Journal of the American Academy of Child and Adolescent Psychiatry 31:893-903.
- Seitz, V., L. K. Rosenbaum, and N. H. Apfel (1985). "Effects of Family Support Intervention: A Ten Year Follow-Up." Child Development 56:376-391.
- Shaw, C. R. and H. D. McKay (1942). Juvenile Delinquency and Urban Areas. Chicago: University of Chicago Press.
- Shaw, D. S., E. B. Owens, J. I. Vondra, K. Keenan, and E. B. Winslow (1996). "Early Risk Factors and Pathways in the Development of Early Disruptive Behavior Problems." Development and Psychopathology 8:679-699.
- Shaw, D. S., J. I. Vondra, D. Hommerding, K. Keenan, and M. Dunn (1994). "Chronic Family Adversity and Early Child Behavior Problems: A Longitudinal Study of Low Income Families." Journal of Child Psychology and Psychiatry 35:1109-1122.
- Simcha-Fagan, O. and J. E. Schwartz (1986). "Neighborhood and Delinquency: An Assessment of Contextual Effects." Criminology 24:667-703.
- Simons, R. L., C. Wu, R. D. Conger, and F. O. Lorenz (1994). "Two Routes to Delinquency: Differences Between Early and Late Starters in the Impact of Parenting and Delinquency Peers." Criminology 32:247-275.
- Smith, C., A. J. Lizotte, T. P. Thornberry, and M. D. Krohn (1995). "Resilient Youth: Identifying Factors that Prevent High-Risk Youth from Engaging in Delinquency and Drug Use." In Z. S. Blau and J. Hagan (eds.), Current Perspectives on Aging and the Life Cycle. Greenwich, CT: Jai Press.
- Smith, D. A. and R. Brame (1994). "On the Initiation and Continuation of Delinquency." Criminology 32: 607-629.

- Smith, D. A. and R. Paternoster (1987). "The Gender Gap in Theories of Deviance: Issues and Evidence." Journal of Research in Crime and Delinquency 24:140-172.
- Snyder, J. and G. R. Patterson (1987). "Family Interaction and Delinquent Behavior." In H. C. Quay (ed.), Handbook of Juvenile Delinquency. New York: John Wiley and Sons.
- Sroufe, L. A., and M. Rutter (1984). "The Domain of Developmental Psychopathology." Child Development 48:1184-1199.
- Steinberg, L. (1985). "Early Temperamental Antecedents of Adult Type A Behaviors." Developmental Psychology 22:1171-1180.
- Stouthamer-Loeber, M., R. Loeber, D. P. Farrington, Q. Zhang, W. Van Kammen, and E. Maguin (1993). "The Double Edge of Protective and Risk Factors for Delinquency: Interrelations and Developmental Patterns." Development and Psychopathology 5:683-701.
- Sutherland, E. H. (1937). "Review of the Glueck's Later Criminal Careers." Harvard Law Review 51:184-186.
- Sutherland, E. H., D. R. Cressey, and D. F. Luckenbill (1992). Principles of Criminology. Dix Hills, NY: General Hall.
- Thomas, A., and S. Chess (1984). "Genesis and Evolution of Behavioral Disorders: From Infancy to Early Adult Life." American Journal of Psychiatry 141:1-9.
- _____ (1986). "The New York Longitudinal Study: From Infancy to Early Adult Life." In R. Plomin and J. Dunn (eds.), The Study of Temperament: Changes, Continuities, and Challenges. Hillsdale, NJ: Erlbaum.
- Thornberry, T. P. (1987). "Toward an Interactional Theory of Delinquency." Criminology 25:863-891.
- _____ (1997). Advances in Criminological Theory: Developmental Theories of Crime and Delinquency. New Brunswick, NJ: Transaction.
- Thornberry, T. P., A. J. Lizotte, M. D. Krohn, M. Farnworth, and S. J. Jang (1994). "Delinquent Peers, Beliefs, and Delinquent Behavior: A Longitudinal Test of Interactional Theory." Criminology 32:47-83.
- Tibbetts, S. G. and A. R. Piquero (1999). "The Influence of Gender, Low Birth Weight, and Disadvantaged Environment in Predicting Early Onset of Offending: A Test of Moffitt's Interactional Hypothesis." Criminology 37:843-877.

- Tiet, Q. Q., H. R. Bird, M. Davies, C. Hoven, P. Cohen, P. S. Jensen, and S. Goodman (1998). "Adverse Life Events and Resilience." Journal of the American Academy of Child and Adolescent Psychiatry 37: 1191-1201.
- Tracy, P. E., M. E. Wolfgang, and R. M. Figlio (1990). Delinquency Carers in Two Birth Cohorts. New York: Plenum Press.
- Tress, W., G. Reister, and L. Gegenheimer (1990). "Mental Health in Spite of Stressful Childhood." In M. Bambring, F. Lösel, and H. Skowronek (eds.), Children at Risk: Assessment and Longitudinal Research. New York: De Gruyter.
- Tremblay, R. E., R. Loeber, C. Gagnon, P. Charlebois, S. Larivée, and M. Le Blanc (1991). "Disruptive Boys with Stable and Unstable High Fighting Behavior During Junior Elementary School." Journal of Abnormal Child Psychology 19:285-300.
- Van der Wolf, J. C. (1988). "School Effects: The Use of Planned Intervention to Study Causal Processes." In Michael Rutter (ed.), Studies of Psychosocial Risk: The Power of Longitudinal Data. New York: Cambridge University Press.
- Van Voorhis, P., F. T. Cullen, R. A. Mathers, and C. C. Garner (1988). "The Impact of Family Structure and Quality on Delinquency: A Comparative Assessment of Structural and Functional Factors." Criminology 26:235-261.
- Wakschlag, L. S., B. B. Lahey, R. Loeber, S. M. Green, R. A. Gordon, and B. L. Leventhal (1997). "Maternal Smoking During Pregnancy and the Risk of Conduct Disorder in Boys." Archives of General Psychiatry 54: 670-676.
- Ward, D. A. and C. R. Tittle (1994). "IQ and Delinquency: A Test of Two Competing Explanations." Journal of Quantitative Criminology 10:189-212.
- Warr, M. (1993). "Age, Peers, and Delinquency." Criminology 31:17-40.
- Warr, M. and M. Stafford (1991). "The Influence of Delinquent Peers: What They Think or What They Do?" Criminology 29:851-866.
- Weinraub, M. and B. Wolf (1983). "Effects of Stress and Social Supports on Mother-Child Interactions in Single and Two-Parent Families." Child Development 54:1297-1311.
- Wells L. E. and J. H. Rankin (1991). "Families and Delinquency: A Meta-Analysis of the Impact of Broken Homes." Social Problems 38:71-93.
- Werner, E. E. (1982). "Resilient Children." Young Children 10:68-72.

- _____ (1985). "Stress and Protective Factors in Children's Lives." In A. R. Nichol (ed.), Longitudinal Studies in Child Psychology and Psychiatry. New York: John Wiley and Sons.
- _____ (1987). "Vulnerability and Resiliency in Children at Risk for Delinquency: A Longitudinal Study from Birth to Adulthood." In J. D. Burchard and S. N. Burchard (eds.), Primary Prevention of Psychopathology: Volume 10. Prevention of Delinquent Behavior. Newbury Park, CA: Sage.
- _____ (1989a). "High-Risk Children in Young Adulthood: A Longitudinal Study From Birth to 32 Years." American Journal of Orthopsychiatry 59:72-81.
- _____ (1989b). "Vulnerability and Resiliency: A Longitudinal Perspective." In M. Brambring, F. Lösel, and H. Skowronek (eds.), Children at Risk: Assessment, Longitudinal Research, and Intervention. New York: Walter de Gruyter and Co.
- _____ (1990). "Protective Factors and Individual Resilience." In S. J. Meisel and J. Shonkoff (eds.), Handbook of Early Intervention. New York: Cambridge University Press.
- _____ (1993). "Risk, Resilience, and Recovery: Perspectives from the Kauai Longitudinal Study." Development and Psychopathology 5: 503-515.
- Werner, E. E. and R. S. Smith (1982) Vulnerable but Invincible: A Study of Resilient Children. New York: McGraw-Hill Book Company.
- _____ (1992). Overcoming the Odds: High Risk Children from Birth to Adulthood. Ithaca, NY: Cornell University Press.
- West, D. J. and D. P. Farrington (1973). Who Becomes Delinquent? London, England: Heinemann.
- White, J. L., T. E. Moffitt, and P. A. Silva (1989). A Prospective Replication of Protective Effects of IQ in Subjects at High Risk for Juvenile Delinquency." Journal of Consulting and Clinical Psychology 57:719-724.
- White, J. L., T. E. Moffitt, F. Earls, L. N. Robins, and P. A. Silva (1990). "How Early Can We Tell? Predictors of Childhood Conduct Disorder and Delinquency." Criminology 28:507-533.
- Wikstroem, P. O. H. (1987). "Age and Crime in a Stockholm Cohort." Journal of Quantitative Criminology 6:61-84.

- Wills, T. A., D. Vaccaro, and G. McNamara (1992). "The Role of Life Events, Family Support, and Competence in Adolescent Substance Use: A Test of Vulnerability and Protective Factors." American Journal of Community Psychology 20:349-374.
- Wilson, J. Q. (1975). Thinking About Crime. New York: Basic Books.
- Wilson, J. Q., and R. Herrnstein (1985). Crime and Human Nature. New York: Simon and Schuster.
- Wilson, W. J. (1987). The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy. Chicago: Chicago University Press.
- Wolfgang, M. E., R. M. Figlio, and T. Sellin (1972). Delinquency in a Birth Cohort. Chicago: University of Chicago Press.
- Wolfgang, M., T. P. Thornberry, and R. M. Figlio (1987). From Boy to Man, From Delinquency to Crime. Chicago: University of Chicago Press.
- Zahn-Waxler, C., A. Mayfield, M. Radke-Yarrow, D. McKnew, I. Cytryn, and Y. Davenport (1988). "A Follow-Up Investigation of Offspring of Bipolar Parents." American Journal of Psychiatry 145-506-509.
- Zill, N. and J. L. Peterson (1986). Behavior Problems Index. Washington, DC: Child Trends, Inc.